INVITATION TO BID

REQUEST FOR BID DESCRIPTION:
APPOINTMENT OF ELECTRICAL CONTRACTOR FOR SUPPLY, INSTALLATION AND COMMISSIONING OF STEP UP AND STEP-DOWN TRANSFORMER INTEGRATED WITH THE DIESEL GENERATOR

TABLE OF CONTENTS

NOTE:
Kindly register on the National Treasury's Central Supplier Database (CSD) via www.csd.gov.za

Bids must ONLY be submitted in hard copy; electronic bid submissions are NOT acceptable.

RETURNABLE DOCUMENTS CHECKLIST

Bidders are required to develop a returnable schedule annexure in accordance with the following table of contents

	List of documents required.	**Submitted [Yes or No}**	
1.	Central Supplier database (CSD) registration report or Unique Registration Reference Number	Yes ☐	No ☐
2.	Valid Tax Clearance Certificate (s) and or proof of application endorsed by SARS and / or SARS issued verification pin code.	Yes ☐	No ☐
3.	Copies of bidders CIPC Company registration documents listing all members with percentage, See bidding structure for required documents.	Yes ☐	No ☐
4.	Copy of the Joint Venture / Consortium Agreement duly signed by all parties	Yes ☐	No ☐
5.	Copy of the Sub-Contracting Agreement duly signed by all parties	Yes ☐	No ☐
6.	Valid proof of BBBEE status for the bidder and its sub-contractor(s)	Yes ☐	No ☐
7.	Designated sectors: Local production and content. **(Where applicable)**	Yes ☐	No ☐
8.	Originally certified copy of Identity Document for the Company representative	Yes ☐	No ☐
9.	Copy of latest audited financial statements	Yes ☐	No ☐
10.	Bid conditions acceptance form on KD17 **(Mandatory)**	Yes ☐	No ☐

ARMAMENTS CORPORATION OF SOUTH AFRICA SOC LTD (ARMSCOR)

Company registration: 1968/008611/06 Vat registration: 4500101169

REQUEST FOR BID: EFAC/2023/07

1. INSTRUCTIONS ON SUBMISSION OF BIDS

1.1 Bid Closing at **11:00 am** on **06 October 2023 (SOUTH AFRICAN TIME)**

1.2 Bids must be submitted in a sealed envelope marked with this bid reference number.

1.3 The sealed envelope must be deposited in the bid box at Armscor Head Office, Visitors Entrance (Block) 8 before the bid closing date and time addressed to:

The Manager:	Supply Chain Management Department Armscor SOC Ltd
Postal address:	Armscor SOC Ltd Private Bag X337 Pretoria 0001
Delivery address:	Armscor Head Office 370 Nossob Street Erasmuskloof Ext 4 Pretoria

1.4 Bids dispatched by the courier service Company must be marked with bid reference number on the delivery note / packaging and the courier must ensure that the bid document is deposited in the bid box before the closing date and time. **Armscor will not be held responsible for any delays where bid documents are handed to the Armscor Reception.**

1.5. Bid proposals received after the closing time and date will not be considered.

2. ENQUIRIES

2.1 All queries regarding this bid must be addressed in writing to SCM Department on aopts@armscor.co.za. Questions/enquiries relating to this RFB should be received three working days prior to the closing date. Queries received after this period will not be entertained.

3. BID VALIDITY PERIOD

Bid proposals to remain valid for acceptance for a period of **ONE HUNDRED AND TWENTY** days counted from the closing date.

NOTE: Bids for the supply of the goods and/or services described in the attached documents are invited in accordance with the provisions of the General Conditions of Contract (A-STD-0020) Issue 5 dated 22 June 2022 as well as any special condition contained in these documents. Copies of the General Conditions of Contract and the Rules of Procedure are available on Armscor's website at www.armscor.co.za.

BIDDING STRUCTURE

Indicate the type of bidding structure by marking with an 'X' in an appropriate box.	
Individual Bidder	
Joint Venture	
Consortium	
Using Sub-contractors	
Other	

Only fill the relevant category:

If individual bidder, indicate the following:	
Name of Bidder	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	

NB: Submit with the bid the following documents:
Copies of the bidder's CIPC company registration documents listing all members with percentages, in case of a CC.
In case of Individual Bidder supply ID document for local and if foreigner supply passport number or identification as applicable in that country
Latest copies of all share certificates, in case of a company or any other form of a legal entity.
Shareholding breakdown per race, gender and percentage shareholding with shareholders of the bidding entity.

If Joint Venture or Consortium, indicate the following: (To be completed for each JV/Consortium member)	
Name of Joint Venture / Consortium	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	
NB: Submit with the bid the following documents:	
Copies of the bidder's CIPC company registration documents listing all members with percentages, in case of a CC.	
In case of Individual Bidder supply ID document for local and if foreigner supply passport number or identification as applicable in that country	
Latest copies of all share certificates, in case of a company or any other form of a legal entity.	
Shareholding breakdown per race, gender and percentage shareholding with shareholders of the bidding entity.	

If Joint Venture or Consortium, indicate the following:	
Name of Prime Contractor	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	
NB: Submit with the bid the following documents:	
Copies of the bidder's CIPC company registration documents listing all members with percentages, in case of a CC.	
In case of Individual Bidder supply ID document for local and if foreigner supply passport number or identification as applicable in that country	
Latest copies of all share certificates, in case of a company or any other form of a legal entity.	
Shareholding breakdown per race, gender and percentage shareholding with shareholders of the bidding entity.	

If using subcontractors, indicate the following:	
Name of Prime -Contractor	
Percentage Value to be subcontracted	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	
Subcontractor Details:	
Name of Subcontractor	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	

NB: Submit with the bid the following documents for both Prime and Sub-Contractors:
Copies of the bidder's CIPC company registration documents listing all members with percentages, in case of a CC.
In case of Individual Bidder supply ID document for local and if foreigner supply passport number or identification as applicable in that country
Latest copies of all share certificates, in case of a company or any other form of a legal entity.
Shareholding breakdown per race, gender and percentage shareholding with shareholders of the bidding entity.

Other:	
Name of Bidder	
Company / Close Corporation Registration Number	
VAT Registration Number	
National Treasury Supplier Number	
Unique Registration Reference Number	
Contact Person	
Telephone Number	
Fax Number	
Email Address	
Postal Address	
Physical Address	
NB: Submit with the bid the following documents:	
Copies of the bidder's CIPC company registration documents listing all members with percentages, in case of a CC.	
In case of Individual Bidder supply ID document for local and if foreigner supply passport number or identification as applicable in that country	
Latest copies of all share certificates, in case of a company or any other form of a legal entity.	
Shareholding breakdown per race, gender and percentage shareholding with shareholders of the bidding entity.	

Declaration:

I, as the duly authorized representative of the bidder hereby authorize Armscor to request, investigate and process company information including tax compliance via the SARS website.

....

Name ID number

BID CONDITIONS ACCEPTANCE FORM

Bidders shall complete and sign this bid conditions acceptance form

I/We hereby offer to supply all or some of the supplies and/or services described in the Pricing Schedule and /or attached documents on the terms and conditions and in accordance with the A-STD-0020 Issue 5 dated 22 June 2022 (and I/we acknowledge that I/we am/are acquainted therewith) at the price and on the terms of delivery/execution inserted by me/us.

I/We agree -

1. that this bid shall remain binding on me/us and open for acceptance for the period stipulated above;

2. that if my/our bids is accepted, the acceptance will be communicated to me/us by letter or order through the post, and such acceptance shall constitute a contract between me/us and Armscor, subject to the terms and conditions set out in Armscor's General Conditions of Contract (A-STD-0020), Issue 5 dated 22 June 2022, the contents of which I/we acknowledge ourselves to be acquainted with.

I/We choose as domicilium citandi et executandi in the Republic

.....

.....
(no post box or private bag)

IN BLOCK LETTERS ON BEHALF OF -

Complete registered:
Name of bidder:.....

AUTHORISED SIGNATURE

..... Date: .....

Name in block letters: .....

Capacity: .....

NB: FAILURE TO COMPLETE AND SIGN THIS PAGE SHALL INVALIDATE THE BID AND WILL BE DISQUALIFIED FROM FURTHER EVALUATION.

SUPPLIER REGISTRATION

1.1 Bidders must register on the National Treasury Central Supplier Database (CSD) in terms of National Treasury Instruction Note 3 of 2016/17.

1.2. Bidders must electronically register for Security on Armscor website to be considered for orders which are administered by Armscor SOC Ltd on Behalf of clients.

For more information on security registration contact:-
The Security Registration
Private Bag X337
PRETORIA
0001

E-mail:- register@armscor.co.za

ALL BIDDERS SHALL COMPLY WITH THE FOLLOWING:

1. Bidders should check the numbers of the pages correspond with the table of contents as no liability arising from claims owing to the omission or duplication of pages will be recognised by Armscor. The appendices mentioned in these pages form part of the bids.

2. **All bidders shall -**

2.1. insert their name at the top of each price schedule form used (a rubber stamp may be used);

2.2. insert the information in the spaces provided in the price schedules by writing or typing on the dotted lines only (additional information should be contained in a separate annexure);

2.3. if they wish to make more than one bid against an item, as an alternative, apply for additional copies of the bid documents or photocopy one or more pages, and not retype or redraft any of the forms used;

2.4. indicate the prices quoted in the units shown and quote them per item;

2.5. indicate in respect of each item whether the goods/services quoted comply strictly with the specified requirements, and furnish particulars of deviations if this is not so;

2.6. complete all appendices.

3. **Value-added tax, customs duties, *ad valorem* customs duties and surcharges:**

3.1. Value added tax levied by the Receiver of Revenue must not be included in the prices quoted but be shown as a separate line item.

3.2. Where supplies are quoted which are subject to levying of any customs duty, ad valorem customs or excise duty or surcharge by the Department of Customs and Excise, such charges must not be included by the bidder in the prices quoted. The applicable customs duty, ad valorem customs or excise duty or surcharge must, however, be indicated separately where provided for on Armscor's Questionnaire

4. **Security:**

4.1. Classified bids are to be handled in the manner set out in Armscor' s Security Instruction, document number A-WI-014, copies of which are obtainable on request from the Contractor Security Section, P O Box 411, Pretoria, 0001.

4.2. Attention is drawn particularly to the procedure set out in chapter 4 of the manual, which is to be complied with when forwarding classified documents.

5. **Advance payments:**

Bidders shall furnish the price without advance payment.

6. **Performance Guarantee**:

Armscor reserves the right to request the successful bidder to submit a performance guarantee for the proposed contract. Bidders must submit prices without provision for the performance guarantee as well as prices including the cost of such a guarantee.

7. **Commissions:**

If any commission is payable by yourself to any person(s) or body as a result of any order which may arise from this Request for Proposal, you must submit full details of the applicable person(s) or body and the amount payable, with this bid.

8. **Tax Compliance Requirements**
It is a condition of bid that the successful bidder MUST be tax compliant, or that satisfactory arrangements have been made with the South African Revenue Service (SARS) to meet the bidder's tax obligations. FOREIGN COMPANIES ARE REQUIRED TO COMPLETE QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS OF ANNEXURE 1 TO KD 25

8.1 In order to meet this requirement the bidder is required to access SARS e-filing and complete the SARS ONLINE "SARS tax compliance status" under tax status. Tax compliance requirements are also applicable to individuals who wish to submit bids.

8.2 SARS will then furnish the bidder with a Tax compliance PIN code that will be valid for a period of 1 (one) year from the date of approval.

8.3 The Tax compliance PIN letter shall be submitted with the bid, with an authorisation letter for Armscor to use the PIN code for verification of tax compliance status of the supplier.

8.4 In bids where Consortia /Joint Ventures / are involved, each party must submit a separate tax compliance PIN with authorisation letter.

9.5 In the event of subcontracting, tax compliance PIN letter and authorisation letter for the subcontractor must also be submitted with the bid.

8.6 Tax compliance is done via e-filing on the SARS websitewww.sars.gov.za.

NOTE: Armscor Suppliers /Bidders and Subcontractors must remain tax compliant for the duration of their contracts.

9. Tax Compliance

The conditions detailed in the Instruction for Application for Tax Compliance (KD 25) must be adhered to. Armscor Suppliers /Bidders must remain tax compliant for the duration of their contracts.

10. Defence Industrial Participation and National Industrial Participation

10.1 The DIP value threshold of foreign content is based on:

Any single agreement of which the foreign content exceeds USD 2 million; Multiple main agreements concluded within two years of each other, within the framework of a specific project or across different projects, for same and or similar products or services, awarded to the same Seller of which the aggregate value of the foreign content exceeds USD 2 million; Extensions or amendments to the main agreement within the active life of the agreement, which result in the aggregate foreign content value of the project exceeding USD 2 million; Where multiple suppliers are used to address a single Defence Acquisition for the same products or services and the value of the foreign content, in total, exceeds USD 2 million, each supplier shall incur pro rata 50% of the total DIP obligation.

10.2 Where a contract to the value of the equivalent of USD10 000 000 or more, is placed on a foreign company, a minimum of 30 % National Industrial Participation (NIP) shall be part of the foreign company's contractual obligations, in addition to the 50 % DIP. This condition is also applicable to all contracts placed on a local company, subcontracting a single foreign company to the aforesaid value or more.

11. Mandatory local production and content for designated sectors

11.1 A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

11.2 If there is no designated sector, Armscor will include as a specific condition of the bid, that only locally produced services or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

12. **Awarding of Bids**

The awarding of bids will be in terms of the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2022 and Armscor Preference Point System of the Preferential Procurement Regulations, 2022.

The applicable points are:

Price: (Pp)	**80 Points**
Specific Goals	**20 Points**
Total:	**100 Points**

The following formula will be used to calculate the points in respect of a bid up to a rand value of R50 000 000, 00 (all applicable taxes included).
(Armscor may also apply this formula to price quotations with a value of less than R30 000, if and when appropriate):

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

80/20

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

Where

Ps	=	Points scored for price of bid under consideration
Pt	=	Price of bid under consideration
Pmin	=	Price of lowest acceptable bid

KD17

BID NUMBER : EFAC/2023/07

CLOSING AT 11:00 ON : 06 October 2023

VALIDITY PERIOD: 120 DAYS

NAME OF BIDDER : _____

ITEM NO	DESCRIPTION	QTY	UNIT PRICE IN FOREIGN CURRENCY	UNIT PRICE IN S.A. CURRENCY	SUBTOTAL
	Supply, installation and commissioning of step up and step down transformer integrated with the diesel generators Single-envelope (using only critical criteria without functional criteria)				
	TOTAL (excluding VAT)				
	VAT				
	TOTAL (including VAT)				

1. Delivery address: ARMSCOR HQ
2. * Period required for commencement of delivery, after receipt of order:.....
3. * Rate of delivery: .....
4. * Period required for completion of order, after receipt thereof: **10 WEEKS**

* Must be completed by Bidder if not completed by Armscor

APPENDIX A: EVALUATION PROCESS

1. ABBREVIATIONS

CIPC: Company & Intellectual Property Registration

COIDA: The Compensation for Occupational Injuries and Disease Act

PPS: Preference Point System

2. BID EVALUATION PROCESS

Each received bid will be evaluated in 4-stages.

STAGE 1	Specific Goals
STAGE 2	Critical Criteria
STAGE 3	Preference Point System: 80 (Price) / 20 (Specific goals)
STAGE 4	Special Requirements

2.1 STAGE 1: Specific Goals

2.1.1 Each bid will be assessed against the specific goals using the criteria set out under the specific goals.

2.1.2 Any bid with evidence documents that are not authentic will be disqualified and eliminated from further evaluation.

2.1.3 All bids with authentic evidence documentation will be allocated points according to the criteria and will be eligible for further evaluation under stage 2.

2.1.4 The specific goals are listed under Appendix A of this RFB document.

2.2 STAGE 2: Critical Criteria

The bidder(s) that comply with the requirements set for stage 1 will be assessed against the critical criteria requirements. Should the bid fail to comply with any one of the critical criteria, the bid will be disqualified from further evaluation.

#	Critical Criteria Description	Compliance Evidence
1.	The bidder shall attend compulsory bidders briefing that will be held at 370 Nossob Street, Erasmuskloof – Pretoria East.	The bidders shall complete and sign briefing attendance register on the **29 September 2023 @ 10:00 AM**
2.	The bidder shall have a valid registration with the Construction Industry Development Board (CIDB) as an Electrical Contractor grading designation of at least 6EB.	The bidder shall submit a CIDB registration letter indicating a unique CIDB CRS number. The bidder's registration must be valid and shall be at minimum CIDB 6EB at the closing date of the bid. All CIDB evaluation requirements will be applicable.
3.	The bidder shall allocate a certified MV Specialist to lead the installation and commissioning of transformers.	The bidder shall submit an MV accreditation certificate/letter of a proposed project leader issued by Eskom Holdings SOC Ltd or City Power Johannesburg (SOC) Ltd or any Organ of State/Municipality responsible for Power Distribution on behalf of Eskom Holdings SOC Ltd.
4.	The bidder shall be a registered electrical contractor with the Department of Labour & Employment according to the Electrical Installation Regulation 6(4).	The bidder shall submit a valid registration letter issued by the Department of Labour and Employment confirming the contractor registration according to Electrical Installation Regulation 6(4).
5.	The bidder shall have completed a Generator or Transformer installation project on a live building/site.	The bidder shall submit a reference letter issued by the client on client letterhead indicating experience on installation of generator or transformer and the nature of the building/ site where the installation was completed.
6.	The bidder shall propose transformer(s) that complies with the specified impedance between 5% - 6.5% *Note: Appendix I refers to: T2.3.2 – Technical Schedules Electrical*	The bidder shall complete, sign and submit with the bid the Appendix I of the RFB and attach the product data sheet for the proposed transformer indicating the impedance between 5% - 6.5%. *Note: Appendix I refers to: T2.3.2 – Technical Schedules Electrical*
7.	The bidder shall fully comply with the Technical requirements detailed in appendix G, H, I and J and the Bill of Quantity Appendix E.	The bidder shall complete and sign the Bid Condition Acceptance Form on Page 7 of the KD17 of the RFB, complete the Bill of Quantity Appendix E and submit with the Bid.

2.3 STAGE 3: PREFERENCE POINT SYSTEM (PPS)

a) Each bid that complies with all the critical criteria set in Stage 2 shall be further evaluated in terms of either the 80 (Price)/ 20 (Specific Goals) Preference Point System.

b) As per the Preferential Procurement Regulations of 2022 Regulation 3(2)(b): The 80/20 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system.

- Price: maximum 80 points
- Specific Goals: maximum 20 points

c) For this RFB, the applicable Specific Goal is Local Content & Production. Points scored for price are determined by the value of the contract. Points scored for Price, Specific Goal are added together (maximum 100 points) and rounded off to the nearest two decimal points.

d) For qualification for Specific Goal points, refer to Appendix C.

2.4 STAGE 4: Special Requirement

2.4.1 A bid that will emerge as preferred bidder after the PPS stage above will be subjected to further assessment under the special requirement stage.

2.4.2 A preferred bidder will be granted an opportunity to submit evidence (if not already submitted with the bid) required under the special requirement before the confirmation of award.

2.4.3 Should the bid fail to comply with any of the special requirements listed under Appendix D, the bid will not be eligible for award.

2.4.4 The bid may only be awarded to a preferred bid that complies with all the Special Requirements.

APPENDIX B

SPECIFIC GOALS

a) Each bid received before closing date & time will be evaluated against the applicable specific goal.

b) For this RFB, the applicable specific goal is Local Content and RDP Programme. The points scored for price are determined by the value of the contract. Points scored for Price, Local Content are added together (maximum 100 points) and rounded off to the nearest two decimal points.

Specific Goals for Procurement from Entities with local manufacturing capabilities for designated sectors		**PPS Points**
Designated Sectors		
1	Full compliance to Local Content and Production: Transformers and Shunt Reactors: Class 1. Technical specifications in Appendix G of the RFB	**10 points**
2	Non-compliance to Local Content and Production: Transformers and Shunt Reactors: Class 1. Technical specifications in Appendix G of the RFB	**0 points**
RDP Programme: Promotion of South African Owned Enterprises		**PPS Points**
1	Entities which are BBBEE Level 1 with 51% black equity ownership	**10 points**
2	Entities which are BBBEE Level 2 with 51% black equity ownership	**9 points**
Maximum Specific Goals points		**20 points**

c) To qualify for **Designated Sectors points**, the bidder shall submit:

i. The fully completed DTIC Annexures C (Local Content Declaration – Summary Schedule), Annexure D (Imported Content Declaration – Supporting Schedule) and Annexure E (Local Content Declaration – Supporting Schedule to Annexure C) for the offered transformer(s);

ii. A DTIC exemption letter for the imported material listed in the DTIC local content register if the local content and production for the offered transformer(s) is less than 70%. The letter from the DTI must clearly indicates the Armscor RFB number;

If, for example, the transformers are manufactured in South Africa but the raw material is imported, an exemption letter must be obtained from DTI for the imported raw material even if they are sourced from a local supplier.

d) To qualify for the **RDP Programme: Promotion of South African Owned Enterprises** points, the bidder shall submit a valid proof of B-BBEE status (B-BBEE certificate issued by a SANAS accredited verification agency or CIPC B-BBEE certificate or B-BBEE affidavit duly sworn and commissioned). If the bidder is a Joint Venture (JV) or Consortium, the bidder shall submit with the bid, a consolidated proof of B-BBEE status.

APPENDIX C

SPECIAL REQUIREMENTS

1. Special Requirement

1.1 A bid that will emerge as preferred bidder after the PPS stage above will be subjected to further assessment under the special requirement stage.

1.2 A preferred bidder will be granted an opportunity to submit evidence (if not already submitted with the bid) required under the special requirement before the confirmation of award.

1.3 Should the bid fail to comply with any of the special requirements listed hereunder, the bid will not be eligible for award.

1.4 The bid may only be awarded to a preferred bid that complies with all the Special Requirements.

	Special Requirement	Evidence Required
1.3.1	**COIDA** The bidder shall be in good standing with the Compensation Commissioner	The bidder shall submit a copy of the valid Letter of Good Standing from the Compensation Commissioner as prescribed by section 89 of the Compensation for Occupational Injuries and Diseases Act, 1993. Issued by Department of Labour or any other accredited bodies
1.3.2	The bidder shall allocate an SACPCMP registered Health and Safety Officer to provide health and safety services for the duration of the project	The bidder shall submit a valid SACPCMP registration certificate for the allocated Health & Safety Officer.

APPENDIX D
SPECIAL CONDITIONS

Special Conditions are additional to A-STD-0020: Armscor's General Conditions of Contract. If the bidder is non-compliant with the special conditions, Armscor will grant the preferred bidder reasonable opportunity to comply before the commencement of the contract. Within 14 days from award date, the preferred bidder will be required to submit the documentation and/or comply with the conditions listed hereunder.

	Special Conditions
1	The successful bidder shall submit project methodology including the project schedule
2	The successful bidder shall be sufficiently covered (minimum R6 million) for public liability for the duration of the project

APPENDIX E
BILL OF QUANTITIES

Item	Description	Unit	Qty	Rate	Cost
	Bill No. 1				
	Compliance for electrical installation				
1	**NOMINATED/SELECTED SUBCONTRACT AGREEMENT**				
	Compliance with Nominated/Selected Subcontract Agreement, JBCC	Sum	1		
2	**EXTRACTS FROM THE PRINCIPAL CONTRACTOR**				
	Allowance for any costs associated with the requirements of the Principal Contract preliminaries which may affect the selected sub-contract.	Sum	1		
3	**COMPLIANCE WITH CONDITIONS**				
	Nett price for compliance with the Conditions of Contract, the Special Conditions of Contract, and various specifications, which costs are not specifically covered elsewhere or by unit rates	Sum	1		
4	**SURETY**				
	Allow for the provision of a performance guarantee for the contract value - refer to the main contract preliminaries attached thereof. Allow cover insurance for all equipment that are on site	Sum	1		
5	**SITE ESTABLISHMENT**				
	Allow for the electrical site establishment, all associated services and for storage of plants, materials and equipment including protection and security.	Sum	1		
6	**TRANSPORT**				
	Provide and arrange for transport and off loading of all electrical material and equipment to site as well as workmen and staff	Sum	1		
7	**Allow for all incidental costs uniquely attached to the execution of the electrical works but not measured separately:**				
	Insurance Workman's Compensation	Item	1		
	Safety (Induction) & Safety Requirements	Item	1		
	Personnel Protection Equipment	Item	1		
	Management, Tools & Consumables	Item	1		
	Value-adjustable Items	Item	1		
	Time-adjustable Items	Item	1		
	Training of local residents re: electrical installation, etc.	Item	1		
TOTAL CARRIED FORWARD					

Item	Description	Unit	Qty	Rate	
TOTAL BROUGHT FORWARD					
8	**GUARANTEE PERIOD** Allow for the guarantee for a period of 12 months for all the electrical works that has been performed on the site and all equipment that has been installed. All the LED Guarantees shall be at least 5 years and the supplier must give us proof of after sales and track records. The guarantees will start from the day of practical handover to the client.	Sum	1		
9	**MAINTENANCE** Allow for a maintenance period of 12 months for defects in equipment, material, workmanship, wear and tear, and normal maintenance for all the electrical works. Maintenance will start/commence from the day of practical handover to the client.	Sum	1		
10	**COMMISSIONING AND TESTING** Supply all test equipment and labour for testing, commissioning and adjustment for all the sections of the installation.	Sum	1		
11	**DRAWINGS & SHOP DRAWINGS** Prior to the contractor starting any installation they will first submit shop drawing for the engineer to approve. Making reference, to other relevant drawings e.g. Civil, Structural, Architectural, existing services, etc., and their after co-ordination of these services marking up for the engineer.	Sum	1		
12	**AS BUILT DRAWINGS** Compilation of as built drawings for the complete electrical installation and the existing services on site	Sum	1		
13	**Samples** The contractor to make allowance for all the samples of equipment to be used on site. No equipment on site will be paid without a sample approval for that particular equipment.	Sum	1		
14	**OTHER NECESSARY WORKS** All other works necessary to complete the installation in a satisfactory manner, and in accordance with the drawings, specification, SABS Code of Practice, the Local Authorities requirements, and to the Engineers satisfaction to include for items specified or shown but not itemised in this bill. e.g. stripping of the electrical installation, liaison with the Client, handing over of all equipment to the Client, arrange for switching off of power supplies and make save of outlet points, etc.	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY					

Item	Description	Unit	Qty	Rate	Cost
	Bill No. 2				
	Reticulation				
1	**Distribution Boards**				
	Supply the following Distribution Boards complete with all switchgear, accessories as specified on the schematic layouts, all fitted in the factory and tested, including delivery to site and off-loading in accordance with the single lines.:				
1,1	Supply VD4-LMT 12.06.32 Retrofit DBB Circuit Breaker with Plug Type Secondary Isolating Connection (ABB circuit breaker)	No.	2		
1,2	Installation & Testing of 2 x VD4- LMT Retrofit Circuit	No.	2		
1,3	Supply LM Shutter with Shutter Mechanism for LMT2	No.	4		
1,4	Supply Reyrolle Racking Handle	No.	2		
2	**Cables and Cable Terminations**				
	Supply, install and connect reticulation cables installed in cable ladder, tray, trenching or sleeves.				
2,1	Cable Schedule				
a	300mm² 4-core PVC/SWA/PVC Cable	m	200		
b	185 mm² Bare Copper Earth Wire	m	200		
c	300 mm² 4-core PVC/SWA/PVC Cable Terminations	No.	20		
d	185 mm² Bare Copper Earth Wire Terminations	No.	20		
2,2	Cable Schedule				
a	185 mm² 4-core PVC/SWA/PVC Cable	m	100		
b	95 mm² Bare Copper Earth Wire	m	100		
c	185 mm² 4-core PVC/SWA/PVC Cable Terminations	No.	10		
d	95 mm² Bare Copper Earth Wire Terminations	No.	10		
2,3	Cable Schedule				
a	50mm² 4-core PVC/SWA/PVC Cable	m	250		
b	35 mm² Bare Copper Earth Wire	m	250		
c	50 mm² 4-core PVC/SWA/PVC Cable Terminations	No.	4		
d	35 mm² Bare Copper Earth Wire Terminations	No.	4		
TOTAL CARRIED FORWARD					

Item	Description	Unit	Qty	Rate	Cost
TOTAL BROUGHT FORWARD					
3	**Cable Trenching**				
	Excavate and backfill cable trench, 600mm deep and 500mm wide, including compacting				
3,1	In hand-pickable soil	m^3	100		
3,2	In soft rock	m^3	30		
3,3	In hard rock	m^3	15		
3,4	Danger Tape	m	290		
4	**Sleeves**				
4,1	Electrical 110mm diameter sleeves type NEXTUBE or similar including sealing of sleeve ends excluding excavation.	m	290		
6	**Manholes**				
6,1	Supply and install in ground 800mmx800mmx600mm deep	Item	2		
7	**Test and Commission**				
7,1	Test and Commission for the complete electrical installation	Sum	1		
7,2	Issue a Certificate of Compliance (CoC) in accordance with	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY					

ITEM	DESCRIPTION	Unit	Qty	Rate	Cost
	Bill No. 3				
	ELECTRICAL BULK SUPPLY, MV AND GENSET				
	THE INSTALLATION MUST BE AS PER THE SANS REGULATIONS 10402-2 AND GENERATOR INSTALLATION MUST COMPLY WITH THE SOUTH AFRICAN NATIONAL STANDARD (SANS 10142-1:2003)				
6,0	**MEDIUM VOLTAGE CABLES**				
a	11kv medium voltage 185 mm² 3-core copper XLPE cable complete with all accessories, terminations, testing and commissioning	m	200		
b	120 mm² sqr bare copper conductor	m	200		
c	Cable testing	Sum	1		
d	Labels - cable numbers	Sum	1		
6,1	**11KV/400V 3000kVA Step-down Transformer**				
	Allowance should be made for the following electrical equipment.				
	Supply, deliver, install and commissioning of electrical mini-sub completely installed with a plinth as per specification				
a	Supply, delivery and install a 1500kVA 11V/400V installed outside complete with all accessories, chassis, fixtures, fittings, terminations, bus bars and wiring, danger signs, as per SANS & NRS 048 specifications.	Item	2		
b	Testing and commissioning of transformer complete as specified and as required by SANS.	Item	2		
6,1	**11KV/400V 3000kVA Step-Up Transformer**				
	Allowance should be made for the following electrical equipment.				
	Supply, deliver, install and commissioning of electrical mini-sub completely installed with a plinth as per specification				
a	Supply, delivery and install a 3000kVA 11kV/400V installed outside complete with all accessories, chassis, fixtures, fittings, terminations, bus bars and wiring, danger signs, as per SANS & NRS 048 specifications.	Item	1		
b	Testing and commissioning of transformer complete as specified and as required by SANS.	Item	1		
TOTAL CARRIED FORWARD					

Item	Description	Unit	Qty	Rate	Cost
TOTAL BROUGHT FORWARD					
6,1	**11KV/400V 3000kVA Step-Down Transformer** Allowance should be made for the following electrical equipment. Supply, deliver, install and commissioning of electrical mini-sub completely installed with a plinth as per specification				
a	Supply, delivery and install a 3000kVA 400V/11kV installed outside complete with all accessories, chassis, fixtures, fittings, terminations, bus bars and wiring, danger signs, as per SANS & NRS 048 specifications.	Item	2		
b	Testing and commissioning of transformer complete as specified and as required by SANS.	Item	2		
6,4	**11 kV Metering Kiosk**				
6.4.1	Supply and install free standing powder coated mild steel metering kiosk complete with accessories as per City of Tshwane specifications.	No.	1		
6.5	Compilation of Operation and Maintenance Manuals	No.	3		
6.6	Certificate of compliance	No.	1		
6.7	Testing, inspection and Commissioning	Sum	1		
	SUB-TOTAL FOR BILL NO 6 CARRIED TO SUMMARY PAGE				

Item	Description	Unit	Qty	Rate	Cost
	Bill No. 4				
	Section 1: LIGHTNING AND EARTHING PROTECTION				
	Note: All installations to be subjected to and conform to the following regulations: SANS 1063 : 2010(earth rods, couplers and connections.), SANS 10199 : 2010(designs and installations of electrodes.) and SANS 10198 - 3 & SANS 10198 - 12				
4.0	**LIGHTNING AND EARTHING PROTECTION**				
1,1	**Specialist Persons**				
	Allow for any costs associated with specialist works:				
a	Soil testing & results	Item	1		
b	Report and the detail drawings	Item	1		
c	As built drawings	Item	1		
d	Issue certificate of compliance	Item	1		
1,2	**Aluminium Termination**				
	Termination of 50mm² aluminium conductor to 50mm² aluminium conductor installed on roofperimeter including lugs rivets and silver solder, etc	No.	8		
1,3	**Air terminal conductors**				
	Supply and fixing on surface inan approved manner of 50mm² bluminium conductor including all fixing accessories, such a§nsulating sleeved and stand-off brackets, but not including terminations. Rates quoted	m	40		
1,4	**Down conductors**				
	Supply and installation 70mm² Anti- theft composite stranded down conductor equivalent to 10mm² BECW with all fixing accessories but not including terminations. Rates quoted shall allow for wastage, of-cuts and joints. (Conduit elsewhere measured)	m	8		
1,5	**Terminations of down conductors to earth conductors**				
	Termination of 50mm² green PVC copper conductor to earthing conductor including lugs and silver solder, etc	No.	8		
2	**EARTHING CONDUCTORS**				
	Termination of earth conductor to earth electrodes including making of the ends, lugs, clamps, etc				
2,1	50mm² Termination to Earth electrodes	m	8		
2,2	Supply and installation of 1,8m long earth electrodes	No.	8		
2,3	Bonding of metal drainage/waterdown pipes	No.	4		
TOTAL CARRIED FORWARD					

Item	Description	Unit	Qty	Rate	Cost
TOTAL BROUGHT FORWARD					
2,4	Supply and testing apparatus and testing in accordance with SABS code	item	1		
2,5	Testing of joint continuity	item	1		
2,6	Testing of lighting protection system	item	1		
2,7	Testing of earthing points	item	1		
2,8	Test Clamp	item	1		
2,9	25mm diameter galvanised conduit complete installed with all bends, fixingsaddles, adaptors, chased into walls, ect. as specified- suface mounted	m	60		
2,10	105 X105 Steel Box - Junction Box/Test Point complete with all accessories and cover	No.	8		
TOTAL CARRIED FORWARD					

Item	Description	Unit	Qty	Rate	Cost
	Bill No. 5				
	Provisional Sums				
	PC Amounts for the project				
1	**Architectural and Structural Engineers fees**	PC	1	250000	R 250 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
2	**Shed structure, storm water system and relocation of fire hydrant**	PC	1	450000	R 450 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
3	**Rational fire and security compliance**	PC	1	180000	R 180 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
4	**Alteration of bus-bars in the MV panel and interlock System**	PC	1	790000	R 790 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
5	**ATS Upgrade**	PC	1	80000	R 80 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
6	**Generator Mobile connection box**	PC	1	800000	R 800 000,00
	Profit required on above PC Sum, by % to be recalculated on actual cost	%			
7	**Day works: Only to be applied for work ordered by Engineer as Day works**				
	Supply of skilled labour (normal time):	Rate only	1		
	Supply of skilled labour (overtime)	Rate only	1		
	Supply of unskilled labour (normal time)	Rate only	1		
	Supply of skilled labour (normal time):	Rate only	1		
	Supply of skilled labour (overtime)	Rate only	1		
TOTAL CARRIED FORWARD TO SUMMARY					

Bill Of Quantities - Summary Page

Bill No.	Description	Total Amount
1	Bill 1 - Compliance for electrical installation	R _____
2	Bill 2 - Cable Reticulation	R _____
3	Bill 3 - Generator & bulk Supply	R _____
4	Bill 4 - Lightning Protection	R _____
5	Bill 5 - Provisional Sums	R _____
	Sub-Total	R _____
	Add 15% V.A.T	R _____
	TOTAL	R _____

APPENDIX F
TECHNICAL SPECIFICATION PART 1 of 4

ETHUN Engineers
ENGINEERING | CONSULTING

GENERATOR INSTALLATION: TENDER DOCUMENT

CLIENT NAME: ARMSCOR

SERVICE: ELECTRICAL ENGINEERING PROFESIONAL SERVICES

SCOPE OF WORK: MV AND GENERATOR INSTALLATION

NOTES TO TENDERERS

SANS OR BS SPECIFICATIONS

Wherever any reference is made to the South African National Standard (SANS) and the British Standard specification (BBS) in either of the General Specification (Part 1), Project Specification (Part 2) and Quality Specification (Part 3) this reference shall be deemed to read "SANS or equivalent standard" and "BS or equivalent standard" respectively.

Important note

However it must be noted that the South African Standard Code of Practice "SANS 0142" Code of practice for the wiring of premises as published in the Government Gazette dated 23 October 1993 (Machinery and Occupational Health and Safety Act, 1983 Act No 6 of 1983) as amended will be applicable to this contract in respect to the following.

REGULATIONS, FACTORIES ACT AND BY-LAWS

(a) The latest issue of the SANS 0142 "Code of Practice for the Wiring of Premises", hereafter called the "Wiring Code".

(b) The Occupational Health & Safety Act 1993.

(c) The Municipal By-Laws and any special requirements of the local Supply Authorities.

(d) The local Fire Office Regulations.

(e) The National Building Regulations and Building Standards Act 1996 (Act 29 of 1996),

(f) The Electricity Act 1996 (Act 88 of 1996)

(g) The Regulations of the local Gas Board

ARMSCOR GENERATOR INSTALLATION

PART 1

SPECIFICATION FOR ELECTRICAL WORK

GENERAL SPECIFICATION

1. REGULATIONS, FACTORIES ACT AND BY-LAWS

(a) The latest issue of the SANS 0142 "Code of Practice for the Wiring of Premises", hereafter called the "Wiring Code" and SANS10142 – 2.

(b) The Occupational Health & Safety Act 1993.

(c) The Municipal By-Laws and any special requirements of the local Supply Authorities.

(d) The local Fire Office Regulations.

(e) The National Building Regulations and Building Standards Act 1996 (Act 29 of 1996),

(f) The Electricity Act 1996 (Act 88 of 1996)

(g) IEC 60076 and SANS 780:2019 standards

2. NOTICES AND FEES

The contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority. The fee charged by the Supply Authority for connection of the installation to the supply mains, will be arranged and paid by the contractor.

3. SCHEDULE OF FITTINGS

In all instances where schedules of light, socket outlet and power points are attached or included on the drawings, these schedules are to be regarded as forming part of the specification.

4. QUALITY OF MATERIALS

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Engineer and the Client. Quality specifications for various materials to be used on this contract are attached to and form part of this specification.

Wherever applicable material is to comply with the relevant South African National Standard specifications, or to British Standard Specifications, where no SANS specifications exist.

Materials wherever possible must be of South African manufacture.

5. DELAY

If the electrical contractor's work should cause any delay to the building operations, he will be held responsible for any claims arising out of such delay.

6. MAINTENANCE PERIOD AND RETENTION MONEY

The maintenance period mentioned in Clause 21 of the General Conditions will be twelve months, calculated from the date the installation has been taken over by the Engineer and the Client's Engineer and the Client's Department Armscor.

Payment of the retention money mentioned in Clause 23 of the General Conditions will be effected after the lapse of the maintenance period and provided the installation has been in satisfactory working order during this period.

7. CONDUIT AND ACCESSORIES:

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SABS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

(a) Screwed metallic conduit and accessories: SANS 162

(b) Plain-end metallic conduit and accessories: SANS 1007

(c) Non-metallic conduit: SABS 950

All non-metallic conduits shall comply fully with SANS 950 and shall be installed in accordance with Appendix C of the same specification as well as SANS 0142.

Insulated heat-resistant wiring shall be used for outlets of totally enclosed luminaires and other fittings where excessive temperatures are likely to occur.

Luminaires and other fittings shall not be supported by non-metallic conduit or conduit boxes. These fittings shall be secured to the surrounding structure in a way that is acceptable to the Engineer and the Client's Engineer and the Client's Department.

The conduit shall be supported and fixed with saddles with a maximum spacing of 1 m, even in roof spaces. (Refer to SANS 0142). The contractor shall supply and install all additional supporting timbers required.

It shall be possible to rewire the completed installation in the future without undue difficulty.

Non-metallic conduit and fittings shall not be used under the following conditions:

(a) Outside a building (unless protected, or sheltered under eaves).

(b) For mechanical load bearing.

(c) Where they may be subjected to temperatures below - 10°C or above 70°C for prolonged periods.

(d) As primary electrical insulation.

(e) In areas where they may be subject to mechanical damage.

(f) For applications other than those for which they are designed.

Painting of Conduits

Exposed conduit may be painted with normal oil or PVA paints, but care must be taken to ensure that the paint used does not contain any component that will soften or have any other detrimental effect on the materials from which the conduit and fittings are manufactured.

Connecting of Conduit to Metal Equipment/Components

When any part of a non-metallic conduit system has to be connected to metal equipment or components (e.g. switchboard, surface socket-outlet or switch box, existing metallic conduit system, etc.) Fittings and joints manufactured specifically for this purpose must be used. Non-metallic conduit must not be threaded to fit metallic connectors.

Bends

In conduit of nominal size not exceeding 25 mm, bends may be made as described hereunder. In all other cases bends must be achieved by the use of accessories that are introduced into the conduit run. Bends shall comply with SANS 0142.

Bending

Conduit of nominal size up to and including 25 mm may be cold bent by hand provided that the radius of the bend is greater than six times the nominal size of the conduit, and that the external angle of the bend does not exceed 90°. The procedure (which involves the use of a bending spring) should be as follows:

(a) Determine the angle through which the conduit is to be bend.

(b) Warm the cold conduit over the length to be bend by rubbing with hands.

(c) Select a bending spring which matches the conduit size and insert it into the conduit beyond the point where the bend is required.

(d) Bend the conduit slowly with one motion (either with the hands alone approximately 1 m apart, or across the knee) to double the required angle, release the conduit and, when its position is stable, withdraw the bending spring (turning it in an anti-clockwise direction to reduce its diameter) and gently correct the angle.

(e) Install and secure the conduit immediately following bending.

Adhesive Joints

All adhesive joints must be made in a clean dry area. The surfaces of all components to be bonded must be dry and clean.

The insertion depth should be marked on the conduit end and the adhesive applied (by means of a soft clean brush) as quickly as possible to the surfaces to be bonded by brushing lengthwise along the conduit, ensuring that a thin coating of uniform thickness is formed. The joint must be made immediately after the application of the adhesive by pushing the prepared parts squarely together with a twisting motion to the full insertion depth. Care must be taken to avoid squeezing adhesive into the cableway and all excess adhesive must be wiped off.

NOTE: Solvent adhesives containing highly volatile liquids and their containers should not be left open.

Cutting of Conduit

A fine-tooth hacksaw should be used to cut conduit to the required length. Each cut end should be square and free from swarf, burrs and loose material. When determining the length of conduit to be cut, allowance must be made for the length of couplings or accessories attached to the conduit. Incorrect determination will cause bulging of the conduit or insufficient joint length.

8. CONDUIT IN ROOF SPACES

In roof spaces, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit shall be secured at intervals not exceeding 1 m by means of saddles fixed to the roof timbers by means of screws or acceptable clout nails.

In the case of repairs and renovations, conduit runs from a distribution board shall, where possible, terminate in fabricated sheet steel draw boxes installed directly above or in close proximity to the boards.

9. WIRING

Except where otherwise specified in Part 2 of the specification, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduits to be clear of moisture and debris before wiring are commenced.

Unless otherwise specified in Part 2 of this specification or indicated on the service drawings, the wiring to the installation shall be carried out in accordance with the "Wiring Code". Further to the requirements concerning the installation of earth conductors to certain length points as set out in the "Wiring Code", it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all lighting points throughout the installation.

Wiring for lighting circuits is to be carried out with 2,5 mm^2 conductor and a 2,5 mm^2 earth conductor. For socket outlet circuits the wiring shall comprise 4 mm^2 and a 2,5 mm^2 earth conductor. In certain instances, as will be directed in Part 2 of this specification the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduits in all other instances, such as feeders to distribution boards, power points etc, shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be in accordance with the "Wiring Code".

The loop-in system shall be followed throughout, and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 300/500 V grade cable to SANS 1507.

Where cable ends connect onto switches, fittings, etc. the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

10. SWITCHES AND SOCKET OUTLETS

All switches and switch socket outlet combination units shall conform to the Quality Specifications which form part of this specification.

No other than 16A 3 pin sockets are to be used, unless other special purpose types are distinctly specified or shown on the drawings.

All light switches shall be installed at 1,4 m above finished floor level and all socket outlets as directed in the Schedule of fittings which forms part of this specification or alternatively the height of socket outlets may be indicated on the drawings.

11. SWITCHGEAR

Switchgear, which includes circuit breakers, iron-clad switches, interlocked switch-plug units, contactors, time switches, etc., is to be in accordance with the Quality Specifications which form part of this specification and shall be equal and similar in quality to such brands as may be specified.

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned shall be used throughout the installation.

12. SWITCHBOARDS

All boards shall be in accordance with the types as specified, be constructed according to the detail

or type drawings and must be approved by the Engineer before installation.

In all instances where provision is to be made on boards for the supply authority's main switch and/or metering equipment the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Any construction, or standard type board proposed as an alternative to that specified, must have the prior approval of the Engineer. All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable end boxes and other auxiliary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The wording of the labels, in English shall be according to the layout drawings or as directed by the Engineer and the Client's Representative, representative and must be confirmed on site. Flush mounted boards to be installed with the top of the distribution board no more than 2.0 m above the finished floor level.

13. WORKMANSHIP AND STAFF

All employees employed on the service must be under the constant supervision of a registered accredited person.

The workmanship shall be of the highest grade to the satisfaction of the Engineer.

All inferior work shall, on indication by the Engineer or the Client's inspecting officers, immediately be removed and rectified by and at the expense of the electrical contractor.

14. EARTHING OF INSTALLATION

The type of main earthing must be as required by the supply authority and the Engineer and the Client's representative, who may require additional earthing to meet test standards.

Where required an earth mat shall be provided, the minimum size, unless otherwise specified, being 1,0 m x 1,0 m and consisting of 4 mm diameter hard-drawn bare copper wires spaced at 250 mm centers and brazed at all intersections.

Alternatively or additionally earth rods or trench earths may be required as specified or directed by the Engineer or the Client's authorised representative.

Installations shall be effectively earthed in accordance with the "Standard Regulations" and to the requirements of the supply authority. All hot and cold water and waste pipes are to be effectively bonded by means of 12,5 mm x 1,6 mm solid or perforated copper tape (not wire), clamped by means of brass bolts and nuts. The tape is to be fixed to walls by means of rounded brass screws at intervals not exceeding 150 mm.

Main earth copper tapes where installed below 3 m from ground level, must be run in 20 mm conduit securely fixed to the walls. Corrugated iron roofs and guttering must be effectively earthed with copper tape and brass bolts with nuts at intervals not exceeding 18 m. Self-tapping screws are not acceptable as a means of securing earth conductors.

Connection from the main earth bar on the main board must be made at the cold water main, the incoming service earth conductor, if any, and the earth mat or other local electrode by means of 12,5 mm x 1,60 mm solid copper tape or 16 mm² stranded (not solid) bare copper wire or such conductor as the Engineer or the Client's representative may direct.

15. MOUNTING AND POSITIONING OF LIGHT FITTINGS

The electrical contractor must note that in the case of board and acoustic tile ceiling, i.e. as opposed to concrete slabs, close co-operation with the building contractor is necessary to ensure that as far as possible, the light fittings are symmetrically positioned with regard to the ceiling pattern.

The layout of the fittings as indicated on the drawings must be adhered to as far as possible, but the exact positions must be confirmed with the Engineer and the Client's Engineer and the Client's Department's representative.

Fluorescent fittings installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6 mm expansion or other approved type fixing bolts are to be provided. The bolts are to be 3/4 of the length of the fittings apart.

Fluorescent fittings to be mounted on board ceilings shall be secured by means of two 40 mm x No. 10 round head screws and washers and in turn secured to the ceiling renderings. The fittings shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed 3/4 of the length of the fitting apart. The use of Butterfly clips to secure the light fittings will not be acceptable.

In addition to the above, an earth conductor is to be taken from the earthing terminal on all fluorescent fittings and solidly bonded onto the conduit installations.

Incandescent fittings are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings, the fittings shall be secured to the brandering or joints by means of two 40 mm x No. 8 round head screws and also to the outlet boxes.

16. VARIATIONS IN EXTENT OF CONTRACT

The Engineer and the Client's Representative reserves the right to instruct the contractor to carry out variations to the contract either in terms of clause 18 of the Standard Conditions of Contract or in accordance with prices quoted by the contractor in the Price Schedule for Variations or Bill of Quantities, whichever is applicable.

For variations not provided for in the Price Schedule, or Bill of Quantities the Engineer and the Client's Engineer and the Client's Department may call on the contractor to submit a separate written quotation.

Labour and material shall be based on clause 10 of the Standard Conditions of Contract, and no payment will be made for the transport of labour and material to and from the service.

The Engineer and the Client's Representative, however, reserves the right to execute any alterations or additions that may be necessary by others.

Before any light fittings are ordered by the Contractor, the makes and types of these fittings must be approved by the Engineer and the Client's Representative. The Engineer and the Client's Representative reserves the right to omit the supply of light fittings, cooking appliances and hot-water cylinders from the contract in whole or in part, and to deliver such material to the contractor by others.

17. CLIENT SUPPLIED MATERIAL

When certain materials are supplied by the Client to the contractor for installation, the contractor must arrange for taking delivery and providing safe storage of these materials.

The contractor will be held responsible for all damage to or loss of such material while it is in his custody.

APPENDIX G
TECHNICAL SPECIFICATION PART 2 of 4

PART 2

SPECIFICATION FOR ELECTRICAL WORK

PROJECT SPECIFICATIONS

2.1 CONTRACT WORK

The installation shall be carried out entirely by the Sub-Contractor's own staff and shall not in any way be sub-let. This part of the specification shall have preference to any other part of the specification.

2.2 CONTRACT PRICE ADJUSTMENT PROVISIONS (CPAP)

The tender price, tendered by the Contractor, shall be a fixed contract price free of any price adjustments.

Tenderers are referred to the Main Building Contract for details regarding the contract period and other applicable details.

2.3 SITE

The Tenderers must, before submitting their tenders, acquaint themselves with the local conditions, accessibility of the sites, soil conditions, availability of labour and labour conditions, transport, off loading store and custody conditions for materials and equipment necessary for the completion of the total contract. No claim based on ignorance in this regard shall be considered.

Permission must be obtained from the Engineer and or the Client's Representative before any Tenderer visits the site, or the Contractor establishes himself on the site.

2.4 EXTENT OF WORK

The work covered by this contract comprises the complete electrical installation, in working order, as shown on the drawings and as per this specification, including the supply and installation of all fittings and the installation of such equipment supplied by the Client.

The work consists of the following items:

- MV Cable reticulation
- MV switch gears
- Installation of transformer
- LV cable reticulation
- Emergency power (generator) reticulation installation
- Electrical distribution boards
- Earthing and Lightning protection
- Small power

2.5 SUPPLY AND CONNECTION

The Electrical Sub-Contractor shall be responsible for the supply, installation and connection of all the specified MV and LV voltage cables including the supply cable to the supply point of the Local Authority.

2.6 INFORMATION

The tenderer's attention is drawn to the fact that if the schedules of this specification are not complete, this tender cannot be adjudicated and may be disqualified.

2.7 SPECIFICATION AND DRAWINGS

The specification and drawings generally show the character and extent of the proposed work, and shall not be held as showing every minute detail of the work to be executed.

Tenderers must ensure that their copy of the specification is complete and that all drawings as listed have been received.

Any discrepancy must immediately be brought to the attention of the Engineer and or the Client's Representative.

2.7.1 Contract Drawings

The layout and extent of the electrical installation will be shown on the construction drawings.

The positions of all power-, light- and switch outlets or routes which may be affected by other services must be confirmed by the Contractor with the Engineer and or the Client's Representative before placing such outlets.

2.7.2 As Built Drawings

The contractor is to prepare the As-Built paper prints in strict accordance with this specification. These drawings are to be kept in the site office. Retention monies normally due before commencement of the maintenance period will not be released until As-Built drawings have been prepared to the satisfaction of the Engineer and or the Client's Representative.

2.8 MAKING GOOD

The successful tenderer will be responsible for making good in all trades of any damage to buildings or other services which he or his employees may have incurred during the construction of the works.

The Contractor will be responsible for keeping the site clean and tidy and shall remove from the site all rubble and litter resulting from the construction work.

2.9. WORDING

The word "approve" means approval by the Engineer and or the Client's Representative.

2.10 SUPERVISION

Work must under all circumstances be supervised by a qualified and experienced representative of the Contractor who must be registered as an accredited person.

The representative must be authorized by the Contractor and must be able to receive instructions on behalf of the Contractor.

2.11 ELECTRICAL EQUIPMENT

All fittings, material and equipment and component parts thereof are to be in accordance with the attached quality specifications and must have the approval of Armscor. In addition all equipment shall be designed, manufactured and tested in accordance with the relevant

South African Bureau of Standards Specification or otherwise the relevant British Standard Specification.

All material and equipment must be suitable for the supply voltage 400/ 230V and the necessary precautions shall be taken against corrosion, i.e. exposed metal shall be anti-rust treated to approval and all metalwork to be galvanised or painted.

2.11.1 Equipment Standard Technical Specifications:

- Crabtree classic range plugs, light switches, and isolators
- SABS Circuit breakers for all distribution boards
- Energy saving equipment & globes
- SABS LED light fittings
- SABS cable trays and trucking
- SABS Transformers and generators
- SABS Bus bars and SANS 60439-1/IEC 60439-1 (SABS IEC 60439-1)

2.12 CONDUIT AND WIRING

The installation may be executed in SABS approved PVC or steel conduit. All conduits shall be concealed in the building work where possible. Steel conduit, black enameled and or galvanized steel conduit shall be screwed or plain end.

Should for some reason it not be possible to conceal conduit in the building work and the conduit installation must be surface mounted and if the installation could cause any danger in future, only steel conduit may be used.

Steel conduit exposed to damp or weather conditions shall be galvanised to SANS 763.

PVC conduit must comply with SANS 950.

PVC conduit must be supported at 1 000mm intervals maximum.

All conduits shall bear the stamp of approval by the SANS.

All conduits, regardless of the system employed, shall be installed strictly as described in the applicable paragraphs of Part 1 of this specification. Wiring of the installation shall be carried out as directed in Part 1 of this specification.

For geyser outlet circuits the wiring shall comprise 4,0mm? PVC insulated conductors and 2,5mm? Earth conductor in 20mm dia conduit and stove outlet circuits, 6,0mm? PVC insulated conductors and 4,0mm? Earth conductor in 25mm dia conduit.

Galvanised draw wires must be provided in all conduits provided for other services.

Flexible conduit shall be made of galvanised steel with rectangular cross-section corrugations to fit standard brass connectors and shall have a PVC sheath. Correct fittings and fixtures must be used. An earth continuity conductor must be installed with all flexible conduits.

All steel conduit joints in concrete slabs and all running joints must be painted.

No chasing by hammer and chisel will be accepted. Slots for conduits must be cut where necessary.

The metal conduit installation must provide a continuous earth.

Bushes on metal conduit shall be of brass only.

All outlet box cover plates must be metal and steel outlet boxes must be hot-dipped galvanized to SANS 763.

Where cavity walls or face brick walls are encountered deep back to back one end closed wall boxes must be used.

Blank cover plates on round outlet boxes must be fixed with flat head brass screws and a gasket to seal the box.

Blank cover plates on 100 x 100 mm outlet boxes must be fixed with two countersunk chrome screws.

Where outlet boxes or draw boxes are mounted on finished surfaces the Electrical Contractor shall take care that such outlets are mounted symmetrically. It will not be sufficient to scale the position of any outlet off the drawings. No extra payment will be allowed where the outlets are not mounted symmetrically and have to be changed.

Draw boxes on the lead in sleeves/conduit for the supply to stair blocks must be flush mounted and must be fitted with weatherproof lids which must have beveled edges. The lids must be fixed with tamper resistant screws to the boxes and must in general comply with the specification on distribution board doors. The draw boxes may not be smaller than 100 x 100mm. Standard factory made boxes as manufactured by GEM Industries, may be considered if submitted to the Department for approval.

2.13 SWITCHES AND SOCKET OUTLETS

All switches and socket outlets shall conform to the attached quality specifications and must be approved by the Engineer and or the Client's Representative.

The installation of switches and socket outlets shall be carried out in accordance with clause 10, Part 1 of this specification.

Light switches must be mounted 1400 mm a.f.f.l.

Switch socket circuits must be protected by 30mA earth leakage units. Light switch and switch sockets of one manufacturer only, will be accepted.

Switch sockets in the front of class rooms must be 300 mm a.f.f.l., where indicated.

Screws longer than 30mm to mount light switches or switch socket outlets will not be accepted.

2.14 DISTRIBUTION BOARDS

2.14.1 GENERAL

Supply and install the distribution boards as specified.

One spare 25mm dia and three spare 20mm dia conduits must be supplied from all distribution boards to roof spaces.

Three sets of factory drawings on all distribution boards must be submitted for inspection before manufacture of the distribution boards commence.

The Department must be notified at least two weeks in advance of the completion of the distribution boards in order that an inspection may be carried out before delivery.

2.14.2 Construction

The construction must be in accordance with Part 3 of this document.

All distribution boards must be flush mounted unless otherwise indicated and must have doors which must be pad lockable.

The current capacity of busbars may not exceed 1,6 A/mm².

Openings into distribution boards must tie up with the installation.

Cables must be terminated with cable glands or mounted with "K"-clamps to the distribution board tray where required. Earth rings and glands must be used to earth cable armouring inside distribution boards.

2.14.3 Installation

The distribution boards must be placed in such a way that the Builder can build them into the walls where required and or applicable. Special provision must be made that the distribution board tray is not damaged while being built in.

The distribution boards must be placed in the position shown on the drawings.

All distribution boards must be installed level.

Apparatus and requirements by the Supply Authority are not indicated on the distribution board diagrams and schedules. It is expected of the Electrical Contractor to install all such apparatus, accessories and systems as may be required by the Supply Authority, as part of the electrical contract price.

A neutral bar associated with each bank of mccb's must be positioned below each bank of mccb's and must be wired in the same sequence as the mccb's. Not more than one conductor per connector will be accepted.

Only hydraulic-magnetic operated mccb's must be used if the new micro ranges are not used.

Including any metering kiosk, only 5kA minimum fault level circuit breakers will be accepted in distribution boards.

The minimum conductor size between lightning arrestors and earth shall be 4mm².

Busbar stubs must be provided where more than one conductor terminates on equipment.

Earth conductors must be fastened with two screws and shoes to earth bars.

Two (2x) keyed alike locks with keys, padlocks must be provided with each distribution board.

2.15 LABELLING

Circuits which are removed from distribution boards must be marked "SPARE" on the distribution boards.

All outlets especially the terminal boxes associated with the intercom or telephone installation must be labeled as such.

Labels indicating the supply point and size of the supply cable must be provided on each distribution board.

Where switchboards are positioned behind doors of building structure i.e. build-in cupboards, a suitable approved electrical danger sign as well as the applicable distribution boards designate label must be supplied and fitted in a suitable position on the outside top section of one of the entrance doors at each such location.

2.16 POWER POINTS

The Contractor is to make allowance for the complete installation of all power points as indicated on the drawings and described hereunder-:

Luminaires

Above ceiling height. Note that the luminaires are not to be mounted under the roof overhang and that they must be mounted under the roof ridge on the end of buildings.

Wall mounted luminaires

Above door frame unless otherwise indicated on the drawings.

Photo Cells

Photo cells must be mounted away from area lighting at the same height as Type A luminaires.

2.17 BALANCING OF LOAD

The electrical contractor is required to balance the load as equally as possible over the multi-phase supply.

2.18 EARTHING OF INSTALLATIONS

Installations shall be effectively earthed in accordance with the "Standard Regulations" and to the requirements of the supply authority, as well as the Departments Representative, who may require additional earthing to meet test standards. Earthing must comply with S.A.N.S. 0142 – 2006.

All hot and cold water as well as waste pipes must be effectively bonded by 12,5 x 1,6 mm solid or perforated copper tape (not wire) clamped by means of brass bolts and nuts. The tape is to be fixed to walls by means of roundhead brass screws at intervals not exceeding 150 mm.

The earth connection from the main earth bar in the main board must be made to the cold water main and the incoming service earth conductor by means of 16 mm^2 stranded (not solid) bare copper earth wire or such conductor as the Department's Representative may direct. Where applicable all steel roof sheeting as well as steel walkways and stairs shall be suitably earthed.

Furthermore an earth electrode (earth spike) of at least 1,5 m long must be provided and driven into the ground at the centre of each gable-end wall of each individual block. This earth electrodes shall be installed at least 1 m from the building's perimeter and shall clear all aprons and water channels. These earth spikes must be driven into the ground to at least 300 mm below ground level and only after final bonding and tests have been carried out must proper backfilling and compacting of same be executed.

In each instance these earth spikes must be interconnected by means of a 16 mm^2 stranded bare copper earth conductor which must be installed in the inside of the ridging of the roof structure and encased in 20 mm flush conduits installed in the gable walls. This earth conductor must be bonded to the roof sheeting at intervals not exceeding 5 m, ensuring that roof sheeting on both sides of the ridging are properly bonded, as specified in Clause 14 of Part 1.

The overall earth resistance at the new electrical distribution board of the block shall not exceed 1 Ohm. The contractor shall assess the soil and site conditions at the time of tendering and allow for this to enable him to perform the proper earthing and bonding of all installations.

2.19 CABLES

2.19.1 General

Supply, install and connect all the low voltage cables specified in this document. The cables must comply with the requirements in Part 3 of this document. Bare hard drawn copper earth continuity conductors are to run with all four core underground cables constituting part of the low voltage distribution system. The earth conductors must be bound to the cables at intervals not exceeding 1 meter.

Conductor insulation which is colour coded by a line only, will not be accepted. The total insulation must have the phase colour.

All cables shall bear the stamp of approval by the SANS.

2.19.2 Installation

a) Testing

All low voltage cables must be tested on site, in the presence of a representative from the Department. All test results must be submitted to the Department.

On each completed section of the laid cable, the insulation resistance shall be tested to approval with an approved "testing" type instrument of not less than 1000 V for low voltage cables.

b) Depth of Trenches

All low voltage cables must be installed 600 mm below ground level to the top of the cable, below ground level.

c) Marking Tape

Yellow PVC marking tape, 150 mm wide must be supplied and installed 400 mm above all cables. The wording "Electric Cable Below - Caution" and "Elektriese Kabel Hieronder - Gevaar" must be provided on the marking tape.

d) Cable Lengths

Tenderers must base their tender price on the preliminary lengths specified in the Bills of Quantities. After installation the exact lengths shall be determined on site. Adjustments to the contract price shall then be calculated using tariffs in the Bill of Quantities.

It shall be the responsibility of the Electrical Contractor to establish the correct lengths of cable on site, before placing an order. The Contractor shall not be reimbursed for any surplus cable.

2.19.3 Cable Trenches

Tenderers must base their tariffs for cable trenches in soil, soft rock and hard rock on the quantities given in the Bill of Quantities. The actual quantities shall be determined on site. Adjustments to the Contract Price shall be calculated using the tariffs in the Bills of Quantities, after completion of the installation.

SOIL: Shall mean hand pickable soil and includes loose gravel, clay, backfilled soil, loose or soft shale, loose literati and rocks less than 75 mm diam.

SOFT ROCK: Shall mean rock which is hand pickable including hard shale, dense literati and rocks exceeding 75 mm in diam to 0,03 cubic meters volume.

HARD ROCK: Shall mean granite, quartz sandstone, slate and stone of similar hardness as well as rocks exceeding 0,03 cubic meter volume.

No guarantee can be given that explosives will not be necessary for excavations. However, should explosives be necessary and the Contractor receive permission to use explosives, the Electrical Contractor shall remain responsible for all work done with the explosives and shall comply to all conditions, regulations, requirements etc. imposed by the governing bodies.

Mechanical excavators may be used for trenching operations provided that they are not used in close proximity to other plant, services or other installations likely to be damaged by the use of such machinery. The use of mechanical excavators shall be subject to the approval of the Engineer and or the Client's Representative.

Should excavations be done in close proximity of existing services extreme care must be taken. Only labourers with experience of these conditions may be utilised.

The bottom and sides of trenches must be of smooth contour, and shall have no sharp dips or rises which may cause tensile forces in the cable during backfilling.

Backfilling of trenches may commence after the trenches have been approved and shall be compacted in layers of 150 mm. Sufficient allowance must be made for final settlement. For the first layer of 150 mm, sifted soil of which 75 mm must be below and 75 mm must be above the cable, must be used. Where no suitable soil is available on site, the Contractor shall import fill from elsewhere and make all the necessary arrangements to do so.

The Electrical Contractor shall be responsible to take the necessary precautions where excavations may be dangerous. Refer to the Occupational Health & Safety Act 1993, Reg. D13 of the General Safety Regulations. The Contractor must ensure that all buildings, sewer, etc, are protected against caging.

The cable trenches shall be excavated to a depth as specified in 2.19.2 above and shall be 300mm wide for one to three cables and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run.

Payment will be made on a cubic excavation rate based on the basis of the given maximum dimensions or the actual dimensions, whichever is the lesser. The only exception shall be in cases of additional excavations caused by obstructions such as water pipes, drains, large rocks, etc., in which case the length of the additional excavation must be agreed upon on site by the Department.

2.19.4 Joints

Joints in cable runs shall not be allowed unless specified or authorised in writing, by the Department. Where cable joints are to be made, a joint hole must be excavated of sufficient size to enable the cable jointer to work efficiently and unimpeded.

Each cable end must be left in a loop of 0,9 m to prevent any tension on the joint.

During backfilling the section supporting the joint must be compacted to the extent that no movement will take place after the trenches have been backfilled.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits. Epoxyresin joints must be made entirely in accordance with the manufacturer's instructions

and with materials stipulated in such instructions. Low voltage PVCA cables are to be made off with sealing glands and materials designed for this purpose which must be of an approved make.

Where cables are cut and not immediately made off, the ends are to be sealed without delay.

2.19.5 Cable laying

Cables must be removed from the drums in such a manner that the cable is not subjected to mechanical damage, twisting or tension exceeding that stipulated by the cable manufacturer.

The laying of cables shall not commence until the trenches have been inspected and approved. The cables must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

2.19.6 Sleeves

All sleeves indicated on the drawings will be supplied and installed by the builder if not included in this Bills of Quantities. It shall be the responsibility of the Electrical Contractor to liaise with the builder to ensure that all the sleeves are correctly installed. Electrical cable sleeves and communication sleeves must be installed at least 600mm apart. All crossings of these sleeves must be at 90^2 with the communication sleeves on top.

Before backfilling the ends of all sleeves must be sealed with paper and a weak cement mixture.

2.19.7 Cable Markers

Cable markers must be provided on all cable runs at 50 m intervals on straight runs and at all bends. The position of cable markers must be confirmed on site.

Cable markers must consist of 150mm x 150mm x 300mm high concrete blocks with aluminium or other rust free metal plates marked with arrows to indicate the route.

The cable markers must protrude 25mm above ground level.

One cable marker must be placed at the site boundary where the telephone sleeve enters the site.

2.20 LUMINAIRES

Supply and install the luminaires schematically indicated on the drawings. (See clause 7). The luminaires must comply with the requirements in Part 3 and the particulars listed hereunder.

Verandah luminaires on multi storey buildings must be vertically in line.

The required luminaire types are specified on the drawings and tie up with the types indicated on the layouts. Samples of <u>all</u> luminaires must be approved by the Inspector of the Department before any order is placed.

All control gear within luminaires, shall bear the stamp of approval by the SANS.

The installation of luminaires must be done in accordance with the relevant clauses in parts 1 and 3 of this specification.

All luminaires must be complete with lamps and where necessary, control gear. In caretaker's residences (where applicable), B.C. lamp holders must be used. Starters of

fluorescent luminaires may not be accessible from outside the luminaire. Openings in the luminaire for starters must be covered to the approval of the Department. Lamp holders for GLS lamps must be porcelain or heavy duty brass.

The following luminaires are indicated on the respective drawings and must conform to the quality specifications Parts 1, 2 and 3 which forms part of this contract.

NOTE: All luminaires must be approved by the Engineer and or the Client's Representative prior to the installation of or any order being placed.

SYMBOL	TYPE	DESCRIPTION	PICTURE	AREA USED
[redacted]	Type B2	46w-Led Colour Temperature 4000k Tridonic Led Module And Driver UV Stabilised, Self-Extinguishing Polycarbonate Diffuser With Photo-Engraved Interior And Smooth Outer Surface Anti-Tamper Polycarbonate Snap-Lock Latches Complete With Mounting Accessories		installation plant

Incandescent lamps and 16W 2D lamps are not acceptable to be used on this project and should be replaced with PL compact fluorescent lamps as an alternative.

2.25 PHOTO CELL

The area lighting must be switched direct by the photo cell. The photo cell must be mounted where indicated on the drawings in such a manner that the luminaires will not affect the operation of the photo cell.

The photo cell must be linked with the distribution board by 3 x 1.5 mm² PVC conductors drawn in conduit in the roof space.

The photo cell must comply to the following: -

i) Area lights must be switched ON when the illumination dropped to 50 lux.

ii) Area lights must be switched OFF when the illumination raised to 90 lux.

iii) It must be weatherproof and must have a built in time delay of approximately 40 seconds.

iv) Built in protection against voltage surges must be provided.

v) The photo cell must be mounted with an aluminium base.

vi) A sample of the proposed photo cell must be submitted to the Department for approval.

vii) 16A rating must be provided.

2.26 MANHOLES

All Manholes will be constructed and supplied by the building contractor.

2.27 SCHEDULE OF CABLE CONNECTIONS

See the schedule on the Site Layout Drawing.

2.28 LOW VOLTAGE DISTRIBUTION CUBICLES (KIOSKS)

Sheet steel canopies as specified in Part 3, must be provided.

2.29 TESTING AND INSPECTION

The Contractor shall test the entire installation in terms of Regulation 7 of the Electrical Installation Regulations 1992 of the Occupational Health & Safety Act 1993 and shall issue a Certificate of Compliance on the official form, Annexure 1, obtainable from the Electrical Contracting Board of South Africa. All tests shall be carried out in conjunction with and to the satisfaction of the Supply Authority and in the presence of the Department's Authorised Representative. The Contractor shall make all arrangements for testing and inspection, the costs thereof being included in the Tender Price.

All 220 V socket outlets shall be tested for polarity and the sensitivity of the earth leakage protection equipment shall be tested by means of an approved instrument.

Each length of cable shall be tested for insulation and polarity by means of a 1000 volt megger designed for that purpose. In the case of underground cables this shall be done before backfilling. In addition, the earth-loop impedance of each main and sub-main feed shall be measured. The earth resistance at each down conductor earth electrode shall be measured. The earth resistance shall be tested by means of an approved instrument.

If there is no power on the day of the test, the Contractor shall supply a 3 kW, 230 V generating plant for testing purposes.

"DANGER" notices shall be displayed at remote ends of cables under test.

The Engineer reserves the right to witness all tests. The Contractor shall advise the Engineer in writing of all results and furnish copies of all certificates.

Load balancing shall be undertaken by the Contractor in conjunction with the Engineer. Where conductors are altered to achieve satisfactory results they shall be re-laced by the Contractor.

The Contractor shall provide all the necessary instruments for the proper testing of the complete installation. If there is reason to doubt the accuracy of such instruments, the Contractor shall take the necessary action to prove their accuracy.

If the results of the first delivery tests are favourable and the installation is found in order, there will be no charge for the test. If the test is found unfavourable a levy of R2000, 00 will be charged to the Contractor for each subsequent test in the form of a variation order omitting such costs from his contract price.

The Contractor shall ensure that the installation is completed in every respect and that there are no major defects prior to notifying the Engineer (in writing) for a first delivery inspection. The Engineer will accept zero minor defects during the final inspection. Should this number of defects be exceeded at the final inspection then the Engineer will terminate that inspection and requests that an additional final inspection be arranged by the Contractor.

3. STEP-UP TRANSFORMER & STEP-UP TRANSFORMER

Technical Specifications: Data Sheet

Item 1: 3000kVA 11/0.400kV Distribution Transformer

Item 2: 3000kVA 0.400/11kV Distribution Transformer

TECHNICAL SPECIFICATION FOR TRANSFORMERS			
NO.	DESCRIPTION	UNIT	GUARANTEED VALUE
1	Manufacturer		**MATLAKSE (PTY) LTD**
2	South African Standard		Tested in Accordance with **SANS 780 Ed. 4**
3	International Standard		IEC60076
4	Type		Distribution Transformer
5	Installation		Outdoor
6	Maximum Ambient Temperature		-5 to 40°C
7	Altitude	m.a.s.l	≤1800m
8	Nominal Power	kVA	3000
9	Primary Voltage	kV	11
10	Secondary Voltage	kV	0.400
11	Rated Frequency	Hz	50
12	Cooling System		ONAN
13	Number of Windings Per Leg		2
14	Number of Phases		3
15	Tap Changer		NLTC
16	Tap Range		±2.5% & ±5.0%
17	Coolant		PCB Free Virgin Mineral Oil
18	No-Load Losses	kW	± 4.750
19	Load Losses	kW	± 22.000
20	Impedance	%	± 5.0 – 6.5
21	The temperature rise (at rated capacity and 30°Cambient temperature, maximum 40°C.)--Top Oil	°C	60
22	The temperature rise (at rated capacity and 30°Cambient temperature, maximum 40°C.)--Winding	°C	65
23	**Basic Insulation Level**		
a)	Primary	kV	75
b)	Secondary	kV	25
24	**Power Frequency Withstand Voltage**		
a)	Primary	kV	28
b)	Secondary	kV	2.5
25	Vector Group		YNd1 | Dyn11
26	Core Material		Grain Oriented Silicon Steel
27	Transformer Powder Coat Finish		C12 – Avocado Green
28	Winding Material (H.V & L.V)		**Aluminium Wound**
TRANSFORMER DIMENSIONS INCLUDING ALL FITTINGS AND WEIGHT			
1	**Overall dimensions**		
a)	Length	mm	As per Drawing
b)	Width	mm	As per Drawing
c)	Height	mm	As per Drawing
2	**Weights**		
a)	Active part	kg	As per Drawing
b)	Total	kg	As per Drawing

	ACCESSORIES		
1	Bolted Hot Dip Galvanized Radiators	Yes/No	Yes
2	Oil Temperature Thermometer with Alarm and Trip	Yes/No	Yes
3	Pressure Relief Valve with Trip Contact	Yes/No	No
4	Oil Level Indicator	Yes/No	Yes
5	Conservator with Silica Gel Breather	Yes/No	Yes
6	Buchholz Relay with Alarm and Trip	Yes/No	Yes
7	M12 Earth Terminals	Yes/No	Yes
8	Auxiliary Terminal Box	Yes/No	Yes
9	Lifting Lugs	Yes/No	Yes
10	Skid Under Base	Yes/No	Yes
11	Filter and Drain Valve	Yes/No	Yes
12	Sealed Bolted Main Cover	Yes/No	Yes
13	H.V and L.V Cable Boxes	Yes/No	Yes
14	Stainless Steel Bolts and Nuts	Yes/No	Yes
	ROUTINE TESTS		
1	Measurement of Insulation Resistance.	Yes/No	Yes
2	Voltage Ratio Measurement and Vector Group Verification Test.	Yes/No	Yes
3	No-Load Loss Test and Confirmation of No-LoadCurrent.	Yes/No	Yes
4	Measurement of DC Winding Resistance.	Yes/No	Yes
5	Load Loss Test and Confirmation of ImpedanceVoltage.	Yes/No	Yes
6	Induced Voltage Withstand.	Yes/No	Yes
7	Separate-Source Power-Frequency Voltage Withstand Test.	Yes/No	Yes
8	Sealing Test.	Yes/No	Yes

3.1 TRANSFORMER DRAWING

See drawing layout

3.2 MV VACUUM CIRCUIT BREAKER

- VD4-LMT 630A Vacuum Circuit Breaker.
- For Double Bus-bar Reyrolle Switchgear
- Rated current 630A
- Rate voltage 12kV
- Rated STC 31.5kA for 3 seconds
- Rated BIL 95kV
- Rated power frequency withstand voltage 28kV
- With Plug type secondary connection
- Fitted with (Per Unit)
- Motorized Spring Charging Mechanism
- Closing coil
- Trip coil
- Supplied with (Per Unit)
- Shutter Box
- Shutter operating mechanism
- Wired to standard drawings supplied by client

APPENDIX H
TECHNICAL SPECIFICATION PART 3 of 4

PART 3

QUALITY SPECIFICATION

3.1 CONDUIT AND CONDUIT ACCESSORIES

3.1.1 GENERAL

This section covers the requirements for conduit and conduit accessories for general installations under normal environmental conditions.

3.1.2 SCREWED CONDUIT

Conduits shall comply with SANS 162 and shall bear the SANS mark.

All conduit shall be heavy gauge, welded or solid drawn, hot-dip galvanised or black enamelled, screwed tube.

Galvanised conduit shall be hot-dipped inside and outside in accordance with SANS 763.

All conduit ends shall be reamed and threaded on both sides and delivered with a coupling at one end and a plastic cap on the other end.

3.1.3 METAL CONDUIT ACCESSORIES

All metal conduit accessories shall be malleable cast iron or pressed steel with brass bushes in accordance with SANS 162. Alloy or pressure cast metal accessories or zinc base alloy fittings are not acceptable. All fittings whether galvanised or black enamelled, shall be fitted with brass screws.

Accessories must be hot-dip galvanised to SANS 763.

3.1.4 CIRCULAR TYPE BOXES

The boxes shall be of the long spout pattern, manufactured of malleable cast iron or pressed steel and stove enamelled jet black or galvanised as required. The two cover fixing holes shall be diametrically opposite each other, drilled and tapped at 50 mm centres.

Junction, draw-in and inspection boxes shall be of adequate size and shall be supplied with heavy gauge metal cover plates.

Boxes shall comply with SANS 162.

3.1.5 SWITCH BOXES AND SOCKET-OUTLET BOXES

All switch boxes and socket-outlet boxes shall be manufactured of pressed galvanised steel of at least 1 mm thickness. All boxes shall be fitted with the necessary lugs to suit standard flush mounted switches and socket-outlets manufactured in accordance with SABS 518 and SANS 1085.

Only galvanised or metal wall boxes will be acceptable to the Engineer and or the Client's Engineer and or the Client's Department, even if the tenderer offered to use non metallic conduit and accessories. Light switch boxes shall be 100 x 50 x 50 mm with two 20 mm knocks-outs on the sides and a single knock-out on the top, bottom and back.

Socket-outlet boxes shall be 100 x 100 x 50 mm with two 20 mm knock-outs each on the top, bottom, sides and back.

Where cavity walls are encountered tenderers must allow to install deep back to back (one end closed) wall boxes. Switch and socket-outlet cover plates shall comply with SANS 1084.

3.1.6 FLEXIBLE CONDUIT

Flexible steel conduit and adaptors shall comply with BS 731, Part 1 where applicable. Flexible conduit shall be of galvanised steel construction and plastic sheathed. Flexible conduit shall only be used as specified and shall then be installed in accordance with SANS 0142.

3.1.7 PLAIN-END METALLIC CONDUIT

As an alternative to the threaded conduit, plain-end (unthreaded) metallic conduit with accessories may be used under the conditions stated in the Standard Specification for "INSTALLATION AND TERMINATION OF CONDUITS AND CONDUIT ACCESSORIES".

Unthreaded conduit shall be manufactured of mild steel with a minimum thickness of 0,9 mm and shall comply with the SABS 1007. Bending and setting of conduit shall be done with the correct apparatus recommended by the manufacturer of the conduit.

The Contractor or Supplier shall be responsible for obtaining the approval of local authorities for the use of this system.

All conduit and accessories used in areas within 50 km of the coast shall be hot-dip galvanised to SANS 763.

3.1.8 NON-METALLIC CONDUIT

Non-metallic conduit shall comply fully with SANS 950 and shall be installed in accordance with Appendix C of the same specification as well as the Standard Specification for "INSTALLATION AND TERMINATION OF CONDUITS AND CONDUIT ACCESSORIES".

3.1.9 EARTH CLAMPS

Earth clamps shall consist of copper strips at least 1,2 mm thick and not less than 12 mm wide secured with a brass bolt, nut and washer and shall be so constructed that the clamp will fit firmly to the conduit without any additional packing.

3.2 PVC-INSULATED CABLES - 600/1000 V GRADE

3.2.1 GENERAL

This section covers the requirements for PVC-insulated cables for general installations under normal environmental conditions.

3.2.2 CONSTRUCTION

Cables shall be manufactured in accordance with SABNS 1507, shall come only from fresh stocks, and shall be constructed as follows:

(a) Unarmoured cables	-	PVC-insulated/PVC-sheathed
(b) Armoured cables	-	PVC-insulated/PVC-bedded/armoured/black extruded PVC outer sheath
(c) Single core cables	-	PVC-insulated/unsheathed

The conductors shall be of high conductivity annealed stranded copper and the cores may be shaped or circular.

The insulation shall be general purpose PVC, 600/1000 V Grade.

The bedding shall consist of a continuous impermeable sheath of PVC extruded to fit the core or cores closely and in the case of multi-core cables, to fill the interstices between the cores.

Where armouring is specified it shall consist of one layer of galvanised steel wire in the case of multi-core cables and non-magnetic metallic wire in the case of single core cables. Aluminium strip or tape armouring is not acceptable.

Where specified, an earth continuity conductor shall be provided in the armouring in accordance with SABS 1507.

3.2.3 PVC-SHEATHED ALUMINIUM-COVERED CABLES

Aluminium covered cables shall comprise PVC-insulated copper conductors protected by an aluminium foil tape screen and a PVC sheath.

Cable ends shall be made off with compression glands fitted with a neoprene ring to seal the end.

Aluminium sheathed cable shall be installed on surface only, using matching saddles installed at suitable intervals to prevent sagging.

Where exposed to sunlight, the cable shall have a stabilised black outer sheath.

3.2.4 LENGTHS

Cable shall be manufactured and supplied in one length to the lengths specified unless these lengths exceed a standard drum length in which case a ruling shall be obtained from the Engineer.

3.2.5 TESTS

At the option of the Engineer, acceptance tests shall be carried out on production runs of the cable in accordance with SANS 1507.

3.3 GLANDS FOR PVC-INSULATED CABLES

Glands to be used for terminating PVC/PVC/SWA/PVC cables shall be of the adjustable type.

Glands shall be suitable for general purpose 600/1000 V Grade cable with steel armouring.

The glands shall be made of nickel-plated bronze or brass.

The glands shall consist of a barrel carrying a cone bush screwed into one end and a nickel-plated brass nipple carrying a nickel-plated brass or a heavy galvanised steel locknut screwed into the other end. The galvanising shall comply with SANS 763.

Non-watertight glands must be easily converted to watertight glands by means of a waterproofing shroud and inner seal kit. On the cable entry side of the barrel a concave groove shall be provided to accommodate the top rim of the waterproofing shroud.

The shrouds shall be made of non-deteriorating neoprene or other synthetic rubber, and shall be resistant to water, oil and sunlight. The shrouds shall fit tightly around the glands and cable.

Glands shall be provided with ISO threads and shall be suitable for the specified cable sizes.

Flameproof glands shall comply with SANS 808, Groups 1, 2a and 2b.

Suitable accessories shall be provided with glands to be used on ECC armoured cables to

facilitate a bolted lug connection of the earth continuity conductors. Grooves cut into the barrel or cone bush to accommodate the earth continuity conductors are not acceptable.

For unarmoured cables the cone bush and compression ring of the gland shall be replaced with a synthetic rubber compression bush and ring to provide the required grip on the outer sheath of the cable.

3.4 CABLE TERMINATIONS AND JOINTS

3.4.1 HEAT-SHRINKABLE MATERIALS

3.4.1.1 General

The complete kit shall be packed in a container that is marked for the type of cable insulation and construction as well as the voltage range for which the materials are suitable.

An illustrated set of instructions for the installation of the materials shall accompany every kit.

The joints and terminations shall make minimal, if any, use of insulating or stress relieving tapes. The use of electrical stress control and insulating tubing that is heat-shrunk onto the termination or joint, is preferred above other methods.

The materials shall comply with VDE 9278 and the supplier shall be called upon to confirm this aspect before acceptance of the materials or installation.

The heat-shrinkable and other materials used for the terminations and joints shall be of a high quality and shall retain their electrical and mechanical properties without deterioration.

3.4.1.2 Terminations with Heat-Shrinkable Materials

Terminations shall be made of a material that gives lasting protection against ultraviolet radiation.

The cores of all cables terminated outdoors and the cores of 3,3 kV and higher voltage cables terminated indoors, shall be completely covered with a shrunk-on protective layer against surface tracking, ultraviolet radiation and weathering.

3.5 LIGHT SWITCHES

3.5.1 GENERAL

This section covers the requirements for switches for use in general installation under normal environmental conditions.

Light switches of one manufacturer only, will be accepted per project.

3.5.2 FLUSH AND SURFACE MOUNTED SWITCHES

All switches shall be suitable for mounting in 100 x 50 x 50 mm boxes, shall comply with SANS 163 and shall bear the SANS mark.

Switches shall be of tumbler operated micrograph type rated at 16 A, 220/250 V.

Switches shall have protected terminals for safe wiring.

Contacts shall be of silver material.

On multi-lever switches, it shall be possible to individually change any of its switches.

The yoke strap shall be slotted to allow for easy alignment.

The covers of surface mounted switches shall have toggle protectors.

Where light switches are installed in partitions, they shall, where possible, be of the special narrow type intended for installation into the mullions.

3.5.3 WATERTIGHT SWITCHES

Watertight switches shall be of the micrograph type suitable for surface mounting and shall bear the SANS mark.

The housing shall be of galvanised cast iron or die-cast aluminium with watertight cover plate and toggle.

The switch shall have a porcelain base and a quick acting spring mechanism and shall be rated at 16 A, 220/250 V.

The ON/OFF positions shall be clearly marked on the switch housing.

3.5.5 COVER PLATES

Cover plates shall be finished in ivory coloured baked enamel, anodised bronze or aluminium unless otherwise specified.

Cover plates shall overlap the outlet to cover wall imperfections.

Cover plates shall comply with SABS 1084.

3.6 UNSWITCHED AND SWITCHED SOCKET-OUTLETS

3.6.1 GENERAL

This section covers the requirements for unswitched and switched socket-outlets for use in general installations under normal environmental conditions.

Switch sockets of one manufacturer only, will be accepted per project.

3.6.2 FLUSH AND SURFACE MOUNTED SWITCHED SOCKETS

All switched socket-outlets shall be suitable for mounting in 100 x 100 x 50 mm or 100 x 50 x 50 mm boxes, shall comply with SANS 164 and shall bear the SANS mark.

Switches shall be of the tumbler operated micrograph type rated at 16 A, 220/250 V.

Terminals shall be enclosed for safe wiring.

Contacts shall be of silver material.

Safety shutters shall be provided on live and neutral openings.

The yoke strap shall be slotted to allow for easy alignment.

The covers of surface mounted switched sockets shall have toggle protectors.

Miniature circuit-breakers shall be used in lieu of a switch where specified.

Where 13 A flat pin switched socket-outlets are specified, these shall comply with BS 1363.

3.6.3 WATERTIGHT SWITCHED SOCKETS.

The housing of watertight switched socket shall be of galvanised cast iron or die-cast aluminium with watertight machined joints.

The switch shall have porcelain base and a quick-acting spring mechanism and shall be rated at 16 A, 220/250 V.

The ON/OFF positions shall be clearly marked on the switch housing.

The socket openings shall be rendered watertight by means of a gasketed cover plate which is screwed onto the body of the unit. The cover plate shall be secured to the body of the unit by means of a chain.

3.7 TUBULAR FLUORESCENT LAMP LUMINAIRES FOR INTERIOR APPLICATIONS

3.7.1 GENERAL

Luminaires, associated equipment and control gear shall be new and unused and shall be supplied complete with lamps, control gear, diffusers, mounting brackets, etc. as applicable, and shall be delivered to site in a protective covering.

Lamps shall be delivered separately.

Tenders shall be accompanied by full descriptive information of the luminaires offered. Photometric data, i.e. polar curves and coefficients of utilization certified by the SABS shall be submitted with tenders for all luminaires offered.

3.7.2 GENERAL TECHNICAL REQUIREMENTS

3.7.2.1 General

Tubular fluorescent lamp luminaires shall comply fully with SANS 1119 and all amendments as well as the additional requirements of this specification. Luminaires which bear the SABS mark are preferred.

The Engineer reserves the right to have samples of luminaires offered tested by the SANS for compliance with SANS 1119. If a sample luminaire is found not to comply with SANS 1119 the cost of such tests shall be borne by the Tenderer.

3.7.2.2 Construction

A luminaire shall consist of a ventilated body manufactured of cold rolled sheet steel not less than 0,8 mm thick, suitably braced or stiffened to prevent distortion. The body shall be of sufficient strength for the mounting of the entire luminaire.

The luminaire body shall be designed to accommodate the control gear, wiring, lamp holders and, where applicable, the diffuser. It shall be possible to reach the control gear without disconnecting wiring or removing the luminaire.

Except for mounting holes and/or slots and the required openings in air-return luminaires, the back of the body channel shall be closed over the full length of the luminaire.

Suitable knockouts shall be provided in the rear of the luminaire body for wire entry.

All components, including screws, bolts and nuts utilised in the construction of the luminaire or fixing of its components, shall be corrosion proof.

3.7.2.3 Internal Wiring

Luminaires shall be completely wired internally, Conductors shall be protected with grommets where they pass through holes in the body.

The wiring shall be totally metal enclosed to prevent any possible contact with live components while changing lamps.

The conductor insulation shall be rated to withstand the temperature inside the luminaire body without deterioration.

The wiring shall terminate on a suitable terminal block. There shall be no joints in the internal wiring.

An earth terminal, welded to the luminaire body, shall be provided. To ensure good earth continuity the earth terminal shall not be spray painted. The earth conductor shall be connected to this terminal by means of a crimped lug.

3.7.2.4 Lamp Holders

Lamp holders shall be of the telescopic spring loaded type only.

3.7.2.5 Control Gear

The control gear, ballasts, capacitors and starters shall be designed and manufactured to suit the control circuitry adopted and shall bear the stamp of approval by the SABS.

Ballasts shall comply with SANS 890 and 891, suitable for operation on 220/250 V, 50 Hz supplies.

Ballasts shall further be suitable for the particular luminaire to ensure that the thermal limits specified in par. 3.5 of SANS 1119 are not exceeded.

Noisy ballasts will not be accepted and shall be replaced at no cost to the Client.

Starters shall comply with BS 3772. Starters with metal cans shall contain integral earthing facilities to earth the can upon insertion.

Starters shall be accessible from the outside of the luminaire, and the replacement of the starter shall not necessitate the removal of lamps.

3.7.2.6 Capacitors

Capacitors shall comply with SANS 1250. The power factor of each complete fitting shall be corrected to at least 0,85.

3.7.2.7 Lamps

Fluorescent lamps shall be suitable for the control circuitry used. Lamps shall comply with SANS 1041.

If no colour is specified in the Project Specification, the light colour shall correspond to colour 2 (4300 K) of SANS 1041.

Lamps of the same colour shall be provided for an entire installation unless specified to the contrary.

There shall be no visible flicker in the lamps and lamps shall readily strike when switched on. Faulty lamps or ballasts shall be replaced at no cost to the Client.

3.7.4 INDUSTRIAL LUMINAIRES

Industrial type luminaires shall consist of a basic channel luminaire fitted with detachable side reflectors.

The reflectors shall be manufactured of cold rolled steel, not less than 0,8 mm thick.

The reflectors shall be designed to improve the downward light output ratio and decrease the upward light output ratio to a value of less than 2%.

3.7.5 FLOODLIGHTS WITH TAMPERED GLASS DIFFUSER

GENERAL:

The luminaire must be compact type mini floodlight of the wall mounted type for use with 2 no of 26 W PL Comact Fluorescent Lamps and must be designed for the functional area lighting around buildings.

CONSTRUCTION DETAILS

DIFFUSER:

The diffuser must be of a precise injection moulding with prisms for optimum light control and manufactured in either tough Ultra-violet resistant acrylic or in highly vandal resistant UV-stabilised polycarbonate.

DIFFUSER FRAME:

The diffuser frame must be a die-cast powder coated corrosion resistant aluminium casting incorporating the diffuser of which both can be removed from the body by utilising one captive stainless steel screw.

LUMINAIRE BODY:

The luminaire body must be manufactured from black epoxy coated aluminium which can incorporate all the electrical components, the reflector and the gasket which seals the diffuser frame and body. A back entry hole suitable for a 20 mm dia. conduit must be provided to accommodate the wiring entry and two mounting holes suitable for 6 mm diameter screws must be provided as a standard feature.

REFLECTOR:

The reflector must be manufactured from ultra pure pre-anodised aluminium for maximum reflection.

ELECTRICAL:

The terminal block and lampholder must be manufactured from porcelain and the wiring must be coated with heat resistant silicone rubber. All control gear shall be suitable for the supply voltage of 220/230 volt –50 Hz and shall bear the SABS mark of approval or equivalent.

3.8 EARTHING ELECTRODES

3.8.1 GENERAL

This section covers uncoated, coated and metal clad circular rod electrodes intended to provide an earth in soil for electrical and lightning arrestor systems.

3.8.2 CATEGORY AND TYPE

3.8.2.1 Only the following type of earthy rods shall be used:

1(a) - Solid copper

(b) - Solid stainless steel

2(a) - Solid steel with bonded copper protection

(b) - Solid steel with plated copper protection

(c) - Solid steel with a shrunk-on copper jacket

3. - Solid steel with a shrunk-on stainless steel jacket

4. - Galvanised steel

3.8.2.2 Bare aluminum is not acceptable as an electrode material.

3.8.2.3 All rods shall be solid and of circular cross section with length as specified in the Project Specification.

3.8.2.4 The nominal diameter of the earthing rods shall not be less than 16 mm unless the rods are specified for placing in pre-drilled holes in which event the minimum nominal diameter shall not be less than 12 mm.

3.8.3 COUPLINGS AND CONDUCTOR CLAMPS

Earthing electrodes shall be provided with (n-1) couplings where n = number of rods supplied.

Rods designed for coupling by means of external sleeves shall be provided with an adequate quantity of hydrocarbon or silicon grease to be applied to the coupling before the joint is made.

Rods designed for coupling by means of internal pins or splines shall be provided with thin-walled tubes and hydrocarbon or silicon grease to seal the joint.

Conductor clamps shall be provided to suit the type and size of rods provided and the type and size of conductor specified in the Project Specification.

The material of the clamps shall be electrolytically compatible with the rod and conductor materials.

Where brazed or welded connections are specified, the supplier of the rods shall stipulate at least two types of metals which are compatible with the rod and conductor materials.

An adequate number of driving caps of bolts shall be supplied with the rods to protect the ends of the earthing rods whilst being driven into hard soil.

3.10 SWITCHBOARDS (Up to 1 kV)

3.10.1 GENERAL

3.10.1.1 Scope

This section covers the manufacturing and testing of flush mounted, surface mounted and floor standing switchboards for general installations in normal environmental conditions and for system voltages up to 1 kV.

3.10.1.2 Size

All switchboards shall be of ample size to accommodate the specified switchgear and provide space for future switchgear. For every four (4x) or part of four (4x) 5 kA circuit-breakers on a switchboard, space for an additional 5 kA circuit-breaker shall be allowed unless future space requirements are clearly specified. For circuit-breakers above 5 kA, this factor shall be 15%. The clearance between adjoining switchgear openings shall be as specified.

3.10.1.3 External Dimensions

The maximum allowable height of free standing switchboards is 2,2 m. Where, due to space restrictions, a board exceeds 2,2 m in height, equipment not normally requiring access, shall be installed in the top section, enabling equipment normally requiring access to be installed lower down in the board, All other specified external dimensions for switchboards shall be strictly adhered to. If the clearances specified cannot be adhered to as a result of restricting external dimensions, the Contractor shall obtain the approval of the Engineer before manufacturing the switchboards.

3.10.1.4 Moisture and Vermin

All switchboards shall be rendered moisture-proof and vermin-proof and shall be adequately ventilated.

3.10.1.5 Load Balance

The load shall be balanced as equally as possible across multi-phase supplies.

3.10.2 CONSTRUCTION OF FLUSH MOUNTED SWITCHBOARDS

3.10.2.1 Standard

Flush mounted switchboards shall comply fully with SABS 1180, Part I. Unless the depths of the switchboards are specified, the depths shall be determined in accordance with par. 3.10.4.

3.10.2.2 Expanded Metal

Where switchboards are to be built into 115 mm thick walls, expanded metal shall be spot-welded to the rear of the bonding trays. The expanded metal shall protrude at least 75 mm on each tray side to prevent plaster from cracking.

3.10.2.3 Knock-Outs

Knock-outs shall be provided in the top and bottom ends of each switchboard tray to allow for the installation of conduits for the specified and future circuits. Knock-outs shall be provided for an equal number of 20 mm and 25 mm dia. conduits.

3.10.2.4 Panel

Front panels shall have machine punched slots for housing the specified and future flush

mounted switchgear. The distance between the inside of the closed doors and the panel shall not be less than 20 mm. No equipment may be mounted on the panel unless the panel is permanently hinged to the switchboard frame.

3.10.2.5 Fixing of Front Panels

The front panel shall be secured to the architrave frame by means of captive fasteners. Alternatively the panel may be secured to the architrave frame by means of two pins at the bottom and a latch or lock at the top of the panel. Self-tapping screws will not be allowed.

3.10.2.6 Door Handles and Catches

Switchboard doors shall be equipped with handles and catches. Locks shall only be provided when specified. In all cases where lockable doors are higher or wider than 450 mm, handles consisting of a pushbutton-and-handle combination with spring-loaded catch or rotary handle-and-catch combination shall be installed. Switchboard doors smaller than 450 mm in height and width may be equipped with spring-loaded flush mounted ring type latches. Square key operated catches are not acceptable unless specified.

3.10.3 CONSTRUCTION OF SURFACE MOUNTED SWITCHBOARDS

3.10.3.1 Standard

Surface mounted switchboards shall comply with SABS 1180, Part II.

3.10.3.2 Switchboard Tray

Surface mounted switchboards shall be equipped with a 1,6 mm minimum sheet steel reinforced tray, suitably braced and stiffened to carry the chassis, door and equipment. Lugs to secure the switchboard to a vertical surface shall be provided.

3.10.3.3 Construction

All joints shall be welded or securely bolted. The tray shall be square and neatly finished without protrusions. The front tray sides shall be rounded with an edge of at least 20 mm to accommodate flush doors.

3.10.3.4 Chassis

A sheet steel chassis for the mounting of equipment shall be bolted to the tray and shall comply with the requirements of par. 3.10.4.

3.10.3.5 Front Panel and Door

The front panel and door shall comply with the above. Doors shall fit flush in the tray when closed.

3.10.3.6 Dimensions

Unless the depth of the switchboards is specified, the dimensions shall be determined in accordance with the requirements of par 3.10.4.

3.10.4 MOUNTING OF EQUIPMENT

3.10.4.1 The mounting of equipment shall comply with SABS 1180 where applicable. Equipment to be mounted on the chassis shall be mounted by bolts, washers and nuts or by bolts screwed into tapped holes in the chassis plate.

In the latter case the minimum thickness of the chassis plate shall be 2,5 mm. The latter method shall not be used where boards will be subject to vibration or mechanical shocks. Self-tapping screws will not be accepted.

3.10.4.2 Mounting of Chassis

The chassis of flush mounted and smaller surface mounted boards shall be mounted in accordance with SABS 1180. For all free standing switchboards and surface mounted switchboards where the main switch rating exceeds 100 A (triple-pole), space for wiring shall be provided between the chassis and tray. This space shall be adequate to install the supply cable behind the chassis and terminate on the main switch without sharp bends in the cable cores.

3.10.4.3 Grouping of Equipment

Equipment shall be arranged and grouped in logical fashion.

Where earth leakage units are required, the associated circuit-breakers shall be installed adjacent to the unit.

3.10.4.4 Mounting of Circuit Breakers

All moulded-case circuit-breakers shall be flush mounted with only the toggles protruding. Miniature circuit-breakers may be installed in clip-in trays mounted on the frame. All other circuit-breakers shall be bolted to the chassis. Special provision shall be made for large main switches when designing the framework. Care shall be exercised that the rear studs of circuit-breakers are properly insulated from the steel chassis. Where necessary, insulating material shall be installed between the rear studs and the chassis. Circuit-breakers shall be installed so that the toggles are in the up position when "ON" and down when "OFF".

3.10.4.5 Instrumentation

All metering instruments shall be flush mounted in the front panel or door. The rear terminals of instruments mounted on doors shall be covered with an insulating material to prevent accidental contact. Current transformers for metering shall be mounted so that the rating plate is clearly visible. Fuses for instrumentation shall be mounted in an easily accessible position and clearly marked.

3.10.4.6 Mounting of Fuses

Fuse holders shall be mounted semi-recessed in the front panel so that fuses can readily be changed without removing the front panel. Busbar mounted fuses for instrumentation shall be used as far as possible.

Where equipment requiring fuses is specified on a board (fuse switches etc.), a ruling shall be obtained from the Engineer on the quantity of spare fuses to be provided.

3.10.4.7 Equipment in Main Boards

Equipment in main low voltage switchboards and sub-main boards shall be grouped in individual compartments.

3.10.5 WIRING

3.10.5.1 Cabling

Cables connected to incoming or outgoing circuits shall be terminated on a gland plate supplied for this purpose. Power cables up to and including 70 mm□ may terminate on clamp type terminals where the clamping screws are not in direct contact with the conductor. Connection to the equipment can then be made with cables that are similarly connected to the clamp terminal. All power cables larger than 70 mm□ shall terminate on busbars that are connected to the associated equipment. Parallel incoming or outgoing cables shall be connected to a collector busbar without crossing the conductors.

3.10.5.2 Current Ratings

The current rating of conductors for the internal wiring shall be sufficient for the maximum continuous current that can occur in the circuit. This value shall be determined from the circuit-breaker or fuse protection of the circuit.

3.10.5.3 Internal Wiring

(a) Standard 600/1000 V grade PVC-insulated stranded annealed copper conductors to SANS 1507 shall be employed for the internal power wiring of switchboards. The smallest conductor size to be used for power wiring in switchboards shall be 2,5 mm□. Flexible cord of minimum size 1,0 mm□.

(b) Where heat generating equipment is present and the internal temperature of the board is likely to exceed 50□C, silicon-rubber insulated stranded conductors shall be used.

(c) Wiring shall be arranged in horizontal and vertical rows and shall be bound with suitable plastic straps or installed in PVC wiring channels. Under no circumstances may PVC adhesive tape be used for the bunching of conductors or for the colour identification of conductors.

(d) Bunched conductors shall be neatly formed to present a uniform appearance without twisting or crossing the conductors. Conductors leaving the harnesses shall be so arranged that they are adjacent to the chassis.

(e) Conductors to hinged panels and doors shall be secured on both the door and the frame and shall be looped between the two points. the loop shall be arranged to produce a twisting notion when the door is opened or closed. A flexible protection sleeve shall be installed over the conductors.

(f) Where wiring channels are used, they shall be installed horizontally and vertically. Under no circumstances may power and control circuit wiring be installed in the same wiring channel. Channels shall not be more than 40% full.

(g) All wiring between different panels within the same switchboard shall be installed in wiring channels.

(h) Grommets shall be installed in each hole in the metalwork through which conductors pass.

(i) All wiring shall be installed away from terminals, clamps or other current carrying parts. Wiring shall also be kept away from exposed metal edges or shall be protected where they cross metal edges.

(j) Conductors may be jointed at equipment terminals or numbered terminal strips only. No other connections are allowed.

(k) Where conductors change direction, smooth bends shall be formed with a radius of at least 5 times the outside diameter of the conductor or harness.

(l) Where screened cables are specified, the screening shall be earthed in the switchboard or control board only unless clearly specified to the contrary.
Screened cables entering control boxes through pressed knock-outs, shall terminate in compression glands. Conductors shall as far as possible remain inside the screening at terminations. Where conductors have to separate from the screen, the braiding shall be separated and the conductors drawn through the braid without damaging the braiding. The conductors shall then be connected to their respective terminals and the screening smoothed and connected to the earth terminal.

(m) Where neutral connections are looped between the terminals of instruments, it is essential that the two conductor ends be inserted into a common lug or ferrule and are crimped or soldered together in order that the neutral connection is not broken when the conductors are removed from one of the instruments.

(n) Wiring should as far as possible be confined to the front portions of switchboards for ease of access. This requirement is important for wiring between smaller circuit-breakers and the associated main circuit-breaker as well as the wiring from circuit-breakers to lighting and socket-outlet circuits.

(o) A maximum of two conductors will be allowed per equipment terminal. Where more conductors must be connected to the same equipment terminal (e.g. main circuit-breaker feeding other circuit-breakers), stub busbars shall be provided for the various conductors.

3.10.5.4 Load End Connections

The supply end connections to all equipment shall under all circumstances be at the top and the load end connections at the bottom.

3.10.5.5 Wiring to Circuit Breakers

Equipment with a rating exceeding the current rating of 70 mm□ conductors shall be connected by means of busbars to the main busbars. Looped connections may only be installed for a maximum of two outgoing circuits. Where there are more than two outgoing circuits, busbars shall be used and equipment connected individually to the busbars.

3.10.5.6 Conductor Terminations

Conductors connected to terminals complying with the Standard Specification for "WIRING TERMINALS", need not be soldered or ferruled. Connections to circuit-breakers, isolators or contactors shall be made by one of the following methods:

(a) A ferrule of the correct size,

(b) Winding a conductor strand tightly around the end to totally cover the end. All conductors terminating on meters, fuse holders and other equipment with screwed terminals shall be fitted with lugs. The lugs shall be soldered or crimped to the end of the conductor.

The correct length of insulation shall be stripped from the end to fit into the terminal. Strands may not be cut from the end of the conductor.

3.10.5.7 Identification

The colour of the conductors for all 220/250 V circuits shall correspond to the colour of the supply phase for that circuit. Neutral conductors shall be black.

3.10.6 PAINT FINISH

Metal components of the framework, panels and chassis shall be painted in accordance with the Standard Specification "STANDARD PAINT SPECIFICATION".

3.10.7 LABELLING

3.10.7.1 Care shall be taken to ensure that all equipment is fully labelled and that accurate descriptions and safety warning notices appear in English.

3.10.7.2 Material

Engraved plastic or ivory sandwiched strips shall be used throughout. The strips shall bear white lettering on black background for normal labels and red letters on a white or yellow background for danger notices.

3.10.7.3 Switchboards

All equipment on switchboards shall be identified with the necessary labels. The circuit numbers shall appear at grouped single-pole circuit-breakers. The circuit numbers shall correspond to the circuit numbers on the final installation drawings. The abovementioned circuits shall be identified on a legend card, which shall be installed on the inside of the switchboard door, or in any other position where it can conveniently be observed. All fuses, including instrument fuses, shall have labels stating function, fuse rating and duty or type where applicable. All other equipment shall be identified separately and their functions shall be clearly indicated.

3.10.7.4 Fixing of Labels

Labels shall not be fixed to components or trunking but to doors, panels, chassis or other permanent structures of the switchboard.

Engraved strips shall be secured to facilitate a neat future alteration of the designation of the labels. Sufficient fixing points shall be provided to prevent labels from warping. Labels in slotted holders shall be secured in position to prevent unauthorised removal. Labels may be secured by the use of brass bolts and nuts, self-tapping screws, slotted label holders or pop-rivets.

3.10.8 TESTS

The Engineer shall be notified when the mechanical construction of the switchboard, i.e. frame, panels and baseframe, is complete in order that it may be inspected at the factory.

Function tests of all equipment, control and interlocking circuits shall be conducted to the satisfaction of the Engineer. Testing equipment and facilities including instruments, dummy loads and additional switchgear and cables shall be provided by the Contractor at no extra cost. The Engineer shall be notified in writing two weeks in advance of any test to be conducted, to allow him to be present at such tests. A complete report on the tests shall be handed to the Engineer.

3.10.9 DRAWINGS

3.10.9.1 Drawings for Approval

A set of three prints of the shop drawings for the switchboards shall be submitted to the Engineer for approval before the boards are manufactured. The following information shall be presented:

(a) A complete wiring diagram of the equipment on the boards.

(b) A complete layout of the arrangement of the switchboards indicating all equipment dimensions and the construction of the boards. The positions and method of fixing and sizes of busbars shall be shown.

(c) All labelling information on a separate sheet.

(d) The make, catalogue number and capacity of all equipment such as isolators, circuit-breakers, fuses, contactors, etc.

The approval of drawings shall not relieve the Contractor of his responsibility to the Client to supply the switchboards according to the requirements of this Specification.

3.10.9.2 Completion

The supply contract shall be regarded as incomplete until all tests have been conducted successfully and all information have been handed to the Engineer.

3.11 LOW VOLTAGE DISTRIBUTION CUBICLES (KIOSKS)

3.11.1 GENERAL

This specification covers the manufacture of distribution kiosks for general reticulation and distribution systems in normal environmental conditions for three-phase, four wire, 400/231 V, 50 Hz systems.

3.11.2 SIZE

Kiosks shall be of ample size to accommodate the specified equipment and provide space for future requirements as specified.

3.11.3 MOISTURE AND VERMIN

Kiosks shall be weatherproof. To prevent the ingress of water onto live equipment, the door entry surrounds shall have a channel shape, at least 12 mm deep, to accommodate the door edge.

The roof shall be constructed with an overhang above non-continuous panelling and shall be provided with a drip-edge.

3.11.4 VENTILATION

Two ventilation grilles or slots, approximately 150 x 125 mm, vermin-proofed and insectproofed by means of 1,5 mm brass mesh or perforated steel plate spot-welded on the inside, shall be provided on the top and bottom of both side panels.

The construction of the grilles shall prevent the ingress of rain or water.

3.11.5 FIBREGLASS CANOPIES

3.11.5.1 Applications

Where specified and for all kiosks to be installed within 50 km of the coast and in corrosive industrial atmospheres, the canopy and doors shall be manufactured of fiberglass.

3.11.5.2 Construction

The laminate shall be constructed to SABS 141.

An outer isopthalic resin gelcoat with a minimum thickness of 0,4 mm and ultraviolet absorption properties to prevent degradation of the surface from exposure to the sun shall be provided.

The gelcoat shall be backed by multiple layers of chopped strand mat glass rendering not less than 1,2 kg/m□. The strength shall be increased to 1,35 kg/m□ on kiosks with panelling larger than 500 x 500 mm.

The fibreglass shall be thoroughly impregnated with polyester resin. The resin should preferably be clear.

The resin to fibreglass ratio shall not be less than 2,5 : 1 and not more than 3,0 : 1.

Air entrapped between the glass mat layers shall be thoroughly worked out. The laminate must be free of air bubbles and voids.

All edges shall be reinforced with an additional 700 g/m□ of fibreglass.

All large surfaces, wider than 300 mm, shall be reinforced or panelled to improve stiffness and rigidity.

A resin coat shall be applied to the inside of the kiosk to cover the fibre pattern.

Brass or steel backing plates shall be laminated into the fibreglass at hinge points, locking mechanism catch support areas, door restraint fixing points and all other points which will be subjected to mechanical stresses.

Doors shall be adequately braced, reinforced, ribbed or double laminated with an air gap between the two layers of laminate to ensure rigidity.
The fibreglass canopy shall be fixed to the internal equipment support frame with bolts accessible through the door only.

3.11.5.3 Finish and Colour of Fiberglass Kiosks

The outside surface of the kiosk shall have a glossy, smooth finish to ensure good weathering. To obtain this the manufacturer shall ensure that the mould is smooth, free of voids, hairline cracks, pores or other defects.

Compound rubbing or sanding of the outside surface will not be permitted.

Pigments shall be added to the outer gelcoat to obtain a matching colour to SABS 1091 "BISCUIT" colour B64 or "LIGHT STONE", colour C37.

Fiberglass kiosks shall not be painted.

3.11.6 SHEET STEEL CANOPIES

Where specified the canopy and doors shall be manufactured of steel to the following requirements:

A metal framework shall be manufactured from solid angle iron, channel iron or 2,5 mm minimum folded sheet steel.

Joints shall be non-continuously butt welded. Welds shall be ground smooth and the joints wiped with plumber's metal in order to provide a smooth finish.

Side panels, doors and the roof shall be manufactured from 2 mm minimum sheet steel. The panels shall have upturned edges which are recessed in the frame or which fit over lips on the frame. The side panels may be either bolted or welded to the frame or form part of the folded metal frame.

The roof of the cubicle shall be removable and shall be fitted by means of bolts which shall be accessible from inside the cubicle only.

All panels and doors shall be suitably braced and stiffened to ensure rigidity and to prevent warping.

The steel canopy and framework shall be fixed to the base frame by four M16 high tensile steel bolts.

3.11.6.2 Finish and Colour of Sheet Steel Kiosks

Metal components of the framework, panels and doors shall be painted in accordance with the Engineer and or the Client's Engineer and or the Client's Department's "STANDARD PAINTING SPECIFICATION".

The colour shall be "BISCUIT", colour B64 or "LIGHT STONE", colour C37 of SABS 1091. A tin of matching touch-up paint (not smaller than 500 ml) shall be provided with each consignment.

3.11.7 DOORS

Doors shall be fitted to the front and to the rear of each cubicle. The doors shall provide free

access to equipment which has to be operated and shall provide a full view of all meters. Cubicles wider than 700 mm shall be provided with double doors.

Doors shall have well returning edges to fit into the channel of the door entry surrounds. Doors shall swivel through 135□.

Brass hinges shall be used to hang the doors. The hinges shall be bolted to the canopy with brass bolts and nuts. Bolt heads or nuts shall not protrude beyond the outer surface of the kiosk. Nylon, aluminium or piano hinges are not acceptable.

Doors shall be fitted with lever locks with a 135□ movement. The locking mechanism shall have a catch on the rear which catches behind the frame or door entry surround. The locking mechanism as well as the catch support area shall be backed with brass or galvanised steel plates. The locking mechanism shall be pad-lockable. Padlocks will be proved by the Engineer and or the Client's Engineer and or the Client's Department, unless otherwise specified in the Project Specification.

The locking mechanism shall be made of brass or stainless steel.

Door restraints shall be provided. Cloth or canvas straps are not acceptable. The fixing points of the restraint at both the door and canopy shall be reinforced.

At least three hinges shall be supplied on steel doors higher than 1,2 m.

Doors shall be fitted with neoprene or equivalent seals.

Metal doors shall be earth bonded to the frame by means of a copper braided strap, tooth washers, bolts and nuts.

3.11.8 EQUIPMENT SUPPORT FRAME

A free standing, angle iron or similar type rigid support framework shall be provided.

The frame shall be bolted down on the base by four M16 high tensile steel bolts. The holding-down bolts shall be accessible from the inside of the cubicle only. The frame of sheet steel canopies may be bolted to the canopy framework.

A galvanised steel cable gland plate shall be bolted to the bottom of the frame across the full width of the cubicle to cover the cable entry opening in the base.

The gland plate shall be suitably punched to accept the number and size of cables specified.

All steelwork shall be hot-dip galvanised in accordance with SABS 753.

A panel of resin bound synthetic wood or other suitable dielectric material shall be provided for the mounting of all equipment and busbars. Impregnated hardboard, other treated or untreated wood products are not acceptable.

Alternatively, all equipment and busbars shall be flush mounted within a purpose-made sheet metal frame enclosed by a machine punched removable front panel through which the operating handles of the equipment protrude. Care shall be exercised that the rear studs of circuit-breakers are properly insulated from the steel chassis. Miniature circuit-breakers may be installed in clip-in trays mounted on the frame.

3.11.9 CONCRETE BASES AND BASE FRAMES

To ensure stability of the kiosk after installation, it shall be mounted on a base frame which, in turn, shall be bolted to a concrete base cast onto the bottom of the cable trench.

The base frame shall be constructed of angle iron, at least 50 x 4 mm thick and small be of welded construction hot-dip galvanised and coated with epoxy resin tar.
The vertical height of the box frame shall be at least 900 mm and the construction shall be such as to provide a rigid support for the kiosk.

The base frame shall protrude to a maximum height of 200 mm above ground level. Provision shall be made for the protection and concealing of the cables entering the kiosk and to prevent access of animals and vermin.

The base frame shall be secured by at least four M16 bolts to the support frame of the kiosk and four M16 bolts and nuts to the concrete base. The bolts, nuts and washers shall be galvanised and supplied with the kiosk.

All galvanising shall be to SABS 763.

The kiosk manufacturer shall supply a detailed drawing of the base frame and the concrete base required.

Alternative designs and materials for the base (or root) of the kiosk will be considered but full details must be submitted for approval by the Engineer and or the Client's Engineer and or the Client's Department.

3.11.11 WIRING

3.11.11.1 Cabling

Incoming and outgoing cables shall be terminated on the gland plate. Cables up to 70 mm□ may terminate on clamp type terminals where the clamping screws are not in direct contact with the conductor. All cable sizes larger than 70 mm□ shall terminate on busbar stubs which shall be connected to the associated equipment. Parallel incoming or outgoing cables shall be connected to a collector busbar without crossing the conductors.

3.11.11.2 Current Rating

The current rating of conductors for the internal wiring shall be sufficient to carry the maximum continuous current that can occur in the circuit. This value shall be determined from the circuit-breaker or fuse protection of the circuit. The smallest conductor size to be used for power wiring shall be 2,5 mm□.

3.11.11.3 Internal Wiring

Standard 600/1000 V Grade PVC-insulated stranded annealed copper conductors to SABS 1507 shall be used for the internal wiring.

Wiring shall be installed away from terminals, clamps or other current carrying parts. Wiring shall also be kept away from exposed metal edges or shall be protected where they cross metal edges.

Joints in the wiring are not acceptable.

Where conductors change direction, smooth bends shall be formed with a radius of at least 5 times the outside diameter of the conductor.

3.11.11.4 End Connections

The supply end connections to equipment shall be at the top and the load end connections at the bottom.

3.11.11.5 Conductor Terminations

All conductors terminating on equipment with screwed terminals shall be fitted with lugs. The lugs shall be soldered or crimped to the end of the conductor with the correct amount of insulation removed from the end to fit into the lug. Strands may not be cut from the end of the conductor.

Connections to circuit-breakers, isolators or contactors shall be made by one of the following

methods:

(a) A ferrule of the correct size,

(b) soldering the end of the conductor, or

(c) winding a conductor strand tightly around the end to totally cover the end.

3.11.11.6 Identification

The colour of the conductors of all 220/250 V circuits shall correspond to the colour of the supply phase for that circuit. Neutral conductors shall be black. All other conductors in the cubicle for control circuits, etc., shall be coded in colour codes in colours other than those specified above. The devised colour codes shall be shown on a wiring diagram. Coloured PVC or other tape will not be acceptable for colour coding.

3.11.12 Mounting of Equipment

The mounting of equipment shall comply with SABS 1180 where applicable. Equipment shall be fixed to the support panel with bolts, nuts, washers and spring washers. Self-tapping screws are not acceptable.

Equipment shall be arranged and grouped in a logical fashion.

All equipment shall be flush mounted behind panels with only circuit-breaker and isolator toggles and meter faces protruding. The front panels shall be secured in position by suitable and approved fasteners. Self-tapping or similar screws are not acceptable.

Blanking plates shall be fitted over slots intended for future equipment. These plates shall be fixed so that fixing holes do not need to be drilled through the front panel.

3.11.13 ACCESS

All equipment, busbars and wiring shall be completely accessible with the door open and the back door and front panel removed. In the case of fiberglass kiosks, the complete canopy shall be removable.

3.11.14 LABELLING

All equipment shall be fully labelled and accurate descriptions shall be given in English.

Engraved brass shall be used for labels. The labels shall be riveted to the kiosks.
The following labels shall be supplied as a minimum requirement:

(a) Number and allocation of kiosk,
e.g. KIOSK B26

(Lettering: At least 10 mm high. Label on the outside in a prominent position).

(b) Designation of circuit i.e. circuit-breaker, isolator, meter, etc.
e.g. ADMIN BLOCK
ADMIN BLOK

POMPTOEVOER
PUMP SUPPLY

(Lettering: At least 5 mm high. One label installed directly below each item of equipment pertaining to the particular circuit shall be provided).

(c) The main switch shall be marked in accordance with the regulations.

(d) The function and circuits of all other equipment shall be clearly identified. Flush mounted equipment within the front panel shall be identified by labels fixed to the

front panel. The labels for all equipment installed behind panels shall be fixed to the support panel close to the equipment.

(e) The labels shall be secured by means of rivets. Self-tapping screws are not acceptable. Labels shall not be glued to their mounting positions. Sufficient rivets shall be provided to prevent labels from warping.

(f) All label designations shall be confirmed with the Engineer and or the Client's Engineer and or the Client's Department before manufacture.

3.11.15 NOTICES

At least one skull crossbones notice with the words "GEVAAR.DANGER.INGOZI" shall be mounted outside on the front of the kiosk. This notice shall be riveted to the steel door so that it cannot easily be removed. Brass rivets shall be used. The notice shall be laminated into the fibreglass door in the case or fibreglass kiosks.

3.11.16 INSPECTIONS

The Engineer and or the Client's Engineer and or the Client's Department shall be notified at least two weeks in advance of the completion of the kiosks in order that an inspection may be carried out before delivery.

3.11.17 DRAWINGS

3.11.17.1 Drawings for Approval

A set of three prints of the shop drawings of the cubicles shall be submitted to the Engineer and or the Client's Department for approval before the cubicles are manufactured. The following information shall be presented:

(a) Schematic and wiring diagrams of the cubicles.

(b) A complete layout of the arrangement of the cubicles showing all equipment dimensions and constructional details. The positions and methods of fixing of busbars shall be shown.

(c) All labelling information in English on a separate sheet.

(d) The makes, catalogue numbers and capacities of all equipment.

(e) A detail drawing of the concrete plinth, showing concrete mixes, dimensions, opening sizes, steel reinforcing details and holding-down bolt fixing details.

The approval of drawings shall not relieve the Contractor of his responsibility to the Engineer and or the Client's Department to supply the cubicles according to the requirements of this Specification.

3.11.17.2 Final Drawings

A complete set of "record" drawings of the cubicles shall be submitted to the Engineer and or the Client's Department within two weeks after delivery of the kiosks.

The information contained in Par. 3.11.17.1 shall be provided.

3.11.17.3 Completion

The supply contract shall be regarded as incomplete until all drawings have been handed to the Engineer and or the Client's Department.

3.12 MOULDED-CASE CIRCUIT-BREAKERS AND AIR CIRCUIT BREAKERS

This section cover single or multi-core moulded case circuit-breakers for use in power distribution systems, suitable for panel mounting, for ratings up to 6000 A, 600 V, 50 Hz.

The circuit-breakers shall comply with SABS 156, SANS 60947-2 and 60947-3 and IEC 60947-2:

The continuous current rating, trip rating and rupturing capacity shall be as specified.

The contacts shall be silver alloy and shall close with a high pressure wiping action.

Where specified, the circuit-breaker shall be capable of accommodating a factory fitted shunt trip or auxiliary contact units or similar equipment.

The operating handle shall provide clear indication of "ON", "OFF" and "TRIP" positions.

The mechanism shall be of the TRIP-FREE type preventing the unit from being held in the ON position under overload conditions.

All moulded-case circuit-breakers in a particular installation shall as be as far as is practical be supplied by a single manufacturer.

The incoming terminals of single-pole miniature circuit-breakers shall be suitable for connection to a common bus-bar.

The circuit-breaker shall have a rating plate indicating the current rating, voltage rating and breaking capacity. Extension type operating handles shall be provided for units of 600 A rating and above.

3.13 EARTH LEAKAGE RELAYS

Earth leakage relays shall be single or three-phase units with a sensitivity of 30mA, on-load switch type or circuit breaker type for use on 220/250 V single phase or 380/433 V three-phase, 50 Hz, supplies.
The units shall be suitable for installation in switchboards in clip-in trays or bolted to the chassis.

The earth leakage relay shall comply with SABS 767 as amended, and shall bear the SABS mark. Integral test facilities shall be incorporated in the unit.

Circuit-breakers with trip coils used integrally with earth leakage units (two-pole for single-phase units and three-pole for three-phase units) shall comply with SABS 156.

On-load switches used integrally with earth leakage units (two-pole for single-phase units and three-pole for three-phase units) shall comply with SABS 152.

The fault current rating of the unit shall be 2,5 kA or 5 kA as required, when tested in accordance with SABS 156.

3.14 ON-LOAD ISOLATORS

This section covers switches suitable for panel mounting for use in power distribution systems up to 600 V, 50 Hz. Switches for motor isolation are included.

The switches shall be of the triple-pole, hand operated type complying with
SABS 152.

The switches shall have a high speed closing and opening feature.

The switches shall be suitably rated for the continuous carrying, making and breaking of the

rated current specified as well as the through-fault current capacity as specified.

To distinguish the switches from circuit-breakers the operating handles shall have a distinctive colour and/or the switch shall be clearly and indelibly labelled "ISOLATOR".

3.15 STANDARD PAINT SPECIFICATION

3.15.1 FINISH REQUIRED

Metalwork of electrical equipment such as switchboards, equipment enclosures, sheet steel luminaire components, purpose-made boxes, etc. shall be finished with a high quality paint applied according to the best available method. Baked enamel, electro-statically applied powder coating or similar proven methods shall be used.

3.15.2 CORROSION RESISTANCE

Painted metal shall be corrosion resistant for a period of at least 168 hours when tested in accordance with SABS Methods 155.

3.15.3 EDGES

Care shall be taken to ensure that all edges and corners are properly covered.

3.15.4 SURFACE PREPARATION

Surface preparation shall comply with SABS 064. Prior to painting, all metal parts shall be thoroughly cleaned of rust, millscale, grease and foreign matter to a continuous metallic finish. Sand or shot blasting or acid pickling and washing shall be employed for this purpose.

3.15.5 BAKED ENAMEL FINISH

Immediately after cleaning all surfaces shall be covered by a rust inhibiting, tough, unbroken metal-phosphate film and then thoroughly dried.
Within forty eight (48) hours after phosphating, a passivating layer consisting of a high quality zinc chromate primer shall be applied, followed by two coats of high quality alkyd-based baked enamel.

The enamel finish on metal luminaire components shall comply with SABS 783, Type III.

Other metal parts e.g. switchboard panels, etc., shall comply with SABS 783, Type IV with a minimum paint thickness after painting of 0,06 mm. In coastal areas, the dry film thickness shall be increased to at least 0,1 mm.

The paint shall have an impact resistance of 5,65 J on cold-rolled steel plate and a scratch resistance of 2 kg.

3.15.6 POWDER COATED FINISH

Immediately after cleaning the metal parts shall be pre-heated and then covered by a microstructured paint powder applied electrostatically.

The paint shall be baked on and shall harden within 10 minutes at a temperature of 190□C.

The minimum paint thickness after baking shall be 0,05 mm. The dry film thickness shall be increased in coastal areas. The paint cover shall have an impact resistance of 5,65 J on cold-rolled steel plate and scratch resistance of 2 kg.

3.15.7 TOUCH-UP PAINT

In the case of switchboards and larger equipment enclosures, a tin of matching touch-up

paint not smaller than 1 litre shall be provided.

3.15.8 COLOURS

The colour of LV switchboards and equipment enclosures in buildings shall be "WHITE" colour G80 or "BISCUIT" B64 of SABS 1091.

The colour of LV distribution kiosks and miniature substations shall be "BISCUIT", colour B64 or "LIGHT STONE", colour C37 of SABS 1091.

APPENDIX I
TECHNICAL SPECIFICATION PART 4 of 4

T2.3.2 TECHNICAL SCHEDULES ELECTRICAL

No	Item description	Units	Technical Particulars
	1 DISTRIBUTION BOARDS		
1.1	Manufacturer		
1.2	Supplier		
1.3	Installation contractor		
1.4	Manufacturer of LT circuit breakers		
1.5	Manufacturer of contactors		
1.6	Manufacturer of meters		
1.7	Manufacturer of current transformers		
1.8	Manufacturer relays		

No	Item description	Units	Technical Particulars
	2 Transformer		
2.1	System Voltage (Primary Voltage)		
2.2	System Voltage (Secondary Voltage) Volt, at no load		
2.3	Frequency		
2.4	Number of phases (Medium Voltage)		
2.5	Number of phases (Low Voltage) Three phase Four Wire		
2.6	KVA Rating		
2.7	Average power factor		
2.8	Neutral – Earthed Manufacturer		
2.9	Manufacturer of MV circuit breaker		
2.10	Manufacturer of LV circuit breaker		
2.11	Manufacturer		
2.12	Supplier		
2.13	Installation contractor		
2.14	Impedance		

No	Item description	Units	Technical Particulars
	3 MEDIUM VOLTAGE CABLES		
3.1	Manufacturer		
3.2	Supplier		
3.3	Installation contractor		

No	Item description	Units	Technical Particulars
	4 LOW VOLTAGE CABLES		
4.1	Manufacturer		
4.2	Supplier		

No	Item description	Units	Technical Particulars and Manufacturer
	5 LIGHTING SCHEDULE		
7.1	Type A - LED Fluorescent Fitting		
7.2	Type AE - as type A with Emergency Back-up		
7.3	Type B – Flood lights		

6 SCHEDULE OF PRICES FOR VARIATIONS TO THE ELECTRICAL

This schedule must be completed by all Tenderers and only provides for amounts to be added to or deducted from the contract amount depending on whether the relevant item is to be supplied and installed as an extra to or has to be omitted from the contract.

All items provided for in this schedule shall comply in all respects with the requirements laid down in the specification and all unit prices shall provide for the complete supply and installation including all the necessary material, accessories, labour and transport but excluding VAT.

7 PVC SWA PVC CABLES

Supply and installation of multicore PVC SWA PVC or 11 kV cable as specified per meter length, including wastage. Measurements must include tails. Also unit price for making off of cable ends complete with glands, lugs and connecting up of cores.

Cable Size (mm^2)	No of cores	Laid in ducts (R/m)	Laid in ground (R/m)	Cable fixed on trays (R/m)	Cable ends each (R/m)	Cable joints complete (R/m)
185	4					
95	1					
300	4					
185	1					

Cable Size (mm²)	No of cores	Laid in ducts (R/m)	Laid in ground (R/m)	Cable fixed on trays (R/m)	Cable ends each (R/m)	Cable joints complete (R/m)
50	4					
35	1					

8 SURGE ARRESTORS

Supply, installation and connecting up of the following:

Description	Completely installed (R each)
DEHN guards CAT No. 900275	
DEHN guards CAT No. 90075	
DEHN Blitzductor Cat No. CTBE/C	

9 DAYWORK

The following rates are for work not covered by any scheduled rates:

	Normal time (R/Hour)	Overtime (R/Hour)
Electrician and Labourer		
Electrician and apprentice		
Labourer		

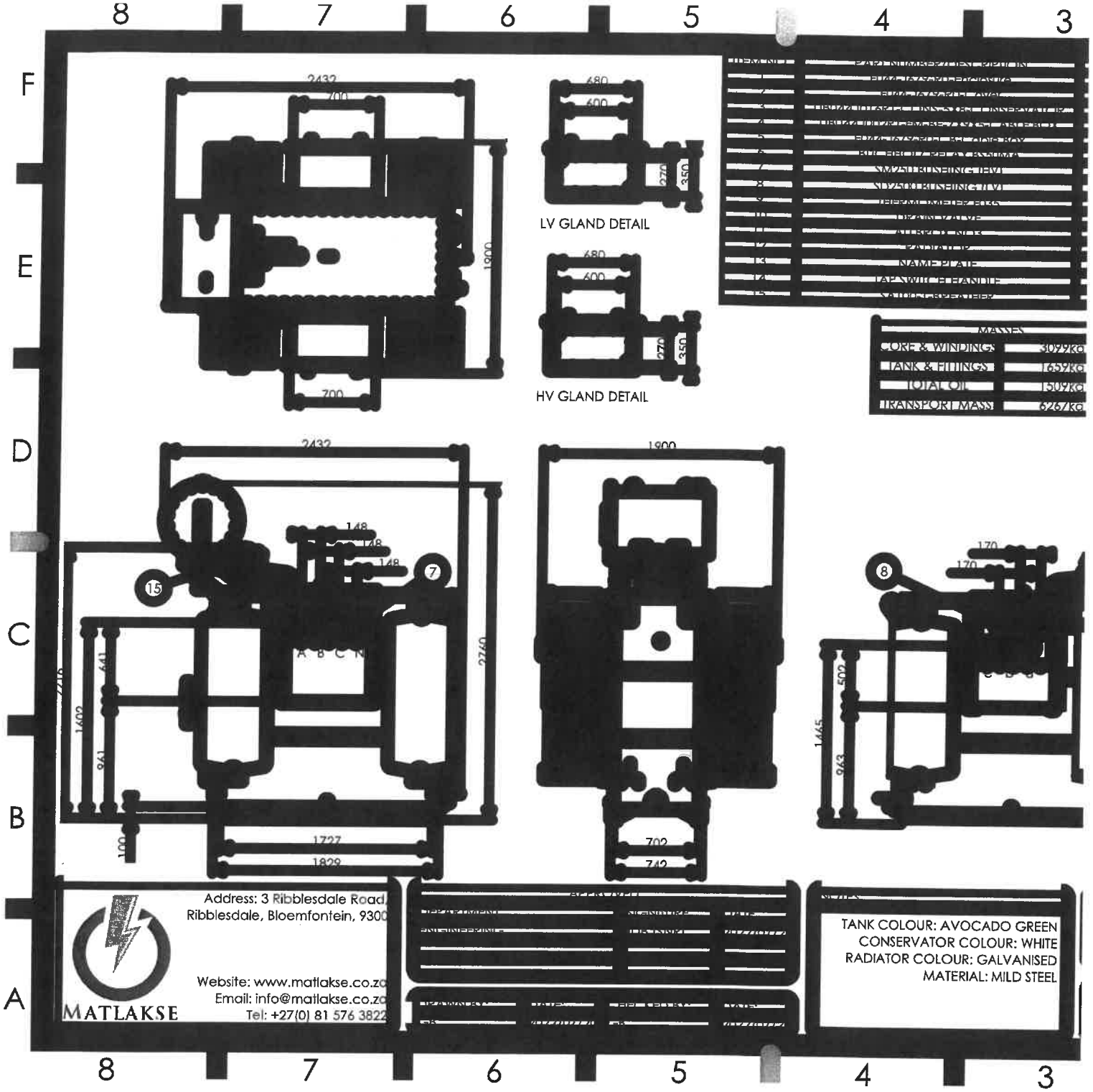
10 TRANSPORT, MATERIALS AND EXCAVATIONS

The following rates are for work not covered by any scheduled rates:

	Per unit
Traveling for vehicles not exceeding 1000 kg capacity	R/Km
Materials, nett cost plus	%
Excavations:	

	Per unit
i) In soft pickable soil.	per m^3
ii) In soft rock (use of power tools)	per m^3
iii) In hard rock per m^3 (use of explosives)	per m^3

APPENDIX J
TECHNICAL DRAWING PART 2c


LV GLAND DETAIL
HV GLAND DETAIL
MASSES
CORE & WINDINGS 3029KG
TANK & FITINGS 1659KG
TOTAL OIL 1509KG
TRANSPORT MASS 6267KG
MATLAKSE
Address: 3 Ribblesdale Road,
Ribblesdale, Bloemfontein, 9300
Website: www.matlakse.co.za
Email: info@matlakse.co.za
Tel: +27(0) 81 576 3822
TANK COLOUR: AVOCADO GREEN
CONSERVATOR COLOUR: WHITE
RADIATOR COLOUR: GALVANISED
MATERIAL: MILD STEEL

Annexure C

Local Content Declaration - Summary Schedule

(C1)	Bid No.
(C2)	Bid description:
(C3)	Designated product(s)
(C4)	Bid Authority:
(C5)	Bidder Entity name:
(C6)	Offered Exchange Rate: PULA EUR GBP
(C7)	Specified local content %

Note: VAT to be excluded from all calculations

Calculation of local content								Bid summary			
Bid item no's	List of items	Offered price each (excl VAT)	Exempted Imported value	Offered value net of exempted imported content	Imported value	Local value	Local content % (per item)	Offered Qty	Total Offered value	Total exempted imported content	Total Imported content
(C8)	*(C9)*	*(C10)*	*(C11)*	*(C12)*	*(C13)*	*(C14)*	*(C15)*	*(C16)*	*(C17)*	*(C18)*	*(C19)*

(C20) Total Offered value	R 0
(C21) Total Exempted imported content	R 0
(C22) Total Offered value net of exempted imported content	R 0
(C23) Total Imported content	R 0
(C24) Total local content	R 0
(C25) Average local content % of Bid	

Signature of Bidder from Annexure B

Date:

Annexure D

Imported Content Declaration - Supporting Schedule to Annexure C

(D1)	Bid No.	
(D2)	Bid description:	
(D3)	Designated Products:	
(D4)	Bid Authority:	
(D5)	Bidder Entity name:	
(D6)	Offered Exchange Rate:	Pula

Note: VAT to be excluded from all calculations

EUR R 9,00 GBP R 12,00

A. Exempted imported content

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

(D19) Total exempt imported value R 0

This total must correspond with Annexure C - C 21

B. Imported directly by the Bidder

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

(D32) Total imported value by Bidor R 0

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

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

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

D. Other foreign currency payments

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

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

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

This total must correspond with Annexure C - C 23

Signature of Bidder from Annexure B

Date:

Annexure E

Local Content Declaration - Supporting Schedule to Annexure C

(E1)	**Bid No.**	
(E2)	**Bid description:**	
(E3)	**Designated products:**	
(E4)	**Bid Authority:**	
(E5)	**Bidder Entity name:**	

Note: VAT to be excluded from all calculations

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	*(E7)*	*(E8)*

(E9) **Total local products (Goods, Services and Works)** R 0

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

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

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

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

This total must correspond with Annexure C - C24

Signature of Bidder from Annexure B

Date: _____

ARMAMENTS CORPORATION OF SOUTH AFRICA SOC LTD
(ARMSCOR)

QUESTIONNAIRE

REPLIES

1 What is the request for bid number? .....

2 If applicable: Price basis of bid
(if not delivered into store) .....

3 Indicate which of the following applies:

3.1 The prices are fixed. ☐

3.2 The prices are not fixed (NB: ☐

4 The delivery period shall be fixed

.....

.....

WHERE SUPPLIES OFFERED ARE TO BE IMPORTED, THE QUESTIONS BELOW MUST BE ANSWERED.

5 Foreign content:

5.1 What amount in foreign currency must be remitted overseas? .....

5.2 What is the rate of exchange used in converting the amount into ZAR1, 00=.....

SA Rand and the date on which this is based? Date .....

6 Statutory costs:

6.1 Are the goods quoted on subject to customs duty,
ad valorem customs or surcharge? .....

6.2 If so, what is the amount payable in respect of

a) Customs duty? .....

b) Ad valorem customs duty? .....

PRICE BREAKDOWN

7. The following particulars must be furnished, failure of which may invalidate the bids.

		AMOUNT	% OF TOTAL PRICE
7.1	FOB/FCA cost of item		
7.2	Sea/Air freight		
7.3	Insurance charges		
7.4	Clearance charges		
7.5	Customs duties		
7.6	Ad valorem customs duties		
7.7	Delivery costs from port/airport to your premises		
7.8	Local content (excluding (10.10)		
7.9	Delivery costs from your premises into store		
7.10	Balance (detail to be submitted)		
	TOTAL		

BROAD-BASED BLACK ECONOMIC EMPOWERMENT

ACRONYMS AND ABBREVIATIONS

B-BBEE	Broad-Based Black Economic Empowerment
CIPC	Companies and Intellectual Property Commission
COTS	Commercial Off The Shelf
EME	Exempted Micro Enterprises
MOTS	Military Off The Shelf
QSE	Qualifying Small Enterprises
SANAS	South African National Accreditations Systems

1. PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000

1.1 The B-BBEE preference points will be awarded in terms of the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2022.

1.2 The 80/20 preference point system is applicable to all bids with a Rand value of up to R50 000 000,00 (all applicable taxes included)

1.3 Preference points for this bid shall be awarded for:

Price	**80**
Specific Goals	**20**
Total points for Price and Specific Goals must not exceed	**100**

1.4 **Bidders who do not submit a valid proof of B-BBEE status will score zero (0) for preference points (B-BBEE Status Level Specific Goals).**

2. ALLOCATION OF PREFERENCE POINTS FOR SPECIFIC GOALS

2.1 B-BBEE Status Level

2.1.1 The preference points for specific goals will be allocated according to the table below, for acquisition of services, works or goods with a value of up to R50 000 000, 00. B-BBEE Points claimed must be in accordance with the table below and must be substantiated by means of a valid proof of B-BBEE.

(Specific Goals) B-BBEE status level	Points Allocated
Level 1	20
Level 2	18
Level 3	14
Level 4	12
Level 5	8
Level 6	6
Level 7	4
Level 8	2
Non-compliant	0

2.1.2 The Armscor BBE Division reserves the right to require a bidder and/or its sub-contractor(s) to substantiate any claim at any stage in the bidding process to verify and confirm the B-BBEE status of the bidder and/or its sub-contractor(s).

2.2 Specific Goals for Local Content & Production

2.2.1 The preference points that may be awarded in terms of the specific goals with regards to procurement processes where local content & production is applicable shall be as follows:

No	**Specific Goals for Procurement from Entities with local manufacturing capabilities for designated sectors**	**Points for 80/20 PPS***
Designated Sectors		
1	Full compliance to the applicable minimum threshold for local content	**10 points**
2	Non-compliance to the applicable minimum threshold for local content	**0 points**
RDP Programme: Promotion of South African Owned Enterprises		
1	Entities which are BBBEE Level 1 with 51% black equity ownership	10 points
2	Entities which are BBBEE Level 2 with 51% black equity ownership	9 points
Maximum Points Available Per PPS*		**20 points**

*PPS stands for Preferential Point System

2.2.1 List Of Designated Sectors & Sub-Sectors
The complete list of sectors and sub-sectors which are designated for local production with a minimum local content threshold can be found on the website of the Department of Trade, Industry & Competition via the link below

http://www.thedtic.gov.za/sectors-and-services-2/industrial-development/industrial-procurement/

2.2.2 Specific Goals For Locality
The preference points that may be awarded in terms of the specific goals with regards to Procurement from Entities Located in Specific Province, Region or Municipality are as follows:

No	Specific Goals for Procurement from Entities Located in Specific Province, Region or Municipality	Points for 80/20 PPS
RDP Programme: Locality		
1	Entities located within the specific locality	10 points
2	Entities located outside the specific locality	0 points
RDP Programme: Promotion of South African Owned Enterprises		
1	Entities which are BBBEE Level 1 with 51% black equity ownership	10 points
2	Entities which are BBBEE Level 2 with 51% black equity ownership	9 points
Maximum Points Available Per PPS*		20 points

3. PRINCIPLES

3.1 Valid proof of B-BBEE status is either of the following:

3.1.1 A B-BBEE Sworn Affidavit fully completed and

3.1.1.1 Deposed and signed in the presence of the Commissioner of Oaths

3.1.1.2 Does not contradict itself (% black ownership matches compliance level)

3.1.1.3 Commissioner of Oaths credentials and signature are reflected.

3.1.2 A B-BBEE Certificate issued by either the CIPC or a SANAS Accredited Verification Agency

3.1.3 An unincorporated Joint Venture / Consortium must submit a Consolidated B-BBEE Certificate in the name of the Joint Venture / Consortium issued by a SANAS accredited Verification Agency.

3.1.4 B-BBEE status must be based on the latest financial year-end information, otherwise it is invalid and unacceptable.

3.2 Sub-Contracting

3.2.1 A bidder awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the bidder concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

3.2.2 A bidder awarded a contract must obtain the approval of Armscor prior to any changes in the subcontracting arrangement.

B-BBEE DECLARATION

1. Confirmation of the Bidder's Turnover

Name of the Bidder			
Registration Number			
Financial Year End			
Turnover (As at the latest financial year end)	R	Starting (Day, Month, Year)	
		Ending (Day, Month, Year)	

2. Confirmation of Subcontractors involved in the execution of the order:

Bidder	% Black Ownership	B-BBEE Status	% Value to be Contracted
1.			
Subcontractors	% Black Ownership	B-BBEE Status	% Value to be Contracted
1.			
2.			
3.			

***Percentages of the bid value which will be subcontracted including main contractor must add up to 100%.**

3. Confirmation of Suppliers involved in the execution of the order:

Supplier's name	% Black Ownership	B-BBEE status	% Value to be Supplied
1.			
2.			
3.			
4.			
5.			

I, the undersigned, am duly authorised to certify on behalf of the abovementioned entity that the information contained herein above is true and correct.

AUTHORISED SIGNATURE :..... Date: .....

Name in block letters : .....

Capacity : .....

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise,
employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....

.....

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:

.....

.....

1 the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;

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

3.3 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 consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 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.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....	.....
Signature	Date
.....	.....
Position	Name of bidder

2 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.

DEFENCE SECTOR BBBEE SWORN AFFIDAVIT – EXEMPTED MICRO ENTERPRISE

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

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

3. I hereby declare under Oath that:

- The Enterprise has _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise has _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise has _____% Black Designated Group Beneficiaries as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- Black Designated Group Owned % Breakdown as per the definition stated above:
    - Black Youth % = _____%
    - Black people living with disabilities % =_____%
    - Black Unemployed % =_____%
    - Black People living in Rural areas % = _____%
    - Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was R5,000,000.00 (Five Million Rands) or less
- Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

100% Black Owned	**Level One** (135% B-BBEE procurement recognition)	
At Least 51% Black Owned	**Level Two** (125% B-BBEE procurement recognition)	
Less than 51% Black Owned	**Level Four** (100% B-BBEE procurement recognition)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the owners of the enterprise which I represent in this matter.
5. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Commissioner of Oaths	**Deponent**
Credentials and Signature	_____ **Signature**
_____ **Date**	_____ **Date**

ANNEXURE 2 TO KD24

DEFENCE SECTOR BBBEE SWORN AFFIDAVIT – QUALIFYING SMALL ENTERPRISE

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

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

3. I hereby declare under Oath that:

- The Enterprise has _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise has _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise has _____% Black Designated Group Beneficiaries as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- Black Designated Group Owned % Breakdown as per the definition stated above:
    - Black Youth % = _____%
    - Black people living with disabilities % =_____%
    - Black Unemployed % =_____%
    - Black People living in Rural areas % = _____%
    - Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was between R5,000,000.00 (Five Million Rands) to R50,000,000.00 (Fifty Million Rands)
- Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

100% Black Owned	**Level One** (135% B-BBEE procurement recognition)	
At Least 51% Black Owned	**Level Two** (125% B-BBEE procurement recognition)	

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

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

Commissioner of Oaths	**Deponent**
Credentials and Signature	_____ **Signature**
_____ **Date**	_____ **Date**

ANNEXURE 1 TO KD25

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF ARMSCOR					
BID NUMBER:		CLOSING DATE:		CLOSING TIME:	
DESCRIPTION					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT :					
ARMSCOR BID BOX VISITORS ENTRANCE (BLOCK 8), 370 NOSSOB STREET,					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**	
CONTACT PERSON	**Mr. A.L Mmbengwa**	CONTACT PERSON	**Mr. A.L Mmbengwa**
TELEPHONE NUMBER	**012 428 3610**	TELEPHONE NUMBER	**012 428 3610**
FACSIMILE NUMBER	**N/A**	FACSIMILE NUMBER	**N/A**
E-MAIL ADDRESS	**scmbids@armscor.co.za**	E-MAIL ADDRESS	**scmbids@armscor.co.za**

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA

B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX]	B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX]
	☐ Yes ☐ No		☐ 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

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
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 BELOW.

ANNEXURE 1 TO KD25

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 IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**
1.3.	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 202, 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 VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3	APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4	BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5	IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6	WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7	NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER: .....

CAPACITY UNDER WHICH THIS BID IS SIGNED: .....
(Proof of authority must be submitted e.g. company resolution)

DATE: .....

ARMAMENTS CORPORATION OF SOUTH AFRICA LIMITED (ARMSCOR)

INTELLECTUAL PROPERTY REQUIREMENTS

1 INTRODUCTION

1.1 What is Intellectual Property?

Intellectual Property (or "IP") means the result or outcome of human creative effort as typically, but not exclusively, manifested and embodied in or taking the form of data items or documents.

IP typically includes design and mental activities, e.g.:

- Bills of Material (BOM's)
- Instructions,
- Reports,
- Specifications,
- Interface designs,
- Manufacturing processes,
- Material Specifications,
- Processes,
- Product designs,
- Re-engineering (maintenance/obsolescence),
- Software,
- Algorithms,
- Source Codes,
- System/integration designs,
- Test and Evaluation Methods, etc.

IP typically excludes Project Management activities and Hardware created/built according to a design or following a "recipe".

1.2 How is IP manifested?

IP is typically manifested and embodied in Data Items or Documents.
"Data items or Documents" means any recorded information, however recorded, including but not limited to books, manuscripts, reports, studies, algorithms, computer software, invention descriptions, registered patents, drawings, designs, plans, analyses, calculations, standards, data packs, process documents, instructions, specifications, mathematical or simulation models, compositions, photographs, video recordings, audio recordings, reports, holographic recordings, trademarks, graphical images, etc.

NOTE:
- The document itself is not IP
- The contents of a document represent IP
- The document becomes the tangible and recordable carrier of IP

1.3 What is Background IP?

For definition, refer to A-STD-0020 "Armscor General Conditions of Contract".

"Background IP" belongs to a contractor because he fully paid for the generation thereof or had bought it at his own cost, which may be used or serve as a basis from which to develop new Foreground IP.

1.4 What is Historic IP?

"Historic IP" is existing IP which was created previously, and which may serve as a basis from which to develop new Foreground IP.

1.5 What is Foreground IP?

For definition, refer to A-STD-0020 "Armscor General Conditions of Contract".
"Foreground IP" is new intellectual property that is created during the execution of the order.

1.6 When is IP Shared or Jointly Owned or Co-owned?

For the definition, refer to A-STD-0020 "Armscor General Conditions of Contract".

"Shared" or "Jointly Owned" or "Co-owned" IP is IP which belongs to both the DOD and a contractor, because both contributed to the cost of generation thereof. Ownership is typically (and preferably) proportional to contribution.

Historic and Foreground IP may be either

1. Wholly owned by the DOD; or
2. Shared or Jointly Owned or Co-owned between DOD or the contractor

2. IP RECORDAL REQUIREMENTS

It is a requirement that prospective suppliers provide all information about applicable Intellectual Property (IP) to the bid. Armscor will record the information on their IP System that will generate a Statement of IP which will be appended to the order. The Statement of IP will serve as a contractual agreement between Armscor and the contractor in so far as IP related matters are concerned.

The recordal requirements are further described herein and broken down to an appropriate level, as follows:

2.1 Background IP Utilised

For each Background IP Item that will be modified or utilised to generate Foreground IP in the execution of the quoted scope of work, provide the following details:
- Short IP description
- Original Supplier
- Cost of Establishment (If available)

2.2 Historic IP Utilised

For each Historical IP item that will be modified or is required as a prerequisite in the execution of the quoted scope of work, provide the following details:
- Armscor IP Number (if available)
- Short IP description
- The next information is to be provided **per order**, on which Historic IP was established:
  - Order Number on which Historic IP was generated
  - Master record index (MRI) reference
  - Original Supplier
  - Cost of Establishment
  - Percentage Ownership (DOD)
  - Associated Milestone / Line item on the order under which the IP was established

2.3 Foreground IP to be generated

For each new Foreground IP item that will be generated in the execution of the quoted scope of work, provide the following details:

- IP number of Historic IP, if IP is enhanced (modified/improved/upgraded).
- Short IP description
- Master record index (MRI) reference with version and date
- Original Supplier
- Cost of Establishment
- Percentage Ownership (DOD)
- Associated Milestone / Line item on the order under which the IP will be established.

Note 1: The cost of establishment has always been included in item/milestone prices of order, and will continue to be so included, but will in future become visible by being shown separately in the Statement of IP appended to orders in order to proper manage such IP;

Note 2: To facilitate the easy and correct recording of IP, bidders and contractors will be required to utilise the specially constructed spread sheet from Armscor's web site.
After completion, the spreadsheet must be printed and attached to the bid, which will thus form an integral part of the bid.

3. SAFEGUARDING OF IP

3.1 IP Agreement

The IP agreement which will be embodied in the Statement of IP will be concluded with the main contractor in the name of the main contractor and will apply to the creating sub-contractor(s), who will remain the design authority for his particular IP.

3.2 Management and Safeguarding of IP

The main contractor will be responsible for the management of IP he generated during the execution of the order, as well as the management of IP generated by his sub-contractors. Upon completion of the project or order, the relevant IP will be formally transferred to the main contractor, who will then be responsible for the continued management of such IP.

The main contractor will be responsible for proper safeguarding and configuration control of IP, including off-site back-ups, as further described in various other Armscor documents, e.g. A-STD-0020 "Armscor General Conditions of Contract, K-STD-61 "Armscor Standard for Technical Contract Conditions", A-WI-014 "Armscor Security Instruction" and other documents that may be applicable.

3.3 IP Delivery

Notwithstanding 3.2 above, upon completion of the order, the main contractor will deliver all data items or documents relating to the IP generated during the execution of the order to Armscor ADAC Department.

3.4 IP Audits

Armscor is by law required to conduct an IP or intangible asset audit of all existing DOD IP every financial year. The main contractor will cooperate with Armscor's Intellectual Property Management Division and the Auditor General during the audit period and will make available all relevant information required to conduct the audit.

4. COMPLETION OF THE IP INFORMATION BY MEANS OF THE ELECTRONIC FORM

4.1 Background

The electronic form of the KD27 IP Information.xlsx is available as a Microsoft Excel workbook on the Armscor website (www.armscor.co.za/Downloads/Download.asp) and must be used as template to provide the relevant IP information.

The workbook consists of the following three spreadsheets:

- "Background IP" provides a form to capture all background IP information
- "Historic IP" provides a form to capture all historic IP information.
- "Foreground IP" provides a form to capture all foreground IP information.

4.2 Electronic Form Definitions

The column definitions as provided in the forms are as follows:

IP Name	A short descriptive name to identify the IP item.
IP Number	Armscor Number provided to Historic IP.
IP Description	An abridged description of the IP Item.
Original Supplier	The name of the supplier at which the IP item exists or was established.
Establishment Cost	The amount paid by Armscor to establish the IP Item (including VAT).
MRI Reference	The Master Record Index (MRI) or other document reference that uniquely describe the IP.
DOD Shareholding	The percentage of the IP that belongs to the DOD through Armscor
Associated Milestone/Item	The contractual milestone or item, which when completed, will define the point in time at which the IP will be established.

5. INTELLECTUAL PROPERTY QUESTIONNAIRE

I/We, the undersigned, who warrant that I/we am/are duly authorised to do so on behalf of the firm certify that the following information is correct and complete in terms of Intellectual Property relevant to the offered scope of work. (Please circle the relevant answer)

Will Background IP be applicable during the execution of the quoted scope of work? Yes No

If yes, state particulars by completing the 'Background IP' worksheet. Indicate each IP item as a separate line.

Will Historic IP be utilised and/or is it required as a prerequisite to execute the quoted scope of work? Yes No

If yes, state particulars by completing the 'Historic IP' worksheet for each IP item. Indicate each IP item as a separate line;

Will any of these Historic IP items be enhanced during the execution of the quoted scope of work? Yes No

If yes, also complete the 'Foreground IP' worksheet for those IP items

Will new Foreground IP be generated during the execution of the quoted scope of work? Yes No

If yes, state particulars by completing the 'Foreground IP' worksheet for each IP item. Indicate each IP item as a separate line.

This completed form, along with all additional information, as requested above where relevant, populated on the KD27 Spreadsheet, have to be attached to the bid.

WITNESSES:

1 .....

2 .....

.....
SIGNATURES OF BIDDER(S)

.....
DATE:

ADDRESS: .....

.....

.....