Department:
Agriculture
PROVINCE OF THE EASTERN CAPE

TENDER FOR THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI

LOCATION: TSOLO AGRICULTURE AND RURAL DEVELOPMENT INSTITUTE, TSOLO

SCMU8-25/26-0107

Directorate: Supply Chain Management **Deputy Director: SCM** **Head Office** 1ST Floor, Indwe House Private Bag X 040 Bhisho 5600 Contact: Name: Mrs. S. Minya Telephone: 040 602 5263/ 079 505 9722 e-mail: nosibusiso.minya@ecagriculture.gov.za	**Directorate: Engineering Services** **Chief Engineer** **Head Office** Dohne ADI. Private Bag X 015 Stutterheim 4930 Contact: Name: S. Kondlo Telephone: 043 683 4500/083 294 4381 e-mail: Sonwabile.Kondlo@ecagriculture.gov.za
Tenderer …… ……	
CSD Number:	
LOGIS Number:	
Preference Points Claimed:	
Closing date on tender: 20 OCTOBER 2025 at 11:00	
Total of the prices inclusive of applicable taxes: R	

The Tender

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

Contents

PART T1: TENDERING PROCEDURES

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

T1.1 Tender Notice and Invitation to Tender

1.	The Department of Agriculture, Eastern Cape Provincial Government, invites tenders from experienced electrical engineering Contractors for **THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.** The construction works shall include the following: • Complete supply and install of new street lighting. • Complete supply and install of overhead and upgrading electrical reticulation system. • Disconnection, removal and deliver to User old street light installation complete. • Bush clearing and Tree cutting • Complete supply and installation of earthing system for street and electrical supply installation. • All materials, equipment, labour and other necessary services for the complete, safe efficient operation of the works must be in full adherence with the specifications laid down in the electrical document. • 12 Months defects and maintenance period from practical completion of the electrical installation • Testing and commissioning, including issuing of a Certificate of Compliance Time of completion for this contract is **12 Weeks**
2.	All tenderers must submit proof of valid registration with the CIDB in a **EP** class of construction works: It is estimated that tenderers must have a CIDB designation of level **4 EP** or higher. Bidders exceeding their threshold of CIDB grading by more than **15%** in combination with any other contract awarded to the contractor, which will be executed simultaneously, could be regarded as non-responsive.
3.	Tender documents will be available during working hours after **08:00** as of **26 SEPTEMBER 2025** until the day before the tenders close and can be downloaded free of charge from the Departmental website (www.ecagriculture.gov.za) or https://etenders.treasury.gov.za/.
4.	A compulsory site inspection and clarification meeting will be held on **09 OCTOBER 2025 at 11:00** at **Tsolo Agriculture And Rural Development Institute, Tsolo,** After the Clarification, meeting the prospective tenderers will be taken to the site to familiarize themselves with the conditions of the roads and site. No documents will be sold at the site inspection meeting. No late attendance will be entertained.
5.	The completed tender document and any supporting documentation shall be placed in a single sealed envelope clearly marked **"CONTRACT NO: SCMU8-25/26-0107: THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI"** and deposited in the tender box at: **THE DEPARTMENT OF AGRICULTURE,** **SCM OFFICES** **1ST FLOOR, INDWE HOUSE,** **BHISHO, 5600** not later than **11:00 on 20 OCTOBER 2025** when the tender box will close. Tenderers should ensure that tender documents are delivered timeously to the correct address. If the tender is late, it will not be accepted for consideration. It is the responsibility of the tenderer/s to ensure that bid documents are submitted on or before closing time and the correct location as the department will not take responsibility of wrong delivery. Tenderers using courier services for delivery of their bid documents must ensure the delivery is at the correct place / location and time as the department will not be held responsible for wrong delivery. The Department will not accept responsibility if bids received by officials are not timely deposited in the

<table>
<tr><td></td><td>Bid Box.</td></tr>
<tr><td>6.</td><td>Tenders will be opened in public immediately after closing time where the name of the tenderer, the financial offer, preference points claimed and proposed period for completion will be read aloud.</td></tr>
<tr><td>7.</td><td>All submitted certificates must be valid for 90 days after the Tender Closing Date.</td></tr>
<tr><td>8.</td><td>In terms of Preferential Procurement Regulation of 2022, the 80/20 preference point system is applicable.</td></tr>
<tr><td>9.</td><td>The Department is targeting specific goals in accordance to the Supply Chain Management Policy 2023 with reference to the Preferential Procurement Regulations 2022 The tenderers must submit verification documentation in proof of the preferential points claimed on SDB 6.1, according to table below:
<table>
<tr><th>No</th><th>Specific Goals</th><th>Preference Points allocated out of the 20</th><th>Documentation to be submitted by bidders to validate their claim for points</th></tr>
<tr><td>1</td><td>An EME or QSE which is at least 51% owned by black people</td><td>5</td><td>• ID Copy
• CIPC (Company registration)’
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>2</td><td>Located in the Province where the services will be rendered/ item delivered.</td><td>2</td><td>• Municipal rates account OR
• Letter from councilor confirming residence OR
• Lease Agreement</td></tr>
<tr><td>3</td><td>An EME or QSE which is at least 51% owned by women</td><td>7</td><td>• ID Copy
• CIPC (Company registration)’
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>4</td><td>An EME or QSE which is at least 51% owned by youth (up to 35 years of age)</td><td>4</td><td>• ID Copy
• CIPC (Company registration)’
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>5</td><td>An EME or QSE which is at least 51% owned by people with disability</td><td>2</td><td>• ID Copy
• CIPC (Company registration)
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)
• Medical certificate
• SASSA registration or confirmation of disability from a relevant authority.</td></tr>
</table>
A trust, consortium or joint venture must obtain and submit documented proof for each party of such trust, consortium or joint venture.</td></tr>
<tr><td>10.</td><td>All tenderers must be registered on the National Treasury Centralized Suppliers Data Base, the CIDB before the closing date of tenders and provide the information.
<u>Invalid or non-submission of the following documents will render the Bidder disqualified:</u>
➢ Tax compliance status and company directors of bidders will be verified on <u>CSD</u> for all price quotations and bids. <u>Therefore, Hard copies of Tax Certificate are no more required.</u>
➢ CK documents must be attached in the bid.
➢ Copy of CIDB contractor grading certificate
➢ JV Agreement (if Applicable)
➢ Proof of CSD registration (active & recently updated)</td></tr>
<tr><td>11.</td><td>Part of the works cannot be sub contracted without prior approval from the Engineer.</td></tr>
</table>

12.	The tender with the lowest price or any tender offer will not necessarily be accepted.
13.	**For a project to the value of R 3.0 million and more, a Bidder/Contractor who is not from the Eastern Cape Province, must sub-contract 25% of the contract value to a Bidder/Contractor within the Eastern Cape Province.**
14.	All tenders must be submitted on the official forms – (not to be re-typed). Telephonic, telegraphic, e-mail or facsimile will not be accepted.
15.	Failure to supply all supplementary information, certificates and documentation may result in the tender being rendered non-responsive.
16.	This tender is subject to the General Conditions of Contract (GCC 2015) and, if applicable, any other Special Conditions of Contract (SCC).
17.	Bidders must submit in terms of point 15 above, the following with the bid submission: i) CIDB certificate of the subcontractor(s). ii) Proof of the CSD registration of the subcontractor(s). iii) Provide details of which items in the bill of quantities will be part of the subcontracting agreement.
18.	**NB: Bidders should note that this forms part of a batch of tenders included into the DOA infrastructure program within the Eastern Cape; the employer reserves the right not to award more than TWO projects to be executed simultaneously within the province. The department as a procuring entity will conduct a risk assessment based on amounts and nature of the commodity for the final decision vs the bidder's capacity.**
19.	Administrative enquiries should be directed to: Mrs. S. Minya Tel: 040 602 5263/ 079 505 9722 Email: nosibusiso.minya@ecagriculture.gov.za
20.	Technical enquiries should be directed to: Mr. M Nyikana Tel: 087 702 4198 Email: mxn@mxnep.com

PART A SBD 1
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NAME OF DEPARTMENT/ PUBLIC ENTITY*)					
BID NUMBER:	**SCMU8-25/26-0107**	CLOSING DATE:	**20 OCTOBER 2025**	CLOSING TIME:	**11:00**
DESCRIPTION	**THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI**				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*					
DEPARTMENT OF AGRICULTURE					
SUPPLY CHAIN MANAGEMENT OFFICES, 1ST FLOOR, INDWE HOUSE,					
BHISHO, 5600					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**	
CONTACT PERSON	Mrs. S. Minya	CONTACT PERSON	Mr. S. Kondlo
TELEPHONE NUMBER	040 602 5263/ 079 505 9722	TELEPHONE NUMBER	0636930652
FACSIMILE NUMBER	040 602	FACSIMILE NUMBER	
E-MAIL ADDRESS	nosibusiso.minya@ecagriculture.gov.za	E-MAIL ADDRESS	Sonwabile.Kondlo@ecagriculture.gov.za

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELL PHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA _____
SPECIFIC GOALS CLAIMED	TICK APPLICABLE BOX] ☐ Yes ☐ No		ALL SUPPORTING DOCUMENTATION FOR THE GOALS CLAIMED ATTACHED		[TICK APPLICABLE BOX] ☐ Yes ☐ No

[ALL DOCUMENTATION REQUIRED FOR THE CLAIM OF PREFERENCE POINTS AS PER THE SPECIFIC GOALS DETAILED IN THE EVALUATION CRITERIA.]

1.1 ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]	1.2 ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER PART B:3]

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.

PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR 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, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
1.4. **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).**
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 PIN 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: ……...

T 1.2

Tender Data

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

T1.2 Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Construction Procurement (August 2019). (See **www.cidb.org.za).**

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

The additional conditions of tender are:

Clause number	Tender Data
C.1.1	The employer is the Department of Agriculture, Eastern Cape Provincial Government**.**
C.1.2	The tender documents issued by the employer comprise:
	T1.1 Tender notice and invitation to tender
	T1.2 Tender data
	T2.1 List of returnable documents
	Part 1: Agreements and contract data
	C1.1 Form of offer and acceptance
	C1.2 Contract data
	C1.3 Form of Guarantee
	C1.4 Adjudicator's Contract
	Part 2: Pricing data
	C2.1 Pricing instructions
	C2.2 Bills of Quantities
	Part 3: Scope of work
	C3.1 Scope of work
	C3.2 Specifications
	Part 4: Site information
	C4.1 Site information
	C4.2 Drawings

Additional documents of which the Contractor are to obtain their own copies are:

"General Conditions of Contract for Construction Works – 3rd Edition 2015".
This document is issued by the South African Institution of Civil Engineering. (Short title "General Conditions of Contract for Construction Works 2015"), and is obtainable separately. Tenderers shall obtain their own copies.

"South African National Standards".
These documents are obtainable separately, and tenderers shall obtain their own copies of the applicable sections.

"The Occupational Health and Safety Act No 85 of 1993 and Amendment Act No 181 of 1993, and the Construction Regulations 2014".
This document is obtainable separately, and tenderers shall obtain their own copies.

In addition, tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations and standards referred to in this document as they are essential for the tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies and participation of targeted enterprise and labour.

The Construction Industry Development Board Act No 38 of 2000 and the Regulations in terms of the CIDB Act 38/2000, Government Notice No 692 of 9 June 2004,

SANS 1921:2004 Construction and Management
Part 1: General Engineering and Construction Works;
Part 6: HIV/AIDS Awareness.

SANS 10396:2003 Implementing Preferential Construction Procurement Policies using Targeted Procurement Procedures

SANS 1914:2003 Targeted Construction Procurement, Parts 1 to 6, dealing with Participation of Targeted Enterprises, Joint Ventures, Targeted Labour etc.

The Department of Agriculture Procurement Policy.

The Tender Document and the drawings shall be obtained from the Employer or his authorized representative at the physical address stated in the Tender Notice, upon payment of the deposit stated in the Tender Notice.

Clause	Data
C.1.4	The employer's agent is: Mr. M Nyikana MXN ELECTROCON PROJECTS 24 Botha Road Selborne East London 5201 Tel: 087 702 4198 Email: mxn@mxnep.com
C.2.1	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations for a **4 EP** class of construction work, are eligible to have their tenders evaluated. Bidders exceeding the threshold of CIDB grade **4** in combination with any other contract awarded to the contractor which will be executed simultaneously could be regarded as non-responsive. Joint ventures are eligible to submit tenders provided that:

	1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the **4 EP** class of construction work; and 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **4 EP** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
C.2.2	The employer **will not** compensate the tenderer for any costs incurred during the tender process.
C.2.7	The arrangements for a clarification meeting are as stated in the Tender Notice and Invitation to Tender.
C.2.13.2	Submit one original document completed in black ink. The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender. Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Proof of posting shall not be accepted as proof of delivery. Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of the standard conditions of tender in this part of SANS 10845 apply equally to the extended deadline.
C.2.13.5	The employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: Location of tender box: **THE DEPARTMENT OF AGRICULTURE,** **SCM OFFICES** **1ST FLOOR, INDWE HOUSE,** **BHISHO, 5600.** Physical address: **SCM OFFICES** **1ST FLOOR, INDWE HOUSE,** **BHISHO, 5600.** Identification details: Reference number, title of tender and the closing date and time of the tender. Postal address: **THE DEPARTMENT OF AGRICULTURE,** **SCM OFFICES** **1ST FLOOR, INDWE HOUSE,** **BHISHO, 5600.**
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.
C.2.15.	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.

C.2.17.	Additional information/clarification could be requested after closure of the bid. Non-submission / late submission of such information/clarification, could result in the bid being declared non-responsive. The employer may also request additional information / bank ratings, in order to establish the financial capacity of the bidder. Non-submission / late submission of such information / bank ratings, could result in the bid being declared non-responsive.
C.2.16.	The tender offer validity period is 90 days
C.2.23.	The tenderer is required to submit with his tender • a Certificate of Contractor Registration issued by the Construction Industry Development Board and where a tenderer satisfies CIDB contractor grading designation requirements through joint venture formation, such tenderers must submit the Certificates of Contractor Registration in respect of each partner. • a Copy of CSD registration Proof (Active & Recently updated). • Joint Venture Agreement and Power of attorney in case of a Joint Venture. • ID certificates in case of one-man concerns. • Workman's Compensation Registration Certificate. • Documentation to proof preferential points claimed.
C.3.4	**Tenders will be opened in public immediately after closing time where the name of the tenderer, the financial offer, preference points claimed and proposed period for completion will be read out loud.**
C.3.11.	**This bid will be evaluated in Four (4) phases as follows:** **Phase One:** Prequalification: Only bids of bidders adhering to the minimum CIDB grading designation, and whose CIDB registration is active on date of closure will be further considered. **Phase Two**: Compliance, responsiveness to the bid rules and conditions, thereafter they will be evaluated on PPPFA. NB Failure to submit all the requested documents such as , key personnel, work program etc. will result in the bid not be further considered. **Phase Three:** Bidders passing all stages above will thereafter be evaluated on PPPFA. **PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT (PPPFA) POINTS WILL BE AWARDED AS FOLLOWS:** Maximum points on price - **80 points** Maximum points for Specific goals - **20 points** **Maximum points** - **100 points** **Important:** • **Failure to submit a fully completed and signed bid document such as Bill of Quantities, work program etc. will result in the bid not being further considered.** • **Gross calculation errors, and omissions in the Bill of Quantities, will render the bid non-responsive.** • **Gross under and over pricing will also render the bid as non-responsive.**

1. PHASE ONE: PRE-QUALIFICATION

1. Prequalification: Only bids of bidders adhering to the minimum cidb grading designation, and who's cidb registration is active on the closing date will be considered further.

2. PHASE TWO: RESPONSIVENESS TO THE BID REQUIREMENTS AND RULES

A. Bidders' proposals must meet the following minimum requirements and supporting documents must be submitted with the completed bid document in a sealed envelope in the bid box at the closing date and time. Failure to comply will automatically eliminate the bid for further consideration:

1. Bid Document (This Document must be submitted in its original format)
2. Bids which are late, incomplete, unsigned or submitted by facsimile or electronically, will not be accepted.
3. Bidder must be registered with CIDB in the correct grading and class of works as per the tender notice and requirements. And must the status on CIDB be active during award stage. It is the responsibility of the bidder to keep the status on CIDB active throughout bidding process (advert till award stage).
4. Bidders must be a legal entity or partnership or joint venture or consortia.
5. Form of offer and Acceptance (fully completed and signed)
6. SBD 4- Declaration of Interest (fully completed and signed)
7. Compulsory Enterprise Questionnaire (Completed and signed)
8. Bid price must be all inclusive of all applicable taxes. Bidders are not entitled to claim the VAT if they are not VAT registered.
9. Certificate of Authority for Joint Ventures (if applicable). In the case of a joint venture, a signed JV agreement stating the share interest or percentage of each partner should also be made available to the department by the JV.
10. Resolution to Sign (if applicable)
11. Attendance of compulsory briefing meeting (where applicable)
12. Only one offer per item per bidder is allowed and alternative offers will not be considered. If more than one offer per item is received, none of the offers will be considered. Bidders are also not allowed to submit a bid/ quotation whilst they are in agreements with other bidders in the form of joint ventures or consortiums.
13. This tender will be awarded as a whole. All trades listed in the Bills of Quantities or Pricing schedule must be priced for (except provisional sums and allowances), failure to do so will result increase commercial risk of the bid and may lead to elimination or passing over of the bidder.
14. Past experience reports(Refer to Annexure K and H)
15. List of Key personnel and their CVs
16. Work program

B. Other Conditions of bid/ Non eliminating

1. DOA Policy applies.
2. Returnable Schedule: SBD1 – Invitation to bid must be completed and signed
3. The bidder must be registered on the Central Supplier Database (CSD) prior the award
4. All bidders' tax matters must be in order prior award. Bidders' tax matters will be verified through CSD.
5. Declaration of Employees of the State or other State Institutions.
6. Bidders must submit a minimum of three (3) written contactable references for projects successfully completed in the past (clearly indicating client name, contract value, contract term, contact person, contact details). Refer to Annexure I and Annexure M. This is not an elimination factor, but important for the department to make a decision. Unless it is used for Quality/functionality Points.
7. Bidders must submit a list of projects where he or she has submitted tender offers but tender results have not been confirmed by the client.
8. Bidders must submit their company profiles, list of available resources, plant and machinery and any other additional capacity with the bid.. This is not an elimination factor, but important for the department to make a decision. Unless it is used for Quality/functionality Points.

	9. The bidder must also list all projects where there are pending litigations or litigations have been concluded. The form for this is also attached after Annexure J. 10. Bidders submit al the required documented proof to validate the preferential points claimed on SBD 6.1. (Refer to Point 9 of the Tender Notice) 11. The Department will contract with the successful bidder by signing a formal contract. 12. This tender will be awarded as a whole. All trades listed in the Bills of Quantities or Pricing schedule must be priced for (except provisional sums and allowances which also need to be added to the total), failure to do so will increase commercial risk of the bid and may lead to elimination or passing over of the bidder. 13. Wherever a brand name is specified in this document (i.e. specifications, pricing schedule, bill of quantities or anywhere), the department requires an item similar/equivalent or better. **3. PHASE THREE: EVALUATION POINTS ON PRICE AND REGULATIONS OF 2022** The **80/20 preference point system** shall be applied for the purposes of this bid as per the requirements of the *Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000)* and SPECIFIC GOALS/ PPPFA Regulations *of 2022* **Criteria** / **Points** **POINTS ON PRICE** / **80** **SPECIFIC GOALS** / **20** **TOTAL** / **100** **The 80/20 preference point system for acquisition of services, works or goods up to Rand value of R50 million:** (a) The following formula must be used to calculate the points for price in respect of tenders (including price quotation) with a Rand value equal to, or above R 30 000 and up to Rand value of R 50 000 000 (all applicable taxes included): The financial offer will be scored using the following formula: $A = (1 - (\frac{P - Pm}{Pm}))$ The value of value of W_1 is: 1) 90 where the financial value inclusive of VAT of all responsive tenders received have a value in excess of R 50 000 000 or 2) 80 where the financial value inclusive of VAT of one or more responsive tender offers have a value that equals or is less than R 50 000 000.
C.3.13.	**Tender offers will only be accepted if:** a) the tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) unless it is a foreign supplier with no local registered entity b) the tenderer is in good standing with SARS according to the Central Supplier Database. Bidders must submit a CSD no. or tax status compliance pin. c) the preferred tenderer will be required to submit an approved insurer undertaking to provide the Performance Bond / Guarantee / Surety / Security to the format and/or standard as per contract data. d) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation;

e) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

f) the tenderer has not:
   i) abused the Employer's Supply Chain Management System; or
   ii) failed to perform on any previous contract and has been given a written notice to this effect;

g) the tenderer has completed the Compulsory Declaration and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process;

h) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract;

i) Bids which are late, incomplete, unsigned or submitted by facsimile or electronically will not be accepted.

j) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer;

k) The tenderer undertakes to maximize the sourcing of building material or infrastructure input material from Eastern Cape based suppliers or manufacturers.

l) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.

m) A Resolution of signatory form has been completed and signed by director/s or a letter bearing a letterhead of the tenderer has been attached (specific to this bid) to the bid submission; it must be duly signed by all directors and submitted the bid. Only a duly authorized official can sign the bid.

n) Prospective bidders must register on CSD prior submitting bids (open tenders). Any prospective bidder found to have Tax matters not in order with SARS (verified through CSD) during the evaluation process (after being given an opportunity to rectify tax matters) will be eliminated and not be considered further in the process. Preferred bidder/s will be afforded an opportunity to rectify their tax affairs within 7 days. A bidder that fails to rectify its tax matters with SARS will be eliminated.

o) **NOTE:** The amount reflected on the Form of Offer and Acceptance takes precedence over any other total amount indicated elsewhere in bidder's tender submission. If the Form of Offer and Acceptance has no value or figure, the bidder will be regarded as having made no offer.

p) The department reserves the right not to award the bid to the most favorable tenderer, if any of the situations occur: if it is not assisting in the advancement of designated groups; risk profile of the favorable firm is too high; the bidder has been awarded a considerable number of projects by the department or provincial government; has performed unsatisfactorily in the past, etc.

q) Documents required for the specific goals:

<table>
<tr><td></td><td>
<table>
<tr><th>No</th><th>Specific Goals</th><th>Documentation to be submitted by bidders to validate their claim for points</th></tr>
<tr><td>1</td><td>An EME or QSE which is at least 51% owned by black people</td><td>• ID Copy
• CIPC (Company registration)'
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>2</td><td>Located in the Province where the services will be rendered/ item delivered.</td><td>• Municipal rates account OR
• Letter from councilor confirming residence OR
• Lease Agreement</td></tr>
<tr><td>3</td><td>An EME or QSE which is at least 51% owned by women</td><td>• ID Copy
• CIPC (Company registration)'
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>4</td><td>An EME or QSE which is at least 51% owned by youth (up to 35 years of age)</td><td>• ID Copy
• CIPC (Company registration)'
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)</td></tr>
<tr><td>5</td><td>An EME or QSE which is at least 51% owned by people with disability</td><td>• ID Copy
• CIPC (Company registration)
• CSD report (the ownership status of the 2 documents must correspond in order to be awarded points)
• Medical certificate
• SASSA registration or confirmation of disability from a relevant authority.</td></tr>
</table>
</td></tr>
<tr><td>C.3.17.</td><td>The number of paper copies of the signed contract to be provided by the employer is one.</td></tr>
</table>

T 1.3

STANDARD CONDITIONS OF TENDER

T1.3 STANDARD CONDITIONS OF TENDER

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Construction Procurement (August 2019). (See www.cidb.org.za).

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:

i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;

ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;

b) funds are no longer available to cover the total envisaged expenditure; or

c) no acceptable tenders are received.

d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

a) C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

b) C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification,

fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

c) C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), referencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its specific goals and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed based on specific goals set out by the department. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) complies with the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer*'s* opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
b) significantly change the Employer*'s* or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

Important:

- **Failure to submit a fully completed and singed bid document such as Bill of Quantities, work program etc. will result in the bid not being further considered.**
- **Gross calculation errors, and omissions in the Bill of Quantities, will render the bid non-responsive.**
- **Gross under and over pricing will also render the bid as non-responsive.**

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in:

(i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer’s obligations in submitting a tender and the employer’s undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	**Qualitative interpretation of goal**
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

a) Open and record tender offers received
b) Determine whether or not tender offers are complete
c) Determine whether or not tender offers are responsive
d) Evaluate tender offers
e) Determine if there are any grounds for disqualification
f) Determine acceptability of preferred tenderer
g) Prepare a tender evaluation report
h) Confirm the recommendation contained in the tender evaluation report

d) C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer*'s* information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
c) has the legal capacity to enter into the contract;
d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer,

has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;

e) complies with the legal requirements, if any, stated in the tender data; and

f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,

b) inclusion of some of the returnable documents and

c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

PART T2 - RETURNABLE DOCUMENTS

T2.1 List of Returnable Documents

The tenderer must complete the following returnable documents:

1 Returnable Schedules required only for tender evaluation purposes

- Certificate of authority for joint ventures (where applicable)
- Compulsory Enterprise Questionnaire
- Record of Addenda to Tender Documents
- Proposed Amendments and Qualifications
- Schedule of Subcontractors
- Schedule of Plant and Equipment
- Schedule of the Tenderer's Experience
- Schedule of current projects

2 Other documents required only for tender evaluation purposes

- Proof of registration on the CSD and copy of active and updated certificate attached.
- Certificate of Contractor Registration issued by the Construction Industry Development Board.
- Documented proof of points claimed for Specific goals.

3 Returnable Schedules that will be incorporated into the contract

- Preferencing Schedule SBD 6.1

4 Other documents that will be incorporated into the contract

- Declaration of validity of information.
- Declaration of Interest - SBD 4.
- POPI – Consent Form
- Certificate of tenderer's visit to site.
- Tenderer's financial standing.
- Surety and Bank details.
- Form of intent to provide a Performance Guarantee.
- Key personnel for project.
- Curriculum Vitae of key personnel.
- Preliminary Construction Programme.
- Alteration by tenderer.
- Contractor's Health and Safety declaration.
- Contractor's Health and Safety Plan.

5 The offer portion of the C1.1 Offer and Acceptance

6 C1.2 Contract Data (Part 2)

7 C2.2 Bills of quantities

CERTIFICATE OF AUTHORITY FOR JOINT VENTURES

This Returnable Schedule is to be completed by joint ventures.

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

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
Lead partner		Signature ……..……... Name …… Designation ……
		Signature ……..…….. Name …… Designation ……
		Signature ……..…….. Name …… Designation ……
		Signature ……..…….. Name …… Designation ……

COMPULSORY ENTERPRISE QUESTIONNAIRE

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

Section 1: **Name of enterprise:** _____

Section 2: **VAT registration number, if any:** _____

Section 3: **cidb registration number, if any:** _____

Section 4: **CSD number:** _____

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

Name*	**Identity number***	**Personal income tax number***

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

Section 6: **Particulars of companies and close corporations**

Company registration number: _____

Close corporation number: _____

Tax reference number: _____

Section 7: **SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.**

Section 8: **SBD 6 issued by National Treasury must be completed for each tender and be attached as a tender requirement.**

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

i) Authorize the employer to verify the tenderers tax clearance status from the South African Revenue Service that it is in order;

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

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

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

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

Signed		Date	
Name		Position	
Enterprise name			

RECORD OF ADDENDA TO TENDER DOCUMENTS

The undersigned confirm that the following communications received from the employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:		
	Date	**Title or Details**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Attach additional pages if more space is required.

Signed		Date	
Name		Position	
Tenderer			

PROPOSED AMENDMENTS AND QUALIFICATIONS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in a covering letter to his tender and reference such letter in this schedule.

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

Page	Clause or item	Proposal

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

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

Tenderer .....

SCHEDULE OF PROPOSED SUBCONTRACTORS

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

If we are awarded a contract, we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

	Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor.
1.			
2.			
3.			
4.			
5.			

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

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

Tenderer .....

SCHEDULE OF PLANT AND EQUIPMENT

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

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

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

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

Tenderer .....

SCHEDULE OF THE TENDERER'S EXPERIENCE

The following is a statement of similar work in respect of this tender successfully executed by myself / ourselves during the past three (3) years:

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

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

SCHEDULE OF CURRENT PROJECTS

Tenderers must submit a max one-page description of all projects under construction/ on hold/ just handed over/ towards completion (if they exist). **Attach an Appointment letter for each of the project provided.**

The description of each project must include the following information:

1. Essential introductory information:
   - 1.1. Name of project.
   - 1.2. Name of client.
   - 1.3. Contact details of client.
   - 1.4. Contact details (including telephone numbers and email addresses) of currently contactable references.
   - 1.5. The period during which the project was performed, and also, if this is different, the period during which the tenderer's team members were contracted.
   - 1.6. Cost of works and/or contract value (making it clear in broad terms what this cost/value purchased, and to what extent (if any) this cost/value was part of a larger project budget or programme budget).

NO.	NAME OF PROJECT.	NAME OF CLIENT.	CONTACT DETAILS OF CLIENT.	PROJECT VALUE	STAGE OF PROJECT
1					
2					
3					

Attach a separate page to address this issue (the above table is just for reference purposes).

The undersigned, who warrants that she/ he is duly authorised to do so on behalf of the enterprise, confirms that the content of this schedule that presented by the tenderer are within my personal knowledge and are to the best of my knowledge both true and correct.

Signed _____ Date _____

Name _____ Position _____

Enterprise name _____

CONTRACTORS CERTIFICATE OF REGISTRATION ON CSD

[The tenderer shall submit the Contractor's Certificate of Registration on the CSD. Failure to submit the certificate with the tender document will lead to the conclusion that the tenderer is not registered on the National Treasury Central Suppliers Database and therefore not eligible to tender].

CONTRACTORS CERTIFICATE OF REGISTRATION WITH CIDB

[The tenderer shall submit the Contractor's Certificate of Registration with CIDB. Failure to submit the certificate with the tender document will lead to the conclusion that the tenderer is not registered with the CIDB and therefore not eligible to tender].

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

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

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

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1. GENERAL CONDITIONS

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

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

1.2 To be completed by the organ of state

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

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

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

(a) Price; and

(b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

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

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

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

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

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

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

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
An EME or QSE which is at least 51% owned by **black people**	**N.A.**	**5**		
Located in the Province where the services will be rendered/ item delivered.	**N.A.**	**2**		
An EME or QSE which is at least 51% owned by **women**	**N.A.**	**7**		
An EME or QSE which is at least 51% owned by **youth (up to 35 years of age)**	**N.A.**	**4**		
An EME or QSE which is at least 51% owned by people with **disability**	**N.A.**	**2**		
Total	N.A.	20		

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm……..

4.4. Company registration number: ……...

4.5. TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify

that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

i) The information furnished is true and correct;

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

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

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

(a) disqualify the person from the tendering process;

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

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

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

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

.....

SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME: .....

DATE: .....

ADDRESS: .....

.....

.....

.....

SBD 4

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

[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.

1.2 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:

……

……

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.

[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.

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

DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI

POPI - CONSENT FORM

Contractor/Service Provider/Supplier:	
Bid/Quotation No.:	
Project Description:	
Duration of Contract:	
Contract Value:	

CONSENT TO PROCESS PERSONAL INFORMATION IN TERMS OF THE PROTECTION OF PERSONAL INFORMATION ACT, NO. 4 OF 2013 (POPIA)

The purpose of the POPIA is to protect personal information of individuals and businesses and to give effect to their right of privacy as provided for in the Constitution. By signing this form, you consent to your personal information to be processed by the Department of Agriculture (DOA) and consent is effective immediately and will remain effective until such consent is withdrawn.

1. I …… a natural person "herein referred to as the Data Subject" with ID No…… hereby give my consent to the DOA "herein referred to as the Responsible Party" to collect, process and distribute my personal information where DOA is legally required to do so.

2. I understand my right to privacy and the right to have my personal information processed in accordance with the conditions for the lawful processing of personal information.

3. I understand the purposes for which my personal information is required and for which it will be used and consent to third parties accessing my personal information and to DOA sharing my personal information strictly for reporting purposes.

4. I understand that, should I refuse to provide DOA with the required consent and/ or information, the DOA will be unable to assist me.

5. I declare that all my personal information supplied to DOA is accurate, up to date, not misleading and that it is complete in all respects and will be held and/ or stored securely for the purpose for which it was collected and that I will immediately advise DOA of any changes to my Personal Information should any of these details change.

6. I also understand that I have the right to request that my personal information be corrected or deleted, if it is inaccurate, irrelevant, excessive, out of date, incomplete, misleading, or obtained unlawfully or that the personal information or record be destroyed or deleted if the responsible party is no longer authorized to retain it.

Signed at..... On this ..... day of .....20…

…..

Signature of data subject/ designated person

……	**……**
Name & Surname/Departmental Responsible Party	**Signature**

CERTIFICATE OF TENDERER'S VISIT TO SITE

This is to certify that, I .....

representative of (tenderer) .....

.....

.....

of (address) .....

.....

.....

.....

Telephone number: .....

Fax number: .....

in the company of (Engineer's representative) .....

visited and examined the site on (date) .....

I further certify that I have made myself familiar with all local conditions likely to influence the work and the cost thereof, that I am satisfied with the description of the work and the explanations given by the said Engineer's Representative and that I understand perfectly the work to be done, as specified and implied, in the execution of this contract.

TENDERER'S REPRESENTATIVE: (Signature).....

(Name).....

ENGINEER'S REPRESENTATIVE: (Signature).....

(Name).....

FORM OF INTENT TO PROVIDE A PERFORMANCE GUARANTEE

[The tenderer must provide a letter from the bank or institution. with whom he has made the necessary arrangements, to the effect that the said bank or institution will be prepared to provide the required performance guarantee when asked to do so].

KEY PERSONNEL

In terms of the Project Specification and the Conditions of Tender, unskilled workers may only be brought in from outside the local municipality if such personnel are not available locally.

The tenderer shall list below the personnel, which he intends to utilise on the Works, including key personnel, which may have to be brought in from outside if not available locally.

EMPLOYEE SKILLS TEAM No ___	NUMBER OF PERSONS			
	KEY PERSONNEL, PART OF THE CONTRACTOR'S ORGANISATION	KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY	UNSKILLED PERSONNEL TO BE RECRUITED FROM LOCAL COMMUNITY	YEARS EXPERIENCE
Site Manager				
Electrician				
OHS Safety Officer				
Skilled Worker				
Semi-skilled Worker				
Unskilled Worker				
Other				
Other				
Other				
Other				

DATE . ..... **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the Tenderer)

CURRICULUM VITAE OF KEY PERSONNEL

SITE MANAGER	
Name:	**Date of birth:**
Profession :	**Nationality:**
Qualifications (Attach certified copies) :	
National Diploma/T3/N6 in Electrical engineering with FIVE (5) years' experience in management of Electrical Reticulation Projects	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes my qualifications, my experience and me.

DATE .. .. **SIGNATURE OF SITE MANAGER .....**

DATE .. .. **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the Tenderer)

ELECTRICIAN	
Name:	**Date of birth:**
Profession :	**Nationality:**
Qualifications (Attach certified copies) :	
Electrical Engineering N4 WITH minimum with FIVE (5) years' experience **AND** **High-Voltage Authorization For Distribution (HV 04 – Authorised/Appointed Operator) (ORHVS)** **AND** **Trade certificate (Issued by the Department of Labour), or higher qualification**	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes my qualifications, my experience and me.

DATE: ..... **SIGNATURE OF ELECTRICIAN:** .....

DATE: . ..... **SIGNATURE OF TENDERER:** .....
(of person authorised to sign on behalf of the Tenderer)

OHS SAFETY OFFICER	
Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications (Attach Certified Copies) :	
Diploma WITH minimum of THREE (3) years' experience on OHS SAFETY and associated work **OR** **Certification (Issued by NOSA), or accredited body (National / International Recognised) WITH minimum one year post qualification experience on OHS Safety and associated equipment.** **AND** **SACPCMP registration as a Construction Health and Safety officer WITH minimum of THREE (3) years' experience**	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes my qualifications, my experience and me.

DATE …….. **SIGNATURE OF OHS SAFETY OFFICER** ……..…..... ……

DATE …….. **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the Tenderer)

PRELIMINARY CONSTRUCTION PROGRAM

The tenderer shall submit a preliminary program reflecting the proposed sequence and duration of the various activities comprising the work for this Contract to include the projected cash flow for each activity. The program shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of his tender.

[Note: The program must be based on the completion time as specified in the Contract Data.]

Schedule	Abbreviated description	Days per action	Cumulative project construction days
1	Site Establishment		
2	Site clearing and levelling of site		
3	Excavation for street light poles		
5	Materials Ordering.		
6	Installation of electrical cabling		
7	Installation of street lights		
8	Testing and commissioning		
9	Training		
10	Clean site and remove establishment on site		

PROPOSED CONSTRUCTION PERIOD _____ WEEKS

DATE . ..... **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the Tenderer)

BASELINE RISK ASSESSMENT

PROJECT TITLE	**THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI**
SCMU NUMBER	**SCMU8-25/26-0107**
PLEASE NOTE THAT THIS IS A BASELINE RISK ASSESSMENT AND NOT A DETAILED RISK ASSESSMENT OF ALL ANTICIPATED ACTIVITIES ON SITE	

Activity	*Risk to Safety*	*Risk to Health*	*Risk to Environmental*	*Risk to Public Safety*	*Control Measures*
COVID 19 OHS	*Low*	*High*	*N.A*	*High*	*Adhere to Disaster Management Act (57/2002): Covid-19 Occupational Health and Safety Measures in Workplaces Covid-19 (Gov Gazette No. 43257, Dated 29 April 2020 and any amendments)*
Excavations of up to 1.5m	*Medium*	*Low*	*N.A.*	*Medium*	*Barricade excavation areas.*
Working at height of 2-11m	*High*	*Low*	*N.A.*	*Low*	*Make use of appropriate scaffolding and ladders.*
Using hazardous chemical substances (cement)	*Medium*	*Low*	*Low*	*Medium*	*SHE talks, task supervision and appropriate safety gear.*
Working on live network (Electrocution)	*High*	*High*	*N.A.*	*High*	*Regular safety assessments of methods and situational awareness.*
Working in single story roof	*Medium*	*Low*	*N.A.*	*Low*	*Make use of appropriate safety gear.*
Movement of machinery and vehicles on site	*Low*	*Low*	*N.A.*	*Medium*	*Fence site, and put access control measures in place.*
Mobile plant, equipment and tools	*High*	*High*	*Low*	*High*	*Ensure employee, operators are fully trained in operating plant and equipment.*

You can list all activities on a separate page to address this issue (the above table is just for reference purposes).

Signed	----------	***Date***	----------
Name	----------	***Position***	----------
Enterprise name	----------		

ALTERATIONS BY TENDERER

Should the tenderer desire to make any departure or modification to the General Conditions of Contract, Special Conditions of Contract, Specifications, Schedule of Quantities or Drawings, or to qualify his tender in any way, he shall set out his proposals clearly hereunder, or alternatively, state them in a covering letter attached to his tender and referred to hereunder, failing which the tender will be deemed to be unqualified.

PAGE	CLAUSE OR ITEM	DESCRIPTION

DATE .. .. **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the tenderer

CONTRACTORS HEALTH AND SAFETY DECLARATION

In terms of Clause 5(1)(h) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Contractor may only be appointed to perform construction work if the Employer is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHSA 1993 Construction Regulations 2014. To that effect a person duly authorised by the tenderer must complete and sign the declaration hereafter in detail.

Declaration by Tenderer

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHSA 1993 Construction Regulations 2014.
2. I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.
3. I hereby confirm that adequate provision has been made in my tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, including the cost of the specific items listed in the tables hereafter.

   (Tables to be completed by tenderer)

TABLE 1: COST OF SAFETY PERSONNEL

PERSONNEL	COSTS AS ALLOWED IN TENDER	NOMINATED PERSON/S
Construction Supervisor		
Construction Safety Officer		
Health and Safety		
Health and Safety Committee		

TABLE 2: COST OF SAFETY EQUIPMENT

EQUIPMENT	STATE YES or NO	COST ALLOWED FOR IN TENDER
Hard hats		
Safety boots		
Add items as per risk assessment:		

4. I hereby undertake, if my tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 7(1)(a) of the Construction Regulations, which plan shall be subject to approval by the Employer.

5. I confirm that copies of my company's approved Health and Safety Plan, the Employer's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Contractor's personnel, the Employer's personnel, the Engineer, visitors, and officials and inspectors of the Department of Labour.

6. I hereby confirm that, I will be liable for any penalties that may be applied by the Employer in terms of the said Regulations (Regulation 33) for failure on the Contractor's part to comply with the provisions of the Act and the Regulations.

7. I agree that my failure to complete and execute this declaration to the satisfaction of the Employer will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2014, and accept that my tender will be prejudiced and may be rejected at the discretion of the Employer.

DATE ..... **SIGNATURE OF TENDERER** .....
(of person authorised to sign on behalf of the Tenderer)

CONTRACTORS HEALTH AND SAFETY PLAN

[Not applicable for tender purposes]

[The successful Tenderer, only, shall be required to submit the Contractor's Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014, and referred to in T2.1, List of Returnable Documents point 4 (other documents that will be incorporated into the contract) <u>after acceptance</u> of the tender]

EVALUATION SCHEDULE 1 – PROJECT REFERENCE FORMS - 1

Project title:	**THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI**
Project Number:	**SCMU8-25/26-0107**

NOTE: This returnable document must be completed by the person who was the Engineer/Project Manager on a project of similar value and complexity that was completed successfully by the tenderer.

I, _____ (name and surname) of

_____ (company name) declare

that I was the Project Manager on the following building construction project successfully executed by _____ (name of tenderer):

Project name: _____

Project location: _____

Construction period: _____ Completion date: _____

Contract value: _____

- Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting "Yes" in the relevant box below:

Key Performance Indicators	**Very Poor 1**	**Poor 2**	**Fair 3**	**Good 4**	**Excellent 5**	**Total**
1. Project performance						
2. Quality of Service						
3. Resources: Personnel						
4. Time management / programming						
5. Financial management / Project budget management/cash flow, etc.						
TOTAL						

- Would you consider / recommend this tenderer again:

YES	NO

- Any other comments:

_____

_____

_____

- My contact details are:

Telephone: _____ Cellphone: _____ Fax: _____

E-mail: _____

Thus signed at _____ on this _____ day of _____ 20___

_____

Signature of principal agent

COMPANY STAMP

NOTE:

If reference cannot be verified due to the inability to get hold of the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points. It is the responsibility of the tenderer to put referees who are reachable.

_____

Name of Tenderer

_____ _____

Signature of Tenderer

EVALUATION SCHEDULE 1 – PROJECT REFERENCE FORMS - 2

Project title:	**THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI**
Project Number:	**SCMU8-25/26-0107**

NOTE: This returnable document must be completed by the person who was the Engineer/Project Manager on a project of similar value and complexity that was completed successfully by the tenderer.

I, _____ (name and surname) of

_____ (company name) declare

that I was the Project Manager on the following building construction project successfully executed by _____ (name of tenderer):

Project name: _____

Project location: _____

Construction period: _____ Completion date: _____

Contract value: _____

- Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting "Yes" in the relevant box below:

Key Performance Indicators	Very Poor 1	Poor 2	Fair 3	Good 4	Excellent 5	Total
1. Project performance						
2. Quality of Service						
3. Resources: Personnel						
4. Time management / programming						
5. Financial management / Project budget management/cash flow, etc.						
TOTAL						

- Would you consider / recommend this tenderer again:

YES	NO

- Any other comments:

_____

_____

_____

- My contact details are:

Telephone: _____ Cellphone: _____ Fax: _____

E-mail: _____

Thus signed at _____ on this _____ day of _____ 20___

_____

Signature of principal agent

COMPANY STAMP

NOTE:

If reference cannot be verified due to the inability to get hold of the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points. It is the responsibility of the tenderer to put referees who are reachable.

_____

Name of Tenderer

_____ _____

Signature of Tenderer

EVALUATION SCHEDULE 1 – PROJECT REFERENCE FORMS - 3

Project title:	**THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI**
Project Number:	**SCMU8-25/26-0107**

NOTE: This returnable document must be completed by the person who was the Engineer/Project Manager on a project of similar value and complexity that was completed successfully by the tenderer.

I, _____ (name and surname) of

_____ (company name) declare

that I was the Project Manager on the following building construction project successfully executed by _____ (name of tenderer):

Project name: _____

Project location: _____

Construction period: _____ Completion date: _____

Contract value: _____

- Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting "Yes" in the relevant box below:

Key Performance Indicators	Very Poor 1	Poor 2	Fair 3	Good 4	Excellent 5	Total
1. Project performance						
2. Quality of Service						
3. Resources: Personnel						
4. Time management / programming						
5. Financial management / Project budget management/cash flow, etc.						
TOTAL						

1. Would you consider / recommend this tenderer again:

YES	NO

2. Any other comments:

_____

_____

_____

3. My contact details are:

Telephone: _____ Cellphone: _____ Fax: _____

E-mail: _____

Thus signed at _____ on this _____ day of _____ 20___

_____

Signature of principal agent

COMPANY STAMP

NOTE:

If reference cannot be verified due to the inability to get hold of the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points. It is the responsibility of the tenderer to put referees who are reachable.

_____

Name of Tenderer

_____ _____

Signature of Tenderer

The Contract

PART C1: AGREEMENT AND CONTRACT DATA

C 1.1

Form of Offer and Acceptance

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI

C1.1 Form of Offer and Acceptance

Note: *1 This form of offer and acceptance is identical to that contained in Annex F of SANS 10845 - 1: Construction Procurement Processes, Procedures and Methods.*
2 SAICE's Practice Manual #1, The use of South African National Standards in Construction Procurement, provides guidance on the formulation of the wording for the actual offer where it is not based on the offered total of prices.

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of: **SCMU8-25/26-0107: THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.** The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS……...

……..…... Rand (in words);

R …… (in figures) (or other suitable wording)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

Signature(s)		Date:	
Name(s)			
Capacity:			
For tenderer: (Name and address)			
Name & Signature of witness:		Date:	

ACCEPTANCE

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:
Part C1 Agreements and contract data, (which includes this agreement)

Part C2 Pricing data

Part C3 Scope of work

Part C4 Site information and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five (5) working days of the date of such receipt notifies the employer in writing of any reason why he/she cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

Signature(s)		Date:	
Name(s)			
Capacity:			
For the employer: (Name and address)			
Name & Signature of witness:		Date:	

SCHEDULE OF DEVIATIONS

Notes:

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

1 Subject _____

Details: _____

2 Subject _____

Details: _____

3 Subject _____

Details: _____

4 Subject _____

Details: _____

By the duly authorised representatives signing this agreement, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

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

For the Tenderer:		For the Employer:
……	Signature	…….
……...	Name	…….
……	Capacity	…….

Name and address of organization:

Name and address of organization:

…… ……

…… ……

…… ……

…… Witness Signature ……

……... Witness Name ……

…… Date ……

CONFIRMATION OF RECEIPT

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

The ……(day) of …….. (month) 20……(year), at

…….. (place)

For the Contractor:

Signature: ……

Name: ……

Capacity: ……

Signature and name of witness:

Signature: ……

Name: ……

C 1.2

Contract Data

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

C1.2 Contract Data

The General Conditions of Contract for Construction Works (2015) published by the South African Institution of Civil Engineering, is applicable to this contract. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel 011-805 5947).

The General Conditions of Contract for Construction Works make several references to the Contract Data for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the general conditions of contract.

The Contract Data and General Conditions of Contract shall have precedence over the Drawings, Scope of Work and Standardised Specifications in the interpretation of any ambiguity or inconsistency.

Contract Specific Data

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

Clause	Data
1.1.1.5	"Commencement Date" means the date the Contractor is given right of access to site (Site handover date)
1.1.1.13	The Defects Liability Period is **12 Months**, measured from the date of the Certificate of Completion.
1.1.1.14	The time for achieving Practical Completion is **12 Weeks,** inclusive of the 14 day period referred to in Clause 5.3.2 below, and inclusive of non-working days referred to in Clause 5.8.1 below, but exclusive of special non-working days (Clause 5.8.1).
1.1.1.15	The name of the Employer is DEPARTMENT OF AGRICULTURE
1.1.1.16	The name of the Employer's Agent is **Mr S. Kondlo** (Chief Engineer – DOA)
1.1.1.17	The name of the Employer's Agent Representative is **Mr M. Nyikana (MXN Electrocon Projects)**
1.1.1.26	The Pricing Strategy is Re-measurement Contract
1.1.1.34	"writing" means any hand-written typed or printed communication (comprising words, figures or drawings) including electronic communication through means of email, but excluding communication via social media (WhatsApp, Facebook etc.) resulting in a permanent record. "In writing" and "written" shall have corresponding meaning.

1.1.1.35	"**Drawings**" means all drawings, calculations and technical information forming part of the Contract Documents and any modifications thereof or additions thereto from time to time approved in writing by the Employer's Agent or delivered to the Contractor by the Employer's Agent.
1.1.1.36	**Letter of Notification**" means the letters of formal notification, signed by the Employer, of the decision of the Supply Chain Management Bid Adjudication Committee sent to all tenderers. The notification of the decision does not form part of the Employer's Acceptance of the successful tenderer's Offer and no rights shall accrue.
1.2.1	**DELIVERY OF NOTICES** The following three additional sub-clauses, covering alternative methods of communication, apply: -
1.2.1.3	Sent by electronic post (e-mail) between parties to the email addresses listed during the site handover meeting.
1.2.1.4	Posted to the addressee for certified delivery by the postal Authorities The Chief Engineer DOHNE ADI Private Bag X15 Stutterheim, 4930
1.2.1.5	Delivered by a courier service and signed for by the addressee
1.2.1.2	The Employer's address for receipt of communications is: **The Chief Engineer** DEPARTMENT OF AGRICULTURE Engineering Services Private Bag X15 Stutterheim 4930

2.1.4	The following additional clause applies: - "Without limiting the generality of the afore going, the Schedule of Rates and Prices shall include: (a) The provision and use of all labour, plant, tools instruments, templates, materials, transport and all other appliances that may be required for satisfactorily protecting and efficiently carrying out the works without interruption or delay. (b) The provision and housing of adequate staff and labour force and the provision of false work of every kind and description necessary for the due and proper performance of the Contract. (c) The execution of the Works in orderly and progressive manner until it has been completed. Time being of the essence of the Contract the progressive development of the Works shall be arranged so that the time from the start to the finish of the construction of the said Works shall not exceed the time laid down in the Tender. (d) The inclusion in the tendered rates for all and any of the general liabilities such as Establishment Charges, legal contingencies, regulations, risks or damage, Royalties and all other overhead charges. The submission of a tender shall be considered prima facie evidence that the Contractor has complied with the requirements of this clause and has satisfied him/herself as to all circumstances and local conditions which may influence or affect his Tender."
2.4.1	The following additional clause applies: - In the event of any discrepancy or conflict between any parts of the Contract Documents, the order of precedence shall be as follows: 1. Project Particular Specifications 2. Special Conditions of Contract 3. General Conditions of Contract 4. Conditions of Tender 5. Generic Specifications 6. Contract Drawings 7. Bill of Quantities
3.2.3	The Employer's Agent shall obtain the specific approval of the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract: Clause 3.3.1 Nomination of Employer's Agent Representative Clause 3.3.4 Employer's Agent authority to delegate Clause 5.8.1 Non-working times Clause 5.11.2 Suspension of the Works Clause 5.12.4 Acceleration instead of extension of time
3.3.7	The following additional clause applies: - The onus rests with the Contractor to raise any item about which the Contractor may be uncertain, with the Engineer's Representative. Any advice given to the Contractor by the Engineer's Representative in response to matters so raised shall not be construed as instructions and shall be held to have been given without prejudice.

3.3.8	The following additional clause applies: - The Employer or the Employer's Agent under delegated authority, reserves the right to obtain the services of consultants on any matter pertaining to this contract; the employment of such consultants forms no part of this contract; a consultant's advice and/or documentation is to be followed only if the Employer's Agent or the Employer's Agent Representative so instructs.
4.1	All references to "design" are deemed to be deleted and the Contractor shall bear no liability in respect of the Projects design, other than the temporary works and items clearly indicated to design on drawings and the Project Particular Specifications.
4.3.3	The following additional clause applies: - The Employer and the Contractor shall enter into an agreement to complete the work required for the construction of the works in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act 85 of 1993) and the Construction Regulations promulgated there under. An agreement is included in the Contract Document (at the end of Contract Data) and shall be completed and submitted to the Employer together with a letter of good standing from the Compensation Commissioner (if not insured with a Licensed Compensation Insurer) within fourteen (14) days after the Commencement Date. The Contractor shall ensure that any letter of good standing shall be timeously renewed in order that it remains in full force for the duration of the Contract.
5.3.1	The documentation required before commencement with the Works execution are: 1 Health and Safety Plan (Refer to Clause 4.3) 2 Initial programme (Refer to Clause 5.6) 3 Security (Refer to Clause 6.2) 4 Insurance (Refer to Clause 8.6) 5 Letter of Good Standing from the Compensation Commissioner (if not insured with a Licensed Compensation Insurer)
5.3.2	The time to submit the documentation required before commencement with the Works execution is 14 days.
5.3.3	The Contractor shall commence with execution of the Works within 7 days after receiving an instruction to commence with the Works.
5.4.1	The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site.
5.5.1	The Works shall be completed (Practical Completion) within **12 Weeks.**

5.8.1	The non-working days are Sundays. The special non-working days are: (1) All gazetted public holidays falling outside the year end break. (2) The year end break commencing on 15 December and ending on 9 January
5.8.3	The following additional clause shall apply: Should the Employer's Agent permit work outside of normal Employer working hours (viz Mondays to Fridays inclusive sunrise to sunset) and on Saturdays, Sundays or on any of the non-working days stated in the Appendix and if he deems the presence of the Employer's Agent Representative or other duly authorised representative to be necessary, the Contractor will be liable for the cost of such supervision (calculated at a daily rate of 1/130 of the annual salary of such representative). Where the Employer's Agent has ordered such work, the salary of the representative will be to the account of the Employer. A minimum of 24 hours notification of intent to work outside normal working hours shall be regarded as sufficient notice as set out in 5.8.1"
5.12.2.2	No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal climatic conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed 2 consecutive working days for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time may be claimed in accordance with the provisions of Clause 5.12. Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously by the Contractor as each day or half-day delay is experienced. It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for any other reason will be entertained
5.13.1	The penalty for failing to complete the Works is **11c/R100 of contract amount per day.** No claim for bonus payments in respect of early completion will be entertained.
5.14.1	Practical Completion: In terms of this contract, practical completion will be reached, once all the works have been completed in full, according to the bill of quantities and project specifications, and dually been approved by the Employers agent representative.
5.16.3	The latent defect period is **5 Years.**

6.2.1	The security to be provided by the Contractor shall be • **10 % Retention** or • **Performance Guarantee of ten per cent (10%) of the Contract Sum.** Retention monies due shall be subjected to Clauses 6.10.3. The Performance Guarantee shall be from an approved Insurance Company or Bank to be jointly and severally bound with the Contractor, in accordance with the provisions of the Performance Guarantee. A Retention Money Guarantee is not permitted. The wording of the Performance Guarantee shall be identical to the pro-forma provided under Clause C1.3: Performance Guarantee of the Contract Data • The time to deliver the Performance Guarantee is within fourteen (14) days after the Commencement Date.
6.6.1	The provisional sums stated in the Schedule of Quantities are net amounts covering the actual expenditure which the Employer may incur.
6.7.6	The following additional clause shall apply: The Works are measured in accordance with the current SANS 1200 and the standard system of measurement of Civil Engineering quantities for South Africa, published by the South African Institution of Civil Engineers. No claims arising from the method of measurement will be entertained.
6.8.1	Should the rated tendered be unrealistically high or low, the Employer's Agent may instruct the contractor to balance the rates while the contract sum will remain firm, before commencement of construction. The revised balanced rates will be final and binding. And the value of the payment certificates is to be calculated in accordance with the revised rates and/or prices of the tender throughout the period of the Contract.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is **80%.**
6.10.3	The percentage retention on amounts due to the contractor is 10%, which will be reduced to 5% on date of completion.
6.10.4	Add the following to clause: Notwithstanding the above, the Employer's Agent shall be empowered to withhold the delivery of the payment certificate until the Contractor has complied with his obligations to report in terms of Clause 4.10.2 and as described in the Scope of Work.
8.3.1.6	Electrical supply interruptions due to 'load shedding" implemented by the electricity suppliers is excluded from the risks accepted by the Employer.

8.5.2	The following additional clause shall apply: If the Contractor receives any claim in respect of any loss or injury or damage to any person or property, then the Contractor shall immediately report the same to the Employer's Agent and, if at the end of ninety days from the date of receipt of such claim the Contractor cannot satisfy the Employer's Agent that the claim has been settled or that valid reasons for the non-settlement of the claim exist, then the Employer may, without limiting the obligations and responsibilities of the Contractor, negotiate a settlement and deduct all sums due in respect of such claim from payments due to the Contractor.
8.6.1.1.2	The value of plant and materials supplied by the Employer to be included in the insurance sum is **Nil.**
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is **R 200 000.00.**
8.6.1.3	The limit of indemnity for liability insurance is R 2 000 000.00 per claim for projects under R 5 000 000.00 and R 5 000 000.00 for projects over R 5 000 000.00.
9.2.1.3.8	Add the following to clause: The Contractor committed a corrupt or fraudulent act during the procurement process or the execution of the contract.
9.2.1.3.8	Add the following to clause: An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the contract that benefited the Contractor.
10.1	Replace all references to **28 days,** with **14 days** in this clause and all sub clauses.
10.2	Replace all references to **28 days,** with **14 days** in this clause and all sub clauses.
10.4.1	The parties may at any time agree to settle disputes with the help of an impartial third party.
10.5.3	The number of Adjudication Board Members to be appointed is THREE.

2. CLAUSES APPLICABLE TO EPWP CONTRACTS

1. Employer's objectives:
   The employer's objectives are to deliver infrastructure using labour-intensive methods according to EPWP guidelines.

2. Labour-intensive works:
   Labour-intensive works shall be conducted using local workers who are temporary employed in terms of the scope of work.

3. Labour-intensive competencies of supervisory and management staff:
   The contractor shall engage supervisory and management staff in labour intensive works that have completed the skills programme including Foreman/Supervisors at NQF level 4 "National Certificate on

	supervision of Civil Engineering Construction Processes" and Site Agent/manager at NQF level 5 on "Manage labour-intensive Construction Processes" or equivalent QCTO qualification.
4.1	Variations to the Conditions of Contract are: *Add the following at the end of sub clause 4.1.2.*
4.1.3	The Employer and the Contractor hereby agree, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Amendment Act, 1993 (Act 85 of 1993), hereinafter referred to as 'the Act', that the following arrangements and procedures shall apply between them to ensure compliance by the Contractor with the provisions of the Act: (i) The Contractor undertakes to acquaint the appropriate officials and employees of the Contractor with all relevant provisions of the Act and the Regulations promulgated in terms of the Act. (ii) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and Regulations on the Contractor will be fully complied with. (iii) The Contractor accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and Regulations and expressly absolves the Employer from himself being obliged to comply with any of the aforesaid duties, obligations and prohibitions, with the exception of such duties, obligations and prohibitions expressly assigned to the Employer in terms of the Act and its associated Regulations. (iv) The Contractor agrees that any duly authorised officials of the Employer shall be entitled, although not obliged, to take such steps as may be necessary to monitor that the Contractor has conformed to his undertakings as described in paragraphs (i) and (ii) above, which steps may include, but will not be limited to, the right to inspect any appropriate site or premises occupied by the Contractor, or any appropriate records or safety plans held by the Contractor. (v) The Contractor shall be obliged to report forthwith to the Employer and Engineer any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the Act and Regulations, pursuant to work performed in terms of this Contract, and shall, on written demand, provide full details in writing, to the Employer and Engineer, of such investigation, complaint or criminal charge.
6.7.6	*Add new subclause6.7.6:* **"Payment for the labour-intensive component of the works** Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations in contract. The Contractor's payment invoice shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. **The contractor's invoices shall not be paid until all pending labour information has been submitted.**
3.	**ADDITIONAL CONDITIONS OF CONTRACT**:
Clause	
4.13	Add new sub clause 4.13: **Applicable labour laws** The Ministerial Determination 4, Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice No R347 of 7 May 2012 (Gazette no 35310), as reproduced below, shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers.

4.13 (cont.)	**1 Introduction** 1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on a Expanded Public Works Programme (EPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a EPWP.
4.13 (cont.)	1.2 In this document – (a) "department" means any department of the State, implementing agent or contractor; (b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a EPWP; (c) "worker" means any person working in an elementary occupation on a EPWP; (d) "elementary occupation" means any occupation involving unskilled or semi-skilled work; (e) "management" means any person employed by a department or implementing agency to administer or execute an EPWP; (f) "task" means a fixed quantity of work; (g) "task-based work" means work in which a worker is paid a fixed rate for performing a task; (h) "task-rated worker" means a worker paid on the basis of the number of tasks completed; (i) "time-rated worker" means a worker paid on the basis of the length of time worked. **2 Terms of work** 2.1 Workers on a EPWP are employed on a temporary basis. **3 Normal hours of work** 3.1 An contractor may not set tasks or hours of work that require a worker to work– (a) more than forty hours in any week; (b) on more than five days in any week; and (c) for more than eight hours on any day. 3.2 An contractor and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day. 3.3 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker. **4 Meal breaks** 4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration. 4.2 An contractor and worker may agree on longer meal breaks. 4.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break. 4.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.
4.13 (cont)	**5 Special conditions for security guards** 5.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

4.13 (cont)	5.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each. **6 Daily rest period** Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day. **7 Weekly rest period** Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work"). **8 Sick leave** 8.1 Only workers who work more 24 hours per month have the right to claim sick-pay in terms of this clause. 8.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract. 8.3 A worker may accumulate a maximum of twelve days sick leave in a year. 8.4 Accumulated sick leave may not be transferred from one contract to another contract. 8.5 A contractor must pay a task-rated worker the worker's daily task rate for a day's sick leave. 8.6 A contractor must pay a time-rated worker the worker's daily rate of pay for a day's sick leave. 8.7 A contractor must pay a worker sick pay on the worker's usual pay day. 8.8 Before paying sick pay, a contractor may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is – (a) absent from work for more than two consecutive days; or (b) absent from work on more than two occasions in any eight-week period. 8.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity. 8.10 A worker is not entitled to paid sick leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.
4.13 (cont)	**9 Maternity leave** 9.1 A worker may take up to four consecutive months unpaid maternity leave. 9.2 A worker is not entitled to any payment or employment-related benefits during maternity leave. 9.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work. 9.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so. 9.5 A worker may begin maternity leave – (a) four weeks before the expected date of birth; or (b) on an earlier date – (i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or (ii) if agreed to between employer and worker; or (c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

	9.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth. **10 Family responsibility leave** 10.1 Workers who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances: (a) when the employee's child is born; (b) when the employee's child is sick; (c) in the event of a death of (i) the employee's spouse or life partner; (ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling. **11 Statement of conditions** 11.1 A contractor must give a worker a statement containing the following details at the start of employment: (a) the contractor's name and address and the name of the EPWP; (b) the tasks or job that the worker is to perform; and (c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract; (d) the worker's rate of pay and how this is to be calculated; (e) the training that the worker will receive during the EPWP. 11.2 A contractor must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement. 11.3 A contractor must supply each worker with a copy of these conditions of employment.
4.13 (cont)	**12 Keeping records** 12.1 Every employer must keep a written record of at least the following: (a) the worker's name and position; (b) copy of an acceptable worker identification; (c) in the case of a task-rated worker, the number of tasks completed by the worker; (d) in the case of a time-rated worker, the time worked by the worker; (e) payments made to each worker. 12.2 The employer must keep this record for a period of at least three years after the completion of the EPWP. **13 Payment** 13.1 A contractor must pay all wages at least monthly in cash or by cheque or into a bank account. 13.2 A worker may not be paid less than the minimum EPWP wage per day as set out in the National Minimum Wage Act no.9 of 2018 and subsequent updates. 13.3 A task-rated worker will only be paid for tasks that have been completed. 13.4 A contractor must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer. 13.5 A time-rated worker will be paid at the end of each month. 13.6 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker. 13.7 Payment in cash or by cheque must take place – (a) at the workplace or at a place agreed to by the worker; (b) during the worker's working hours or within fifteen minutes of the start or finish of work;

	(c) in a sealed envelope which becomes the property of the worker. 13.8 A contractor must give a worker the following information in writing: (a) the period for which payment is made; (b) the numbers of tasks completed or hours worked; (c) the worker's earnings; (d) any money deducted from the payment; (e) the actual amount paid to the worker. 13.9 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it. 13.10 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment. **15 Deductions** 15.1 A contractor may not deduct money from a worker's payment unless the deduction is required in terms of a law. 15.2 A contractor must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay. 15.3 A contractor who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned. 15.4 A contractor may not require or allow a worker to – (a) repay any payment except an overpayment previously made by the contractor by mistake; (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or (c) pay the contractor or any other person for having been employed.
4.13 (cont)	**15 Health and safety** 15.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe. 15.2 A worker must – (a) work in a way that does not endanger his/her health and safety or that of any other person; (b) obey any health and safety instruction; (c) obey all health and safety rules of the EPWP; (d) use any personal protective equipment or clothing issued by the contractor; (e) report any accident, near-miss incident or dangerous behaviour by another person to their contractor or manager. **16 Compensation for injuries and diseases** 16.1 It is the responsibility of the contractor to arrange for all persons employed on a ESPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993. 16.2 A worker must report any work-related injury or occupational disease to their contractor or manager. 16.3 The contractor must report the accident or disease to the Compensation Commissioner. 16.4 An contractor must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The contractor will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

17 Termination

17.1 The contractor may terminate the employment of a worker for good cause after following a fair procedure.

17.2 A worker will not receive severance pay on termination.

17.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

18.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

17.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

18 Certificate of service

18.1 On termination of employment, a worker is entitled to a certificate stating –

(a) the worker's full name;

(b) the name and address of the employer;

(c) the EPWP on which the worker worked;

(d) the work performed by the worker;

(e) any training received by the worker as part of the EPWP;

(f) the period for which the worker worked on the EPWP;

(g) any other information agreed on by the contractor and worker.

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause	Data
1.1.1.9	The name of the Contractor is ……
1.2.1.2	The address of the Contractor is: Physical Address: Postal Address: …….. …….. …….. …….. ……. …….. ……. …….. e-mail: …… Tel. No. …….. Fax No. ……
1.1.1.14	The time for achieving Practical Completion is **12 Weeks.**
6.5.1.2.3	The percentage allowance to cover overhead charges is …… %
6.2.1	The security to be provided by the Contractor shall be the following:

Type of security (Value Added Tax is excluded from the Contract Sum and the value of the Works for calculating the percentages)	10% Retention

C 1.2

Contract Data

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

C1.3 PERFOMANCE GUARANTEE (PRO FORMA)

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

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: .....

Physical address: .....

"Employer" means: THE DEPARTMENT OF AGRICULTURE, EASTERN CAPE

"Contractor" means: .....

"Employer's Agent" means: As appointed by the Employer

"Works" means: THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI

"Site" means: The land and other places made available by the Employer, for the purpose of theContract, on, under, over, in or through which the Works are to be carried out

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

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

Amount in words: .....

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

Amount in words: .....

Type of Performance Guarantee: **Fixed**

"Expiry Date" means .....or any other later date set by the Contractor and/or

Employer provided such instruction is received prior to the Expiry Date as indicated her

CONTRACT DETAILS

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

AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993

THIS AGREEMENT is made between .....

……

(hereinafter called the EMPLOYER) of the one part, herein represented by: .....

.....

in his capacity as: .....

AND:

(hereinafter called the CONTRACTOR) of the other part, herein represented by .....

.....

in his capacity as: .....

duly authorised to sign on behalf of the Contractor.

WHEREAS the CONTRACTOR is the Mandatory of the EMPLOYER in consequence of an agreement between the CONTRACTOR and the EMPLOYER in respect of

CONTRACT No.: **SCMU8-25/26-0107: THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI** for the construction, completion and maintenance of the works;

NOW THEREFORE the parties agree as follows:

1. **The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.**

2. The CONTRACTOR undertakes to fully comply with all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations: Provided that should the EMPLOYER have prescribed certain arrangements and procedures that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.

3. The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures, if any, imposed by the ACT and Regulations, and the CONTRACTOR expressly absolves the EMPLOYER and the Employer's CONSULTING EMPLOYER'S AGENTS from being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedures in respect of the work included in the contract.

4. The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with his undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

5. The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

Thus signed at .....for and on behalf of the **CONTRACTOR**

on this day .....day of .....20_____

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESS: 1. ..... ……..

2. .....

Thus signed at .....for and on behalf of the **EMPLOYER**

on this day .....day of ..... 20_____

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESS: 1. .....

2. …….

CESSION OF RIGHTS FOR MATERIALS ON SITE

Claim for materials on site

Payment Certificate No. ..... **Date:** ....

Contract: .....

Employer: ..... …

Contract No:..... .....

Contractor: ....

I / We, the undersigned,.....
(Print name)

in my / our capacity as .....of ..... …….
(Print capacity) (Company)

hereby confirm that the Contractor is the bona fide owner of the goods and materials described in the attached schedule and the Contractor hereby cedes assigns and transfers all the right, title and interest claim and demand in and due to the materials and goods described in the attached schedule in favour of the Employer.

All rights of the Employer in and to this Cession shall become effective immediately upon the Contractor obtaining payment for the goods referred to on the attached schedule (less payment of retention monies that may be validly retained in respect thereof) from which time forward the ownership of all the stated goods and materials will vest in and pass irrevocably to the Employer.

Notwithstanding the foregoing all risk or loss and/or damage to the said goods and materials whilst in the Contractor's stores up until the time that all the goods and materials have been installed in the Works shall be the responsibility of the Contractor.

This Cession shall neither constitute a novation of nor amend the terms of the Contract existing between the Employer and the Contractor nor shall it in any manner vitiate any of the rights and obligations imposed on either party.

Signed by: ..... Date: .....
for and on behalf of the Contractor.

Witnessed by: .....Date: .....

(**NOTE**: This form, together with the documentary proof of ownership or proof of payment by the Contractor to the supplier, shall accompany the Contractor's claim for payment for materials on site in terms of Clause 49.1.5 of the General Conditions of Contract Third Edition 2015).

PART C2 – PRICING DATA

C 2.1

Pricing Instructions

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

C2.1 Pricing Instructions

1. Measurement and payment shall be in accordance with the relevant provisions of clause 8 of each of the SABS 1200 Standardised Specifications for Civil Engineering Construction referred to in the Scope of Work. The Preliminary and General items shall be measured in accordance with the provisions of SABS 1200-A, *General.*

2. The units of measurement described in the Bills of Quantities are metric units. Abbreviations used in these Bills of Quantities are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
m²	=	square metre
m²-pass	=	square metre-pass
m³	=	cubic metre
m³-km	=	cubic metre-kilometre
month	=	month
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC sum	=	Prime Cost sum
R/only	=	Rate only
sum	=	lump sum
t	=	ton (1000 kg)
W/day	=	Work day

3. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

4. The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.

5. It will be assumed that prices included in these Bills of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards)

6. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items

7. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.

8. The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.

9. The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.

10. Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the SABS 1200 Standardized Specifications.

C 2.2

Bill of Quantities

BILL 1 - PRELIMINARY & GENERAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	
1	**Conditions of Contract**				
1.1	Compliance with all the contractual requirements of the contract, including project programming, outage management, weekly progress reporting, materials management, meetings and quality & environmental management.	Sum	======	==========	
1.2	**Establish facilities on site. The Contractor shall provide a fenced space with fence at least 1.8m high with a lockable gate for a temporary Site Office and Stores where all drawings and Specifications will be kept, as well as the provision of safe and ad**				
	Facilities for Contractor :				
	a) Offices & storage sheds	Sum	======	==========	
	b) Establishment of staff accommodation, office accommodation on site for site meetings and a Clerk of Works including office furniture and telephone / telefax as specified and facilities.	Sum	======	==========	
	c) Ablution & latrine facilities	Sum	======	==========	
	d) Tools & equipment	Sum	======	==========	
	e) Water supplies, electric power & communications	Sum	======	==========	
1.3	Removal of all items indicated above upon completion of construction and making good and restoring of the Site to the satisfaction of the Project Manager.	Sum	======	==========	
1.4	Provision of "As Built" drawings.	Sum	======	==========	
1.5	**Construction Name Board** - The Contractor shall place an order and collect from **His/ Her supplier** and maintain one project signboard bearing the name of the project, the name and logo of Tsolo Agriculture and Rural Development Institute (TARDI), Department of Agriculture , consultant name and the Contractor.	Sum	======	==========	
1.6	Provision of samples of materials to be used (only materials supplied by contractor) and construction thereof sample line and board.	Sum	======	==========	
1.7	Provision for the compilation of the Construction Programme, to be done in MS Project and updated on a fortnight basis and Quality Assurance Programme for the works	Sum	======	==========	
2	**Occupational Health & Safety Requirements**				
2.1	Provision for Legal and Contractual Compliance.	Sum	======	==========	
2.2	Provision of personal protective equipment and clothing for all the contractor's staff, including sub-contractors.	Sum	======	==========	
2.3	Provision of safety measures, e.g.. Fall arrest systems, shoring for safety purposes etc.	Sum	======	==========	
2.4	Compliance with OH&S Act & Construction Regulations.	Sum	======	==========	
	Amount Carried Over To Next Page				

	Amount Brought Forward From Previous Page				
3	**TARDI Materials**				
3.1	The Contractor shall make allowance to receive, off load and stack the free-issue materials supplied to the contract. The rate shall also include the implementation and maintenance Management System for the duration of the contract.	Sum	======	================	
3.2	On Completion of the project, all unused TARDI supplied free issue materials shall be reconiled and qualified. Once authorised by the Consultant/Project Co-ordinator, the unused materials shall be transported to TARDI stores.	km	1000		
4	**Time Related Items (To maintain site for the duration of the project)**				
4.1	Operate and Maintain Facilities on Site				
	Facilities for Contractor:				
	a) Offices & storage sheds	Week	12		
	b) Ablution & latrine facilities	Week	12		
	c) Tools & equipment	Week	12		
	d) Water supplies, electric power & communications	Week	12		
	e) Safety related items	Week	12		
4.2	Provision of office accommodation on site for site meetings and a Clerk of Works including office furniture and telephone / telefax as specified.	Week	12		
4.3	Contract management and full time supervision of the works	Week	12		
4.4	Community Liaison Officer conversant in English or Xhosa and local cultural norms	Week	12		
5	**Security**				
5.1	Contractor shall provide security guard/s to ensure the site including offices, storage sheds and all Senqu municipality material are protected from theft or any damage. The Contractor needs to ensure that the above mentioned is guarded 24hrs a day.	Week	12		
				TOTAL (BILL 1)	

BILL NO 2 - LV OVERHEAD DISTRIBUTION LINES

ITEM NO.	DESCRIPTION	UNIT	QTY	MATERIAL RATE	INSTALL RATE	TOTAL
4.1	**Low Voltage Distribution System**					
Note	The LV insulated aerial bundle conductor system shall be in accordance with SABS 1418 and insulated in accordance with SABS 0198 and the Distribution Standard Part 3.					
Note	The unit rate per meter shall include the tensioning and stringing of the bundle in accordance with the sag and stress tables provided by the manufacturer with all plant, equipment and accessories required to erect an LV overhead bundled distribution line i.e. Drum trailer, winch, wind-off pulleys, pulling rope/cable with connection, dynamometer, slide-lock, sheathed synthetic-fibre belt, woven snatch belt, snatch block, tackle, shackle, etc.					
Note	Measured lengths for stringing shall be net line route lengths and unit rates shall include for sag, off-cuts, etc.					
	Contractor to Safely store and transport to site and string. The conductor will be delivered on sealed drums and adequate allowance shall be made for the correct handling thereof.					
2.1.1	Three phase ABC (70mm^2) Bare Neutral + 25mm² streetlighting conductor	m	800			
2.1.2	Three phase ABC (50mm^2) Bare Neutral + 25mm² streetlighting conductor	m	1200			
2.2	**LV STRUCTURES THREE PHASE** Allow for the assembly of the following LV strain and suspension assemblies in accordance with the specifications shown in the drawings. Including all earthing, drilling of holes and treating of drilled holes. All LV ABC hardware, line connectors, PVC cable ties, nuts, bolts, washers, lock washers shall be allowed for in the appropriate item below. Excluding the supply and planting of poles, stays and struts, which are measured elsewhere.					
2.2.1	ABC Suspension Assembly 0-30 (D-DT-1100)	no	50			
2.2.2	ABC Terminal Assembly (D-DT-1120)	no	20			
2.2.3	ABC Strain Assembly (0-60°) (D-DT-1121)	no	11			
2.2.4	ABC Strain Assembly (60-90°) (D-DT-1122)	no	7			
2.2.5	ABC T-off from Intermediate (D-DT-1140)	no	4			
2.2.6	ABC Intermediate Suspension Assembly (D-DT-1141)	no	10			
	Amount carried over to next page					

	Amount brought forward from previous page					
2.2.7	ABC T-off from Strain (D-DT-1142)	no	4			
2.2.8	ABC T-X Intermediate Strain Assembly (D-DT-1143)	no	5			
2.3	**LV Fuse Switch Units** **Supply, deliver to site, off load on site and safely store. The fused switch shall be supplied complete with the pole mounting bracket, nuts, bolts, washers, etc. for securing the unit to the wooden pole. The fuses shall be supplied with the fuse switch unit. Fuse ratings shall be as shown on the drawings. Install the on load fused disconnecting switch on the transformer structure including the drilling of holes as required, including the termination of the LV ABC to the unit.**					
2.3.1	80A Load disconnecting switch similar to MORSDORPHER 80A	no	20			
2.4	**LV Pole Mounted Service Boxes** **Supply and install on a wooden and/or concrete pole a pole mounted distribution box as specified complete with pole mounting brackets, cable ties, PG clamps, miniture circuit breaker(s), neutral, phase and earth bars, insulated copper tails for connecting to LV ABC, insulation piercing connectors and factory installed cable openings. Included shall be the stainless steel strapping and buckles and terminations of the tails onto the LV ABC.**					
2.4.1	Pole-mounted 4-Way, 20A, Split Meter Distribution Box complete with insulated copper tails, insulation piercing connectors and nylon compression glands, per DDT0180.	no	50			
2.5	**Earthing of LV Network**					
Note	All MV transformer earthing is measured elsewhere and all LV earths per structure are meaured with the structure. This section is intended for LV earths at transformers Allowance shall be made for the testing of the earth resistance for the entire reticulation system in accordance with the TN-C-S earthing system as defined in the Distribution Standard Part 2 and any earth tests which may be required in terms of the standard and detailed specifications.					
2.5.1	LV Earth (D-DT 0637)	no	18			
2.6	**Testing** **Allowance shall be made for the testing of each LV ABC distributor on accordance with the project specification. Included shall be the provision of test certificates and all documentation as required.**					
2.6.1	LV Test	no	32	==========		
					TOTAL (BILL 2)	

BILL NO 3 - SUPPORT FOR OVERHEAD RETICULATION

ITEM NO.	DESCRIPTION	UNIT	QTY	MATERIAL RATE	INSTALL RATE	TOTAL
3.1	**Poles**					
Note	Poles for service connections are measured elsewhere **Supply and install pole in excavated hole, including cutting and scafing, kicking blocks, bonding, treating, etc. Excavations and compaction are measured elsewhere.**					
3.1.1	7m Pole, 120-139mm top diameter (D-DT-0055)	no	15			
3.1.2	9m Pole, 140 mm top diameter (D-DT-0055)	no	45			
3.1.3	9m Pole, 160 mm top diameter (D-DT-0055)	no	65			
3.1.5	11m Pole, 180 mm top diameter (D-DT-0051)	no	10			
3.1.6	11m Pole, 200 mm top diameter (D-DT-0051)	no	5			
3.2	**Supply, off load and install the following wooden cross arms.**					
3.2.1	2.5m, 140-159mm Diameter (D-DT-0316)	no	8			
3.2.2	3.5m, 140-159mm Diameter (D-DT-0317)	no	2			
3.2.3	4.5m, 160-179mm Diameter (D-DT-0317)	no	6			
3.3	**Stays, Flying Stays and Anti-Climbing Devices**					
Note	The unit price for a standard stay and an aerial stay shall exclude the wooden poles, but include the stay wire, stay rods, insulators, stay plate, stay guards, bitumastic paint, guy grip dead end, earthing of stay, line splice, precast concrete slabs, po					
3.3.1	LV Stay (D-DT-0343)	no	6			
3.3.2	LV Flying Stay (D-DT-0343)	no	4			
3.4	**The following struts shall be in accordance with the specification**					
3.4.1	LV 9m Strut (D-DT-0342)	no	10			
	Amount Carried Over To Next Page					

	Amount Brought Forward From Previous Page					
3.5	**The following anti-climbing devices shall include barbed wire as specified**					
3.5.1	Anti climbing devices as per 05TI09 (Including on stays as per DDT0399)	set	5			
3.6	**Excavations and Compaction**					
Note	The excavations for service connections are measured elsewhere					
	Determination of pole positions, excavate in all ground conditions as necessary, and supply a mechanical boring device if required. The rate shall include backfilling, compaction to 93% MOD AASHTO density, and where necessary the supply and transportation					
3.6.1	Hole for 7m pole - 1.5m deep	no	15	==========		
3.6.2	Hole for 9m pole - 1.5m deep	no	51	==========		
3.6.3	Hole for 11m pole - 1.8m deep	no	15	==========		
3.6.4	Hole for LV stay - 1.4m deep	no	16	==========		
3.7	**Pole Labels**					
	Supply and install labels on all poles in accordance with the specifications including the provision of all fixing materials					
3.7.1	Equipment labels (Trfs, links, SB)	no	3	==========		
3.7.2	Transformer max fuse labels	no	3	==========		
3.7.3	Warning labels	no	10	==========		
3.8	**General**					
	Supply and install labels Spiral Vibration Dampers as per the DT Standards					
3.8.1	Vibration Dampers, spiral (D-DT-3175)	no	4			
					TOTAL (BILL 3)	

BILL NO 4 - SERVICE CONNECTIONS

ITEM NO.	DESCRIPTION	UNIT	QTY	MATERIAL RATE	INSTALL RATE	TOTAL
4.1	**House Connections**					
	House Connections (Type A, direct to dwelling), test and commissioning complete including CoC, IC's, control sheets, sealing and as built drawing on completion.					
4.1.1	Type A (D-DT-0360)	no	20			
4.1.2	Submit populated Control Sheet and PCS CorDaptix information to the Project Engineer upon the successful energising of a customer.	no	20	==========		
4.2	**Supply and install APPROVED SUPPLIERS, transport to site, off load on site and safely store on site the following Passive Base Units, Split metering unit , complete with rail, galvanised steel mounting brackets for securing to the dwelling, nuts, bolts, washers and lock washers as required. Secure the passive base, Split metering unit and brackets to the dwelling as required including the termination of conductors. Excluding the conductors.**					
4.2.1	Ready -board, 20A,Split Metering unit	no	20			
4.2.2	Customer Interface Unit, L&G PLC	no	20			
4.2.3	Meter, Split Din Rail 20A PLC	no	20			
4.3	**Airdac**					
Note	Measured lengths for stringing shall be net line route lengths and unit rates shall include for sag, cut-offs etc.					
	Supply and install APPROVED SUPPLIERS, transport to site, off load on site and safely store on site cable 1kV 2C 4mmsq Concentric airdac					
4.3.1	16mm² AIRDAC from LV Pole service box to the house D-DT 3140	m	1000			
4.4	**Sundry Items**					
	<u>Supply</u> and install pole in excavated hole, including cutting and scafing, kicking bolts, bonding, treating, etc. Excavations and compaction are					
4.4.1	5m Pole, 80-99mm top diameter (D-DT 0058)	no	5			
4.4.2	7m Pole, 120-139mm top diameter (D-DT 0050)	no	15			
	Amount Carried Over To Next Page					

	Amount Brought Forward From Previous Page					
	Determination of pole positions, excavate in all ground conditions as necessary, and supply a mechanical boring device if required. The rate shall include backfilling, compaction to 93% MOD AASHTO density, and where necessary the supply and transportation of suitable ground as may be required to receive the desired compaction, except where cement is specified. Any damage to existing services shall be made good by the Contractor at his own expense and to the approval or the PM(C).					
4.4.3	Hole for 5m service pole - 1m deep	no	5	==========		
4.4.4	Hole for 7m service pole - 1.4m deep	no	20	==========		
4.4.5	Sealing of meters	no	20	==========		
4.5	**House Labels** **Supply and install house lables in accordance with the specifications including the provision of all fixing materials**					
4.5.1	Morsdorfer lables	no	32			
4.5.2	House Labels	no	20			
4.5.3	LV Phasing lables	no	15			
					TOTAL (BILL 4)	

BILL 5 - STREETLIGHTS

ITEM NO.	DESCRIPTION	UNIT	QTY	MATERIAL RATE	INSTALL RATE	TOTAL
5	**STREETIGHTS**					
5.1	4m Mounting Height Galvanized pole - Complete with bolts, nuts, washers and all material needed to complete as per Department of Agriculture specifications	No.	65			
5.2	BEKA Sol-One or Similar Quality	No.	65			
5.3	4mm2 PVC covered copper wire (red)	m	50			
5.4	4mm2 PVC covered copper wire (black)	m	50			
5.5	Earth Spikes *Supply, delivery to site, Installation of Earth spikes including all fastening materials, lugs, etc.*					
5.5.1	1800mm x 16mm Diameter	No.	65			
5.6	Testing and Commissioning					
5.6.1	Testing and Commissioning of installation including CoC and As-built Drawings	Sum	1	==========		
	TOTAL : Carried Forward to Summary					

BILL 6 - CABLING

ITEM NO.	DESCRIPTION	UNIT	QTY	MATERIAL RATE	INSTALL RATE	TOTAL
6.1	**Low Voltage Switchgear**					
6.1.1	10A 1P 5kA MCB (Curve 2)	No.	23			
6.1.2	20A 1P 5kA MCB (Curve 2)	No.	32			
6.1.3	20A 3P 5kA MCB (Curve 2)	No.	16			
6.1.4	40A 3P 5kA MCB (Curve 2)	No.	1			
6.1.5	60A 3P 5kA MCB (Curve 2)	No.	1			
6.1.6	100A 3P 5kA Isolator	No.	16			
6.1.7	125A 3P 5kA Isolator	No.	10			
6.1.8	150A 3P 5kA Isolator	No.	6			
6.1.9	32A 3P contactors with 230V AC coils	No.	20			
6.1.10	32A 3P contactors with 230V AC coils	No.	18			
6.1.11	32A 4P contactors with 230V AC coils	No.	14			
6.1.12	*80A 3P contactors with 230V AC coils*	No.	6			
6.1.13	80A 4P contactors with 230V AC coils	No.	8			
6.2	**Tools**					
6.2.1	Distribution kiosk – special key	No.	10			
6.2.2	Light pole cover triangular key	No.	10			
6.2.3	DB key	No.	10			
6.2.4	DB face plate square key	No.	10			
6.3	**Cables** *(SANS 150) PVCSWAPVC cables drawn into cable sleeves, installed on cable trays/ladders or laid in open trenches including cutting and off cuts*					
6.3.1	50mm2 x 4 core	m	50			
6.3.2	35mm2 x 4 core	m	150			
6.3.3	25mm2 x 4 core	m	165			
6.3.4	16mm2 x 4 core	m	200			
6.3.5	10mm2 x 4 core	m	200			
6.3.6	10mm2 x 3 core	m	140			
6.3.7	6mm2 x 2 core	m	260			
6.3.8	4mm2 x 2 core	m	600			
6.3.9	2,5mm2 x 2 core	m	140			
6.4	**Terminations for**					
6.4.1	50mm2 x 4 core	No.	4			
6.4.2	35mm2 x 4 core	No.	2			
6.4.3	25mm2 x 4 core	No.	3			
6.4.4	16mm2 x 4 core	No.	4			
6.4.5	10mm2 x 4 core	No.	5			
6.4.6	10mm2 x 2 core	No.	6			
6.4.7	6mm2 x 2 core	No.	7			
6.4.8	4mm2 x 2 core	No.	30			
6.5	**Bare Copper Earth Wire** *Wired tied to cables installed in the above scheduled cables including terminations*					
6.5.1	35mm2	m	50			
6.5.2	25mm2	m	150			
6.5.3	16mm²	m	165			
6.5.4	10mm2	m	200			
6.5.5	6mm2	m	140			
6.5.6	4mm2	m	260			
6.5.7	2.5mm²	m	800			
6.6	**Cable sleeves** *Heavy duty or flexible (Kabelflex) PVC cable sleeve laid in open trench including cutting and joining* *NOTE: Spare sleeves for future use to be sealed at both ends*					
6.6.1	110mm	m	200			
6.6.2	110mm slow bends	No.	10			
6.6.3	50mm	m	100			

6.6.4	50mm slow bends	No.	40			
6.6.5	32mm	m	80			
6.6.6	32mm slow bends	No.	6			
6.7	**Trenching for Cables**					
	Trenching of cable trenches 600mm deep x 400mm wide including backfill and compacting.					
6.7.1	Earth or pickable ground	m	1500	==========		
6.7.2	Soft rock requiring use of pneumatic tools	m3	1	==========		
6.7.3	Hard rock requiring use of dynamite	m3	1	==========		
6.7.4	Allow for the importing of suitable soil to be used as either bedding layer and/or backfilling layer (bedding to be in layer of 75mm and backfilling in layers of 150mm)	m3	50			
	Filling obtained from excavations and/or prescribed stock piles on site compacted to 95% Mod AASHTO density					
6.7.5	Allow for the backfilling of the trenches, using imported soil and/or selected (excavated) material	m3	50	==========		
6.8	**Cables Labelling**					
	Label cables on both ends with numbering beads or non-corroding straps to indicate their connection points.	Sum	=======	==========	==========	
6.9	**Cable Warning Tape**					
	Skull and Crossbones Danger Tape	m	400			
6.10	**Cable Markers**					
	Concrete cable markers complete with galvanised wire fastened to cable and aluminium marker plate. with description	No.	5			
6.11	**Low Voltage Earthing**					
	Allow for bonding of the electrical installation	Sum	=======	==========	==========	
6.12	**Earth Spikes**					
	Supply, delivery to site, installation of earth spikes including all fastening materials, lugs, etc.					
6.12.1	1800mm x 16mm diameter	No.	4			
6.13	Power Manholes					
	Double skin brick 700mm deep manhole with heavy duty cover with the following minimum inside dimensions:					
6.13.1	inside dimensions: 900mmL x 900mmW x 600mmD	No.	1			
6.14	**Cable Jointing**					
6.14.1	Complete joint kit for PVC/SWA/PVC + ECC cables, shall include supply and and installation					
6.14.1.1	25mm² 4c Cable	No.	1			
	TOTAL : Carried Forward to Summary					

FINAL SUMMARY		
Bill	Description	Total Price (R)
1	**PRELIMINARY AND GENERAL**	
2	**LOW VOLTAGE OVERHEAD DISTRIBUTION LINES**	
3	**SUPPORT FOR OVERHEAD RETICULATION**	
4	**SERVICE CONNECTIONS**	
5	**STREETLIGHTING**	
6	**MAINS CABLING, SWITCHGEAR AND UNDERGROUND RETICULATION**	
	TOTAL ON MATERIALS AND LABOUR	

CONTIGENCIES @ 5%

TOTALS INCLUDING CONTIGENCIES

VAT 15%

GRAND TOTAL OF TENDER INCLUSIVE OF VAT

C 3.1
Scope of Work

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

C3.1 Scope of Work

1. Scope of Work and Management

TOPIC	SUB TOPIC
DESCRIPTION OF THE WORKS	
Employer's objective	Low Voltage (LV) Electrical Installation Upgrade and Refurbishment Works at Tsolo Agriculture And Rural Development Institute within and around premises largely as contemplated in SANS Code of Practice and Standards.
Overview and extent of works	This contract entails the installation of new street lighting, over head and upgrading electrical reticulation system and tree trimming. The construction works will include but not limited to the following: • Complete supply and install of new street lighting. • Complete supply and install of over head and upgrading electrical reticulation system. • Disconnection, removal and deliver to User old street light installation complete. • Bush clearing and Tree cutting • Complete supply and installation of earthing system for street and electrical supply installation. • All materials, equipment, labour and other necessary services for the complete, safe efficient operation of the works must be in full adherence with the specifications laid down in the electrical document. • 12 Months defects and maintenance period from practical completion of the electrical installation • Testing and commissioning, including issuing of a Certificate of Compliance
Location of the works	Tsolo Agriculture And Rural Development Institute in Mhlontlo Local Municipality. Co-ordinates: 31°17'37.9"S and 28° 45' 42.7" E.
ENGINEERING	
Design + Drawings + Specifications	
PROCUREMENT	
Preferential procurement procedures	Method 1 – Price Preference
Sub-contracting	Sub-contracting will be allowed. The Contractor must however indicate at tender stage which portions of the work will be sub-contracted and to whom.
CONSTRUCTION	
Works specifications	1. Applicable SANS 1200 standards for the building works. 2. Attached Project Particular Specifications will apply.
Plant and materials	1. The Employer will not provide any plant or material. 2. The Contractor shall inform the Engineer in good time, to inspect and approve the plant and materials that will be used before construction commences or on arrival of material on site.
Construction equipment	1. The Employer will not provide any equipment. 2. The Contractor shall provide all suitable construction equipment necessary to complete the project.
Existing services	Care should be taken by the contractor not to damage any existing services. The Engineer shall show the position of all existing infrastructure both above ground and below ground to the Contractor and the contractor are to ensure that no excavations shall commence without consent of the Engineer.
Site establishment	1. The Employer will not provide any facilities on site. 2. The Contractor shall provide an office, storage shed, toilets, security, vehicles, labour and accommodation.

Site usage	The Contractor shall not utilize the site for any other purpose than the construction of the agreed works.
Permits and way leaves	The Contractor will negotiate all necessary permits and way leaves with the local community.
Survey control and Setting out works	The Contractor will be responsible for the survey and setting out of all construction levels. After setting out the levels the Contractor will inform the Engineer to inspect the levels before any excavation work or construction work may commence.
MANAGEMENT	
Management of works	1. Applicable SANS 1200, SANS 10400 standards will apply. 2. Attached generic standards will apply. 3. The standards specifications will apply, as stated in: "Specifications of Construction Materials and methods to be used for Agricultural on-farm Infrastructure", Second Edition, April 2022, Revision "DOA SCMM-02/2022", will apply. 4. Drawings and specifications will be provided by the Employer and shall be the only acceptable drawings for the agreed works. 5. The Engineer will be available to perform inspections every day on request, but will perform at least one scheduled inspection per week. 6. The Contract type is measured where payments to the Contractor will be made after measurement of the work done by the Engineer according to the following payment schedule. 6.1. The Contractor shall submit invoices according to the agreed claims and the Engineer will recommend the payment. 6.2. The Engineer will inspect the work at the Contractor's request to measure the progress and determine the part payment that is due when both parties are in agreement about the claim. 6.3. All payments can include materials that are secured on site under control of the Contractor. Materials on site which are not yet built into the works will compensated at 80% of the value as per the invoice from the material suppliers. 6.4. The Employer allows for monthly interim payments for the project that can be used, 1 practical and 1 final payment. 6.5. The practical completion of the construction work implies the work is complete and the beneficiaries can use the infrastructure. 6.6. The final and last payment is the retention money that will be paid after a predetermined period after all construction work is done. This is the defects liability period. 6.7. Certificates of Completion and Final Approval will be issued by the Engineer for practical and final construction completion. 7. The Contractor shall provide the Engineer with proof that Insurance has been obtained for the contract period. 8. The Contractor shall keep a daily record of all labour related matters, weather occurrences, all incidents that influenced construction. 9. Communications between the Employer and Contractor will be in writing with copies to all stakeholders. 10. The Contractor shall be responsible for testing the works after completion to ensure compliance with the Employer's requirements. 11. The Employer will commission the works during a public handing over ceremony. 12. The Contractor shall repair all defects of workmanship and materials during the liability period.
Health and safety	1. Attached Generic Occupational Health and Safety Specifications will apply. 2. Applicable SANS 1200, SANS 10400 and 10142 standards will apply; 3. Occupational Health and Safety Act (Act No. 85 of 1993) will apply; 4. The Contractor shall appoint a person that will be responsible for health and safety issues on site and provide the Engineer with the name and credentials of this person. This person must also be trained in First Aid and must have a comprehensive First Aid Kit on site. 5. The Contractor shall be responsible to design and apply measures to prevent accidents or injury to any person or property during construction.

C 3.2

Specifications

PARTICULAR / GENERIC SPECIFICATIONS

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

SCOPE

PS SCOPE

THIS BID FOR THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

PS 1 DISCLAIMER

The information regarding subsurface conditions, materials on site and site information supplied, is provided in good faith for the contractor's convenience as an indication of conditions likely to be encountered. No responsibility will be accepted for, and there is no guarantee of the information being representative of the whole area of the works or materials.

The information provided will not be regarded as in way limiting. The contractor will be held to have satisfied himself of all conditions to be encountered on site and to allow accordingly in his tendered rates.

PS 2 APPLICABLE STANDARDS

The South African Bureau of Standards, Standard Specifications for Civil Engineering Construction (SABS 1200). It shall however be noted that reference is made in certain of the specifications to other standardized specifications which may or may not be included in this document. Where such specifications are not included, they shall however be deemed to be included in the Contract documents.

The Contractor shall have available for reference on site at all times a full set of the above specifications, together with any other to which they refer. These specifications shall remain the property of the Contractor but shall be made available to the Engineer whenever required throughout the duration of the Contract.

The South African Bureau of Standards, Standard Specifications for Civil Engineering Construction (SABS 1200) shall apply to this Contract together with additional amendments as set out herein

PS 3 PLANT AND MATERIALS

The Employer will not be providing any plant or supplying any materials for use by the Contractor in executing the works. The Contractor must provide all plant and materials of whatever nature necessary to enable him to undertake the works as specified.

The Contractor must provide all necessary samples and copies of the relevant test results required to prove compliance with the specifications, prior to utilisation of any material within the works.

PS 3.1 Construction Equipment

The provision of all tools and equipment of whatever nature, required for execution of the scheduled items, must be the responsibility of the Contractor, and the cost thereof must be included in the rates for the respective items of work.

PS 4 EXISTING SERVICES

The Contractor will be issued with drawings showing the position of existing services in the vicinity of his working area. The Contractor must contact the service authorities concerned (i.e. Water, Sanitation, Electricity and Telecommunications) to confirm the position of existing services, and must apply for the Construction Permit for work programmed within the road reserve when required.

The Contractor is required to undertake work in proximity to existing services and he must take all necessary precautions to prevent any damage to these services. In this regard, the Contractor must excavate by hand to expose and confirm the location and depth of each existing service prior to carrying out any construction over or around the service.

Should his operations result in any damage to existing services, he must immediately notify the Engineer and the local authority, who will inspect the damage and determine what further action is required. The Contractor must be responsible for the cost of all repairs or reinstatement necessary, whether these are carried out with his own resources or by a third party.

PS 5 SITE ESTABLISHMENT

PS 5.1 Services and Facilities Provided by the Employer

The Employer will not provide any facilities or services.

PS 5.2 Facilities Provided by the Contractor

Due to the extremely constricted nature of the site, the Contractor must be required to determine the most convenient location for his camp site in consultation with the Community/Owner such that this will cause the least disruption and interference with his activities. Dependent on his actual space requirement, different components of the camp could be located in different areas.

Should the Contractor elect to locate any or all of his facilities in one area for a certain duration, and then relocate them later, any associated costs must be solely for his account, and no claims of any nature for additional costs will be entertained.

The Contractor will be required to provide certain facilities for the exclusive use of the Engineer and his staff, all as defined in SABS 1200 AB, and as amended by any variations / additions in clause C3.4.1.6.

PS 5.3 Storage and Laboratory Facilities

The employer has no specific requirements for any storage or laboratory facilities, and the Contractor should provide whatever he deems to be necessary to support his activities.

PS 5.4 Other Facilities and Services

Should the Contractor require a supply of municipal water to enable him to undertake any of his activities on the site then he must make his own arrangements with the Community/Owner or Municipality for a suitable point of supply. The Contractor must agree the details of both the position and the size of connection required with the relevant officials, and must be responsible for the cost of the connection, the cost of water used, and the cost of removal and reinstatement on completion.

Should the Contractor require an electrical connection to his campsite then he must submit an application to the Community/Owner, Municipality's electricity department or Eskom as might be applicable to obtain a supply with the necessary capacity at a suitable position. The Contractor must be responsible for the cost of the connection, the cost of electricity used, and the cost of removal and reinstatement on completion.

The Contractor must:

i) make his own arrangements for whatever telephone and facsimile services he may require.
ii) provide sufficient serviced, portable toilets at convenient locations for the use of his staff during their time spent on site.
iii) supply a first aid kit to be available at the site office, and re-stock the contents as and when necessary.
iv) make available a list of emergency contact numbers for ambulance, police and fire services.
v) provide the necessary facilities on site to temporarily store refuse, and make arrangements with the Municipality for regular refuse removals. Refuse storage facilities must make allowance for waste separation, re-cycling and re-use wherever possible

All costs associated with any of the above aspects must be included in the relevant preliminary and general items.

PS 5.5 Vehicles and Equipment

No vehicles or specialised equipment is required for the employer and his agents.

PS 5.6 Advertising Rights

No advertising of any kind will be allowed on the site.

PS 5.7 Notice Boards

Two project notice boards will be required in accordance with SABS 1200 AB, and as amended by any variations/additions in clause C3.4.1.6.

PS 6 SITE USAGE

The Contractor must restrict his operations to the boundaries of the site and he must not be allowed to occupy or impact on any other adjacent areas.

PS 7 PERMITS AND WAY LEAVES

The Contractor will be required to provide copies of permits for any borrow pits or quarries from which he intends to obtain bedding material or aggregate.

The Contractor must be responsible for obtaining all of the necessary way leaves, permissions or permits applicable to working near any existing services or other infrastructure on Site, and must ensure that any way leaves, permissions or permits obtained by the Employer's Agent prior to the award of the Contract are transferred into the Contractor's name. (Refer also to clause C3.4.4 above.)

The Contractor must abide by any conditions imposed by such way leaves, permissions or permits.

The Contractor must ensure that all way leaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.

PS 8 ALTERATION, ADDITIONS, EXTENSIONS AND MODIFICATIONS TO EXISTING WORKS

Wherever the Contractor is required to carry out construction to lines and levels based on or tying into existing infrastructure, he must first check that the information provided for the existing works is accurate and correct. Should there be any discrepancies as regards position, or defects in the quality of the existing work which may affect the proposed work, then the Contractor must report these to the Engineer and request clarification prior to proceeding with the new construction.

PS 9 INSPECTION OF ADJOINING PROPERTIES

The Contractor and the Engineer must together inspect and record the condition of all adjoining properties or existing services, prior to the commencement of any work that may impact on these existing facilities in any way.

PS 10 WATER FOR CONSTRUCTION PURPOSES

The Contractor must make his own arrangements with the Community/Owner or Municipality to obtain water for construction purposes.

PS 11 SURVEY CONTROL AND SETTING OUT OF THE WORKS

The Contractor must be solely responsible for the setting out of his work, and will be provided with the necessary bench marks and co-ordinated pegs on which to base the setting out.

All other control points and benchmarks required for construction or computation of quantities must be set out by the Contractor in consultation with the Engineer. Points set out must be clearly marked and the position and all other relevant data placed on a site plan. A copy of the plan must be handed to the Engineer immediately, for control purposes.

Any existing beacons disturbed or removed during the course of the Contract will be replaced at the Contractor's cost. Only a land surveyor or the Engineer's Surveyor who originally installed the beacons will be allowed to replace them.

PS 12 MANAGEMENT

PS 12.1 Management of the Works

PS 12.1.1 Applicable SANS Standards

The applicable standards are listed in clause PPS 2.

PS 12.1.2 Particular / Generic Specifications

Particular or generic specifications are included for all parts of the work.

PS 12.1.3 Planning and Programming

Within 14 days of the Commencement Date the Contractor must prepare and submit to the Engineer for approval a fully detailed programme showing:

- the sequence and duration of all activities required to undertake the scheduled work.
- the linkage between activities deemed to be on the critical path.
- critical dates for receipt of information and drawings.
- milestone date for Completion of different sections of the work.

Whenever the work deviates significantly from the proposed programme for whatever reason, the Contractor must, following a request from the Engineer, must prepare a new programme that shows how the work will be re-scheduled so as to achieve the original Completion Date.

The Contractor must take cognisance of the exploration work which has to be executed prior repairing or replacing of existing pipelines.

PS 12.1.4 Sequence of the Works

The sequence of work must be carried out strictly in accordance with the approved programme as detailed above.

PS 12.1.5 Methods and Procedures

Prior to the commencement of any work on the Site the Contractor must submit method statements for each separate construction activity that he is required to undertake. The method statements must be submitted to the Engineer for approval at least 10 days prior to the scheduled start of the activity. The method statements must set out the technical procedures to be followed in carrying out the activity and must include details of compliance with both Occupational Health and Safety and Environmental aspects.

The Contractor must ensure that his staff and workers are properly trained in the safe and effective use of any equipment, plant or materials necessary to undertake the work.

PS 12.1.6 Quality Control

The Contractor must provide whatever samples of materials are required for approval prior to commencement, together with the applicable test results to prove compliance with the relevant specification. He must undertake all necessary tests that are stipulated in terms of the applicable specification to ensure that his workmanship meets the required standard.

PS 12.1.7 Environment

The Contractor must ensure that he is fully aware of the requirements of the CEMP and that he understands his responsibilities regarding both his management of the project and the actual construction activities on Site.

PS 12.1.8 Accommodation of Traffic

The Contractor is responsible for the safety of all vehicular and pedestrian traffic affected by his work and must provide all the necessary warning signs, barricading and lighting as necessary, fully in compliance with the requirements of the SADC Road Traffic Signs Manual and with the approval of the Traffic Department.

PS 12.1.9 Other Contractors

The Contractor has sole possession of the site and does not have to deal with other contractors.

PS 12.1.10 Testing, Completion, Commissioning

Each aspect of the work included in the Contract must be fully tested in accordance with the requirements of the relevant standard specification, as amended by the Specification Data as applicable, prior to completion of the works as a whole. All outstanding work must be completed and substandard work must be corrected prior to completion taking place.

PS 12.1.11 Recording of weather

The Contractor is required to keep a detailed record of daily weather conditions on the Site. The information must include rainfall, wind speed and direction, cloud cover and temperature. The format and extent of detail required must be agreed with the Engineer prior to commencement. (Refer to clause PS 12.1.17) below). A summary of inclement weather shall be recorded in the minutes of site meetings.

PS 12.1.12 Format of Communications

All communication of whatever nature is through the Engineer. Only under circumstances that relate to health and safety can the Contractor act on instructions issued by any other party. These instructions must then be immediately communicated to the Engineer with a request for confirmation of the instruction.

The Contractor is required to provide a suitable triplicate book which is used for communication between the Engineer or his representative and the Contractor. The book may be used for the issue of site instructions, the request for information or inspections, or merely to record aspects of contractual importance.

PS 12.1.13 Key Personnel

Within 14 days of the Commencement Date and prior to commencement of any operations on site, the Contractor shall submit to the Employer's Agent detailed CV's of his key personnel together with their relevant contact details. Should the key personnel not be the same as those included in the tender submission, then the Contractor shall be required to provide personnel with equivalent or better qualifications and experience.

The Contractor keeps a site representative competent to administer and control the works continuously in the Working Areas during the execution of the works. The Contractor informs the Engineer of the name of the site representative, and any instruction given to the site representative by the Engineer is deemed to be given to the Contractor.

PS 12.1.14 Management Meetings

The Contractor is required to attend a monthly site meeting during which all aspects relating to the progress, scope, expenditure, OHS, environmental and general administration of the Contract is discussed. The Contractor must ensure that his representative at the meeting has the necessary understanding and authority to make decisions regarding these issues.

In addition, technical meetings are held on monthly, during which time aspects of a more technical nature relating to the actual construction process and quality of the work are addressed.

PS 12.1.15 Forms for Contract administration

The Contractor will keep all records as stated below as well as the following:

- EPWP forms to be submitted together with all Payment Certificates.
- Report on progress and labour at site meetings.

PS 12.1.16 Payments

All payments to the Contractor are by means of direct electronic transfer and the Contractor must provide his banking details to the Engineer together with the initial payment claim.

PS 12.1.17 Daily Records

The Contractor is required to maintain a daily record of all construction activities taking place on Site which includes details of plant, personnel, and visitors as well as other events such as weather conditions or any circumstances that may have a bearing on the nature and progress of his operations.

The Contractor is required to provide a detailed report at each site meeting. The report must be in a format to be agreed with the Engineer and contain the following:

- Details of actual progress versus programme for each construction activity.
- A daily record of rainfall and other weather events that could affect the work.
- Details of any delays that have occurred due to weather or any other cause.
- A record of resources (people, plant and equipment) present on Site.
- Details of any accidents or lost time incidents that have occurred.
- A list of information required.

PS 12.1.18 Payment Certificates

Payment Certificates shall be drawn up in an agreed format based on the bills of quantities and any variation orders authorised. The date for submission of each payment claim shall be agreed with the Employer's Agent. The procedure for preparation of Payment Certificates shall be as follows:

- The actual quantity for each item shall be agreed with the Employer's Agent or his representative based on the cumulative total of the previous monthly quantity and the additional work carried out during the month.
- The Contractor shall draw up and submit his claim using the agreed quantities.
- The Employer's Agent shall check the claim and confirm the amount to be paid.
- The Contractor shall provide a VAT invoice to the Employer's Agent for the agreed amount.
- The Employer's Agent shall prepare the payment certificate and submit the claim, accompanied by the VAT invoice.

PS 12.1.19 Proof of Compliance with the Law

The Contractor is required to comply with all regulations and laws of whatever nature which are applicable to his operations throughout the duration of the Contract, and produce documentary evidence when requested for all aspects, including, but not limited to:

- Valid proof of registration with the Compensation Commissioner.
- Proof of registration for income tax and VAT.
- Compliance with the Occupational Health and Safety Act and Construction Regulations.

PS 12.2 Health and Safety

The Contractor must comply with all relevant aspects of the Occupational Health and Safety Act together with the Regulations referred to therein, as applicable to the scope of his activities.

Particular attention must be paid to the issuing of the relevant Notices, appointment of responsible people, undertaking Hazard Identification and Risk Assessments, and preparation of a Health and Safety Plan. All necessary documentation must be prepared and submitted for comment and approval immediately after the Contract award.

Specific Health and Safety considerations applicable to this project are detailed in the Occupational Health and Safety Specification, attached to this document.

Method statements submitted for the Contractor's construction activities include details of compliance with Occupational Health and Safety, and must be submitted immediately after the Contract award and prior to commencement with any work on Site.

The Contractor must provide the necessary personal protective equipment and clothing to all staff as relevant for the type of work being carried out.

Whenever the Contractor's staff are subjected to hazardous substances, excessive dust or noise, he must arrange for pre and post-employment medical examinations on the affected employees.

No member of the Contractor's staff is allowed on Site while under the influence of alcohol or drugs. Any member of his staff who exhibit signs of alcohol or drug usage must be immediately removed from the premises.

The Contractor is responsible for the protection of the public in the areas in which he is working and must provide barricades and lighting as necessary to ensure their safety. He is also responsible for the safe control of traffic wherever his works impact on the existing roadways.

ELECTRICAL SUPPLY NETWORK UPGRADE AT TSOLO AGRICULTURE AND RURAL DEVELOPMENT INSTITUTE.

HEALTH AND SAFETY

PAM HEALTH AND SAFETY SPECIFICATIONS

Generic occupational health and safety specification for construction work contracts

PAM: SCOPE

This health and safety specification in respect of a construction work contract:

a) provides the overarching framework within which the contractor is required to demonstrate compliance with certain requirements for occupation health and safety established by the Occupational Health and Safety Act of 1993 during construction;

b) establishes the manner in which the contractor is to manage the risk of health and safety incidents in during the construction; and

c) establishes the manner in which the employer's health and safety agent will interact with the contractor.

Note 1. This specification establishes generic requirements to enable the employer and the contractor to satisfy aspects of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Construction Regulations, 2014. The contractor is required to develop, implement and maintain package specific health and safety plans. The employer is required to provide certain package specific information to the contractor or a health and safety specification for the works to enable such plans to be formulated. Accordingly, this generic specification on its own cannot ensure compliance with the requirements of the aforementioned Act (See Annexure A).

Note 2. The Construction Regulations, 2014, require an employer to stop any contractor from executing construction work which is not in accordance with the contractor's health and safety plan for the site or which poses to be a threat to the health and safety of persons.

Note 3. This specification establishes generic health and safety requirements. Site specific requirements for health and safety are stated in the scope of work associated with a contract (see Annexure A).

Note 4. The South African Council for the Project and Construction Management Professions has established the following specified categories of registration in terms of the Project and Construction Management Professions Act of 2000 (Act No. 48 of 2000):

a) a Construction Health and Safety Agent who may be appointed by an employer to act as his agent in terms of the Occupational Health and Safety Act of 1993 and the Construction Regulations issued in terms of that Act;
b) a Construction Health and Safety Manager who may be appointed by an employer to complement his professional team or by a contractor to manage company or project health and safety performance and compliance in accordance with the Occupational Health and Safety Act and Regulations; and
c) a Construction Health and Safety Officers who may be appointed by an employer to mitigate the risk on a project or by a contractor to monitor and assist on-site health and safety performance and compliance in accordance with the Occupational Health and Safety Act and Regulations and services.

PAM 1 DEFINITIONS

Act: The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

contractor: person or organization that contracts to provide the work covered by the contract

contract manager: person appointed by the employer to administer the contract on his behalf

competent person: any person who:

a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications specific to that work or task; and

b) is familiar with the Act and applicable regulations made in terms of the Act

Note: The Regulations stipulate that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act of 2000.those qualifications and training must be regarded as the required qualifications and training.

danger: anything which may cause injury or damage to persons or property

employer: person or organisation that enters into a contract with the contractor for the provision of the work covered by the contract

employer's health and safety agent: the person appointed as agent by the employer in terms of Regulation 4(5) of the Construction regulations and named in the contract data as the being the employer's agent responsible for health and safety matters

ergonomics: the application of scientific information concerning humans to the design of objects, systems and the environment for human use in order to optimise human well-being and overall system performance

hazard: a source of or exposure to danger

hazard identification: the identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed

health and safety plan: a documented plan which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified

health and safety specification: a site, activity or project specific document pertaining to all health and safety requirements related to construction work which is included in the contractor's contract with the employer or an order issued in terms of framework agreement

healthy: free from illness or injury attributable to occupational causes

incident: an event or occurrence occurring at work or arising out of or in connection with the activities of persons at work, or in connection with the use of plant or machinery, in which, or in consequence of which:

a) any person dies, becomes unconscious, suffers the loss of a limb or part of a limb or is otherwise injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or to continue with the activity for which he was employed or is usually employed;

b) a major incident occurred; or

c) the health or safety of any person was endangered and where:
   i) a dangerous substance was spilled;
   ii) the uncontrolled release of any substance under pressure took place;
   iii) machinery or any part thereof fractured or failed resulting in flying, falling or uncontrolled moving objects; or machinery ran out of control

inspector: a person designated as such under section 28 the Act

major incident: an occurrence of catastrophic proportions, resulting from the use of plant or machinery, or from activities at a workplace

reasonably practicable: practicable having regard to:

a) the severity and scope of the hazard or risk concerned;

b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk;

c) the availability and suitability of means to remove or mitigate that hazard or risk; and

d) the cost of removing or mitigating that hazard or risk in relation to the benefits deriving therefrom;

risk: the probability that injury or damage will occur

safe: free from any hazard

scaffold: any temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both

structure:

a) any building, steel or reinforced concrete structure (not being a building), railway line or siding, bridge, waterworks, reservoir, pipe or pipeline, cable, sewer, sewage works, fixed vessels, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, bulk mixing plant, pylon, surface and underground tanks, earth retaining structure or any structure designed to preserve or alter any natural feature, and any other similar structure;

b) any false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

c) any fixed plant in respect of construction work which includes installation, commissioning, decommissioning or dismantling and where any construction work involves a risk of a person falling

substance: any solid, liquid, vapour, gas or aerosol, or combination thereof

suitable: capable of fulfilling or having fulfilled the intended function or fit for its intended purpose

temporary works: any falsework, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during construction

workplace: any premises or place where a person performs work in the course of his employment

PAM 2 INTERPRETATION

PAM 2.1 The Act and its associated regulations shall have precedence in the interpretation of any ambiguity or inconsistency between it and this specification.

PAM 2.2 Compliance with the requirements of this specification does not necessarily result in compliance with the provisions of the Act.

PAM 3 REQUIREMENTS

PAM 3.1 General requirement

The contractor shall:

a) create and maintain as reasonably practicable a safe and healthy work environment,

b) execute the work in a manner that complies with all the requirements of the Act and all its associated regulations, and in so doing, minimize the risk of incidents occurring;

c) conspicuously display any site specific number assigned to the construction site in terms of the Construction Regulations 2014 at the main entrance to the site; and

d) respond to the notices issued by the employer's health and safety agent as follows:

   1) Improvement Notice: improve health and safety performance over time so that repeat notices are not issued;

   2) Contravention Notice: rectify contravention as soon as possible;

   3) Prohibition Notice: terminate affected activities with immediate effect and only recommence activities when it is safe to do so.

Note: Financial penalties can be applied should Contravention Notices be issued. This should be dealt with in the Contract Data.

PAM 3.2 Administration

PAM 3.2.1 Notification of intention to commence construction work

PAM 3.2.1.1 The contractor shall on sites where no construction work permit has been issued by the Provincial Director of the Department of Labour notify such director in writing using a form similar to that contained in Annexure 2 of the Construction Regulations issued in terms of the Act before construction work commences and retain proof of such notification in the health and safety file where the work includes:

a) excavation work;

b) working at height where there is a risk of falling;

c) the demolition of a structure;

d) the use of explosives; or

e) a single storey dwelling for a client who is going to reside in such dwelling upon completion

PAM 3.2.1.2 The contractor shall ensure that no work commences on an electrical installation which requires a new supply or an increase in electricity supply before the person who supplies or contracts or agrees to supply electricity to that electrical installation has been notified of such work.

PAM 3.2.1.3 The contractor shall ensure that no asbestos work is carried out before the Provincial Director of the Department of Labour has been notified in writing.

PAM 3.2.2 Copy of the Act

The contractor shall ensure that a copy of the Act and relevant regulations is available on site for inspection by any person engaged in any activity on the site.

PAM 3.2.3 Good standing with the compensation fund or a licensed compensation insurer

The contractor shall before commence with any work on the site provide the employer's health and safety representative with proof of good standing with the compensation fund or with a licensed compensation insurer.

PAM 3.2.4 Emergency procedures

PAM 3.2.4.1 The contractor shall submit for acceptance to the employer's health and safety agent an emergency procedure which include but are not limited to fire, spills, accidents to employees, exposure to hazardous substances, which:

a) identifies the key personnel who are to be notified of any emergency;

b) sets out details including contact particulars of available emergency services; and

c) the actions or steps which are to be taken during an emergency.

PAM 3.2.4.2 The contractor shall within 24 hours of an emergency taking place notify the employer's health and safety agent in writing of the emergency and briefly outline what happened and how it was dealt with.

PAM 3.2.5 Health and safety file

PAM 3.2.5.1 The contractor shall establish and maintain on site a health and safety file which contains copies, as relevant of:

a) the following documents which shall be placed in the file prior to commencing with physical construction activities

1) copy of the contraction work permit issued in terms of the Construction Regulations 2014;

2) the contractor's health and safety policy, signed by the chief executive officer, which outlines the contractor's objectives and how they will be achieved and implemented by the contractor;

3) copies of all risk assessments that were conducted

4) the notification made to the Provincial Director of Labour, and if relevant, the notification of the person who supplies or contracts or agrees to supply electricity to that electrical installation;

5) the letters of appointment, as relevant, together with a brief curriculum vita (CV) of:

— the construction manager and any assistant construction managers;
— the construction health and safety manager
— the construction health and safety officer
— the risk assessor who is tasked to perform the risk assessments; and
— the registered person responsible for the electrical installation covered by the Electrical Installations Regulations;
— the authorised persons responsible for gas appliances, gas system gas reticulation system covered by the Pressure Equipment Regulations;

6) a copy of the certificate of registration of the registered person responsible for the electrical installation covered by the Electrical Installations Regulation;

7) the approval of the design of the part of an electrical installation which has a voltage in excess of 1 kV by a person deemed competent in terms of the Electrical Installations Regulations;

8) the approval of the design of the part of an electrical installation which has a voltage in excess of 1 kV by a person deemed competent in terms of the Electrical Installations Regulations;

9) proof of registration of the electrical contractor who undertakes the electrical installation in terms of the Electrical Installations Regulations;

10) the preliminary hazard identification undertaken by a competent person;

11) the organogram which outlines the roles of the construction supervisor's assistants and safety officers; and

12) the contractor's health and safety plan;

13) the emergency procedures;

14) the procedure for the issuing and replacement of lost, stolen, worn or damaged personal protective clothing and equipment; and

15) proof that the contractor and all the subcontractors are registered and in good standing with the compensation fund or with a licensed compensation insurer relevant to the type of work performed;

b) the following documents, as relevant, which shall be placed in the file after construction activities have commenced

1) the letters of appointments, if relevant, together with a brief curriculum vita (CV) of:

— persons who are required to assist the construction supervisor;
— construction supervisor for the site in respect of construction work covered by the Construction Regulations;
— competent persons;
— assistants of construction supervisor; and
— designers of temporary works;

2) any revisions to the organogram which outlines the roles of the construction supervisor's assistants and safety officers;

3) each and every subcontract agreement and each and every subcontractor's approved health and safety plan;

4) proof that every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer relevant to the type of work performed;

5) proof of all subcontractor's induction training whenever it is conducted;

6) copies of the minutes of the contractor's subcontractors' health and safety meetings;

7) copies of each of the contractor's subcontractors' health and safety policy, signed by the chief executive officer, which outlines the contractor's objectives and how they will be achieved and implemented by the contractor;

8) the health and safety plans of all the contractor's subcontractors who are required to provide such plans;

9) copies of the fall protection plan and each revision thereof;

10) a comprehensive and updated list of all the subcontractors employed on site by the contractor, indicating the type of work being performed by such sub-contractors;

11) the outcomes of the monthly audits for compliance with the approved health and safety plan of each and every sub-contractor working on the site;

12) any report made to an inspector by the health and safety committee;

13) the minutes of all health and safety meetings and any recommendations made to the contractor by the health and safety committee;

14) the findings of all audit reports made regarding the implementation of the contractor's or a subcontractor's health and safety plan;

15) the inputs of the safety officer, if any, into the health and safety plan;

16) details of induction training conducted whenever it is conducted including the list of attendees;

17) proof of the following where suspended platforms are used:

- a certificate of system design issued by a professional engineer, professional certificated engineer or a professional engineering technologist;
- proof of competency of erectors, operators and inspectors;
- proof of compliance of operational design calculations with requirements of the system design certificate;
- proof of performance test results;
- sketches indicating the completed system with the operational loading capacity of the platform;
- procedures for and records of inspections having been carried out;
- procedures for and records of maintenance work having been carried out;
- proof that the prescribed documentation has been forwarded to the provincial director;

18) letters of appointments for competent persons to supervise the activities which law requires to be so supervised;

19) a copy of risk assessments made by competent persons;

20) records of the register of inspections made by a competent person immediately before and during the placement of concrete or any other load on formwork;

21) the names of the first aiders on site and copies of the first aid certificates of competency;

22) the names of the persons the persons who are in possession of valid certificate of competency in first aid and copies of such certificates;

23) medical certificates of fitness for the contractor's and subcontractors' employees specific to the construction work to be performed and issued by an occupational health and safety practitioner:

24) details of all incidents together with the Contractor's investigative report on such incident;

25) the record of inspections carried out by the designers of structures to ensure compliance with designs; and

26) any other documentation required in terms of regulations issued in terms of the Act including a record of all drawings, designs, materials used and other similar information concerning the completed structure;

PAM 3.2.5.2 The health and safety file shall be made available for inspection by any inspector, subcontractor, the contract manager, the employer's health and safety agent or employee of the contractor upon the request of such persons.

PAM 3.2.5.3 The health and safety file shall be updated to ensure that its contents always reflect the latest available information.

PAM 3.2.5.4 The contractor shall hand over a copy of the health and safety file to the employer's health and safety agent upon completion of the contract and if relevant, a certificate of compliance accompanied by a test report for the electrical installation in accordance with the provisions of the Electrical Installation Regulations.

PAM 3.2.6 Health and safety committee

PAM 3.2.6.1 The contractor shall convene health and safety meetings whenever more than two health and safety representatives have been appointed for the site. These meetings shall be attended by all health and safety representatives and persons nominated by the contractor. Such meetings shall be convened whenever necessary but at least once every month to:

a) make recommendations to the contractor regarding any matter affecting the health or safety of persons on the site; and

b) discuss any incident on the site in which or in consequence of which any person was injured, became ill or died.

PAM 3.2.6.2 The contractor shall consult with the health and safety committee on the development, monitoring and review of the risk assessment.

PAM 3.2.6.3 The contractor shall ensure that minutes of the health and safety committee meetings are kept. The employer's health and safety agent shall be invited to attend such meetings as an observer.

PAM 3.2.7 Inspections, formal enquires and incidents

PAM 3.2.7.1 The contractor shall inform the relevant safety representative:

a) beforehand of inspections, investigations or formal inquiries of which he has been notified by an inspector; and

b) as soon as reasonably practicable of the occurrence of an incident on the site.

PAM 3.2.7.2 The contractor shall record all incidents and notify the employer's health and safety agent of any incident, except in the case of a traffic accident on a public road, as soon as possible after it has occurred and report such incidence to an inspector of the department of labour and notify the Provincial Director of the Department of Labour of such incident within 7 days on the prescribed form.

PAM 3.2.7.3 The contractor shall investigate all incidents and issue the employer's health and safety agent with copies of such investigations.

PAM 3.2.7.4 The contractor shall in the event of an incident in which a person dies, or is injured to such an extent that he is likely to die, or suffered the loss of a limb or part of a limb:

a) notify the Provincial Director of the Department of Labour of such incident by telephone, facsimile or similar means of communication;

b) ensure that no person disturbs the site at which the incident occurred or remove any article or substance involved in the incident therefrom, without the consent of an inspector, unless an action is necessary to prevent a further incident, to remove the injured or dead, or to rescue persons from danger; and.

c) provide the Provincial Director of the Department of Labour with a report which includes the measures that the contractor or his subcontractor intend to implement to ensure a safe site as reasonably practicable.

PAM 3.2.7.5 The contractor shall notify the Provincial Director of the Department of Labour of the death of any person which results from injuries sustained in an incident.

PAM 3.2.8 Personal protective equipment and clothing

The contractor shall ensure that:

a) all workers are issued with the necessary personal protective clothing;

b) all workers are identifiable at all times by having the company for which they work for printed on the back or front of their overalls; and

c) clear procedures are in place for the replacement of lost, stolen, worn or damage personal protective clothing.

PAM 3.3 Appointments

PAM 3.3.1 Construction manager

The contractor shall appoint in writing one full time competent person as the construction manager with the duty of managing all the construction on a single site including that of ensuring occupational health and safety compliance. Where appropriate, the contractor shall appoint in writing one or more assistant construction managers.

PAM 3.3.2 Appointment of construction health and safety officers

The contractor shall after consultation with the employer after considering the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, prior to commencing the work and if necessary, appoint a full-time or a part-time suitably qualified health and safety officer to assist in the control of all health and safety related aspects on the site.

PAM 3.3.3 Construction supervisors

PAM 3.3.3.1 The construction manager shall in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

PAM 3.3.3.2 A contractor shall after considering the size of the project and if considered necessary, appoint in writing one or more competent employees for different sections of the work to assist the construction supervisor.

PAM 3.3.4 Competent persons

PAM 3.3.4.1 The contractor shall appoint in writing competent persons to supervise or inspect, as relevant, any of the following:

a) formwork and support work operations;

b) excavation work;

c) demolition work;

d) scaffolding work operations;

e) suspended platform work operations;

f) material hoists;

g) bulk mixing plants;

h) temporary electrical installations;

i) the stacking and storage of articles on the site; and

j) fire equipment.

PAM 3.3.4.2 The contractor shall appoint in writing competent persons to:

a) induct employees in health and safety; and

b) prepare and update as necessary a fall protection plan and to provide the construction manager with a copy of the latest version of such plan.

PAM 3.3.5 Health and safety representatives

PAM 3.3.5.1 The contractor shall appoint in writing one health and safety representative for every 50 employees working on the site, whenever there are more than 20 employees on the site, to:

a) review the effectiveness of health and safety measures;

b) identify potential hazards and potential major incidents;

c) in collaboration with his employer, examine the causes of incidents;

d) investigate complaints by any employee of the contractor relating to that employee's health or safety on the site;

e) make representations to the contractor on matters arising from a), b), c) or d) or on general matters affecting the health or safety of the employees at the workplace;

f) inspect the site with a view to, the health and safety of employees, at regular intervals;

g) participate in consultations with inspectors at the workplace and accompany inspectors on inspections of the workplace; and

h) participate in any internal health or safety audit.

PAM 3.3.5.2 The contractor shall provide the health and safety representatives with the necessary assistance, facilities and training to carry out the functions established in 4.3.1

PAM 3.4 Employer’s health and safety agent

PAM 3.4.1 The employer’s health and safety agent shall:

a) audit the contractor’s compliance with the requirements of this specification prior to the commencement of any physical construction activities on the site;

b) accept or reject the contractor’s health and safety plans, giving reasons for rejecting such plans;

c) monitor the effective implementation of all safety plans;

d) conduct periodic and random audits on the health and safety file to establish compliance with the requirements of this specification;

e) visit the site at regular intervals to conduct site inspections, and based upon such visits issue, wherever necessary, Improvement Notices, Contravention Notices and Prohibition Notices, to the contractor or any of the contractor's subcontractors with a copy to the contract manager and, where relevant, to the contractor.

PAM 3.4.2 The contractor shall invite the employer's health and safety agent to audit compliance with the requirements of this specification before commencing with any physical construction activity on the site.

PAM 3.5 Creating and maintaining a safe and healthy work environment

PAM 3.5.1 General

PAM 3.5.1.1 The contractor shall with respect to the site and the construction work that are contemplated:

a) cause a preliminary hazard identification to be performed by a competent person before commencing any physical construction activity;

b) evaluate the risks associated with the identified hazard to the health and safety of such employees and the steps that need to be taken to comply with the Act; and

c) as far as is reasonably practicable, prevent the exposure of such employees to the hazards concerned or, where prevention is not reasonably practicable, minimize such exposure.

PAM 3.5.1.2 The contractor shall ensure that:

a) all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;

b) no structure or part of a structure is loaded in a manner which would render it unsafe; and

c) account of information, if any, provided by the designer of the structure is taken into account in the risk assessment;

Note: The information provided by the designer should outline known or anticipated dangers or hazards relating to the work and make available all information required for the safe execution of the work. It should provide as relevant, geotechnical information (or make reference to reports provided in the site information), the loading the structure is designed to withstand, the methods and sequence of construction.

PAM 3.5.1.3 The contractor shall carry out regular inspections and audits to ensure that the work is being performed in accordance with the requirements of this specification.

PAM 3.5.2 Risk assessment

PAM 3.5.2.1 The contractor shall before the commencement of any work on site and during construction work, cause a risk assessment to be performed by a competent person appointed in writing. Such an assessment shall as a minimum:

a) identify hazards to which persons may be exposed to;

b) analyse and evaluate the identified risks associated with the identified hazards;

c) document a plan of safe work procedures, including the use of any personal protective equipment or clothing and the undertaking of periodic "toolbox talks" or inductions before undertaking hazardous work, to mitigate, reduce or control the risks and hazards that have been identified;

d) provide a monitoring plan; and

e) provide a review plan.

Note: A risk assessment is an important step in protecting workers as well as complying with the law. It helps to focus on the risks that really matter in a particular workplace – the ones with the potential to cause

real harm. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. The following four steps are suggested:

1) Identify the hazards by looking at what could reasonably be expected to cause harm, ask employees or their representatives what they think, obtain advice from trade associations or publications on health and safety, check manufacturer's instructions or data sheets for chemicals and equipment as they can be very helpful in spelling out the hazards and putting them in their true perspective, review accident and ill-health records, think about long-term hazards to health (eg high levels of noise or exposure to harmful substances) as well as safety hazards etc.

2) Identify who may be harmed and how by identifying how individuals and groups of people might be harmed i.e. what type of injury or ill health might occur.

3) Evaluate the risks and decide on precautions by doing everything 'reasonably practicable' to protect people from harm i.e. by looking at how things are done, what controls are in place and how the work is organised and comparing this against good practice to see if more can be done to bring practices up to standard. Consider if the hazard can be removed all together, and if not how can the risks be controlled so that harm is unlikely, e.g. try a less risky option (eg switch to using a less hazardous chemical); prevent access to the hazard (eg by guarding); organize work to reduce exposure to the hazard (eg put barriers between pedestrians and traffic); issue personal protective equipment (eg clothing, footwear, goggles etc); and provide welfare facilities (eg first aid and washing facilities for removal of contamination).

4) Record the findings by writing down the findings of the risk assessment.

PAM 3.5.2.2 The contractor shall ensure that as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated and addressed in the risk assessment.

PAM 3.5.2.3 Notwithstanding the provisions of the fall protection plan, the contractor shall ensure that:

a) all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;

b) no person works in an elevated position, unless such work is performed safely as if working from a scaffold or ladder;

c) notices are conspicuously placed at all openings where the possibility exists that a person might fall through such openings;

d) fall prevention and fall arrest equipment is:

— suitable and of sufficient strength for the purpose or purposes for which it is being used having regard to the work being carried out and the load, including any person, it is intended to bear; and
— securely attached to a structure or plant and the structure or plant and the means of attachment thereto is suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and any person who is liable to fall;

e) fall arrest equipment is only used where it is not reasonably practicable to use fall prevention equipment; and

f) suitable and sufficient steps are taken to ensure, as far as is reasonably practicable, that in the event of a fall by any person, the fall arrest equipment or the surrounding environment does not cause injury to the person.

PAM 3.5.2.4 Where roof work is being performed on a construction site, the contractor shall ensure that it is indicated in the fall protection plan that:

a) the roof work has been properly planned;

b) the roof erectors are competent to carry out the work;

c) no employees are permitted to work on roofs during inclement weather conditions or if weather conditions are a hazard to the health and safety of the employees;

d) prominent warning notices are to be placed where all covers to openings are not of sufficient strength to withstand any imposed loads and where fragile material exists;

e) the areas mentioned in paragraph *(d)* are to be suitably barricaded off to prevent persons from entering;

f) suitable and sufficient platforms, coverings or other similar means of support have been provided to be used in such a way that the weight of any person passing across or working on or from fragile material is supported; and

g) there is suitable and sufficient guard-rails or barriers and toe-boards or other similar means of protection to prevent, so far as is reasonably practicable, the fall of any person, material or equipment.

PAM 3.5.3 Health and safety plans

PAM 3.5.3.1 The contractor shall prior to commencing the work to which this specification applies, submit to the employer's health and safety agent for approval a suitable and sufficiently documented health and safety plan, based on this specification, the health and safety specification and the risk assessment that is conducted.

PAM 3.5.3.2 The health and safety plan shall as a minimum provide:

a) the information contained in Table 1 in respect of each of the hazards associated with work falling within the scope of the contract); and

b) an outline of the manner in which the contractor intends complying with the requirements of this specification.

Table 1: Example of the format of a health and safety plan

What are the hazards relating to work tasks?	Who might be harmed and how?	What are the safe work procedures for the site?	What further action is necessary (monitoring and review)?	Action by whom	Action by when

PAM 3.5.3.3 The contractor shall discuss the submitted health and safety plan with the employer's health and safety agent, modify such plan in the light of the discussions and resubmit the modified plan for approval.

PAM 3.5.3.4 The contractor shall apply the approved health and safety plan from the date of its commencement and for the duration of the work to which this specification applies.

PAM 3.5.3.5 The contractor shall conduct periodic audits for compliance with the approved health and safety plan at intervals agreed upon with the employer's health and safety agent, but at least once every month.

PAM 3.5.3.6 The contractor shall review and update the health and safety plan whenever changes to the works are brought about or following the occurrence on an incident.

PAM 3.5.4 Responsibilities towards employees and visitors

PAM 3.5.4.1 The contractor shall as far as be reasonably practicable, cause every employee to be made conversant with the hazards to his health and safety attached to any work which he has to perform, any article or substance which he has to produce, process, use, handle, store or transport and any plant or machinery which he is required or permitted to use, as well as with the precautionary measures which should be taken and observed with respect to those hazards or safe work procedures.

PAM 3.5.4.2 The contractor shall ensure that all employees under his or her control and the employees of his subcontractors who are performing construction work are:

a) informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk

assessment; and

b) issued with proof of health and safety induction training issued by a competent person and carry proof of such induction when working on site.

PAM 3.5.4.3 The contractor shall cause a record of training to be kept which indicates the training dates, the names, identity numbers and job description of all those who attended such training and the name, identity number and competence of the person who provided the training.

PAM 3.5.4.4 The contractor shall not allow or permit any employee to enter the site, unless such person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

PAM 3.5.4.5 The contractor shall ensure that each visitor to a construction site, save where such visitor only visits the site office and is not in direct contact with the construction work activities:

a) undergoes health and safety instruction pertaining to the hazards prevalent on the site; and

b) is provided with the necessary personal protective equipment.

PAM 3.5.4.6 The contractor shall provide suitable on-site signage to alert workers and visitors to health and safety requirements. Such signage shall include but not be limited to:

a) unauthorized entrance prohibited;

b) signage to indicate what personal protective equipment is to be worn; and

c) activity related signs.

PAM 3.5.4.7 The contractor shall not permit any person who is or who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace.

PAM 3.5.5 Subcontractors

PAM 3.5.5.1 The contractor may only subcontract work in terms of a written subcontract and shall only appoint a subcontractor should he be reasonably satisfied that such a subcontractor has the necessary competencies and resources to safely perform the work falling within the scope of the contract. Such a subcontract shall require that the subcontractor:

a) co-operate with the contractor as far as is necessary to enable both the contractor and sub-contractor to comply with the provisions of the Act; and

b) as far as is reasonably practicable, promptly provide the contractor with any information which might affect the health and safety of any person at work carrying out work or any person who might be affected by the work of such a person at work or which might justify a review of the health and safety plan.

PAM 3.5.5.2 The contractor shall provide any sub-contractor who is submitting a tender or appointed to perform a sub-contract falling within the scope of the contract, with the relevant sections of this specification and the health and safety specification.

PAM 3.5.5.3 The contractor shall discuss and negotiate with each subcontractor performing construction work the subcontractor's health and safety plan and approve that plan for implementation.

PAM 3.5.5.4 The contractor shall take reasonable steps as are necessary to ensure that:

a) potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;

b) each subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to their performance of work on site;

c) all the subcontractor's employees have a valid medical certificate of fitness specific to the construction work which are to be performed which is issued by an occupational health and safety practitioner;

d) all sub-contractors co-operate with each other to enable each of those sub-contractors to comply with the requirements of the Act and associated regulations;

e) each subcontractor performing construction work has and maintains a health and safety file containing the relevant information described in 4.2.5; and

f) each sub-contractor's health and safety plan is implemented and maintained.

PAM 3.5.5.5 The contractor shall conduct periodic document verifications and audits for compliance with the approved health and safety plan of each and every sub-contractor working on the site at intervals agreed upon with such subcontractors, but at least once per month.

PAM 3.5.5.6 The contractor shall stop any subcontractor from executing construction work which is not in accordance with the contractor's or subcontractor's health and safety plan for the site or which poses a threat to the health and safety of persons.

PAM 3.5.5.7 The contractor shall ensure that where changes to the works occur including design changes, sufficient health and safety information and appropriate resources are made available to subcontractor to execute the work safely.

PAM 3.5.5.8 The contractor shall ensure that:

a) every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on site;

b) potential subcontractors submitting tenders have made provision for the cost of health and safety measures during the construction process; and

c) every subcontractor has in place a documented health and safety plan prior to commencing any work on site which falls within the scope of the contract.

PAM 3.5.5.9 The contractor shall receive, discuss and approve health and safety plans submitted by subcontractors.

PAM 3.5.5.10 The contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the risk assessment before any work commences, and thereafter at such times as may be determined in the risk assessment.

PAM 3.5.5.11 The contractor shall reasonably satisfy himself that all employees of subcontractors are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment.

PAM 3.5.5.12 The contractor shall satisfy himself and ensure that all subcontractor employees deployed in the site are:

a) informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment; and

b) issued with proof of health and safety induction training issued by a competent person and carry proof such induction when working on site.

PAM 3.5.5.13 The contractor shall undertake a risk assessment together with subcontractors whenever subcontractors are working in close proximity to other subcontractors particularly activities involve excavations, the moving of earth, the movement of heavy machinery and working at heights.

PAM 3.5.6 First aid, emergency equipment and procedures

PAM 3.5.6.1 The contractor shall where more than five employees are employed at a workplace, provide a first aid box or boxes at or near the workplace which shall be available and accessible for the treatment of

injured persons at that workplace. Such first aid boxes shall contain suitable first aid equipment which includes the items listed in the General Safety Regulations issued in terms of the Act.

PAM 3.5.6.2 The contractor shall ensure that where there are more than 10 employees employed on the site that for every group of up to 50 employees at that workplace, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid.

PAM 3.5.7 Facilities for workers

PAM 3.5.7.1 The contractor shall provide and keep clean and fit for use at or within reasonable access of the site:

a) at least one shower facility for every 15 workers;
b) at least one sanitary facility for every 30 workers;
c) changing facilities for each gender; and
d) sheltered eating areas.

PAM 3.5.7.2 A contractor shall provide reasonable and suitable living accommodation for the workers at construction sites which are remote from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

PAM 3.6 Design of temporary work

The contractor shall:

a) provide the health and safety agent with the names and contract particulars of the designers involved in the design of temporary works;

b) issue the designers with a copy of the health and safety specification as well as any pertinent information contained in the contract and;

c) provide the health and safety agent with certificates issued by the designer of the temporary works that such works are fit for purpose before such works are used in support construction activities.

PAM 4 MEASUREMENT AND PAYMENT

PAM 4.1 Principles

Tenderers (including those sub-contractors and/or suppliers who are preparing prices/quotations for submission to the main Tenderer) must ensure that they make adequate financial provision in their tenders for full compliance with the OHS Act, the Regulations thereto and this H&S specification. Financial provision shall therefore be made by each Tenderer for, inter alia, the following:

- Carrying out and documenting risk assessments of all work to be carried out under the contract.
- Preparation of safe work procedures.
- Preparation of an H&S plan, discussing it with the Employer, and then amending it as agreed.
- Preparation of a Project H&S File to include all requirements of Annexure A.
- Regular updating of all of the foregoing.
- Provision of medical certificates of employees.
- Provision of PPE and protective clothing for employees
- Complying with all H&S requirements for the duration of the contract.
- Provision of forced ventilation (as required when working in confined spaces).
- The completion and checking of the safety file upon completion of the works and handing it over to the Employer.

To enable the Employer to appraise the allowances that Tenderers have made for H&S in their tenders, so that he/she can fulfil his/her obligations in terms of Clause 7 of the Construction Regulations, separate items have been included in the Bill of Quantities for Health and Safety.

Failure by a Tenderer to submit realistic prices for the scheduled H&S items may prejudice his tender.

ANNEXURE A (to H&S specification)

PAM 5 TASK COMPLETION FORM

The Principal Contractor and Sub-Contractors must submit proof of compliance with Annexure A with the construction phase H&S plan where applicable.

PAM Item No.	Requirement	OHSA Requirement	Submission Date
2.1	Notification of Intention to Commence Construction / Building Work	Complete Schedule 1 (Construction Regulations)	Before commencement on site
2.2	Assignment of Responsible Person to Supervise Construction Work	All relevant appointments, as per OHS Act and Construction Regulations.	Before commencement on site
2.3	Competence of Responsible Persons	Employer Requirement & OHS Act	Together with H&S plan
2.4	Compensation of Occupational Injuries and Diseases Act (COIDA) 130 of 1993	COIDA Requirement	Together with H&S plan
2.5	Health and Safety Organogram	Employer Requirement	Together with H&S plan
2.6	Initial Hazard Identification and Risk Assessment based on the Employer's assessment	Construction Regulations.	Together with H&S plan
2.7	Medical Certificate of Employees	Construction Regulations	On commencement of construction.

ANNEXURE B (to H&S specification)

PAM 6 OTHER REQUIREMENTS

The Principal Contractor shall comply but not be limited to the following requirements and shall report on these to the Employer at progress meetings or at least monthly whichever is sooner.

What	**When**	**Output**	**Accepted by Employer & date**
Induction training	Every worker before he/she starts work.	Attendance registers	
Awareness Training (Tool Box Talks)	At least weekly	Attendance registers	
Health & Safety Reports	Monthly	Report covering: - Incidents / accidents and investigations - Non-conformances by employees & contractors - Internal & External H&S audit reports	
Emergency procedures	Ongoing evaluation of procedure	Table procedure in writing as well as tel. numbers	
Risk assessment	Updated and signed off at least monthly	Documented risk assessment	
Safe work procedures	Drawn up before workers are exposed to new risks	Documented set of safe work procedures (method statements) updated and signed off.	
General Inspections	Weekly & daily	Report OHS Act compliance: - Scaffolding - Excavations - Formwork & support work - Explosive tools	
General Inspections	Monthly	- Firefighting equipment - Portable electrical equipment - Ladders - Lifting equipment/slings	
List of contractors	List to be updated weekly	Table list, number of workers and Company tel. numbers	
Workman's Compensation	Ongoing	Table a list of Contractors' workman's compensation proof of good standing.	

PAM 7 MEASUREMENT AND PAYMENT

PAM 7.1 Basic principles

In addition to those aspects covered by PAM 7.2 below, Occupational Health and safety aspects related to particular items of work will be held to be covered by the tendered sum or rate for that work.

PAM 7.2 Scheduled items

	ITEM	UNIT
7.2.1	**General safety obligations:** ……	**Sum**

Compliance with the general health and safety obligations will be measured and paid by the sum. This item may be scheduled as a fixed charge item.

7.2.2	**Time related obligations:** ……	**Sum**

Compliance with the general health and safety obligations will be measured and paid by the sum. This item may be scheduled as a time-related item.

PEM ENVIRONMENTAL MANAGEMENT PLAN

PEM.1 PURPOSE

The purpose of the EMP is to encourage good management practices through planning and commitment with respect to environmental issues, and to provide rational and practical environmental guidelines to minimise disturbance of the natural environment.

PEM.2 RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The contractor will be responsible for environmental control on site during construction and the maintenance period. The construction activities will be monitored by an independent environmental specialist and audited against the EMP.

PEM.3 TRAINING AND INDUCTION OF EMPLOYEES

The contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.).

PEM.4 COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK

Any complaints received by the project team from the community will be recorded. The complaint will be brought to the attention of the site manager.

All complaints received will be investigated and a response given to the complainant within 28 days.

All environmental incidents occurring on the site will also be recorded.

PEM.5 ENVIRONMENTAL SAFETY

The management of impacts associated with various categories of concern is discussed as separate topics, indicated below.

PEM.5.1 Soil

(a) Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.

(b) Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.

(c) Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. The need for such measures will be indicated in the site-specific report.

(d) Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed.

(e) Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and microorganisms in the soil.

(f) Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the Project Manager.

(g) Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds.

(h) Limited vehicular access is allowed across rocky outcrops and ridges.

(i) All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete.

(j) Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and de-stabilized.

(k) All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired.

(l) Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods.

(m) Runoff must be reduced by channeling water into existing surface drainage system.

PEM.5.2 Water

(a) Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of a riverbanks or riverbeds takes place.

(b) Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place.

(c) All fuel, chemical, oil, etc. spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralise the toxic effects prior to the entry into a watercourse.

(d) Oil absorbent fibres must be used to contain oil spilt in water.

(e) During construction through a wetland, the majority of the flow of the wetland should be allowed to pass downstream.

(f) Vehicular traffic across wetland areas must be avoided.

(g) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.

(h) The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWAF. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWAF.

(i) No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season.

(j) No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river without written permission from the Project Manager.

(k) Disturbances to nesting, breeding and roaming sites of animals in or adjacent to wetland areas must be minimized.

PEM.5.3 Air

(a) Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.

(b) Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that must not result in the generation of run-off.

(c) The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site specific study must be implemented.

(d) The Contractor must notify the Principal of all schools within 50m of the site of proposed activities. The Principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g. dust clouds may reduce visibility affecting sports activities.

(e) Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.

(f) Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. IAP's must be informed of the excessive noise factors.

(g) The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent land owners.

(h) No loud music is allowed on site and in construction camps.

(i) No fires are allowed if smoke from such fires will cause a nuisance to IAP's.

PEM.5.4 Social and Cultural

(a) Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only.

(b) The Contractors crew must be easily identifiable due to clothing, identification cards or other methods.

(c) Rapid migration of job seekers could lead to squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed.

(d) Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers.

(e) Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g. the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document.

(f) No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site.

(g) The Contractor must provide suitable sanitation facilities for site staff. Sanitation provided during the construction phase should be managed so that it does not cause environmental health problems. The use of the surrounding fields or grounds for toilet purposes is not permitted under any circumstance.

(h) The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure:

- A basic understanding of the key environmental features of the work site and environments, and
- Familiarity with the requirements of this document and the site specific report.

(i) Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document endanger his/her life or cause him/her to damage the environment.

(j) The demand for construction materials and supplies will have an effect on the local economy. This impact can be optimised by sourcing and purchasing materials locally and regionally wherever possible, insofar as the material complies with the design specification.

(k) The Contractor must maintain a detailed complaints register. This must be forwarded, together with solutions, to the authorities when requested.

PEM.5.5 Aesthetics

(a) Scenic Quality

Damage to the natural environment must be minimized.

Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical.

The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield.

No painting or marking of natural features must be allowed.

(b) All above ground structures could be treated or painted to blend in with the natural environment.

(c) Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment.

(d) Natural outcrops, rocky ridges and other natural linear features, must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction.

(e) Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved off site either temporarily or permanently.

(f) Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the Contractor.

PEM.5.6 Archaeology and Cultural Sites

a) All finds of human remains must be reported to the nearest police station.

b) Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).

c) Work in areas where artefacts are found must cease immediately.

d) Under no circumstances must the Contractor, his/her employees, his/her sub-contractors or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999.

e) A fence at least 2 m outside the extremities of the site must be erected to protect archaeological sites.

f) All known and identified archaeological and historical sites must be left untouched.

g) Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.

PEM.5.7 Flora

a) All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation.

b) The felling and/or cutting of trees and clearing of bush must be minimised.

c) Bush must only be cleared to provide essential access for construction purposes.

d) The spread of alien vegetation must be minimized.

e) Any incident of unauthorised removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor.

f) Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding fields so as to provide biomass for other microorganisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated top soiled surface. No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such vegetation can be made available to the local inhabitants to be used as firewood.

g) No tree outside the footprint of the Works area must be damaged.

PEM.5.8 Fauna

a) No species of animal may be poached, snared, hunted, captured or willfully damaged or destroyed.

b) Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee.

c) Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes.

d) Disturbances to nesting sites of birds must be minimized.

e) The Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.

PEM.5.9 Infrastructure

a) The relevant authorities must be notified of any interruptions of services, especially the District Municipality, Local Municipality, National Road Agency, Spoornet, TELKOM and ESKOM. In addition, care must be taken to avoid damaging major and minor pipelines and other services.

b) The integrity of property fences must be maintained.

c) No telephone lines must be dropped during the construction operations, except were prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary.

d) All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.

e) Storage Facilities

- Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials.

- The Contractor must ensure that accidental spillage does not pollute soil and water resources.

- Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources.

- Cement must be stored and mixed on an impermeable substratum.

f) Traffic Control

All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods.

Before any work can start the Local Traffic Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.

g) Access Roads

The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes.

Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site.

Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed.

h) Batching Plants

Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing has been completed, all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. Storm water must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. Operators must wear suitable safety clothing.

i) Chemical toilet facilities should be managed and serviced by a qualified company. No disposal or leakage of sewerage should occur on or near the site.

j) Blasting

Blasting must not endanger public or private property.

Noise mufflers and/or soft explosives must be used to minimize the impact on animals.

All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with.

The Contractor must take measures to limit fly rock.

PEM.5.10 Safety

a) Measures must be taken to prevent any interference that could result in flashover of power lines due to breaching of clearances or the collapse of power lines due to collisions by vehicles and equipment.

b) Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes.

c) All tall structures must be properly earthed and protected against lightning strikes.

d) The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced.

e) The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

PEM.5.11 Waste

PEM 5.11.1 Solid Waste

(a) Littering on site and the surrounding areas is prohibited.

(b) Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.

(c) All bins must be cleaned of litter regularly.

(d) All waste removed from site must be disposed at a municipal/permitted waste disposal site.

(e) Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.

(f) The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.

(g) Contaminated soil must be treated and disposed of at a permitted waste disposal site, or be removed and the area rehabilitated immediately.

(h) Waste must be recycled wherever possible.

PEM 5.11.2 Liquid Waste

(a) The Contractor must maintain mobile toilets on site.

(b) The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.

(c) All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil.

(d) All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.

PEM 5.11.3 Hazardous Waste

(a) No hazardous materials must be disposed of in the field or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.

(b) The Contractor must maintain a hazardous material register.

PEM.5.12 Rehabilitation and Site clearance

(a) When all major construction activities are completed, the site must be inspected to determine site-specific rehabilitation measures. This may be considered as unplanned work e.g. soil rehabilitation due to oil spills.

(b) All temporary buildings and foundations, equipment, lumber, refuse, surplus materials, waste, construction rubble fencing and other materials foreign to the area must be removed.

(c) If waste products cannot be recycled they must be disposed of at a permitted landfill site.

(d) All drainage deficiencies including abandoned pit latrines and waste pits must be corrected.

(e) Cut and fill areas must be restored and re-shaped.

(f) The area must be restored to its natural vegetation condition using indigenous trees, shrubs and grasses as directed by a grassland and/or rehabilitation expert.

(g) Borrow pits must be re-shaped into even slopes and surfaces to blend with the natural terrain and topsoil must be replaced.

(h) The grass mix, shrubs and trees used for rehabilitation must be compatible with the species identified in the site-specific investigation.

(i) Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

PEM.6 MEASUREMENTS AND PAYMENT

No additional payment will be made to the Contractor to comply with the above actions as it will be deemed to be included in the rates tendered.

PART C4 – SITE INFORMATION

C 4.1

Site Information

EASTERN CAPE GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

1 Site Information

ITEM	DESCRIPTION
Site Location	TARDI is ±3km from Tsolo town.
GPS co ordinates	TARDI co-ordinates **31°17'37.9"S and 28° 45' 42.7" E**
General geography	Rough terrain
Road conditions	Gravel road from Tsolo Town to site
Site extent	1 354ha
Site clearance required	Yes
Site soil properties	Unknown, contractor to inspect and verify the suitability
Site vegetation	Shrubs and trees
Site fenced	No.
Site access	Moderate difficulty to access due to bad roads
Services available	None
Accommodation	Provide own
Labour	Negotiate for local labour with the Community
Storage of materials	Provide own
Security	Provide own
Construction difficulty	Fair terrain
Plant required	Jackhammers, whacker, concrete mixer, generator with welder, concrete vibrator, Tractor-Loader-Backhoe.
Equipment / tools required for	Contractor to identify specific tools for various tasks
Transport required	For all materials For all plant, equipment and tools For contractor's personnel
Testing of works	Concrete test cubes for testing of concrete strength; Laboratory testing of compacted area Engineer to oversee testing of the completed Works
Commissioning of works	Contractor to commission and test.

2. GENERAL

i) Improvements on site
Street Lighting and Electrical Reticulation Upgrade

ii) Results of soil investigations
A geotechnical report is unavailable.

iii) Underground services
There are underground services traversing the building site. Care should be taken not to damage underground services during construction.

iv) Adjacent buildings
Existing office block and student accommodation.

v) Environmental issues
Contractor to comply to all regulations.

C 4.2

Works Specification

C4.2: WORKS INFORMATION (DETAILED SPECIFICATIONS)

TABLE OF CONTENTS

C4.2.1: STANDARD TECHNICAL SPECIFICATION

Contents

1.0 Purpose

This Specification is intended to set out the general technical and procedural requirements for the installation of electrical lighting, power and ancillary services within and around premises largely as contemplated in The Code of Practice for the Wiring of Premises, South African Bureau of Standards SANS 10142-1:2003 (hereinafter called the Wiring Code, or SANS 10142-1:2003). Where the installation falls outside the scope of the Wiring Code, those portions of the installation (e.g.: MV switchgear and cabling, power transformers, and so forth) shall be covered in one or more supplementary specifications appended hereto or, alternatively, i) shall be detailed in the Detailed Specification/Particular Requirements (hereinafter referred to as 'Detailed Specification') forming part of this Document or, ii) shall be detailed within this Standard Specification.

This Specification shall be read in conjunction with the Contractual Conditions, Detailed Specification, Schedules, Bills of Quantities and Drawings pertaining to the particular project to which these Documents apply.

Clause separations and headings are given for guidance only and the Work may not necessarily be limited to any particular section(s) of this Specification and the project Documentation must be read as a whole.

2.0 Scope

This Specification covers the supply, delivery, off-loading, storage, installation, testing, commissioning and handing over in full working order, complete in all respects of lighting, power and ancillary services as outlined in the Detailed Specification and/or shown on the drawing(s). Unless specifically stated otherwise, any reference in the Documentation (see clause 3.1.2) to any material or service being provided, fixed, rendered etc, shall mean that such provision falls under the Contractor's contractual obligations.

The service/s installation/s shall comprise, but shall not be limited to: all notifications and applications to Authorities, including payment of fees, distribution boards, cables, bus-bars, wireways, wiring, controls, accessories, luminaires and lamps, earthing, static and lightning protection/bonding, facilities for other services, fixings and building-in, earthworks, painting, special power supplies, data services, fire alarms, access and intruder control, communication, TV and radio services, working and record drawings, maintenance manuals etc and all other things to form a complete and proper installation to the extent as contemplated in the Documentation.

The Tenderer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and of his rates and prices contained in the various schedules and that his offer shall cover all his obligations under the Contract for the full and proper completion of the Works.

3.0 Definitions

In addition to the definitions contained in Part 3 of the Wiring Code, and also in addition to definitions contained in the General Conditions of Contract, Electrical and Mechanical Engineering Works as issued by the South African Association of Consulting Engineers ('SAACE'), the following shall apply:-

'Document' and 'Documentation' shall mean the complete set of contract Documents including any relevant government department's specifications and conditions (where applicable), supplementary standard specifications, the Detailed Specification, schedules, bills, drawings and any variation orders or site instructions issued in terms of the Contract.

3.1.2 'Contractor' or 'Electrical Contractor' shall mean the person, partnership, company or firm appointed to undertake the electrical and or ancillary installation hereinafter called the electrical installation or Works in terms of this Contract. In this Document, 'Contractor' shall have the same meaning as nominated, selected or domestic sub-contractor where the electrical installation is in any form a sub contract to the Main Contract. For clarity, the builder or principal contractor shall be referred to as the 'Main Contractor'. The Contractor shall also be fully responsible under the contract for any of his sub-contractors, agents, assigns, suppliers etc.

3.1.3 'Tenderer' shall mean the person, partnership, company or firm who makes a bid to carry out the Works. The successful Tenderer will normally become the Contractor upon official award of the contract and

the completion of contractual Documentation when all obligations under this Contract shall become the Contractor's liability.

4.0 Site Visit

In instances where there may be no mandatory formal Tenderers' site visit, Tenderers nevertheless are advised to visit the Site of the Works, prior to the submission of any tender, to ascertain site conditions, accessibility, available facilities etc. No claim on the grounds of want of knowledge in these respects, or any others, will be entertained.

5.0 Compliance with Regulations

5.1. The installation shall comply with the latest versions of the following standards and regulations except where more stringent requirements are laid down in the contract Documentation in which event the latter shall take precedence:-

The Code of Practice for the Wiring of Premises, SANS 10142-1:2003.
The latest issues of all SABS Standards and Codes of Practice (hereinafter called SABS standard/s) or, if such standards do not exist, then the latest versions of the appropriate international standard as issued by the British Standards Institute (BS) and/or the International Electrotechnical Commission (IEC).
The Occupational Health and Safety Act 1993 (Act 85 of 1993), (OHSA) and the Construction Regulations R1010 dated 18 July 2003.
The bye-laws and regulations of the Local Municipality and Authorities who are responsible for the area in which the Works are situated
Telkom regulations and specifications

5.2. The Contractor shall issue all notices and pay all the required fees in respect of the installation to the authorities, and shall indemnify the Employer, Main Contractor and Engineer from all losses, claims, costs or expenditure which may arise as a result of the Contractor's failure to comply with these requirements and the regulations of any relevant Authority.

5.3. It shall be assumed that the Contractor is conversant with the requirements outlined in 5.2. Should any requirements, by-laws or regulation, which contradicts the requirements of this Document, apply or become applicable during the course of the Works, such requirements, by-law or regulation shall overrule this Document and the Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out any variations to the installation in terms of such contradictions without obtaining the written permission to do so from the Engineer.

6.0 Standards and Quality of Work
Works falling outside the scope of the Wiring Code shall comply fully with the latest versions of the applicable standards and codes issued by the SABS or, in the absence of such standard, with an acceptable international standard. Any reference to a particular standard may be given for guidance/clarification only; this shall not relieve the Contractor from complying with all relevant standards in their entirety.

6.2 All components shall be new and of the best available quality and of the class most suitable for the purpose and environment for which they are intended. The whole installation shall be extremely reliable and all parts shall be of such material as will ensure that they are capable of withstanding variations in temperature and humidity arising under working conditions without distortion or deterioration or setting up of undue strain on any part.

Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards/types/performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Tenderers. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

Only equipment and materials with a proven track record in similar applications will be considered. A minimum service period of 100 equipment -years is required.

6.3 Equipment and components of a similar class, such as wiring accessories, switch disconnector units etc, shall be of the same make, pattern, and where applicable, colour, throughout.

6.4 The Work shall comply with the requirements of the Documentation, but where it may become necessary to carry out the Work in a different manner; the Contractor shall first obtain the approval of the Engineer in writing.

In cases where items offered by Tenderers are not in accordance with the contract Documentation, the deviation/s must be fully detailed, irrespective of whether a special form is included for this purpose or not, and such details shall accompany the tender submission in the form of a covering letter, or on the form provided. Merely stating 'as (manufacturer's name / item)', or submission of manufacturer's pamphlets etc. is not acceptable, will not be considered part of any offer and will be ignored. Where no details are submitted, in a covering letter, or on a form provided, the offer shall be deemed to comply fully with the Works Documentation and the successful Tenderer/Contractor shall be liable for performance strictly in accordance with all specifications and conditions.

6.5 The complete Work shall be carried out by qualified, highly trained, skilled and competent operatives to the highest standard of workmanship. The minimum requirement is that a permanent on-site electrician whether working alone or leading the Contractor's workforce, and who must be an 'A' Grade artisan as determined by the Department of Labour, is to be the appointed artisan who shall be responsible for the day to day installation work. Alternatively, the grade/s and/or qualifications of operatives will be specified in the Detailed Specification.

An adequate number of workmen shall be employed at all times to ensure satisfactory progress of the Works in accordance with the overall pace of the project and/or in harmony with any Works programme set by the Architect, Main Contractor or Engineer, etc.

The Contractor shall liaise and cooperate with any other contractor(s) whose work is related to, close to or build into with the Works as detailed herein and shall coordinate the Work to avoid fouling, unsatisfactory setting out etc. Any failure by other contractors to collaborate with the Contractor herein shall be immediately reported in writing to the Engineer and Main Contractor.
shall at all times and for the full duration of the Contract, be carried out under the management and supervision of a skilled and competent representative of the Contractor who will
be authorised to receive and carry out instructions on behalf of the Contractor and to attend site meetings.

7.0 Rejection of Inferior Work and Materials

All inferior work or work containing inferior material shall be rejected by the Engineer whereupon the Contractor shall immediately remove and rectify the faulty work as necessary and bear all costs in connection therewith.

8.0 Drawings and Samples

8.1 Tenderers may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure full compliance with all performance and regulatory criteria.

NOTE: A request for submission of samples or drawings does not imply that the Tenderer's quotation will necessarily be accepted.

8.2 Drawings shall be clearly marked "WORKING DRAWINGS FOR APPROVAL", or as otherwise applicable. Samples shall be forwarded to and shall remain in the possession of the Engineer until completion and taking over of the Works or, with the Engineer's approval, the samples may be embodied within the installation.

8.3 All expenses in connection with the supply and return of the drawings and samples shall be borne by the Tenderer/Contractor.

9.0 Guarantee

9.1. All equipment supplied and all work performed shall be guaranteed against defective operation, poor design (where designed by the Contractor, or in components / assemblies with inherently poor design), and

unacceptable / faulty workmanship, all as determined by the Engineer, for a period of 12 months after commissioning, handover and Client acceptance.

Any faults found during the guarantee period shall be timeously repaired or replaced by the Contractor, including peripheral damage/disturbance (e.g.: wall finishes etc damaged during the course of repairs), at his own expense, misuse and abuse by others and fair wear and tear excepted. Discharge type lamps shall be included in the 12-month guarantee period; however, incandescent lamps shall carry a 3 month guarantee.

The Contractor is required to carry out any remedial work under the guarantee at times and in a manner which will cause the least disruption to the Client's, or other occupant's, operations.

9.2. The Contractor shall ensure that he has access to sufficient spare components for all equipment readily available to forestall any delays in repairing the installation.

10.0 Operating and Maintenance Details

Two complete sets of technical manuals complete with spares schedules, as-fitted layout drawings, schematic wiring diagrams and operating and general maintenance information, bound in hard-cover ring binders shall be prepared by the Contractor and delivered to the Client at or before final handover. A full 'as-fitted' set of drawings shall also be submitted to the Engineer for record purposes.

The main and individual distribution board (DB) single line diagrams shall be brought up to 'as-fitted' status and copies placed in the technical manual. A further copy of the main single line diagram shall be mounted in a glass-fronted frame and hung in a suitable position in the main LV room. Copies of the distribution board diagrams shall be folded (or reduced) to A4 size and placed in an A4 sized perspex fronted frame or document pocket in the applicable DB. Such frames or pockets shall be fabricated from 1,2mm pre-galvanised steel and spot welded to the DB (usually to the inside of the DB door).

This documentation shall be submitted to the Engineer for comment and approval prior to handing over to the Client. It is therefore advisable to submit the details in draft format so that any amendments/corrections can be easily incorporated.

11.0 Inspection and Testing of Works

11.1 The Contractor shall attend upon the Engineer as reasonably required for Work inspection. Normally, inspection of Work in progress will take place on the same day as the general site meeting, or such other times as the Engineer may reasonably require. Handing-over inspections will be done at the completion of the Contractor's testing, issuing of the Certificate of Compliance by the Contractor's accredited person, livening the installation by the Supply Authority, commissioning of the installation and upon making a written request for the Engineer to carry out an initial handover inspection.

Where the installation is to be switched on and taken over in portions, the Certificate of Compliance shall be limited to that particular part of the Work. New Certificates of Compliance shall be completed for remaining phases of the project as applicable and the Supply Authority's permission formally obtained to switch electricity to those areas.

The Contractor shall, prior to requesting the Engineer to undertake an initial handover inspection, do a full, complete and proper inspection of his Work to ensure that everything is absolutely complete and in accordance with the Documentation. Following this inspection, and rectification of any faults in parts of the installation that may be required, the Contractor shall make a written request to the Engineer for a handover inspection. Any faults still found in the installation shall be listed by the Engineer and handed to the Contractor who shall attend to all faults within a reasonable period as decided by the Engineer except that this period will in no circumstance exceed 14 days. Once all listed faults have been rectified, the Contractor shall again request the Engineer in writing to carry out a final handover inspection.

Upon the successful completion of a handover inspection and the issuing of a handover certificate by the Engineer, the responsibility for the security of the installation, or part thereof, shall be deemed to be with the Client.

Under no circumstances will any inspection by the Engineer and/or, if appointed, the Electrical Clerk of Works of Resident Engineer, relieve the Contractor of his obligations in terms of the Documentation.

11.2 On completion of the installation, or such part thereof as may be determined by the Engineer, the Contractor shall carry out installation testing and inspection in accordance with Part 8 of SANS 10142-1:2003 and/or any other relevant Standard.

The result of these tests, duly certified by the Contractor, shall be submitted to the Engineer in the form of a typed test-result certificate. No testing for acceptance purposes will be carried out by the Engineer until this is received.

Upon receipt of the test certificate, the Engineer will arrange to carry out acceptance tests and to witness commissioning procedures, including load-balance, phase rotation, bonding and labelling checks. If any faults are found in the installation, a list of those immediately noticed will be handed to the Contractor by the Engineer. The Contractor shall forthwith rectify such faults and issue a further test certificate endorsed “RE-TEST” with all reasonable despatch whereupon the Engineer will carry out further check-tests.

Any list of faults issued by the Engineer shall not be regarded as final, but given only for the assistance of the Contractor who will be bound to exercise all necessary diligence in their rectification and to check for any other faults and to rectify same.

The Contractor shall supply all necessary testing instruments for carrying out tests, including, but not limited to: insulation tester, earth loop-impedance tester, clip-on ammeter (e.g.: for load-balance testing), earth-leakage tester, etc. Where there is reason to doubt the accuracy of the instruments, the Contractor shall arrange for tests to check their accuracy.

11.3 Where cast-in conduit is installed, the Contractor shall thoroughly check his layout, fastness etc, well before any concrete is poured. The Engineer shall be informed by the Contractor in writing that he is ready for a check-inspection, giving the Engineer not less than 48 hours notice (usually by telefax). A qualified operative of the Contractor shall stand by at all times when concrete is being poured so that any conduits or boxes that may become loose, displaced etc can be refixed.

11.4 If it is necessary for the Engineer, his agents or assigns, to spend extraordinary time in respect of checking, testing, inspection or any other matter due to the Contractor’s default or unsatisfactory attendance all costs of the Engineer in obtaining remedy shall be for the Contractor’s account. For example, if the Contractor failed to carry out his own prior testing in a reasonable and diligent manner, or to check cast-in conduits properly before calling the Engineer to undertake a check-inspection, thus necessitating further visits and/or extra time incurred, costs of the Engineer will be charged to the Contractor. These costs will be deducted from the Contractor’s claims, or shall be claimed by submission of an account. Engineer’s claims for wasted time, including disbursements, shall be based on the applicable SAACE Form of Agreement for Consulting Services.

12.0 Technical and Installation Requirements

12.1 Main Electrical Supply

In instances where the incoming main supply from the Supply Authority is at low voltage (LV), requirements of the Supply Authority with regard to method of incomer connection, earthing, testing/approval of main circuit breaker etc, must be strictly adhered to. Where the main LV supply is obtained from a transformer installed by the Contractor, the method of connection shall be as specified in the Detailed Specification and/or drawings.

The Supply Authority’s requirements for their metering must be complied with and all facilities, space, bus-bar links for current transformers (CTs), etc, as the case may be, shall be in accordance with their requirements. The Contractor shall be deemed to have made all allowances for the Supply Authority’s requirements in their tender submission.

12.2 MV Equipment and Cabling

Medium voltage (MV) equipment falls outside the scope of this building services specification. Where required, MV cables, MV switchgear and power transformers etc. shall be specified in a supplementary specification and/or the Detailed Specification and/or drawings.

12.3 Miscellaneous Equipment and Installations

Miscellaneous items such as diesel generators, uninterruptable power supplies (UPSs), overhead lines etc. which fall outside the scope of this building services specification shall be specified in a supplementary specification and/or the Detailed Specification and/or drawings.

12.4 Distribution Boards

General

Distribution Boards (DBs) shall be of the type as detailed in the single line diagrams, the Detailed Specification and, where applicable, the equipment schedules. Unless otherwise indicated, distribution boards shall be provided with prefitted space/s for a minimum 20% extra switchgear, subject to a minimum of one space for each class of circuit breaker, combination fuse switch (CFS), contactor etc, viz.: 3-pole, single pole etc, as the case may be.

DBs shall comply fully with SANS 1765.

Enclosures

Distribution boards for internal applications shall be constructed from folded pre-galvanised 2mm mild steel sheet suitably welded, bolted and braced to form a rigid construction and finished with an epoxy coating after fabrication. DBs for external applications shall be similar to internal DBs, but shall be fabricated from 2mm 3CR12, plus a suitable epoxy finish. Boards for special applications may be made from polished 2mm 316 stainless steel, fibreglass etc; these will be more fully described in the Detailed Specification where applicable.

All equipment, except door mounted instruments, indicators and so forth, shall be mounted behind removable fascia plates with only the switchgear operating handles protruding.

Normally, free standing boards shall not exceed 2,3m in height with operating handles, push-buttons etc not exceeding 1,8m from the floor nor lower than 600mm above floor level (subject to any equipment part not being lower than 300mm from the floor).

Cabinet type boards used mostly for LV distribution shall be ‘Form 1’ degree of separation to IEC 439 while cubicle boards used mostly for Motor Control Centres (MCCs) shall be ‘Form 4’.

The Contractor is to check all access routes for distribution boards. Where necessary, DBs are to be made in sections to allow access into their final position.

Protection

All boards shall be rendered moisture and vermin proof and shall be adequately ventilated. Unless otherwise specified, free standing and wall mounted DBs in a normal internal environment shall be protected to IP43. DBs in certain factories may have to have a higher degree of protection which will be stated in the Detailed Specification or single line diagrams. The complete DB and its components shall be suitable for coastal conditions.

Bus-Bars

The bus-bars shall be of high conductivity 99,9% pure copper of adequate cross section for the current and short circuit rating, mounted on edge (not flat). Multiple/laminated bars shall be appropriately derated as necessary and shall be spaced by a distance equa
l to the bar thickness. Bars shall be supported on resin type insulators suitable for mechanical stresses due to prospective fault currents and otherwise so arranged and braced as to
obviate distortion under short circuit conditions. The material used for bracing, shielding etc must be tested and approved by SABS and shall be completely non hygroscopic and non-tracking.

Bus-bar current ratings for both phase and neutral shall be based on an internal temperature of 40°C with a maximum bar temperature rise of 60°C.

As a guide, the following current densities should not be exceeded for single bars:

100 Amps and below	: 3,50A/mm²
101 - 300 Amps	: 2,65A/mm²
301 - 1000 Amps	: 1,85A/mm²

1001 Amps and above : 1,20A/mm²

In addition to the current rating, the bars shall be sized to accommodate the prospective fault rating and the cross sectional area of the bars shall be the greater of the calculated sizes. Sizing for fault levels shall be based on the following:

a = 8, 2 x Isc x √t, where:
a = minimum cross section in mm²
I_sc = prospective short circuit current in kA
t = maximum time in seconds to clear fault, subject to a minimum of 0,2s

An earth bus-bar shall be installed at a convenient position, usually near the bottom, along the entire length of DBs with an incomer size of 200 Amps or more, or they may be of shorter but adequate length for smaller DBs. Earthbars need not be supported on insulators. The cross-sectional area of the earthbars shall be equal or greater than half the cross-sectional area of the incomer feeder cable. Earth terminal strips with screw connections may be used for boards with a maximum incomer size of 100 Amps.

Teed-off neutral bars are to have the same cross-sectional area as the sub-feeder phase bars and shall be mounted in a suitable position adjacent to the switchgear, which they serve. The outgoing connections must match the sequence of the switchgear to which they relate. Neutral terminal strips with screw connections may be used for boards with a maximum incomer/sub-feeder size of 100 Amps. These requirements shall also apply to smaller DBs where such neutral bars are also the main neutral bars.

A separate neutral bar shall be installed for circuits protected by adjacent single phase earth leakage breakers connected to the same phase.

Gland Plates

Bottom entry boards shall be provided with minimum 2mm galvanised steel gland plates installed across the full width of each DB section at a minimum height of 300mm above the level of the bottom of the DB. Sufficient clearance for the bending of cable cores shall be provided between the lowest terminals of any equipment.

Where single core cables are to be terminated, 10mm non-hygroscopic Delaron or similar material shall be used for the gland plate. Alternatively, gland plates for single core cables shall be made from 4mm thick aluminium.

Doors

Where called for, doors shall be fabricated from the same material as the main enclosure and shall be provided with closed-cell silicon gasketing to obtain the level of protection required (Refer also to 12.17.6). The doors shall be provided with catches, square-key turnbuckles, lockable catches or cylinder locks and handles, as specified in the Detailed Specification and/or drawings. All DB keys, where provided, shall be the same for all DBs on the particular project.

Paintwork

Pre-galvanised sheet metal shall be cold galvanised at all exposed edges and welded surfaces, degreased, bonderised, etch-primed and then finished with baked epoxy enamel or powder coatings per SANS 51274, as applicable and to paint manufacturer’s recommendations to achieve a dry film thickness (DFT) of 70 microns.

3CR12 panels shall be pickled, passivated and etch-primed before being finished, similarly to pre-galvanised sheet steel boards, with baked epoxy enamel or powder coatings to achieve a DFT of 70 microns.

Colour finishes shall be as follows:

Normal Supply LV Distribution Boards: Light Orange, colour B26 of SANS 1091
The standby power sections of DBs shall be Signal Red, colour A11 of SANS 1091
Uninterruptable Power Supply (UPS) DBs, or such sections within composite boards shall be Dark Violet, colour F06 of SANS 1091

Small domestic and shop type DBs, and boards in open kitchen areas shall be finished white, colour G80 to SABS 1091 (unless the latter is of bright stainless steel)

A minimum of 1 litre of touch-up paint for each colour shall be provided.

Switchgear

MCCBs, MCBs and switch-disconnectors shall be of the same make throughout. Similarly, CFS units shall be metalclad type and are to be of the same make throughout. Current ratings must be clearly indicated on the front of the units.

A suitably braced chassis for the mounting of moulded case type switchgear, including DIN type rails etc, shall be firmly secured to the frame of the switchboard. Large switchgear, such as ACBs, shall be secured directly to the framework using suitable structural/bracing members.

MCCBs switch disconnectors and CFS units with a rating of 150 Amps and above shall be connected to the main bus-bars with bus-bar links. PVC insulated cable, neatly installed, shall generally be used for switchgear below 150 A. This latter requirement shall not preclude the use of small-section feeder bus-bar arrangements where available. Where long runs of PVC insulated cable are run within the DB, they shall be neatly laced together, or shall be installed in purpose made slotted PVC trunking. The smallest cable size for DB wiring shall be 2,5mm².

Where necessary, stub bus-bars shall be fitted to the outgoing side of MCCBs and CFS units and the supply side of switch disconnector incomers to allow for lug connections to the cable cores.

Incoming circuit breakers and bus-coupler breakers rated 800 Amps and above shall be of the withdrawable type air circuit breakers (ACBs) or large frame MCCBs, as specified.

Castell, or similar interlocks shall be provided for all main DBs which have bus-couplers. Alternatively, where detailed in the single line diagrams and/or Detailed Specification, the bus-coupler shall comprise a shuttered cradle only (no circuit breaker fitted) to match the incomer circuit breaker cradles. In the latter instance, bus-coupling will be effected by racking out the appropriate incomer ACB/MCCB, fitting it into the bus-coupler cradle and engaging the ‘ON’ position.

Where MCCBs and ACBs have been set to a lower rating (e.g. 400A MCCB set to 350A etc.), the setting arrangements shall be sealed off and rendered tamper-proof after adjustment.

Where instrument fuses or fused switchgear is used, spare fuses shall be housed in a small compartment built into the applicable board. 20% of each size of fuse, subject to a minimum of three, shall be provided and shall be mounted in stainless steel ‘Terry’ type clips inside the compartment. A label inside the spare fuse compartment shall indicate all part numbers for reordering. The outside of the compartment shall be labelled as follows:

SPARE FUSES

THE FUSES ARE USED TO CONTROL DANGEROUS PROSPECTIVE FAULT CURRENTS – DO NOT BRIDGE OUT UNDER ANY CIRCUMSTANCES

Reorder and replace any used-up fuses immediately

Where fault limiting is employed, fuses or fault-limiter MCCBs shall be selected to limit down-stream faults to levels no higher than indicated in the single line diagrams or implied in the design.

Surge Arrestors

Surge arrestors, which comply with SANS 61643-1, may be installed in each distribution board. These shall be fitted at the load side of main incomers to each phase and the neutral.

Timeswitches

Timeswitches shall be suitable for single-phase operation at a minimum rating of 15 Amps. They shall be of the programmable electronic type complete with a minimum 24-hour back-up rechargeable battery. The battery shall be a locally available type and shall be arranged for easy removal and replacement. The characteristics of the timeswitch shall suit the requirements of the circuit as dictated by details in the single line diagrams (e.g.: day omitting etc). Solar type timeswitches shall be used for all outside lighting circuits unless photocells are employed for control purposes.

A manual by-pass switch, mounted in the DB fascia, or as otherwise indicated, shall be provided to permit the circuit to be switched ‘on’ or ‘off’ manually for one switching cycle without affecting any other settings.

Contactors

Contactors shall be DP or TP electromagnetically operated air break, low noise type suitable for the rated supply voltage, circuit current and prospective fault level current.

Contactors for general lighting and power shall be AC1 category while AC3 category shall be used for motor starting.

Where auxiliary contacts are not specified to be fitted initially, the contactor shall have provision for adding these contacts. Auxiliary contacts shall be rated at 6 Amps, 250V AC. Auxiliary contacts characteristics such as ‘make-before-break’, ‘late break’ etc must be inherent in the design and shall not be adapted from standard contacts.

All contactors shall have the following features:

Easily replaceable coil
Permanent air-gap in the magnetic circuit
Clearly marked main and auxiliary terminals
Provision for easy inspection and changing of contacts

Contactors shall be electrically and mechanically interlocked for changeover arrangements and electrically interlocked only for star-delta starters.

Instruments and Controls

Instruments, indicators and controls shall be provided as indicated in the single line diagrams. Where the components are to be actuated from the front of the DB door, they shall be rated to the appropriate IP level (e.g.: IP43). In instances where meters and the like are required, and where these cannot be protected to the level specified by themselves, suitably protection-rated impact resistant glass windows shall be provided in the door through which to view the dials and the instrument/s mounted in the inner fascia.

Doors in which instruments are installed shall be provided with a flexible woven copper earth link across the hinge side. Insulating shrouds or other suitable barriers shall be installed to prevent accidental contact with door mounted instrument terminals.

Fuses for the protection of instruments shall be of the HRC cartridge type mounted behind the DB fascia. All control fuses shall be clearly labelled.

Push-buttons for protection ratings of IP65/66 shall be provided with rubber ‘boots’ for enhanced protection. Any exposed rubber shall be further protected (e.g.: with silicon covers) where used in food factories containing sugars and other carbohydrates which may give rise to attack from bacteriological action when fine particles collect on or near the rubber.

Only LED type indicator lamps shall be used. A set of spare LEDs (20% of each type, subject to a minimum of three) shall be supplied. These may be housed in the spare fuse compartment where provided, and the labelling suitably modified. Alternatively, the LEDs shall be housed in a small labelled compartment similarly to HRC fuses as aforementioned

Unless otherwise specified, ammeters, voltmeters, frequency meters and running-hour meters shall have a minimum dial size of 96mm x 96mm with anti-static impact resistant clear faces. Instruments shall be screened against magnetic interference.

0 - 500V as appropriate. Selector switches used in conjunction with a single voltmeter shall be of the cam-actuated or wiping air-break type. The switch shall be labelled with the ‘OFF’ position and other positions as specified (e.g.: ‘N - R’ for neutral to red phase, ‘R - Y’ for red to yellow phase etc.)

Ammeters shall have a moving iron element to indicate instantaneous values. Direct reading ammeters may be used up to 60 Amps. Current Transformer (CT) operated ammeters of 60 Amps and above shall be 5 Amps full scale, calibrated to read actual primary currents. The CT ratio shall be indicated on the faceplate.

Unless otherwise stated, ammeters shall be of the Maximum Demand (MD) reading type. The mean value over a fifteen minute period shall be indicated by a red pointer driven by a bimetal spiral element. Full load current shall be indicated with a distinctive line on the dial. The scale should indicate at least 25% over full-load rating.

Instrumentation and control (I&C) wiring shall be segregated into LV and ELV wiring and installed in separate slotted plastic trunking within the main casing of the board. I&C wiring shall also be kept separate from power wiring. The smallest ELV conductor shall be 1mm². Conductors connecting to components on hinged panels shall be shrouded in spiral plastic 'loom-former' and fixed on both sides of the hinge. A loop shall be formed in the wiring so that the loom produces a twisting motion away from the door jamb when it is closed.

Consumption Meters

KWh meters shall be Direct on Line (DOL) type up to 80 Amp rating and CT operated above this amperage. Meters shall be calibrated for the specific application to obviate the use of multiplication factors.

Consumption meters shall have cyclometer dials with six digit readout, the last digit indicating one-tenth of a unit.

Facilities for a security seal shall be provided on the fixing screws of the terminal cover.

Current Transformers

Current transformers shall be epoxy resin encapsulated and comply with the requirements of SANS 60044-1 and IEC 185. Unless otherwise stated, the secondary current of CTs shall be 5 Amps and all instruments, meters etc shall be selected accordingly. The rated burden shall not be less than 10VA.

The following accuracy classes shall be adhered to:

Application	Primary Current	Class
Indication	A11 5	
Protection	A11 3	
Metering	Up to 250A	1
Metering	250 - 600A	0,5
Metering	600 - 800A	0,2
Metering	800A +	0,1

Power Factor Correction

Where called for, power factor correction (PFC) capacitors shall be housed in a separate section of the DB, segregated from other sections by a metal barrier, and designed for extra ventilation. The PFC section shall have low-level vermin proofed inlet louvres and the top shall have a 12mm diamond mesh 'roof' with a solid flat section spaced at least 50mm above the mesh. Whilst the construction, paintwork etc, shall be similar to the DB casing, the level of protection shall be IP21.

PFC capacitors shall be protected and controlled by HRC fuses and contactors specially designed for PFC applications. Switchgear shall be rated 70% higher than the normal current rating of the capacitor, e.g.: for a 60kVAr capacitor, the rating of the protective fuses would be 150 Amps in a 400V system.

Where metalised plastic film capacitors are used, the board construction shall be such as to limit the temperature rise, with all capacitors switched-in, to 35°C above ambient. If necessary a fan, complete with switchgear, controls and failure alarm, shall be employed. This equipment will not normally be indicated in the single-line diagram/s and the Contractor shall make due allowance as necessary.

PFC controllers shall be electronic type giving 6 or 12 steps of control as specified. Digital indication of the power factor shall be built in, as well as 'auto, manual, off' controls and LED pilot lights indicating PFC steps.

The separate capacitor section of the DB shall have a 'double skin' metal separating barrier with a 12mm air gap for all PFC loads of 250kVAr and above.

A discharge resistance system shall be provided for each capacitor to ensure effective discharge within 60 seconds after switch-off. A suitable barrier, complete with warning notice, shall be installed for all capacitor banks.

Anti-Condense Heaters

Where specified, 'black-heat' anti-condense heaters shall be fitted in the bottom sections of DBs in areas of high humidity or dampness. The heaters shall be fitted behind suitable screening to obviate accidental contact with persons or wiring. Anti-condense heaters shall be protected by dedicated MCBs or fuses and shall be sized to prevent condensation without giving rise to excessive temperature levels inside the DB housing.

Labels

Before installation, the Contractor shall submit a fully detailed proposed labelling schedule to the Engineer for comment and approval.

Engraved plastic 'Ivorine' or 'Traffolyte' type sandwiched labels shall be used for all labelling on DBs, control panels etc. Main labels on the outside of panels, and labels for individual components, switchgear etc shall be fixed to the panel or fascia face with brass bolts, nuts and washers. Labels for small grouped items such as a row of single pole MCBs may be securely fixed into slotted label holders. In the latter cases, the labels would normally identify the circuit number only and a typewritten legend card installed to the fascia front, or inside the DB door in a card holder, used to identify the circuit function.

Normal informative labels shall have black lettering on a white background while warning labels shall have white lettering on a red background.

Lettering sizes for labels shall generally be as follows:

Outdoor Panels, Minisubs etc: 50mm
Indoor Panels (main labels): 15mm
Bus-bar sections and sub-compartments: 10mm
Individual switchgear, indicators etc: 5mm

Substations, minisubs, kiosks, transformer room & switchgear rooms, shall be provided with notices as required by the Occupational Health and Safety Act.

Testing

Unless otherwise specified, the Contractor shall make all arrangements and provide all instruments for inspection and testing by the Engineer of distribution boards at the manufacturer's premises. The Contractor shall give the Engineer at least 5 working days notice of any impending test/s.

The tests shall comprise, but shall not be limited to:

Visual inspection, label checks etc
Polarity checks
500V Megohm meter insulation resistance test
Injection tests for CTs etc
Function tests for all equipment, control and interlocking circuits, indicators, earth leakage relays etc

In addition, these tests will be spot-checked at Site when phase rotation checks, and installation commissioning will be carried out.

After successful completion of tests, the Contractor shall provide the Engineer with duplicate test certificates for all DBs.

Extra time, travelling etc expended by the Engineer in repeating tests due to any failure shall be claimed from the Contractor in accordance with clause 11.4 herein.

Free Standing Distribution Boards

In addition to the general requirements contained in clause 12.4.1, free standing DBs shall be as follows:

Distribution boards shall have a 'U' channel baseframe designed to support all equipment and to span cable trenches etc.

General power supply boards shall be of the cabinet type with sections no wider than 1,5m.

Cubicle boards for the control of motors shall be of a modular cubicle design. The disconnector for each cubicle shall be operated from the front and it shall not be possible to open the particular cubicle without switching off the disconnector.

Unless otherwise stated, free standing boards shall be of the front access, bottom and/or top entry type as dictated by installation requirements and/or stated in the
single line diagrams. Where called for, rear panels shall be removable and shall be secured to the frame by means of square key turnbuckles.

Where specified, boards shall be extensible to the left or right, as called for. This shall be accomplished by the installation of removable bus-bar cover plates in the side panels.

Upon completion of cabling into the distribution board, the Contractor shall ensure that the board is rendered totally vermin proof, especially at the bottom of the board around the incoming cables.

Distribution boards for external applications shall be fabricated from 2mm 3CR12 corrosion resistant steel sheets. External DBs shall be fitted with gasketed doors and shall be protected to IP55. These boards shall have sloped overhanging roofs for rain protection.

Where boards exceed 2m in width, they shall be provided with suitable lifting bales to facilitate off-loading, emplacement etc using a crane or similar. Where no facilities are available at Site for off-loading heavy DBs, the Contractor is to ensure that the boards are delivered using a crane lorry, or shall make such other arrangements as required.

Surface Mounted Distribution boards

In addition to the general requirements contained in clause 12.4.1, surface mounted boards shall be as follows:

Unless otherwise indicated, all DBs shall be provided with flush mounting doors secured with catch/es, lock/s etc, as specified.

Except where otherwise specified, DBs shall be installed so that the top of the board lines up with the top of door frames. Where no such reference line exists the tops of boards shall be at a height of 2m above finished floor level. The maximum permissible height of any switchgear handle, push-button, meter or instrument face shall be 1,8m.

Suitable heavy duty lugs for securing the board to a vertical surface shall be provided.

Boards for external applications shall be fabricated from 2mm 3CR12 corrosion resistant sheet steel and shall be protected to IP55. A sloped roof shall be provided for rain protection. All cables entering or leaving externally mounted DBs shall do so at the bottom only.

Flush Mounted Distribution Boards

In addition to the general requirements contained in clause 12.4.1, flush mounted boards shall be as follows:

Unless otherwise indicated, all DBs shall be provided with adjustable overlapping architraves and flush mounted doors complete with catch/es or lock/s as specified.

Except where otherwise specified, DBs shall be installed so that the top of the board lines up with the top of door frames. Where no such reference line exists the tops of boards shall be at a height of 2m above finished floor level. The maximum permissible height of any switchgear handle, push-button, meter or instrument face shall be 1,8m.

The built-in tray may be fabricated from 1,6mm pre-galvanised steel without any further paint finish except for cold galvanising at exposed edges, weld joins etc.

Small domestic type DBs may have the front panel and door made from 1,6mm pre-galvanised sheet steel. Such boards shall not exceed 500mm x 500mm and the framework shall be finished as per clause 12.4.1 h).

Where called for, 'semi-recessed' boards shall be provided with a 35 to 50mm deep overlapping architrave surround into which the door/s and inner fascia are recessed. The portion of the architrave perpendicular to the wall shall be suitable for the future termination of surface conduits into the DB.

DBs for fitting into 115mm single brick walls shall be provided with suitable 'keying' strips of expanded metal spot welded to the sides of the tray for building into the brick courses. In addition, expanded metal shall be spot-welded to the rear of the bonding trays to act as 'keying' for plaster etc. This mesh shall overlap the tray by 75mm on all sides to obviate cracks in plaster.

At least two 20mm diameter spare conduits shall be installed from each DB into the ceiling void where applicable.

Layout Drawings for Approval

The Contractor shall timeously obtain detailed/dimensioned proposed layout drawings of distribution boards, including schematic wiring diagrams, bus-bar sizes, component details etc, from the board manufacturer prior to fabrication. The Contractor shall check all details, correct them where necessary and submit two sets to the Engineer for approval. No distribution board is to be fabricated until the Engineer's formal approval has been given.

Cablework

General

The Contractor shall be responsible for all main, sub-main and final circuit cablework.

Cable Types

Only the following types of cables shall be used for LV work:-

PVC Insulated, Armoured Copper Cables (PVC/SWA/PVC)

Polyvinylchloride insulated, armoured, copper cable shall be 600/1000V grade in accordance with SANS 1507, comprising PVC insulated stranded copper conductors with PVC bedding, galvanised steel wire armouring and PVC sheathing overall.

Mains voltage cables shall be at least 2,5mm² and no larger than 185mm² for ease of handling. Parallel cables of equal size shall be utilized where the current demand is greater than that rated for 185mm² cables.

Control cables shall be at least 1,5mm² unless otherwise specified.

PVC Insulated, Armoured Aluminium Cables (PVC/SWA/PVC) and PVCATAPVC Cable)

Polyvinylchloride insulated, armoured, aluminium cable shall be 600/1000V grade in accordance with SANS 1507 comprising PVC insulated solid

aluminium conductors with PVC bedding, galvanised steel wire or aluminium tape armouring and PVC sheathing overall.

The cables shall be at least 16mm² and no larger than 120mm². Parallel cables shall be utilized where necessary.

Aluminium cables shall be used only when specifically specified.

PVC Insulated, Non-Armoured Cables (PVC/PVC)

Polyvinylchloride insulated non-armoured cable shall be 600/1000V grade in accordance with SANS 1507, comprising PVC insulated stranded copper conductors with PVC sheathing overall.

PVC/PVC mains cables shall only be used for trefoil configured applications.

For ease of handling the core size shall be limited to 240mm² except in special circumstances where space, routing etc. may allow for larger sizes.

Trefoil cables shall comprise 3 sets of three single core cables (R, Y & B), and one set of two cables for the neutral.

XLPE Insulated Cables

Where called for Cross-Linked Polyethylene (XLPE) insulated cables shall be used. These are similar to the specifications for the foregoing PVC insulated cables a) b) and c) except that the initial insulation shall be XLPE, thereafter PVC bedding and sheathing shall be used.
The Contractor must ensure early ordering of these cables as they are usually only made upon request and to a minimum quantity. For ease of identification, the Contractor shall insure that the manufacturer embosses the outer sheath: "XLPE insulated".

Flame Retardant and Halogen Reduced/Free Cables

Where called for in the Detailed Specification, low halogen (LH), halogen free (Non-halogenated, low smoke and fume, flame retardant - or "NHLSFR") or flame retardant (FR) PVC cables to SANS 1507 and BS6724 (latest issues) shall be used.

Cable Terminations

Cable Glands

Cable glands shall be used for armoured multi-core cables and are to be of the electroplated brass or bronze compression type and shall be matched to the type of cable used and shall be suitable for waterproof, flameproof or general installations, as required. PVC or neoprene shrouds and plated earthing washers shall be used in all instances.

Single Core Terminations

to the termination point. Alternatively, with the Engineer's approval, a treated hardwood cleat arrangement may be employed.

Cable Joints

Because of the relatively short runs of cable utilized in industrial general lighting and power services, through-joints shall only be used in exceptional circumstances and only with written permission from the Engineer.

Where a tee-off is required in indoor circuit cabling, this shall be effected using a suitable cable junction box, as Pratley, or equal and approved. Such junction boxes shall be of the weatherproof type, complete with integral compression glands and DIN rail-mounted terminals of appropriate rating.

Joints in power cables shall only be allowed a) where the cable runs exceed a standard drum length, or, b) with the express permission of the Engineer in writing

Conductor Lugs

Lugs for the termination of conductors onto busbars and equipment are to be of the compression type and of the correct size and type for the application.

For cables of size up to 16mm², the locking type of handplier crimpers may be used. Above this size, the hydraulic type must be employed.

Where aluminium lugs, used for aluminium conductors, are bolted to a dissimilar metal (e.g. copper, tinned copper, etc.), suitable bonding compound shall be used to obviate the possibility of electrolytic action.

Shaped lugs shall be used in conjunction with shaped cable cores.

Handling of Cable Drums

Drums of cable shall be delivered to Site with seals intact and shall be off-loaded and stored in an approved manner. Any drums, which show signs of damage or mishandling, shall at the Engineer's option, be replaced with fresh undamaged stocks. The Contractor shall bear all costs of replacing such unacceptable cables.

Cable drums shall be supported on an axle and support jacks when the cable is unreeled. The arrow on the drum flanges showing the direction of rotation shall be observed. Rolling of drums along the ground will not be permitted.

Empty cable drums shall be stored in a tidy and safe manner prior to their removal from the Work Site. The Contractor shall be responsible for the removal and disposal of all empty drums at intervals dictated by Work progress, or upon instruction by the Engineer or the Main Contractor.

Installation of Cables

Surface (Direct)

Where cables are run along horizontal or vertical building surfaces, structural steel members, in vertical ducts, etc., they shall be secured with approved means of fixing such as saddles, cleats, etc.

All cable runs shall be vertical or horizontal, or run parallel to building or structural members and shall at all times present a neat appearance.

Cable Trays

Where a sheet steel cable tray is required, this shall consist of approved galvanised sheet-metal perforated medium duty tray supported with approved substantial brackets or hangers at suitable intervals to reduce sag to a maximum of 10mm. Where necessary to achieve this, the run of cable tray shall be reinforced along its length with angle iron or similar stiffening members, or shall be of the heavy duty type.

When wire mesh trays are required, these shall be of heavy duty hot-dipped galvanised type, or stainless steel, left bright as required. Mesh trays shall be installed in a similar manner to perforated tray.

All cable tray accessories such as bends, tees, etc., shall be as supplied by the tray manufacturer and made-up components will not normally be allowed.

Trays shall be installed vertically or opening-up horizontally as specified. Brackets and hangers shall be constructed to permit the easy removal of any cable from the tray. Flat horizontal runs of tray suspended from slabs shall be installed at least 200mm clear of the soffit. Trays crossing under beams shall be spaced off the beam soffit to allow the removal of the largest cable(s) in the group.

Earth continuity shall be maintained throughout the complete run of cable tray.

Cable Ladder-Rack

Where ladder-rack is called for, this shall consist of 2,0mm thick galvanised steel with side sections of 75mm and cross-rungs every 350 – 400mm.

Only manufacturer's accessories shall be used for ladder-rack.

Ladder-rack shall be installed in the same manner as cable trays (Refer to 12.5.5 (b)).

Where specified, cable trays and racks shall be finished in a light orange epoxy coating, colour B26, or other colour appropriate to the service, to SANS 1091, all as clause 12.4.1 h).

Epoxy coating damaged or removed during installation shall be made good.

Cable Installation on Racks and Trays

Racks and trays shall be sized to afford at least 20% spare space. Control cables may be installed touching, but not bunched. Power
cables shall be laid-up spaced apart not less than the diameter of the largest adjacent cable, unless otherwise specified.

Cables shall be fixed to racks and trays using stainless steel cable strap and buckles fixed every 500mm, or fixing-rung intervals for edge-on rack / tray installations and at 1000mm or every second fixing-rung interval for cables laid flat and also where installed vertically.

Different classes of services (e.g. power and instrumentation) shall not be installed on the same rack or tray.

Common Earthing for Racks and Trays

Cables for final circuits installed on racks and trays shall, unless otherwise specified, be provided with an integral earth core or shall have a separate bare earth conductor per cable, or as indicated in the circuit diagram.

Multiple runs of heavy power feeder cables may share a common earth conductor comprising bare copper tape of at least 70mm² run along mesh type trays or ladder rack. (Perforated cable tray would normally carry light circuitry only and common earthing would not apply).

Earth tapes are to be fixed and bonded at regular intervals and the final earth connection shall comprise an appropriately sized bare copper earth-wire tail bonded to the common tape earth using a compression lug and high tensile bolt and nut arrangement.

Underground Cable

Unless otherwise specified, cables installed earth trenches shall be buried at a depth of 750mm; multiple runs of cables shall be laid 150mm apart throughout the run.

Cables shall be drawn along the trench using rollers corner rollers, snatch blocks and skid plates as necessary.

Unless stated to the contrary, the Contractor shall carry out all excavations of cable trenching, including bedding, topping, backfilling and compaction, generally in accordance with SANS 1200 LC and SANS 1200 DA. Differing soil-type classifications shall be as specified in the bills of quantities, or Detailed Specification.

The Contractor shall allow for all necessary removal of vegetation, roots and tree branches, hazard protection, drainage, including pumping, watching, lighting, barriers, disposal of spoil and vegetation, supply of fill, levelling of subsidence and 10mm thick temporary steel plates to allow vehicles of 3 tonnes maximum axle load and pedestrians to pass over excavations where these cross
other requirements at or near public roads, bridges, buildings and other structures.

No excavations shall be backfilled until the Engineer has the

opportunity to inspect cables and has given permission to backfill.

The floor of the trench shall be free of stones and sharp projections. A 75mm layer of –6 fines sifted soil or no-sharps sand shall be applied (bedding), onto which the cables shall be laid. A further layer of the same material shall be laid to a depth of at least 75mm above the top of the cable(s).

Dampened soil free from fibrous matter, rocks and large stones shall be backfilled on top of the cable(s) (or cable sleeve(s)), as follows:-

Two 150mm hand-rammed layers to 93 % AASHO compaction

Thereafter, well compacted power-rammed layers of not more than 150mm, to 93 % AASHO compaction.

The backfill shall be raised by approximately 50mm above the normal surface level to allow for settlement. Such raised surfaces shall be periodically levelled, as necessary, and finally levelled not less than 90 days after backfilling. Grassed surfaces shall be made good. Others will make good paved or concrete surfaces etc.

Cable trenches may be hand or machine excavated and shall be of such a width as to afford a minimum of 150mm clearance between the cable(s) and the trench walls. Excavation within 600mm of other services shall only be done by hand.

Unsuitable soil and filthy material encountered during the execution of the Works shall not be deposited on the surface of any road or footpath, but shall immediately be carted away to a dumping site.

The Contractor shall take all necessary steps to avoid the pollution of streams, drainage systems etc. by excavated soil and its dust.

Where required, concrete protective cable tiles shall be installed 300mm over the tops of cables. These shall cover the full width of the layer of cables within the trench. Concrete cable protective tiles shall be of the interlocking type approximately 900mm long by 150mm wide with a suitable inscription on the supper side such such as “Danger Electric Cables” or similar.

Where unsleeved cables cross other services, they shall be taken at least 500mm under such service. Interlocking concrete cable tiles shall be laid 300mm above the cables and shall extend 900mm each side of the crossing point.

Cable Markers and Tape

Cable markers shall be provided for all underground cable routes. Such markers shall be provided at each point of entry to any building, at either side of any road to rail crossing, at any change of

direction of the cable, at intervals not exceeding 30m along any straight runs and over cable joints. Cable markers shall be made of concrete and cast in the form of a truncated pyramid, approximately 250mm high, 100mm square at the top and 150mm square at the base. The markers shall be provided with brass plates complete with direction arrows and suitably inscribed.

Yellow 0,1mm thick cable marker tape with the words “Danger Electric Cable” printed continuously and depicting a skull and cross-bones, shall be laid at a depth of 300mm below the finished surface level and immediately above all cables and sleeve pipes. Should a roadway or paved area base layer exceed 300mm, the tape shall be laid immediately below the base.

Cable Sleeves

Cables sleeves shall be provided wherever required or indicated on drawings and also for all cables entering or leaving any building, crossing a road or other services. Such sleeves shall be supplied and installed by the Contractor unless otherwise required. In all cases the Contractor shall ensure that all sleeves are installed in good time, in correct positions, and in the proper manner.

Where no details are given, the sleeves shall be of generous size and made of substantial material, which may be galvanised steel, ceramic, pitch fibre, high impact uPVC, corrugated high-density polyethylene (HDPE), etc., capable of withstanding any stresses to which they may be submitted, e.g. road compacting. Care shall be taken to ensure the easy passage of cable through the sleeves by providing large radius bends where necessary.

NB: For health reasons, the use of pipes containing asbestos is strictly forbidden.

The ends of all sleeves shall be sealed with non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

Earthworks by Others

Where trenches, sleeves etc. are provided by another contractor e.g., civils, the Contractor shall liaise and co-ordinate with such other party regarding general advices, sleeve positions, radii etc. Moreover, the Contractor shall stand by and ensure correct backfilling and the positioning of marker tape.

Cable Identification

A non-corrosive strap with the cable number, or circuit number, stamped or embossed upon it shall be provided at each end of the cable (and at joints, in cases where these are permitted).

Bus-Bar Feeders

General
Bus-bar feeder systems shall comply with SABS 1195 or shall be authorised by SABS, and shall consist of metalclad copper bus-bars for voltages not greater than 1000V.

Bus-bar feeder systems shall be used for the following:

Indoor and outdoor connections from transformer LV terminals to main LV switchboards
Horizontal indoor power distribution to workshop and factory machinery etc
Indoor lateral and vertical-riser feeders for distribution boards and MCCs

All bends, accessories, take-off units, bus-bar sections/modules and so forth shall be a standard or pre-engineered component by the bus-bar trunking manufacturer; no site fabricated items will be allowed without the express permission of the Engineer in writing.

Construction Details

Enclosures

Bus-bar systems for indoor use shall be enclosed in hot-dipped or pre-galvanised sheet metal casings finished in epoxy coating similarly to distribution boards. (See clause 12.4.1 (h)). Alternatively, the casing shall be of extruded aluminium. The bus-bar trunking shall be vermin proof, adequately ventilated and protected to IP30.

ii) Outdoor, non-ventilated casings shall be constructed from 3CR12 corrosion resistant steel, finished as for indoor trunking, or alternatively, shall be of extruded aluminium, and protected to IP54 or better.

iii) In all instances, metal enclosures shall be of adequate gauge and strength to withstand rough usage and the mechanical stresses of prospective fault conditions.

iv) The casings shall be provided with heavy duty fixing lugs or similar suitable for M10 bolts or studding supports.

v) Sections of bus-bar trunking shall be joined in an approved manner maintaining mechanical strength and protection levels.

Bus-Bars:

Bus-bars shall be of high conductivity 99,9% pure copper of adequate section for the maximum current and short-circuit rating. Unless otherwise specified, the bars shall be mounted edge-wise (long side vertical).

The bars shall be supported in the casing by substantial high dielectric, non-tracking, and non-hygroscopic members at sufficient intervals to allow for mechanical stresses due to prospective fault conditions.

Joints in bus-bars shall overlap by a minimum length equal to twice the bar width. Contact surfaces shall be tinned using non-acid based flux, and bolted together with high-tensile cadmium plated bolts, nuts and spring washers.

As well as sizing for current rating, the bars shall be sized to accommodate the prospective fault level rating in accordance with clause 12.4.1 e), whichever size is the higher.

Where installed, neutral bars shall be the same cross section as phase bars.

An earthbar shall be installed along the entire length of the bus-bar trunking and shall be sized in accordance with IEC 439.

Bends

Horizontal (flat) bends in the trunking system shall house bus-bars bent at the correct angle with the supports and casings made to suit, while vertical internal or external bends shall have the bars bolted together at the correct angle. Alternatively, bus-bar bends may be of the flexible laminated type.

Take-Off and Feeder Points

Take-off points shall be pre-engineered and located to specific requirements by the bus-bar trunking manufacturer in the case of power feeders for distribution boards in risers etc, or shall comprise shrouded plug-in arrangements at regular intervals for machine shops etc.

The take-off unit shall consist of a suitably rated MCCB with contacts to satisfy the requirements for a switch-disconnector, housed in a sheet steel or polycarbonate enclosure arranged for bolting directly to the bus-bar trunking in the case of tap-off type units, or permanently fixed in the case of pre-engineered take-offs.

iii) Feeder end boxes shall be suitable for terminating feeder cables or feeder bus-bars, as applicable.

Expansion Joints

Expansion joints to allow for thermal expansion and contraction for a temperature range of between 0°C and 90°C in the bus-bars and 0°C and 45°C in the enclosure shall be provided at intervals per manufacturer's recommendation, but in any event, not exceeding every 10 metres. The full rating of all current carrying parts shall be maintained through the joint as well as casing integrity and level of protection.

Fire Barriers

Fire compartmentation shall be maintained at wall and floor penetrations of bus-bar trunking by the use of 4-hour rated fire barriers installed centre with the applicable partition wall or floor slab. The Contractor shall ensure that the main contractor is timeously informed of the need to make good around such penetrations; this information shall be put in writing with a copy to the Engineer.

Installation and Testing

Installation

Bus-bar trunking shall be fixed directly to walls or other structural members or shall be suspended on galvanised studding, supported on channels, angle iron etc as dictated by installation conditions and requirements, and as may be specified in the Detailed Specification or drawings.

Testing

Completed bus-bar systems shall be subjected to a test voltage of 2,5kV rms for one minute in accordance with SANS 1195.

Fabrication Drawings

Where it is necessary to have bus-bar trunking prefabricated prior to delivery to Site, the Contractor shall liaise with all relevant parties to have fabrication drawings prepared (usually by the bus-bar trunking manufacturer), viz.: transformer supplier, main and sub-main LV board supplier, etc as the case may be.

The Contractor shall check all drawing details, including on-site dimensions, coordination with other services etc, rectify where necessary and submit to the Engineer for approval. The Engineer will approve the general layout of the system only. The Contractor shall be fully responsible for the correctness of all dimensions etc.

Tubular Conduit Wireways

Types and Applications

Screwed Conduit

Heavy gauge screwed welded (HGSW) steel conduit and associated fittings shall be to SANS 1065-1 and shall be black enamelled or hot-dipped galvanised as specified. No conduit of less than 20mm diameter shall be used.

HGSW conduit shall be used for all general applications run either surface on walls, ceilings, on machinery etc, or else installed flush in walls, cast into concrete slabs etc.

Plain End Conduit

Plain end (non-screwed) steel conduit shall be to SANS 1065-1 with a minimum wall thickness of 0,9mm. Only hot-dipped galvanised conduit of 20mm diameter minimum size will be permitted.

Plain end conduit shall be used for all general applications, except heavy industrial environments or flameproof installations, run surface on walls and ceilings, or else installed flush in walls, cast into concrete slabs etc.

Non-Metallic Conduit

Plastic conduit shall be to SANS 950. No conduit smaller than 20mm diameter shall be used.

Plastic conduit shall be used for general applications, except any industrial or flameproof installation or any surface installation on walls, machinery etc. Non-metallic conduit shall be run surface only on ceilings or in ceiling voids, chased into walls, cast into concrete slabs etc.

Flexible Conduit

Flexible conduit shall be of the orange PVC covered spiral metal type, as Kopex, Adaptaflex or equal, with an internal diameter of at least 15mm. Flexible conduit connectors shall be of the gland or screw-in type manufactured from either brass or mild steel plated with zinc or cadmium.

Flexible conduit shall be used to form the final connection to equipment that has to be moved frequently to enable adjustments to be made, for the connection of motors or any other vibrating equipment, for the connection of thermostats and sensors on equipment, for stove and similar appliance connections etc.

General Installation Details

Insofar as relevant conduit types apply as per clause 12.7.1, the following general installation details shall apply:

No manufactured bends less than 32mm diameter or any inspection elbows or tees are to be used.

Open ends of conduits for future extensions and conduit and accessory boxes shall, during the building process, be temporarily plugged to prevent the ingress of moisture, rubble etc.

Where conduit crosses an expansion joint in a building or structure, the following method shall be used:

An adaptable box shall be installed at a suitable position within 2m or the expansion joint and a draw box and a conduit sleeve one size larger than the circuit conduit shall be installed from the draw box to the edge of the expansion joint on the draw box side

The circuit conduit shall pass across the joint and through the sleeve and project 30-35mm inside the box where the end shall be bushed

For metallic conduits, an earth clip shall be secured to the circuit conduit end in the draw box and this shall be bonded to the box with a minimum 2,5mm² jumper

In addition, for metallic conduits, an earth wire shall be installed between the fitting outlet boxes either side of the expansion joint

Adjacent multiple runs of conduits which are to cross expansion joints should preferably be taken via one large adaptable box, across the expansion joint, into a second large adaptable/draw box.

All accessory boxes for switches and socket outlets etc shall be made of pressed galvanised steel and are to be provided with earth studs.

No portion of the conduit installation may be installed closer than 150mm to any other service, including gas, water etc. No wireway carrying mains voltage cables shall be installed closer than 150mm to any communications/data wireway or cable etc, except in the case of multi-service power skirting or similar.

'Unwired' conduits for other services shall be provided with rustless steel draw wires.

Where necessary, draw boxes shall be installed to facilitate the easy drawing-in of wiring and/or to avoid pulling wires through more than two right angled bends or the aggregate thereof. Adjacent multiple runs of conduit, which requires draw boxes should preferably be taken via one large draw-box. Where possible, draw boxes are to be installed at inconspicuous positions away from general view.

20% spare conduits, subject to a minimum of two, shall be installed from wall mounting distribution boards into the ceiling void for possible future additions. A coupling with a temporary plug shall be fitted to the ends of spare conduits.

Flush Conduit Installations

Insofar as the relevant conduit types apply as per clause 12.7.1, the following installation details shall apply to flush conduit installations:

Where conduits are chased into brick walls or similar they shall be adequately secured with crampets or other approved devices driven into the wall fabric and shall further be secured at strategic points by mortar. The clearance between the finished wall surface and the conduit shall be not less than 12mm. Only power tool chasing machines shall be used for making chases. (E.g.: angle grinders).

Accessory boxes shall be fixed square and mortared in. Concrete surfaces, columns and face brick surfaces shall not be chased without the written permission of the Engineer in each case.

The building contractor will make good all normal chasing and cutting away except that the Contractor shall be held responsible for the cost of work done by the building contractor due to faulty setting out, redundant chases or late installation of conduits and accessories.

Conduits installed within concrete slabs, beams, columns or walls shall be firmly fixed in position before the concrete is cast. Adequate fixings and/or spacer blocks shall be employed to prevent conduits 'creeping' to the surface. Conduit must not be fixed longitudinally together with reinforcement rods.

The general disposition of conduits within the slabs shall be agreed upon before installation between the Engineer, structural engineer and the Contractor. Furthermore, where such conduits occur in large concentrations, or where large diameter conduits (32mm dia. or larger) are installed, the Contractor shall obtain the approval of the Engineer for the positioning of such conduits. Generally, however, conduits shall be installed in the middle or neutral axis of the slab thickness and extension boxes or extension rings shall be provided for as necessary.

Where conduit runs occur in groups or in large concentrations (e.g. near distribution boards, draw-boxes or in similar situations), they shall be fixed with a clearance between adjacent conduits of not less than one conduit diameter to permit adequate penetration of concrete.

Conduit may be installed in surface beds provided that the conduits are clear of contact with ground and are completely encased in mass concrete.

Conduits may only be installed directly into floor screeds where a cover of at least 40mm can be affected. For clearances of 20-40mm, "chicken wire" shall be used as a cover over the conduit to act as a screed binder. For clearance less than 20mm, the conduit may be chased into the slab, provided the written permission of the Engineer is obtained in each case.

Conduit crossings in screed shall be avoided as far as possible. Where this is unavoidable, one conduit may be set under the other one and chased into the slab, provided the written permission of the Engineer is obtained in each case.

Conduits shall be firmly fixed to slabs intended to receive screed by means of half saddles or similar.

Conduit boxes, draw-boxes etc. installed on shuttering decks or wall shutters shall be suitably sealed against the ingress of moisture and vibrated concrete with dampened paper rammed in them, and shall be securely fixed to the shuttering by means of lashing with galvanized steel wire (except in the case of off-shutter ceilings) or else by temporarily fixing the box to the shuttering by screws through the shuttering into the fixing lugs of the box. It is of the utmost importance that fixing screws or lashings be released immediately the concrete has been allowed to set and before the shuttering is struck.

Where fibreglass or other pre-formed plastic shuttering is used by the builder, equipment shall be fixed to the reinforcement steel only and the equipment/box shall be arranged to press firmly against the shuttering. No holes shall be made in the shuttering.

The Contractor shall stand by when concrete is being poured in order to rectify any defects that may occur such as loose boxes or displaced upright conduits (See also item 11.3).

All conduit boxes and accessory boxes shall be finished flush with the finished plaster work and the Contractor shall co-operate with the building contractor to this end. Where necessary, extension plates or rings shall be fitted to meet this requirement.

Surface Conduit Installations

Insofar as the relevant conduit types apply as per clause 12.7.1, the following details shall apply to surface conduit installations:

Conduit run surface on walls, floors, ceilings, or in accessible ceiling voids, etc. shall be installed in a neat manner running generally with the building lines. The conduits shall be vertically plumb and horizontally level as applicable.

Bends in multiple runs of conduit shall have following bends. Other right angle bends shall be standard machine made. In all instances the installation shall present a neat and workmanlike appearance.

Evenly spaced spacer bar saddles shall effect fixing of tubing. Light gauge saddles may be used for general internal installation while heavy base saddles are to be used for external installations and industrial applications.

Galvanized conduit shall be used for all surface installations, as follows: -

In damp or external areas
Within 50 km of the coast
In kitchens, laundries and boiler rooms
Where exposed to humidity, such as plenum chambers
In buildings where animals are housed, e.g.: kennels, cattle/sheep pens etc.

Unless otherwise specified, all surface mounted metallic conduits and accessories shall be painted after installation. Conduits shall be cleaned, degreased and de-rusted and finished with 2-coats of brush-applied enamel paint. Galvanised steel shall be bristle-scrubbed with solvent detergent complying with SABS 1344 and rinsed with clean water to achieve a water-break free surface prior to painting.

For industrial installations, the following colours shall be used:

SERVICE	COLOUR	SANS 1091 REF.
Electrical	Light Orange	B26
Instrumentation	Light Blue	
Fire Alarms	Red	A11
Communications and Data	White	G80

For non-industrial installations, the colours shall be specified in the Detailed Specification.

Steel Conduit

Insofar as the relevant conduit types apply as per clause 12.7.1, the following installation details shall apply to steel conduit installations;

HGSW conduit shall be cut square and clean before threading. Threads shall be made using suitable conduit thread dies and the liberal application of cutting grease or similar. The length of thread shall be such as to permit conduits to be firmly butted together in couplings and hard against the shoulders of threaded conduit box spouts. The ends of all cut lengths of conduit shall be reamered free from burrs and any loose swarf shall be removed from inside the conduit. Running joints in conduit shall be securely locked with a conduit lock nut.

Terminations into non-threaded equipment and accessories shall be mechanically secure and electrically continuous. Terminations may be threaded and locknutted on both sides of the termination point together with a brass female bush. Alternatively terminations shall be made with couplings and brass male bushes. All mating faces are to be thoroughly cleaned of paint, couplings being filed flat and free from unevenness at the mating face. All conduits shall be earth bonded at distribution boards using copper tape and wire.

Exposed threads of screwed conduit and damaged paint or galvanised surfaces shall be painted with red-lead or zinc rich paint to prevent rust.

Couplings and box entries of plain-ended conduit in cast-in situations shall be taped up with adhesive PVC tape to prevent the ingress of moisture or vibrated concrete.

All bends and sets shall be undertaken using bending apparatus suited for the purpose. Plain-end conduit bends shall be made with benders recommended by the conduit manufacturer.

Any damaged conduit resulting from incorrect bending methods shall be completely removed and replaced, including any wiring installed, all at the Contractor's expense.

Mechanical and electrical continuity shall be maintained throughout all steel conduit installations.

Only HGSW conduit shall be used for ;-

Flameproof installations
Load-bearing situations
Suspension pendants
Damp or exterior surface areas

Non-metallic Conduit

The following installation details shall apply to non-metallic conduit as outlined in 12.7.1

Unless otherwise specified, only steel accessory boxes shall be used in conjunction with plastic conduit installations.

Hand bending, using a bending spring, may be used for conduits up to and including 25mm diameter. Above this size, the appropriate manufactured bend/accessory must be used.

Tubing is to be out square and clean using a fire-toothed hacksaw, and all burrs and loose material removed. The correct adhesive is to be used on clean and dry surfaces with all excess adhesive being wiped off after fitting together.

Plastic conduit and accessories are not to be used for mechanical load-bearing, luminaires support etc, nor are they to be used where they could be subject to temperatures below -10°C or above 70°C.

Flexible Conduit

The following installation details shall apply to flexible conduit as outlined in 12.7.1 d):-

In installations where the equipment has to be moved frequently to enable adjustment during normal operation, for the connection of motors or any other vibrating equipment, for the connection of thermostats and sensors on equipment, for stove connections and where otherwise required by the Engineer, flexible conduit shall be used for the final connection to the equipment.

Flexible conduit shall preferably be connected to the final connection point from a local draw-box. The flexible conduit may be connected directly to the end of a conduit if an existing draw-box is available within 2m of the junction and if the flexible conduit can easily be rewired.

Flexible conduit shall be metal-reinforced plastic conduit (Kopex, Adaptaflex or equal) orange PVC-covered spiral metal conduit with an internal diameter of at least 15mm, unless approved to the contrary.

Connectors for coupling to the flexible conduit shall be of the gland or screw-in type, manufactured of either brass or mild steel plated with either zinc or cadmium.

Trunking Wireways

Scope

This section describes the following types of wiring trunking:-

Standard wiring trunking
Lighting channel
Power skirting, dado and bench-top trunking
Underfloor trunking

Standard Wiring Trunking

Wiring trunking and accessories shall be fabricated from folded or cold-rolled sheet steel. The trunking manufacturer shall supply all bends,
tees, stop-ends etc. No accessory shall be made up where a manufactured accessory is available.

Any made up accessories shall be neatly fabricated and shall be brazed or strongly pop-rivetted at joining edges.

Accessories and sections of trunking shall be coupled with coupling pieces and earth bonded together with copper bonding links. In addition, the links shall be bonded to the trunking main earth or largest circuit earth wire with a jumper of at least 2,5mm².

The maximum number of circuit and earth wires that may be installed into any trunking shall be such that the total overall cross-sectional area of the wiring including the insulation does not exceed 45% of the free area of the trunking.

With the exception of underfloor trunking and loosely filled “opening-up” trunking, wiring retainers shall be installed every metre of run and at other positions as required.

The trunking shall be installed in a neat and workmanlike manner on ceilings, walls, plant machinery etc., as indicated in the drawings.

All standard trunking used in industrial applications shall be finished in the colour code appropriate to the service (refer to 12.7.4 (e)).

Where channel passes through a “fire-wall” the channel lid shall be cut 100mm either side of the penetration and the wall entry around the channel shall be sealed by the building contractor. The Contractor shall supply and install suitable fire-barriers inside the channel. These shall consist of intumescent or other approved fire resistant material, as supplied by PH Protection Plaster Systems (Pty) Ltd of Johannesburg, Pyro-Cote cc of Durban, or equal and approved and installed in accordance with the supplier’s recommendations.

Lighting Channel

General

Lighting channel and accessories shall be “Cabstrut” or equal and approved, and shall be manufactured from cold-rolled steel sheet and galvanized. For industrial installations and elsewhere as specified the channel shall be epoxy coated light orange (colour ref. B26 according to SANS 1091).

Unless otherwise required the dimensions of the channel shall be 41,3mm x 41,3mm.

Lighting fittings or pendant drop conduits shall be fixed directly to “opening-down” channel using special connecting nipples as supplied by the channel manufacturer. Alternatively, fittings may be fixed to the solid underside of channel installed “opening-up” using bushed entries and screws, nuts and washers. Self-tapping screws shall not be used.

Conduit connections to wiring channels shall be terminated directly into the channel using a screwed and

bushed entry. Alternatively, where channels are fixed surface directly to a soffit, entry may be effected from a flush conduit box through a bushed hole in the back of the channel.

Surface Installations

Self supporting lighting channel shall be manufactured from cold-rolled steel of thickness at least 2,5mm, and shall be fixed in such a manner that the maximum deflection recommended by the channel manufacturer is not exceeded with all wiring and fittings installed.

Fixings shall be by stirrups supported from structural members via threaded steel rod of at least 10mm diameter, or 20mm diameter conduit. Alternative or additional supports shall be effected by girder clamps etc. Cartridge pin fixings shall not be permitted without the prior written approval of the Engineer.

Where required, channel installed directly to a soffit shall be fixed at intervals not exceeding 1m subject to a minimum of two substantial fixings to every accessory or section of channel. Channel fixed in this fashion may be not less than 1,6mm thick.

Clip-in lidding of plastic or of zinc-coated metal, as specified, shall be installed over all faces of the channel left open after the installation of fittings etc.

Flush Installation

Lighting channel installed flush, either in or forming an integral part of a suspended ceiling shall be manufactured from minimum cold-rolled or folded sheet steel of thickness not less than 1,6mm.

Where the channel is cast into concrete, fastening straps shall be provided every 600mm as supplied by the manufacturer of the channel. The channel shall be firmly fixed to the shuttering by galvanized steel wire lashing or by screws fixed through the concrete insert lugs. The channel shall be suitably sealed against the ingress of vibrated concrete by the use of dampened paper or expanded polystyrene inserts.

Where the ceiling finish is “off-shutter”, narrow clip-in plastic or metal lid shall be used. This shall be grey for non-painted ceilings and white for painted ceilings. Wire lashings may not be used for fixing channels to shuttering in “off-shutter” areas.

Where plaster finish is to be applied, the plaster shall be taken up to the edges of the channel. Overlapping metal lidding finished white shall be used, fixed over the opening by means of special extension screws into fixing nuts installed in the channel.

For suspended-ceiling lighting channels, the channels will be supplied and installed by the ceiling erector, unless otherwise specified.
White plastic clip-in lidding shall be used for all suspended-ceiling lighting channels. The Contractor shall supply and fit the lidding unless otherwise specified.

In the case of mullion partitioning the mullion may be utilized as a wiring channel where specified. For other types of partitioning, conduit switch-drops shall be used. Any entry into the lighting channel shall be suitably bushed to obviate abrasion of wiring.

Power Skirting and Dado Height Trunking

a) General

Power skirting and dado height trunking shall, unless otherwise specified, be formed from folded and welded pre-galvanized sheet steel of thickness not less than 1,2mm, to form two or three equal compartments designed for power services, socket outlets etc., (upper compartment) and communications/data services (lower compartment(s)). The power skirting shall be finished in baked enamel of colour(s) as stated in the Detailed Specification. The paintwork shall be in accordance with 12.4.1 (h) with due account being taken of the pre-galvanizing. The trunking shall be 150-225mm high x 50-55mm deep with fixed partitions to divide it into two or three compartments. The compartments shall each be provided with separate removable covers.

Where a building module is applicable, the power compartment shall have provision for 16 A switched socket outlets at the module interval, or where the module interval exceeds 2m, twice every module interval. Socket outlet positions shall be centred between the window mullion or column modules. At the mullion or column position, a permanently fixed 250mm wide cover shall be provided across all compartments to permit the erection of partitions etc., without interfering with accessibility into the power skirting.

Socket outlets shall be 16 A 3-pin and shall be attached to a fixing grid or mounting bracket in the trunking body. The cover shall be pre-punched to accept the socket outlet and shall be fixed both to the trunking body and socket outlet fixing grid. Wiring terminals shall be of the recessed type, or alternatively fitted with an insulated cover, to prevent accidental contact with bare earth wiring that may be installed or disturbed while adjacent circuits are alive.

Where the trunking is a non-modular type, the punched socket outlet cover shall normally be 250mm long. Where it is of the modular type, the power section cover between the over-lapping covers shall be in one piece. Irrespective of whether socket outlets are indicated or not, full facilities including blanked off pre-punched covers shall be provided at the spacings specified herein.

Unless otherwise required, provisions for telephone and data outlets shall comprise a blank plate, or plates, mounted in line with socket outlets.

b) Installation

Power skirting shall, unless otherwise required, be installed surface against the wall at finished floor level. Where vinyl tiles or other fixed finish is to be laid, the power skirting shall be laid on top of the tiles. Where carpeting is specified, the power skirting shall be installed onto the screed before the installation of carpets.

Dado trunking shall be installed surface on the wall at 900mm above finished floor level (to underside), or as otherwise specified.

Fixings, suitable for the particular application, shall be provided at intervals not exceeding 1m. Subject to a minimum of two substantial fixings to each accessory or section of trunking.

Conduit entry into power skirting installed along brick or concrete walling shall be effected via a bushed entry from a conduit box or standard 100mm x 50mm switch box mounted in the wall behind the respective compartment.

Conduit entry into power skirting installed along sheet metal curtain walling or similar shall be effected via a bushed entry from a conduit box, or similar, mounted in the floor under the power skirting. Wiring to the upper compartment(s) shall pass through a short conduit link within the lower communication(s) compartment(s). The conduit links shall be installed towards the back of the lower compartment(s) to afford adequate space for wiring to pass.

The trunking main earth wire immediately adjacent to the socket outlet positions including the socket outlet earth jumper shall be suitably sleeved at the tee-off to prevent accidental contact with live terminals.

All covers shall be adequately bonded to earth either through the fixing screws or a separate earth wire jumper fixed to an earthing stud brazed, at the manufacturer's works, to the lid. Where necessary, power skirting covers shall be specially ordered to include earthing studs.

c) Bench-Top Trunking

Where called for, bench-top socket outlet trunking shall be installed along bench tops etc, in workshops and laboratories. The general construction, socket outlet mounting and installation procedure shall be similar to power skirting or dado trunking. Details of compartments, sizes etc, shall be as detailed in the drawings or specified in the Detailed Specification.

Underfloor Trunking

a) General

Several types of underfloor trunking are available and in the main, the choice depends upon certain structural restraints as floor type, screed thickness etc. Therefore the exact type to be used will be specified in the Detailed Specification or drawings.

Unless otherwise specified, the trunking shall be manufactured from pre-galvanized folded sheet steel and shall be single, double or triple compartment as specified.

Pre-formed outlets, suitably blanked off, shall be provided at intervals to suit the particular application.

Flush floor level junction boxes shall have a removable trafficable cover and shall be designed to accept a portion of the floor tile, carpet or similar. The Contractor must liaise with the Main Contractor to determine the thickness of the floor finish.

Multi-channel junction boxes shall be so designed that the compartmentalisation is continued through these accessories.

Socket outlets, telephone outlets and data outlets shall be provided where required in surface floor level pedestals or recessed floor boxes as specified. Suitable barriers shall be included to segregate different classes of services.

b) Installation

Trunking designed to be fully built into the screed shall be fixed to the slab surface by suitable straps or clips. A topping of at least 50mm of screed cover the trunking shall be applied. Where a cover of less than 50mm, but exceeding 25mm occurs, expanded metal shall be applied over the trunking to act as a screed binder. Where less than 25mm of screed topping occurs, the trunking shall be installed into the concrete slab to achieve at least the minimum cover. The written permission of the Engineer shall be obtained in each case.

Trunking designed to be set flush with the screed surface shall be installed straight and level on mortar bedding on the slab. The trunking shall be slightly dove-tailed in section or shall have other suitable means to ensure that the trunking will remain firmly fixed into the screed.

The Contractor shall obtain the screed finish datum line from the building contractor for levelling trunking and junction boxes.

General Wiring

General Applications

For general applications, 600/1000 V PVC insulated single core stranded copper conductors shall be used. In situations where high ambient temperatures are likely to be encountered, such as the enclosures of certain types on incandescent lighting fittings, ceiling voids of metal roofed buildings, etc., silicon or butyl insulated single core stranded conductor cables shall be used. All wiring cables shall bear the appropriate SABS or SANS mark and shall be delivered to Site with seals intact.

No cable of size smaller than 2,5mm² shall be used. The current carrying capacity of wiring shall comply with the requirements of SANS 10142-1:2003, particular regard being given to volt drop limitation and to derating due to bunching of cables and ambient temperatures.

Installation

Wiring within conduit shall be by means of the looping-in system. Joints will only be permitted in special circumstances and where accessible, subject to the approval of the Engineer in writing. Wires shall not be allowed to become twisted or tangled within the conduit when drawing in, and lubricating agents shall not be used.

Where earth conductors are looped between terminals of equipment, the conductor shall either remain unbroken in the terminal, or shall be twisted together and ferruled or soldered to ensure that earth continuity is maintained when the conductors are removed from the terminal(s).

Unless otherwise indicated in the drawings, no more than one circuit shall be run in one conduit.

Vertical runs of wiring shall be provided with a suitable stress relieving arrangement at intervals not exceeding 15m.

Within wiring trunkings, each separate circuit of wiring shall be neatly strapped or laced together and shall be so disposed as to afford easy removal. Adhesive insulating tape or similar shall not be used for binding of circuit wires.

Wire Markers

All wires in industrial installations, and where otherwise specified, are to be provided with closed-sleeve markers at each feeder termination point, including each leg of looped wires. The markers shall indicate the relevant distribution board and circuit number, e.g.: “DB-AP/P9” etc.

General Earthing

General

The installation shall be effectively earthed in accordance with the requirements of SANS 10142-1:2003 and the local supply authority. All metallic hot and cold water pipes and waste pipes shall be bonded with copper tape clamped by means of a brass bolt and nut and earthed. Metal roofs, gutters, and downpipes shall be bonded together and earthed.

Earth Continuity Conductors

Separate bare copper earth continuity conductors shall be run with all multi-core cables (where no earth core is incorporated), and green/yellow PVC insulated earth conductors, or bare earthwires, as specified, shall be installed with all mains circuits, sub-circuits and final circuits wired with PVC insulated conductors in conduit or trunking wireways.

Only one earth conductor is required per group of conductors run in one wireway provided that such earth conductor is not less than half the cross sectional area of the largest conductor in the group (subject to a minimum are of 2,5mm²), and provided the earthing complies with the requirements of SANS 10142-1:2003. Teed off connections shall be undertaken using crimped tee-ferrules, or shall be soldered. Under no circumstances shall the common earth be broken.

Where practicable, common earth continuity conductors shall be run as a “ring main”.
Luminaires

General

Luminaires shall, unless otherwise specified, be supplied by the Contractor in accordance with the Detailed Specification and / or luminaire schedule as applicable. All luminaires shall bear the SABS “S” safety mark and, where applicable, the SABS “A” approved performance mark also.

All luminaires shall be fitted with the appropriate lamps.

Unless otherwise specified, fluorescent lamps shall be “cool white”, colour temperature 4300°K with a minimum colour rendering index (Ra) of 64.

Dichroic lamps shall be of the sealed type. Open reflectors will not be permitted.

Unless otherwise agreed in writing by the Engineer, only the following makes of lamps will be permitted:-

Osram
Sylvania
Philips
GEC

Linear tubular fluorescent lamps shall have bi-pin end cap arrangements. The lamp holders shall be of the telescopic or spring-mounted type.

Lenses

Prismatic, opal and clear lenses shall be manufactured from UV stabilised high-impact acrylic material for general luminaires.

Where specified, luminaires, floodlights and lanterns shall be fitted with clear glass or clear tempered glass lenses as required.

All tungsten halogen fittings shall be complete with glass lenses.

Streetlight and area lighting post-top lanterns shall be in accordance with the Detailed Specification and/or drawings.

Lantern ballasts shall have tappings for 95% and 100% of the nominal voltage, unless otherwise specified.

For ease of maintenance, luminaires and lamps in the following classes shall be from one single manufacturer / supplier per class;

Fluorescent luminaires and general incandescent fittings.

Indoor decorative / display luminaires (downlighters, decorative spotlights etc.)

Outdoor lanterns, bollards and floodlights

Industrial high-bay luminaires

Operating theatre fittings
Medical examination lamps
Dark Room lights
Other specialised luminaires as specified (E.g.: stage lighting etc.).

Installation of Luminaires

General

Where possible, all luminaire outlets shall terminate in standard round boxes to which the fitting shall be fixed in addition to other fixings that may be required. Where conduit is run in roof spaces, or where conduits are cast into screeds and not directly into the slab, back-entry conduit boxes are to be used which shall be so installed as to be flush with the finished ceiling.

Mounting

Fluorescent fittings shall be fixed to one conduit box in the centre with two further independent fixings either side, one sixth of the fitting length from each end of the fitting. Fittings of 300mm or wider shall be fixed with two pairs of fixings.

Where fluorescent fittings are fixed in continuous rows, wiring may be carried out from one outlet and then wired through the channels of the fittings. The entry from one channel to another shall be suitable bushed and the internal wiring shall be clipped to the insides of the channels.

Corrosion proof and explosion proof type fluorescent luminaires shall be fixed using external stirrups or brackets. The wiring entry must be made via the gland entry arrangement using suitable multicore wiring (e.g. “Cabtyre”, PVC/PVC etc.) routed from an adjacent conduit box or Pratley type box, as appropriate. Under no circumstances shall the body of the fitting be pierced for any reason whatsoever.

In surface installations to incandescent bulkhead type fittings, the conduit shall not enter the fitting directly but shall terminate in an adjacent conduit box; one outgoing way of the conduit box being terminated in the fitting. A fixed porcelain or plastic terminal block within the conduit box and heat resisting wire, (e.g. silicon insulated), shall form the final connection to the fitting. Alternatively, the whole circuit wiring shall be heat resistant (See clause 12.9 1(a)).

Where luminaires are mounted onto conduit boxes in external or potentially damp situations, a suitable neoprene gasket seal or other approved means shall be used at the junction of the fitting and the conduit box.

The mounting positions of the luminaires shall be verified on Site with the Engineer before installation commences. Fittings will normally be mounted in an even or symmetrical pattern in relation to the particular area having due consideration for architectural features, beams, ceiling tiles, etc.

Where fluorescent fittings are specified to be suspended on pendants the Contractor shall provide at least two pendants for each fitting, such pendants consisting of 20mm diameter conduit finished in white enamel for commercial and domestic installations and electrical standard light orange for industrial installations.

The wiring to the fitting shall be taken through one of these pendants. The pendants shall be secured to the outlet box or fixing surface by means of domelids. Where the length of the pendants exceeds 0,6m. Domelids shall be of the swivel type. The domelids shall be painted to match the pendants.

Luminaires shall not be mounted directly to ceiling boards and suitable wooden inserts are to be supplied and installed by the Contractor for this purpose. Alternatively, fixings may be made into brandering where convenient.

Heavy industrial high-bay luminaires, floodlights etc, shall be fixed to substantial steel brackets or “Cabstrut” type channel or as indicated in the drawings or Detailed Specification.

Where specified, luminaires shall be fed via a 5 Amp socket outlet mounted close to the fitting. The Contractor is advised to procure luminaires with suitable 3-core flexible cords with rubber clad plug-tops attached, as necessary.

c) Mounting Facilities

Where no facilities exist for supporting fittings, the Contractor shall supply and install brackets, hangers, angle irons, wooden battens inside ceiling space or other means as approved by the Engineer.

d) Fixings

Fixings direct to conduit boxes shall consist of cadmium plated or sheradised steel screws screwed into the conduit box fixing lugs. Extra independent fixings into concrete or brick shall consist of suitable fibre or plastic fixing plugs and steel or brass wood screws. Wooden fixing plugs shall not be used. Fixings for fittings over 10kg in mass shall be of the self-drill anchor or expanding bolt-type. Fixings into hollow blocks etc, shall consist of steel screws secured into the hollow cavity with a spring-loaded toggle-nut or other approved cavity fixing device.

Cartridge pin fixings shall not be used unless the prior approval of the Engineer is obtained in writing.

Refer also to clause 12.17 (Fixings and supports).

Poles and Masts

Street lighting and area-lighting poles and masts shall be supplied in accordance with the Detailed Specification and/or drawings.

All poles, masts, outreach arms etc. shall comply fully with all relevant SANS Specifications and Codes of Practice and shall be manufactured from:

Galvanised Steel
Self-Coloured fibre-glass
Aluminium,

As detailed.

Poles and masts shall be suitable for fixing to a concrete surface (this method being restricted to post-top lanterns of no more than 4m height), or burying the “root” in soil.

Where buried, each pole must be provided with a suitable base-plate complete with drain hole. Baseplates shall be secured with a minimum of 2 off 20mm dia. hook bolts.

Spigots shall be provided to suit the specified lantern. Particular care shall be taken to establish the exact diameter and length of the spigot or spigots required such that the luminaire fits neatly up against the shoulder formed between the pole and the spigots. Care shall be taken to avoid damage to the spigots during transport, storage and erection.

Galvanised poles shall be provided with a “corrosion collar” which must extend at least 150mm below and above finished ground level.

Unless otherwise stated, galvanised poles will not require painting.

After galvanising, poles shall be stacked and transported in such a way as to minimise mechanical damage to the zinc coating. In particular, poles shall not be stored in direct contact with the ground and if stacked on top of each other, wood spacers shall be used to prevent the formation of white rust. Poles shall be carefully handled at all times and shall not be dragged along the ground in such a way that the coating may be damaged.

Notwithstanding the foregoing, any small areas of the galvanised coating which have become damaged shall be repaired by shot blasting and zinc spraying to a nominal thickness of not less than 0,1mm. Care shall be taken to ensure that all loose flakes of coating around the area to be repaired are removed prior to zinc spraying. Any signs of substantial damage to the galvanised coating, as determined by the Engineer, will result in the pole being rejected.

Poles and masts shall be provided with suitable cable entries and access openings with fixing chassis suitable for the connection of cables and the installation of MCBs. Access openings shall be provided with a cover plate of the same material as the pole. Covers shall be provided with suitable gaskets and means of fixing to the approval of the Engineer.

Unless otherwise specified no cable glands or gland plates are required for the termination of PVC/SWA/PVC cables. The cable shall be brought up to a convenient position adjacent to the lower section of the access opening. The outer PVC sheath shall be stripped back and the steel wire armouring pulled away from around the cables, twisted into compact tails and bonded together by means of an adequately sized line tap.

A separate earth conductor shall be taken from this line tap to the earth stud in the pole base compartment. Phase and neutral conductors shall be jointed using shrouded line taps and the cables neatly secured to the bottom of the fixing chassis by means of saddles.

Poles shall be planted in the positions indicated on the drawings. They shall be planted absolutely plumb with the outreach, where applicable, at right angles to the roadway edge. The root depth shall be as recommended by the manufacturer.

Should any pole position coincide with trees, building canopies, driveway entrances, overhead conductors or other obstacles, an alternative position is to be confirmed with the Engineer before excavation of the pole hole.

Poles shall be carefully aligned with each other to form straight lines or smooth curves generally following the alignment of the associated roads. The planting depth shall be
carefully controlled to ensure that all luminaires will be at the same height above the level of the roadway, parking area etc.

Care shall be taken when backfilling around the pole to ensure that compaction is even all around the pole and is to the requirements specified in sub-clause 12.5.5 f) viii). Where poles are to be planted in fill material, on ramps, etc., one pocket of dry cement shall be mixed with the backfill material before commencing backfilling and compaction. Subject to the prior approval of the Engineer, this technique shall also be applied wherever it is considered necessary to stabilise the pole due to unsuitable soils, etc. Where the Contractor feels that this situation exists, he must advise the Engineer immediately and obtain a decision.

Where poles are to be anchored into rock, the base of the pole shall have a reinforced concrete block cast around it. The dimensions of this block shall be approximately 1,25m x 1,25m x 0,5m and the bottom face shall be reinforced by R10 bars at 250mm centres in both horizontal axes. A Y20 bar shall be grouted into the rock for a distance of 300mm. The grouted end shall be straight while the end located in the concrete shall be provided with a hook around the reinforcing bars. Alternatively, 20mm “Rawplug” or similar duplex studs may be used in place of grouted bars.

Lighting Switches

General

Switches shall be of 15-20 A rating and shall comply with the requirements of SANS 60669-2-1. No switch shall be used to control more than 2000 W of incandescent, or 1500 W of discharge and fluorescent lighting.

All switch boxes shall be fitted with an earth stud.

Switch Types and Installation

Flush Switches

Flush switches with pressed steel or plastic overlapping coverplates shall be mounted into pressed steel rust-proofed boxes installed flush in the building fabric. The switch boxes shall be installed square and shall be flush with the wall finish. Boxes chased into walls shall be fixed square and mortared in position prior to plaster or other finish being applied.

Surface Switches

Surface switches shall be of the metal-clad type. Protected dollies shall be used for all industrial applications. The switch plate and box shall have a suitable rust resistant enamel finish.

Architrave Switches

Architrave switches shall be used in partitioning mullions as required.

Unless otherwise specified, tapped holes for screws and outlet openings will be provided by others. The Contractor shall co-ordinate fully with the contractor providing the holes with regard to positions and switch screw templates. Fixing screws shall be provided by the Contractor.

Wiring to architrave switches may be run within the hollow mullion or other hollow metal structural members of the partitioning, but shall be run in conduit from the lighting outlet, terminating with a bush at the point when wiring enters the hollow mullion.

Where the wiring for lighting circuits is run in a ceiling channel which is situated directly over the hollow mullion or other wire carrying member, then the wiring to switches may be taken directly into the latter without the use of conduit or lead-in tubes. Under no circumstances shall the wire pass over sharp edges and suitable provisions shall be made to shield the wiring accordingly.

d) Watertight Switches

Watertight switches shall be used for all external applications and in potentially damp areas.

Watertight switches shall have cast alloy or UV stabilised high-impact plastic enclosures.

The minimum protection rating shall be IP55.

Mounting Heights

Unless otherwise specified, switches shall generally be mounted at 1,4m above finished floor level to the underside of the switch.

Where switches are located on walls near a change of wall finish, e.g. on tilted, face brick, or wood panelled dadoes, they shall be positioned so that the coverplates fall completely within one or other of the surfaces, but not on the junction line of the different finishes. The Contractor shall liaise with the relevant other trades to ensure that switches on surfaces present a neat appearance.

Switches in locations meant for persons in wheelchairs (paraplegic toilets etc.) shall be mounted at 1,1m above finished floor level to underside.

Dimmers

a) Standard Dimmers

Dimmer units suitable for controlling 220/230 V incandescent and fluorescent luminaires shall be of the integral controller/dimmer unit type suitable for mounting in a standard switchbox, or else in a suitable box supplied with the unit. The units shall be rated at 250 V and sized according to the load.

Dimmer units used in conjunction with 12 V dichroic luminaire transformers shall be of the induction type.

All dimmers shall be provided with a mains on-off switch and a dimmer control knob. Multi-lever switches may be utilized where there is a combination of dimmed and non-dimmed circuits fed from the same position.

The correct pre-heat transformers and lamps shall be used for all dimmable fluorescent luminaires, in accordance with the supplier's details. Alternatively, units suitable for use with electronic fluorescent ballasts shall be used where electronic ballasts are employed.

Dimmers shall be noise-free and fully suppressed for radio and fluorescent ballast interference.

b) Remote Dimmers

Dimmers for loads larger than 1200 W are to be of the two-part type, i.e. with a local controller and a remote dimmer.

Photo-electric Controls

Where specified photocells shall be used to switch external lighting installations. Photo-electric switches shall be of the type comprising a photo-sensitive resistor, thermal actuator with an inherent operating delay to make it insensitive to short duration changes in light levels and a change-over switch mechanism, all housed within a tough, translucent, weather proof ultra violet stabilised cover. The operating level shall be factory preset to switch on at approximately 50 lux and off an approximately 100 lux. The response time after sudden changes in light level shall be not less than 15 seconds.

Integral protection against voltage surges shall be provided.

Photocells shall be positioned in such a way that they will not be affected by spill-light from the external lighting installation or by vehicle headlamps.

Labelling

All switches in industrial applications, and elsewhere as specified shall be provided with a Traffolyte label screwed to the wall, or other fixed member, immediately adjacent to the switch. The label designation shall indicate the distribution board and circuit and outlet number, e.g.: "DB-AB/L4.3".

Bell Pushes

Bell pushes shall be 250 V rating, even where used for low voltage bell installations. In all other respects the requirements for lighting switches given in 12.12 shall apply to bell pushes. Bell pushes shall be mounted in separate boxes to switches or other components.

Socket Outlets and Plug Tops

16 A Switched Socket Outlets (SSOs)

16 Amp SSOs shall be 250 V rating; shuttered 2 pin and earth type complying with the requirements of SANS 164-1.

Outlets on circuits rated up to 20 A shall be of the normally switched type whilst outlets on 25-32 A circuits shall be provided with a class F0 SP MCB, or where especially detailed, a DP MCB. The ratings shall be 16A unless otherwise specified.

Both single and twin flush wall mounting SSOs shall be housed in 100 x 100 x 50mm accessory boxes. Surface single-outlet sockets shall be housed in 83 x 119 x 50mm galvanised steel boxes. SSOs for mounting in power skirting, bench-top trunking, hospital bed-head channels etc. shall be mounted on cradles suitable for such applications. Unless otherwise required, flush wall mounting outlets shall have pressed steel coverplates

finished white or ivory. Surface outlets shall be of the industrial protected-dolly type with grey pressed steel coverplates.

Where SSOs complying with SANS 164-1 are to be used in exposed areas, they shall be housed in a York S15 weatherproof enclosure or equal and approved.

Non-Standard Socket Outlets

a) Data/Electronic Equipment Outlets

Dedicated 16 Amp SSOs shall be similar in construction to normal SSOs but shall have flattened earth pins in the 10 o'clock or 12 o'clock position as specified. The earth socket shall be isolated from the chassis of the unit to allow for the connection of 'clean' earths.

Unless otherwise specified, the socket outlet plate shall be of a distinctive colour (usually red, or as specified in the Detailed Specification). Alternatively, the socket pin shrouds and switch dolly shall be of the selected colour; the latter instances usually being applied to outlets in power skirting or hospital bed-head channel etc.

Where specially called for, dedicated SSOs are to be of the British Standard square pin, 13 Amp type. Similarly to 12.4.2 (a) (i), the earth socket shall be isolated from the chassis of the unit.

Wall mounting 13 Amp SSOs shall be suitable for mounting in a standard 100 x 100 x 50mm accessory box. Surface and power skirting mounted units shall generally be as detailed for 16A SSOs (12.14.1(c)).

16 A dedicated plug tops, colour-matched to the respective plate or shrouds, and 13 A plug tops in ivory or white plastic, complete with 5 A cartridge fuses, at the rate of 60 % of all relevant outlets shall be provided and handed to the Client at Works handover.

b) Luminaire Outlets

Where required luminaires shall be fed via a locally mounted 5A SP, N + E non-switched socket-outlet. In these instances, the luminaires shall be fitted with 3m of 3-core flex and a rubber-clad 5A plug-top.

220/240 V Plug-Tops

When required to be supplied by the Contractor, 13 A plug-tops shall be white or ivory plastic. 16 A plug tops shall be white or ivory plastic for general office areas and rubber clad type for workshops, production areas, etc. or colour coded plastic for dedicated types

When wired, a small loop shall be made in the earth core of the flex within the plug top so that in the event of undue stress upon the
equipment flex, the earth connection will tend to remain intact even if the feed wires are pulled loose.

3-Phase Socket Outlets

a) Existing Installations

420 V 3-Phase socket outlets for use in existing factories etc. shall generally match the units already installed, unless otherwise specified.

b) New Installations

Generally multi-phase sockets shall be BICC Marachel type DS 16/30A or 32/50A TP + N + E wall mounting decontactors, or equal and approved, or as otherwise specified.

Each decontactor or similar shall be supplied with a plug unit which shall be handed to the Client upon Works completion and handover. 16 A units shall be fed with cable not exceeding 6mm² and 32 A units with cable not exceeding 10mm².

Mounting Heights

Unless otherwise required SSOs shall be mounted at the following heights from finished floor/surface level to the bottom of the outlet.

Flush outlets, generally	:	0,3 m
Garages, factories and workshops	:	1,4m (SP & TP units)
Kitchens and tea rooms	:	1,0m
Above work surfaces (Kitchens and Offices)	:	0,2m (SP only)

Labelling

Socket outlet labelling shall be as for switches, refer 12.12.5.

Miscellaneous Power Connections

Geysers

Domestic-type geysers will be supplied, installed and connected to water services by others. The Contractor shall undertake all electrical connections.

For wall mounted geysers, flush supply conduit shall terminate in a flush round box conveniently close to the electrical entry to the water heater. A surface type metal clad or polycarbonate encased 30 A DP switch disconnector shall be superimposed over the conduit box and the final connection shall be made using surface galvanised conduit, painted after installation.

Where geysers are installed in concealed positions such as roof voids, the final connection from the local switch disconnector may comprise PVC covered flexible steel conduit.

Unless otherwise indicated in the single line diagrams, wiring for geyser circuits not exceeding 4 kW single-phase shall be carried out with conductors and earthwire at least 2,5mm² each.
Connections to calorifiers and large type geysers shall be as specified.

Kitchen Equipment

a) Domestic Stoves

Domestic stoves will be supplied and placed in position by others.

The Contractor shall provide a suitable electrical supply and final connection. A feed shall be taken to a flush mounted 60 A DP switch-disconnector positioned 300mm to one side of the stove and at a height determined by work surface, kitchen cupboards etc. From the switch-disconnector, flush conduit shall be taken to a point 450mm above floor level, and centred to the rear of the stove, terminating in a round conduit box. The final connection shall be carried out using a superimposing spout-entry conduit box and PVC covered flexible conduit for permanently connected units and via a 'stove connector' socket for plug-in units.

b) General Kitchen Equipment

Canteen kitchen equipment such as stoves, fryers etc. shall be connected up by the Contractor.

Unless otherwise specified, equipment shall be fed via a local polycarbonate encased switch-disconnector mounted at 1400mm on the wall behind the appliance. The switch-disconnector shall be single-phase DP, or 3-phase 4-pole as required. The final connection shall be taken from the switch-disconnector using flush conduit offset out of the wall at 450mm above floor level. Water-tight PVC covered flexible steel conduit shall connect directly to the end of the wall conduit and shall then connect to the particular item of equipment.

Where no wall exists, a stainless steel pedestal and switch-disconnector arrangement shall be supplied, as detailed in the Work drawings.

Air Conditioning Units

Console, ceiling and wall-mounting air conditioners (ACs) will be supplied and installed by specialist contractors.

The Contractor will undertake electrical and control connections to the extent outlined in the drawings.

Unless otherwise specified, AC units shall be fed via a locally mounted 30 A DP switch-disconnector unit and the final connection shall comprise the 3-core flex supplied with the AC unit taken via a cord-outlet arrangement mounted on the switch-disconnector faceplate.

Fans

a) General

Where fans are required to be supplied by the Contractor, they shall be supplied complete with all necessary accessories as applicable, such as mounting brackets, diaphragm plates, wire guards where fan blades are liable to be touched by hand, weatherproof louvres where fans are mounted on an outside wall, etc.

Fans and all accessories supplied therewith, shall be bolted, screwed or secured to walls and other surfaces as required.

Holes in walls or windows will be provided by the building contractor to details to be supplied by the Contractor.

b) Connection to Lift Motor Room Fans

Where a lift motor room fan connection is required, the Contractor shall, in addition to the fan, also provide and install a "close-on-rise" 20A rating thermostat, having room temperature range, which shall be mounted near the fan unless otherwise indicated.

The wiring to the fan shall be taken from a SP MCB on the distribution board through a clearly labelled local 15/20A switch disconnect and through the thermostat to the fan motor terminals.

Final connections to the fan shall be carried out in flexible conduit.

c) Connection to Small Extract Fans

Where a small extract fan, such as is used in domestic kitchens toilets, etc., is specified, and when no facilities exist on the fan for conduit entry, connections may be made to the fan terminals by means of 3-core

plastic-covered or “cabtyre” flexible cord, taken from a cord-outlet 15/20A switch disconnector unit in close proximity to the fan.

Plant and Motor Connections

a) General

Due to the many types of plant and/or motors that the Contractor may be called upon to connect up, specific details will be as described in the drawings or Detailed Specification.

b) Plant Supplies

Generally the Contractor will be called upon to supply and install an incoming feeder cable to a motor control panel (MCC), or similar, supplied by others.

The Contractor shall liaise and co-operate with the plant vendor/contractor regarding program, correct location, testing – including phase rotation check, and switch-on.

Where the Contractor has any doubt regarding electrical and safety aspects of plant controls and equipment by others, he shall have the right to refuse to liven up the system until the receipt of an indemnity from the Engineer.

c) Motor Connections

Unless otherwise specified motors and associated machinery will be supplied and fixed by others. The Contractor will be required to provide an electrical supply and to connect the means of disconnection, starting and to the motor terminals and accessible to the machine operator where applicable.

Unless specified as being supplied by others, the Contractor shall supply and install a padlockable, local switch disconnector for each motor. A suitable starter (which will be provided with the motor) shall be fixed and connected by the Contractor.

Switch-disconnectors shall, unless otherwise specified, be wall mounted adjacent to the motor, or onto a suitable floor mounting pedestal or onto the framework of the machine or equipment. The switch disconnector shall be within 2,0m of the motor terminals.

Unit starters shall, where possible, be mounted adjacent to the switch disconnector provided that this position will afford easy control of the machine by the operator.

The final connection to a motor shall comprise a multi-core armoured cable with a neatly strapped loop of slack at least 800mm long to allow adjustments to be made to the motor and/or its mountings. The multi-core cable shall contain an extra core for earthing purposes. The entry into the motor terminal box should preferably be from below/or alternatively from the side, but never from above.

The Contractor shall ensure the correct rotation of the motor and the settings of the starter in co-operation with the representative of the supplier of the motor.

Labelling

All cables, cores, switch-disconnectors and other items of control equipment shall be labelled. Labels for controls shall be affixed to a non-removable member or wall, adjacent to the item.

Refer to items 12.9.3 and 12.12.5 for general requirements.

Provisions for Ancillary Services

General

Where provision only for telephones and other systems of communication, fire defence, security, aerial, computer data or other services are specified, the Contractor shall supply and install all necessary conduit, wiring channel, cable tray, boards, outlet boxes, sleeves etc., as detailed.

Junction Boards

Where called for, junction boards for telephone and data services shall be supplied as specified. The boards are to be similar in construction and finish to flush, surface or semi-flush distribution boards, as required (See clause 12.4). Boards shall generally be 100 – 115 mm deep with an internal 15 mm softwood backing. Doors shall be secured with square-key turnbuckles and provision for padlocking. Main distribution frames (MDFs) shall generally be similar to normal junction boards but are to be 150 mm deep.

Cable Sleeves

Unless otherwise specified or indicated on the drawings, the Contractor shall supply and install all sleeves for telephone and other service cables of sizes and in positions as detailed.

Where sleeves are specified to be supplied and installed by others, the Contractor shall be responsible for ensuring that such sleeves are installed in good time and in their correct positions. Suitable rustless draw wires are shall be provided in all sleeves.

Conduit

All conduit for telephones and other services shall be provided and installed to the same requirements as for the electrical installation, and shall be fitted with rustless draw wires. Colour coding for industrial project and other installations where specified shall be in accordance with 12.7.4 (e).

Each class of service shall be kept entirely segregated from any other service.

Outlets

Unless otherwise specified all outlets for telephones and other services shall consist of standard 100 x 50mm flush type pressed steel boxes generally mounted a height of 0,3m from finished floor level to bottom of box.

Where switch sockets or other outlets are mounted in the same room at nominally the same height above floor, care shall be taken to ensure that the undersides of all such outlets are accurately lined up.

Coverplates

The Contractor shall supply and fit metal or plastic coverplates of the same material and finish to match flush switches and switched socket coverplates. A blank cradle shall be fitted in the outlet box to which the coverplate shall be screwed, allowing for proper alignment of the coverplate. Nickel or chromium plated screws shall be used to secure all blank coverplates.

Co-operation

The Contractor shall co-operate with the suppliers and installers of other services in providing all information required, and shall assist such other installers in the event of difficulties which they may experience with drawing in of their cables into conduit or channel provided by the Contractor and where such difficulty arises because of want of knowledge of location, blockages broken draw-wires etc.

Fixings and Supports

General

The Contractor shall be responsible for all fixings in connection with his installation, including: brackets, suspensions, clamps, bolts, screws etc, and all accessories and fixing devices to effect a substantial and proper means of fixing equipment, components, wireways, cables etc.

All items shall be selected to fully suit the application, due cognisance being taken of:

Weight of equipment and fixing media (‘pullout strength’)
Temperature and humidity
Effect of corrosive and damp environments
Weathering, UV degradation etc
Electrolytic effects

The following details shall apply to all fixings irrespective of the various categories in which they are described.

Concrete and Brickwork

Wall Plugs

Fixings into concrete and brick surfaces for equipment with a maximum mass of 10kg may be undertaken with plastic or fibre ‘wall-plugs’. Under no circumstances shall wooden inserts be used.

A masonry drill of the correct size shall be used, in conjunction with a suitable hammer drill or similar, to make holes into the brick or concrete fabric; fixings into mortar joints will not be allowed. The fixing plug length must match the threaded portion of the fixing screw; undersized plugs will not be allowed.

Round or cheese headed screws of the correct diameter to match the respective plug shall be used throughout.

Anchor Bolts

Fixings into concrete and brick surfaces for equipment with a mass exceeding 10kg, or where the fixing holes are 10mm or larger, shall be undertaken using expanding anchor bolts, or by means of bolts cast into concrete.

For expanding anchor fixings, holes shall be made similarly to wall-plug holes (see 12.17.2 a) ii)).

Channel Fixings

Where brackets, cable-rack support arms etc are to be fixed, the Contractor shall supply and install Cabstrut, or equal and approved, galvanised channel supports and associated clamps, cantilever arms and so forth. Surface channels for the support of various brackets, pendant studding etc shall be fixed into concrete ceilings or brick/concrete walls using anchor bolts.

In instances where cast-in support channels are to be used, the Contractor shall liaise with the building/civil contractor to ensure that inserts are installed timeously on to shuttering and that all openings are protected from the ingress of vibrated concrete.

Unless otherwise detailed in the Detailed Specification and/or drawings, the Contractor shall submit particulars, including sketch drawings, of proposed fixings to the Engineer for approval prior to installation. Such proposals shall be accompanied by design calculations of loadings and fixing spacings.

Cartridge Fixings

Health and Safety Regulations and shall ensure that warning signs are placed at all entrances where such work is in progress.

Hollow Partitions, Hollow Blocks and Ceiling Boards

Fixings shall not be made using gypsum, fibre or similar ceiling boards or ceiling tiles as the supporting medium.

For ceiling boards, the component shall be installed to a substantially fixed conduit box. In the case of linear fluorescent luminaires or other large components, further fixings shall be made into the support brandering. Where there is no brandering conveniently located, the Contractor shall supply and install independently fixed wooden inserts.

Surface fixed items mounted to ceiling tiles within support tees shall be fixed similarly to the foregoing except that, with written permission of the Engineer, supplementary fixings may be made into the ceiling tee lips using approved self-tapping screws.

Fixings into hollow partitioning material, or hollow building blocks, shall be done by means of spring-loaded ‘toggle’ fixings, or, where suitable, compression type cavity fixing devices may be used.

Fixings on Steelwork

Support brackets, hangers etc shall be fabricated from galvanised angle iron or channel iron, or shall be made up using Cabstrut or equal channel and associated accessories to suit the application.

Brackets etc shall be fixed to the structural steelwork using purpose made galvanised beam clamps, Caddy clips or similar. Welding to structural steelwork may only be carried out with the written permission of the Engineer.

Painting

All exposed steel shall be cold galvanised.

Where specified, supports etc shall be primed and painted using an epoxy finish, colour: light orange, SANS 1091, ref. B26. Refer to clause 12.4.1 (h) for details of painting.

Adhesives

Under no circumstance will any adhesive material be used for any fixing with the single exception of the fixing of door gaskets.

The adhesive for use with gaskets shall be applied as per manufacturer's specifications, or self-adhesive gasketing material shall be used. The adhesive shall be of the silicone-based type suitable for use under extreme weathering and temperature ranges between -40ºC and +70ºC.

Earthing and Lightning Protection

General

In instances where soil resistivity surveys have been carried out to determine the design of the earth electrode system/s, Tenderers shall submit their price in accordance with the Tender Documentation, including the bills of quantities where applicable.

Where no resistivity survey has been conducted prior to calling for tenders, prices shall be based upon a provisional design and, where applicable, a provisional bill of quantities. The final design will be based upon a subsequent soil resistivity survey.

All earthing and lightning protection surveys, installations and testing must be carried out by a recognised specialist. Unless the Tenderer is also the earthing specialist other Tenderers (e.g.: electrical contractors) must submit full details of their proposed specialist sub-contractor.

This section does not include switchyard earthing. Where necessary a supplementary specification: "Standard Specification for Substation Earthing" will be issued.

Earth Resistance Testing

Soil resistivity tests shall be carried out at the proposed location of the electrode/s and following ground levelling by the civil/building contractor, where applicable.

The Contractor must give at least 48 hours notice of impending tests to the Engineer to allow him to attend and witness them at his option.

The tests must be carried out in accordance with SANS 10199 using a recognised method (e.g.: Wenner method) with a four terminal null balance 'megger' tester. A meter calibration certificate proving calibration within the last six months undertaken by a recognised testing authority must be submitted to the Engineer prior to carrying out earth readings. If there is any reason to suspect the accuracy of any instrument, the Engineer may call for confirmation testing at the Contractor's expense.

The result of tests, including a specification for the electrode design, shall be submitted to the Engineer within seven days. The test results in tabulated and graphical form shall be accompanied by a copy of the meter test certificate.

The following maximum resistances shall apply:

Transformers

Up to 500kVA	:	5 Ohms
500 - 800kVA	:	3 Ohms
800 - 1000kVA	:	2 Ohms
Above 1000kVA	:	1 Ohm

Lightning Protection

SANS 10313, category A structures: 30 Ohms overall, subject to a maximum of 200 Ohms for any single electrode (or per SANS 10313, whichever is the lower reading).

SANS 10313, category B & C structures: 50 Ohms overall, subject to a maximum of 200 Ohms for any single electrode (or per SANS 10313, whichever is the lower reading).

Plant Bonding – Hazardous Areas

Where specified to be bonded, the electrode reading for tanks, silos etc must not exceed 7 Ohms with the electrode disconnected from any other electrode system (See also item 12.18.6).

Earth Electrode

The earth electrode shall consist of earth rods, bare copper wire, copper tape etc, or a combination of these, as specified in the Detailed Specification and/or drawings.

Earth rods shall nominally be 1500mm long, 16mm diameter extensible type steel cored, copper jacketed where the copper cladding is at least 250 microns thick molecularly bonded to the steel rod, as ‘Cadweld’, or equal and approved.

Mains earthing conductors (‘trench earths’) shall consist of 70mm² bare copper cable while conductors for lightning protection and static bonding shall be 50mm².

Trench earth conductors, as well as the tops of earth rods shall be not less than 600mm below finished ground level.

Earth rods shall be driven into the soil utilising a purpose made driving head in conjunction with a mechanical hammer. In hard ground and in rock, the rods shall be installed into pre-drilled holes made with an earth-drilling rig. Whilst loose soil or a soil slurry may be used to back-fill holes in hard soil, carbonaceous conductive aggregate, such as ‘Marconite’ or equal and approved, shall be used for holes bored in rock.

Rods longer than the nominal 1500mm shall be coupled using an external sleeve arrangement and the liberal application of silicon or hydrocarbon grease. Rods must butt against one another inside the coupling; gaps will not be allowed.

Rods, tapes and cable conductor in highly corrosive soils shall be of stainless steel, or as otherwise specified.

Joints in copper cable electrodes shall only be effected using an exothermic welding process as ‘Cadweld’, or equal and approved.

Lightning protection trench earths shall not be run directly in soil under pathways. In these instances the conductor shall be run in 75mm diameter uPVC sleeving which shall be laid under the path and at least 1000mm clear of its edges.

Mains Earthing

The earth electrode resistance for mains earthing of transformers, switchgear etc. shall be in accordance with 12.18.2 (e) (i)

A main earthing bar of high conductivity copper, at least 50mm x 6mm in section and 500mm long, (or as otherwise specified in the Detailed Specification and/or drawings) installed in the transformer room

facing the LV side of the transformer/s shall be provided. This shall be mounted onto insulators at 500mm above finished floor level. The bar shall be pre-drilled with 12 No. M12 diameter holes for the connecting of earth leads.

The earth electrode cable/s and all earth bonding leads shall be connected to the bar by means of brass or stainless steel bolts, nuts, washers and lock-washers. Earth cable terminations shall comprise hydraulically crimped tinned lugs. The point of origin of each conductor must be clearly indicated by means of an embossed or punched metal tag attached to the conductor near its lug or connection point.

The following points shall be bonded to the earth bar with 70mm² conductor, or as otherwise specified:

Transformer star points (*)
LV switchboard neutral bar (*)
LV switchboard earth bar (*)
MV switchgear

(*): Subject to the earth conductor being not less than half the cross sectional area of the of the relevant phase conductor between the transformer and the LV switchboard.

Minisubs shall be earthed in a similar fashion to main substations except that the earthing bar in the LV compartment shall take the place of the separate main earth bar.

Lightning Protection

Besides earth resistance testing, the Contractor shall arrange for the design of the lightning protection system, including air terminals, roof bonding, down conductors etc to be carried out by a reputable specialist. The Engineer will provide suitable drawings to the Contractor for this purpose either as transparencies or as DXF Computer Assisted Draughting (CAD) files.

Following submission of the design to the Engineer for comment (modification where necessary) and approval, the Contractor shall submit the final design to the SANS for approval. Transparencies of the SANS approved drawing/s shall be submitted by the Contractor to the Engineer for record purposes prior to, or simultaneously with, the start of the installation.

Air terminals may be of various designs. As a general guide, the following basic requirements shall be complied with:

All conductor material shall be electrical grade aluminium alloy in accordance with the requirements of BSS 1476/H/E9 or American Standards Specification 6063. Conductors shall be installed in such a way that no part of the system shall come into contact with concrete of plaster.

Circular conductors shall have a minimum cross sectional area of 50mm². Flat conductors shall be 20mm x 3mm minimum.

Joints in circular conductors shall be done using a hydraulic crimping machine. Flat conductors shall be joined with either two bolts, or else two aluminium rivets of 6mm diameter.

Bonding to extraneous metallic surfaces shall be done by bolting or riveting.

Conductors must be mounted into aluminium alloy guides which in turn are seated on a suitable barrier material (plastic or similar) and which allow free longitudinal movement of the conductor.

Straight horizontal runs of conductor shall be provided with expansion loops every 30m or less.

Electrically continuous metal roofs shall be used as the air termination. Where flat metallic roofs may be surrounded by non metallic parapet walls, conductors are to be installed on top of the wall and bonded to the metal roof sheeting at intervals not exceeding 20 metres.

Non metallic roofing supported by steel trusses and purlins which are electrically continuous may be treated as for a complete metal construction.

Where required 12mm diameter x 500mm long finials shall be installed at the outer corners of buildings of 15m to 30m in height and in addition at intervals of no more than 30m along exposed parapet walls. The finials, in turn must be bonded to the peripheral conductors.

Tall structures, as defined in SANS 10313, shall, where required, have 12mm diameter x 1000mm long finials. These shall be installed at an angle of 30° out from the structure and bonded to the peripheral air terminal system, all as required by the Code of Practice.

Down conductors shall consist of aluminium alloy run surface down the outside of buildings, or, where suitable, shall comprise structural steel columns, or reinforcement steel in reinforced concrete columns all as described in the Detailed Specification and/or installation drawings and in accordance with the Contractor's SANS approved design.

Down conductor spacing shall not exceed 30 - 0,4h metres, where h = the maximum height of the structure. However the minimum separating distance need not be less than 10 metres except for tall slim structures (like chimney stacks) where a minimum of two down conductors must be installed.

Large expanses of external metal wall cladding as well as external metal staircases, ductwork etc shall be bonded to ensure vertical electrical continuity and to the lightning protection system at their upper and lower extremities.

Aluminium based down conductors shall terminate at 500mm above ground level where they shall be bonded to the earth electrode system. Under no circumstances shall aluminium conductor come into contact with the ground.

The Contractor must liaise closely with the building contractor to ensure the timeous placement of cast-in threaded bonding sockets at the tops and bottoms of reinforced concrete columns.

Test points shall be provided where specified. These shall be either mounted near the base of the down conductor in the lower part of the wall or else contained in a small cast iron inspection chamber installed in the ground, all as detailed in the installation drawing/s and/or Detailed Specification.

Static Bonding

Static bonding of operating theatres, explosives magazines, petrochem installations, electronic workshops and the like fall outside the scope of this
general specification and, where required, will be specified in supplementary specifications or the Detailed Specification.

Testing and Maintenance Manuals

Upon completion of the earthing installation, testing in accordance with the relevant SANS specification/s shall be carried out by the Contractor and the results submitted to the Engineer. The Contractor shall also supply maintenance manuals, including as-fitted and SANS approved record drawings, test certificates etc, all as outlined in clause 10.0.

C4.2.2: DETAILED SPECIFICATION – ELECTRICAL INSTALLATION

Introduction & General

This detail specification complements & qualifies the foregoing specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

Should there be any conflict or ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:-

Schedule of Quantities
Project Specification including Equipment Schedules

Drawings (loose and bound-in)
Standard Specification

Should the Tenderer notice any inconsistencies between these sections, it is his responsibility to notify the Engineer in order to obtain clarification thereon.

Scope of Work

This contract calls for the Area Lighting and Low Voltage (LV) Electrical Installation Upgrade and Refurbishment Works at Tsolo Agriculture And Rural Development Institute within and around premises largely as contemplated in SANS Code of Practice and Standards.

The following sections of work are included in the contract:-

Complete supply and install of new street lighting.
Complete supply and install of over head and upgrading electrical reticulation system.
Disconnection, removal and deliver to User old street light installation complete.
Bush clearing and Tree cutting
Complete supply and installation of earthing system for street and electrical supply installation.
All materials, equipment, labour and other necessary services for the complete, safe efficient operation of the works must be in full adherence with the specifications laid down in the electrical document.
12 Months defects and maintenance period from practical completion of the electrical installation
Testing and commissioning, including issuing of a Certificate of Compliance

The following sections of work are excluded:-

Installation of telephone, data cabling and associated equipment

Site Conditions

3.1 General

This is a existing electrical reticulation and building installation project.

Design conditions are:-

Max. temperature	-	29,4 DB : 23,3 WB
Min. temperature	-	1,7 °C
Voltage	-	400 / 230V ±10%
Frequency	-	50 Hz

Builder's Work

The following will be provided by the principal Contractor under the building works contract:-

Openings through walls and floor slabs.
Final backfilling and compaction of cable trenches to finished levels

The electrical subcontractor will be responsible for the following:-

Manholes and covers
PVC sleeves 50mm dia. to 110mm dia.
Trenching, bedding and backfilling for LV cables above marker tape.

All excavation shall be executed in accordance with the Standard Specification.

Excavation

5.1 General

Tenderers are to note that excavation shall be carried out in strict accordance with the Detailed Specification. The contractor may use any method he chooses to excavate any class of material, but his chosen method shall not determine the classification of the excavation.

The Engineer will decide on the classifications of the material based on the inspection of the excavated material and the criteria entailed in Clause 5.2 below.

NOTE: Before any cable(s) are installed in the trench or trenches, such trench or trenches shall be inspected by the Engineer at a site meeting agreed upon and once approval is given that such trench or trenches are acceptable, may the cable or cables be installed.

Measurement, Pricing & Payment

For the purpose of this contract, only two classes of material have been measured, and comprise the following criteria:

5.2.1 Soft excavation:

Excavation generally by pick and shovel in soft soil. Determining factors ruled by descriptions in Item 5.3.1, “Soft Excavation” above.

Intermediate excavation :

Excavation deemed to be possible by pneumatic tools. Determining factors include descriptions in :

Item 5.3.2 “Intermediate Excavation”
Item 5.3.4 “Boulder Excavation Class A”
Item 5.3.5 “Boulder Excavation Class B”

5.3 Classes of Excavation

The following criteria have been extracted from SANS 1200.

5.3.1 Soft excavation:

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

a bulldozer of mass (including mass of ripper if fitted) approximately 22t and flywheel power approximately 145kW, or
a tractor-scraper unit of total mass approximately 28t and flywheel power approximately 245kW, pushed during loading by a bulldozer equivalent to that specified in 5.3.1 a) below, or
a track-type front-end loader of mass approximately 22t and flywheel power approximately 145kW.

In the case of restricted excavation, soft excavation shall be excavation in material that can be efficiently removed by al back-acting excavator of flywheel power approximately 0,10kW for each millimeter of tinned bucket width, without the assistance of pneumatic tools such as paving breakers.

Intermediate excavation :

Intermediate excavation, other than in restricted excavation, shall be excavation (excluding soft excavation) in material that can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220kW.
In the case of restricted excavation, intermediate excavation shall be excavation (excluding soft excavation) in material that requires a back-acting excavator of flywheel power exceeding 0,10kW for each millimeter of tined-bucket width or the use of pneumatic tools before removal by equipment equivalent to that specified in 5.3.1 b) above.

Hard rock excavation :

Hard rock excavation, other than in restricted excavation, shall be excavation (excluding boulder excavation) in material that cannot be efficiently ripped by a bulldozer equivalent to that specified in 5.3.1 a) above before removal.

NOTE : Such excavation generally includes materials such as formations of unweathered rock that can be removed only after blasting.

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

Boulder excavation Class A

Boulder excavation Class A shall be excavation in material containing more than 40 % by volume of boulders of size between 0,03m3 and 20m3, in a matrix of soft material or smaller boulders.

Excavation in dolomite formations other than solid dolomite will be classed as boulder excavation Class A if the formation contains more than 40 % by volume if lumps of hard dolomite of size between 0,03m3 and 20m3, in a matrix of soft material or smaller lumps of hard dolomite.

Excavation of solid boulders or lumps of size exceeding 20m3 will be classed as hard rock excavation.

Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.

Boulder excavation Class B :

Boulder excavation Class B shall be excavation of boulders only in a material containing 40 % or less by volume of boulders ranging in size between 0,03m3 and 20m3, in a matrix of soft material or smaller boulders. Those boulders requiring individual drilling and blasting in order to be loaded by a track type front-end loader or back-acting excavator, as the case may be, as specified in 5.3.1 a) or 5.3.1 b) above, will each be separately measured as boulder excavation Class B. The excavation of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

Schedules of Information

The schedules of information contained in this document consist of 2 sections:

Information supplied by the Engineer (schedules of drawings, cables, distribution boards, etc. as applicable.)

Information to be supplied by the Contractor at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)

Tenderers are required to enter, at the time of tendering, in the “Schedule of Equipment and Material Offered”, sufficient details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a tender to state “as specified” in the schedules.

Failure to complete these schedules (if applicable) may render a tender invalid.

Samples and Alternatives

Bidders may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE: A request for submission of samples or drawings does not imply that the Bidders quotation will necessarily be accepted.

Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to

the approval of the Engineer, may be offered by Bidders. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

Supervision, Workmanship and Delays

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the contractor, who must be able and authorized to receive and execute instructions on behalf of the electrical contractor.

In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the contractor.

Similarly, should delays in the contract be caused by poor performance on the part of the Contractor causing the Engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Contractor.

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

Making Good

The contractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

10.0 Commissioning and Testing

10.1 Commissioning

A documented method shall be followed whereby the electrical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

Performance Tests

The electrical contractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the electrical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the electrical contractor will supply documentary proof of full performance tests of all relevant equipment.

Acceptance Tests

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the electrical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not.

Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

Testing Equipment

Testing equipment required for the successful commissioning of the Works described herein is to be made available by the Contractor.

Details of the Contractor's testing equipment are to be stated in schedule Part A.16.6 "Schedule of Contractor's Testing Equipment". Should the Contractor not have suitable equipment for carrying out the

tests at the time of testing, the Engineer will make the necessary arrangements for this equipment or instruct testing specialists to undertake this work. All arrangements for this equipment or instructing of testing specialists to undertake this work and all associated costs, including professional fees shall be deducted from money due to the Contractor.

Compliance with Regulations, Standards and Codes

The contractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:-

All relevant by-laws and regulations of local authorities.
All relevant SANS, BS and other international standards of the latest revision, where applicable.
The Occupational Health and Safety Act of 1993 as amended.
The Construction Regulations R1010 date July 2003 as amended.

12.0 Programme

The Contractor must conform to the programme as submitted by the principal Contractor. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

13.0 Drawings

General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

13.1 Bid Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed in Part 6: C5.1.1. It is the Bidder's responsibility to inform the Engineer as to the absence of any of these drawings.

13.2 Record / As-Built Drawings

The Contractor must prepare record/as-built drawings of the completed installation as constructed e.g. indicating actual cable runs, circuiting, distribution board details, final sleeve pipe positions, luminaire and power point layout details. The contract will not be deemed complete until these drawings have been submitted.

13.3 Construction / Workshop Drawings

Unless otherwise stated in the Standard Specification and / or the Detailed Specification the Contractor shall submit, in triplicate, installation drawings within 21 (twenty one) days after the signing of the Contract, to allow the Consulting Engineer to examine and approve them before equipment manufacture is started, or material delivered to site.

Should the Consulting Engineer require that any drawing be amended, the Contractor shall make the necessary alterations and re-submit the drawing within 2 (two) weeks.

The Contractor shall provide the Main Contractor and the Consulting Engineers with complete layout, installation and shop drawings, together with any necessary descriptions and specifications. Sufficient

details shall be given to permit a full appraisal of all parts of the installation and their relation to the building structure.

Drawings shall give details of all foundations, ducts, chases, pits and openings and shall set out all lines and levels for the work (where applicable).

Delays caused by the submission of drawings or by an error, omission or inadequacy in these drawings, shall not be considered a reason for an extension of the Contract time.

The successful Bidder shall submit construction drawings of manufactured equipment, such as distribution boards, panels, etc., for consideration by the Engineer prior to manufacture thereof.

The Engineers approval of construction or workmanship drawings does not relieve the contractor of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the contractor of responsibility for errors or omissions in the construction / workmanship drawings.

14.0 Sufficiency of Bid

The Bidder's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

The Bidder's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

15.0 Measurement

The Bidder shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

All outlet boxes up to 100 x 100mm are measured as one item regardless of the number of entries.

Conduit boxes shall always include the fixing to the conduit with lock and bush nuts as specified.

All switches and plug units shall include the fixing to conduit as specified.

Outlet boxes shall be without covers and draw boxes shall include covers, screws, etc.

Light switches, switch plugs, etc. shall include screws, cover plates and other equipment specified.

All fittings and accessories always include the connections thereto. All light fittings shall be complete with lamps and tubes, unless otherwise stated in the Bill.

300mm additional length per conductor has been measured for conductors drawn into conduit, per termination point. Tenderers must allow in their rate for any conductor lengths required for his own purposes, in addition to the 300mm measured.

All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

Monthly Certificates

Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the contractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

17.0 LV Distribution Boards

All distribution boards will be supplied, wired and complete with all equipment of quantities, types, sizes and ratings as specified on the distribution board schematics, which are included in this document. The

distribution boards shall be manufactured in accordance with the Standard Specification for Electrical Building Services.

The Contractor shall ensure on site and on the drawings, before commencing with any work that sufficient space and access is available to install the DB's as specified. No additional claims for failure to check these details and rectify any default will be entertained.

Before handing over, the boards shall be thoroughly cleaned inside and outside. Finished surfaces shall be made good where necessary with identical paint to the original finish.

PVC sleeve pipes as indicated on the drawings shall be provided and built into the wall for incoming and outgoing cables.

LV Distribution Cables

All cables shall be in accordance with the Standard Specification. The cables shall be of sizes and construction as shown on the drawings.

The Contractor is advised to measure actual lengths of cable required on site before ordering as he will not be compensated for redundant cable or in fact any other material over supplied.

19.0 Earthing

It is the electrical subcontractor's responsibility to ensure that the complete earthing system of the building is in accordance with the code of practice.

To this end the subcontractor shall perform earth resistivity tests to ascertain which method of earthing is most suitable to ensure compliance with the code.

All metallic 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 screws at intervals not exceeding 150 mm.

The earth connection from the main earth bars of all the distribution boards must be made to the cold water mains and in the incoming service earth conductor or such conductor as the Engineer may direct. Where applicable all metallic roof sheeting as well metallic walkways and stairs shall be suitably earthed.

Furthermore, earth electrodes (earth spikes) of at least 1,5m long must be provided and driven in to the ground at least 1m from all the building's perimeter and shall clear all aprons and water channels. The earth spike must be driven into the ground at least 300mm below ground level. Only after final bonding and tests have been carried out must backfilling and compacting of same be executed.

The earth conductor must be bonded to the roof sheeting at intervals not exceeding 5m, ensuring that roof sheeting on both of the ridge are properly bonded.

The overall earth resistance at any distribution board shall not exceed 1 Ohm. The contractor shall access 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 the installation.

Conduit, Wireways and Accessories

20.1 Conduit

All conduit/outlet boxes and associated fittings for use in this installation will be SABS approved.

The electrical subcontractor must provide all conduit and accessories for the lighting, power, telephone, communications and computer, as shown on the drawings and as measured in the schedule of quantities.

Flexible metallic tubing of galvanized steel shall be used for connections to water heaters, fans and other similar equipment. The corrugations of the tubing shall have a rectangular cross section suitable to fit standard brass connections.

Powerskirting

Powerskirting has been utilised and shall be PVC with clip-on covers, structured light beige or an alternative colour chosen by the architect. The powerskirting shall be as specified in the “Conduit and Wireways Schedule”.

Wiring

Lighting and Power wiring in conduit and channel wireways shall comprise 600/1000V single core PVC insulated copper wire sized in accordance with the distribution board schematics. Conductor outer sheaths shall be of the following colours:-

Phase Conductors	:	red, white, blue
Neutral	:	black
Earth	:	green or yellow/green

Wall Switches and Switch Socket Outlets

All wall switches to be of the flush type complete with cover plates and screws in 100 x 50 x 50 extension outlet boxes mounted on the wall surfaces. Colours of outlet boxes and cover plates to match.

All surfaces mounted switch socket outlets to be in 100 x 100 x 50 extension outlet boxes mounted on the wall surfaces. Colours of outlet boxes and cover plates to match.

All switched socket outlets mounted in power skirting to have matching cover plates.

Further details of these outlets are listed in the Switch, SSO and Isolator Schedule.

The electrical subcontractor will be responsible for the installation of power points to feed equipment such as water heaters, air-conditioners, fans, security equipment, etc. This equipment, if supplied and installed by others, will be connected by the electrical subcontractor.

The cover plates to all outlets shall be fixed AFTER the final coat of paint has been applied. The Tenderer shall allow for this in his programme and pricing of the Works.

Labelling

All light switches and sockets shall be permanently labelled with a circuit number eg

Pn/m
Ln/m

where n = circuit number (1, 2, 3, etc)
m = component number in the circuit

Luminaires, Standards and Photocells

The luminaires are detailed in the “Luminaire Schedule”.

The electrical subcontractor shall comply with the installation requirements of the luminaire manufacturer. The method of supporting the luminaires is to be approved by the Engineer prior to installation.

Photocells shall be installed in positions as indicated on the drawings. The photocell shall be mounted in a dummy luminaire as detailed in the luminaire schedule, or inside a kiosk behind a Perspex cover. The following specifics shall apply:-

Activating Light Level	:	50 lux
De-activating Light Level	:	90 lux
Protection Rating	:	IP 44
Rated Switching Load	:	16 A

Protection against voltage surges will also be provided.

Lighting Protection Installation

The electrical contractor will be responsible for the employment of an accredited specialist sub-contractor to design and install the lightning protection system.

This specialist shall conduct a full survey on site and from the roof layout drawings in order to evaluate the type of lightning protection system (LPS) to be implemented. This survey must be conducted in accordance with the latest following SANS codes of practice.

SANS 10313: Protection against lighting – Physical damage to structures & life hazard.
SANS 62305-1: General Principals.
SANS 62305-2: Risk management.
SANS 62305-3: Physical damage to structures & life hazard.
SANS 62305-4: Electrical & electronic systems within structures.
SANS 1063: Earth rods, couplers & connections.
SANS 10199: The design & installation of earth electrodes.

The LPS specialist shall provide a risk analysis spread sheet to conclude the buildings classification. The risk analysis shall take into account the following criteria.

Type of structure:
- Construction of walls.
- Roof construction.
- Roof covering.
- Equipment on the roof.

Contents of the structure:
- Risk of panic.
- Kind of contents.
- Value of contents
- Measures for reduction of damage.

Consequential losses:
- Danger to the environment.
- Loss of services to the public.
- Other consequential losses.

Based on the above results & in conjunction with location & accepted annual frequency of lightning flashes the required protection level must be established. The design methodology (protective angle, grid or rolling sphere) used for the system must be stated and it must be shown with the use of drawings etc that the building / structure falls within the shielding offered by the LPS.

The LPS specialist shall also provide drawings to indicate the positions of the air termination system & down conductors. Where applicable the down conductors are to be installed in existing down pipes. Each down conductor should be bonded to the air termination system & be terminated to a 1,2m copper earth spike in the ground.

The issue of a Certificate of Compliance for the Lightning Protection Systems is compulsory on completion of the installation.

C-Bus Building Management System Installation

The purpose of the building management system (BMS) is to conserve power usage for lighting. The electrical contractor shall be required to employ of a specialist sub-contractor with proven tract record to install and commission this system.
Each controlled space (office, passages, boardrooms, etc) will be provided with occupancy sensors to be wired back to distribution boards through a C-bus looping system for the purpose of controlling lighting luminaires in respective spaces.
As a minimum requirement the BMS will operate as follows:

When an occupancy sensor senses the absence of occupants for a predetermined period, it signals a BMS device in the distribution board (DB) to switch the lights off and the air-conditioner in the room. After

10min with the lights switched off a second signal will be sent by the BMS device in the DB to a relay to turn off the airconditioning unit.

As soon as an occupant walks into the monitored space the sensor signals the device in the DB to switch lights on.

Sensors will measure natural lighting entering perimeter spaces and reduce artificial lighting accordingly to save on power.

The BMS will switch on and off all passage lighting circuits at a predetermined times in mornings and afternoons as discussed and agreed with the DPW and user departments.

Outside lights also be controlled by the BMS system at predetermined times and will therefore not require photocells.

Lights in fire escape stairs and passages must not be switched and are to stay on 24 hours a day.

The BMS control / switching must be able to be manually overridden temporarily at the reception desk should this be required.

Telephone, Computer and Security Installations

The electrical contractor will be responsible for the installation for conduit only. This will include all distribution boards, outlet boxes with cover plates and draw wires, all as indicated on the layout drawings.

The equipment, cabling and wiring for these systems will be done by others.

25.0 Copyright

Copyright on designs, specifications, patents (including pending), systems and processes contained in this document remain the reserve of the Author. Any transgressor shall be held responsible jointly and severally, in their personal and corporate capacities for any contravention of this right.

26.0 Facsimile Bids

No facsimile bids will be accepted.

27.0 Schedule of Sub-Contractors

The Bidder shall state in the Schedule of Proposed Sub-contractors of this document) the name of any Sub-contractors he proposes to employ to assist him to complete the Works, and the proposed extent of the Sub-contractor's responsibilities.

28.0 Schedule of similar types of installations carried out by Bidder

The Bidder shall list in the Schedule of Similar Types of Installations Carried out by the Bidder of this document) the name, year, value, etc. of any similar contract undertaken previously by the Tenderer.

29.0 Schedule of staff available

The Tenderer shall list in the Schedule of Staff Available of this document) the name, designation, years of relevant experience (i.e. similar type of work) of all staff (from senior personnel to labourers) who will be made to perform any duties for and on behalf of the Tenderer on this project.

30.0 Cession for materials stored off site

This form shall be used to facilitate payment and cede rights in respect with ownership of materials stored OFF site in terms of the Conditions of Contract between the Contractor and Main Contractor.

31.0 Schedule of work in hand

The Tenderer shall list brief details of all projects which are currently in progress indicating Name of Project, Client, etc. including details of 3 projects where the quality of your workmanship can be inspected.

32.0 Identification

Tenderers are kindly reminded to enter their company's name in the space allocated on the front cover of this document for ease of reference.

DO IT NOW!

33.0 Progress Meetings

Progress meetings will be held on site every month or as mutually arranged by all parties. The Contractor must arrange for his authorized representative, who must be approved by the Engineer, to attend these progress meetings when required to do so. All costs for these meetings, including testing, commissioning, snagging and handing over meetings, shall be deemed to have been covered by the Preliminary and General Costs.

C4.2.2: DETAILED SPECIFICATION – ELECTRICAL INSTALLATION

1.0 Introduction & General

This detail specification complements & qualifies the foregoing specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

Should there be any conflict or ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:-

- Schedule of Quantities
- Project Specification including Equipment Schedules
- Drawings (loose and bound-in)
- Standard Specification

Should the Tenderer notice any inconsistencies between these sections, it is his responsibility to notify the Engineer in order to obtain clarification thereon.

2.0 Scope of Work

This contract calls for The Electricity infrastructure refurbishment at TARDI within and around premises largely as contemplated in SANS Code of Practice and Standards.

The following sections of work are included in the contract:-
- Complete supply and install of new street lighting.
- Complete supply and install of overhead and upgrading electrical reticulation system.
- Disconnection, removal and deliver to User old street light installation complete.
- Bush clearing and Tree cutting
- Complete supply and installation of earthing system for street and electrical supply installation.•
- All materials, equipment, labour and other necessary services for the complete, safe efficient operation of the works must be in full adherence with the specifications laid down in the electrical document.
- 12 Months defects and maintenance period from practical completion of the electrical installation
- Testing and commissioning, including issuing of a Certificate of Compliance

The following sections of work are excluded:-

- Installation of telephone, data cabling and associated equipment

3.0 Site Conditions

3.1 General

This is a existing electrical reticulation and building installation project.

Design conditions are:-

- Max. temperature - 29,4 DB : 23,3 WB
- Min. temperature - 1,7 °C
- Voltage - 400 / 230V ±10%
- Frequency - 50 Hz

4.0 Builder's Work

The following will be provided by the principal Contractor under the building works contract:-

- Openings through walls and floor slabs.
- Final backfilling and compaction of cable trenches to finished levels

The electrical subcontractor will be responsible for the following:-

- Manholes and covers
- PVC sleeves 50mm dia. to 110mm dia.
- Trenching, bedding and backfilling for LV cables above marker tape.

All excavation shall be executed in accordance with the Standard Specification.

5.0 Excavation

5.1 General

Tenderers are to note that excavation shall be carried out in strict accordance with the Detailed Specification. The contractor may use any method he chooses to excavate any class of material, but his chosen method shall not determine the classification of the excavation.

The Engineer will decide on the classifications of the material based on the inspection of the excavated material and the criteria entailed in Clause 5.2 below.

NOTE: Before any cable(s) are installed in the trench or trenches, such trench or trenches shall be inspected by the Engineer at a site meeting agreed upon and once approval is given that such trench or trenches are acceptable, may the cable or cables be installed.

5.2 Measurement, Pricing & Payment

For the purpose of this contract, only two classes of material have been measured, and comprise the following criteria:

5.2.1 Soft excavation:

Excavation generally by pick and shovel in soft soil. Determining factors ruled by descriptions in Item 5.3.1, “Soft Excavation” above.

5.2.2 Intermediate excavation :

Excavation deemed to be possible by pneumatic tools. Determining factors include descriptions in :

- Item 5.3.2 “Intermediate Excavation”
- Item 5.3.4 “Boulder Excavation Class A”
- Item 5.3.5 “Boulder Excavation Class B”

5.3 Classes of Excavation

The following criteria have been extracted from SANS 1200.

5.3.1 Soft excavation:

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

i) a bulldozer of mass (including mass of ripper if fitted) approximately 22t and flywheel power approximately 145kW, or
ii) a tractor-scraper unit of total mass approximately 28t and flywheel power approximately 245kW, pushed during loading by a bulldozer equivalent to that specified in 5.3.1 a) below, or
iii) a track-type front-end loader of mass approximately 22t and flywheel power approximately 145kW.

b) In the case of restricted excavation, soft excavation shall be excavation in material that can be efficiently removed by al back-acting excavator of flywheel power approximately 0,10kW for each millimeter of tinned bucket width, without the assistance of pneumatic tools such as paving breakers.

5.3.2 Intermediate excavation :

a) Intermediate excavation, other than in restricted excavation, shall be excavation (excluding soft excavation) in material that can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220kW.
b) In the case of restricted excavation, intermediate excavation shall be excavation (excluding soft excavation) in material that requires a back-acting excavator of flywheel power exceeding 0,10kW for each millimeter of tined-bucket width or the use of pneumatic tools before removal by equipment equivalent to that specified in 5.3.1 b) above.

5.3.3 Hard rock excavation :

a) Hard rock excavation, other than in restricted excavation, shall be excavation (excluding boulder excavation) in material that cannot be efficiently ripped by a bulldozer equivalent to that specified in 5.3.1 a) above before removal.

NOTE : Such excavation generally includes materials such as formations of unweathered rock that can be removed only after blasting.

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

5.3.4 Boulder excavation Class A

Boulder excavation Class A shall be excavation in material containing more than 40 % by volume of boulders of size between 0,03m3 and 20m3, in a matrix of soft material or smaller boulders.

Excavation in dolomite formations other than solid dolomite will be classed as boulder excavation Class A if the formation contains more than 40 % by volume if lumps of hard dolomite of size between 0,03m3 and 20m3, in a matrix of soft material or smaller lumps of hard dolomite.

Excavation of solid boulders or lumps of size exceeding 20m3 will be classed as hard rock excavation.

Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.

5.3.5 Boulder excavation Class B :

Boulder excavation Class B shall be excavation of boulders only in a material containing 40 % or less by volume of boulders ranging in size between 0,03m3 and 20m3, in a matrix of soft material or smaller boulders. Those boulders requiring individual drilling and blasting in order to be loaded by a track type front-end loader or back-acting excavator, as the case may be, as specified in 5.3.1 a) or 5.3.1 b) above, will each be separately measured as boulder excavation Class B. The excavation of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

6.0 Schedules of Information

The schedules of information contained in this document consist of 2 sections:

- Information supplied by the Engineer (schedules of drawings, cables, distribution boards, etc. as applicable.)

- Information to be supplied by the Contractor at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)

Tenderers are required to enter, at the time of tendering, in the “Schedule of Equipment and Material Offered”, sufficient details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a tender to state “as specified” in the schedules.

Failure to complete these schedules (if applicable) may render a tender invalid.

7.0 Samples and Alternatives

Bidders may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE: A request for submission of samples or drawings does not imply that the Bidders quotation will necessarily be accepted.

Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Bidders. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

8.0 Supervision, Workmanship and Delays

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the contractor, who must be able and authorized to receive and execute instructions on behalf of the electrical contractor.

In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the contractor.

Similarly, should delays in the contract be caused by poor performance on the part of the Contractor causing the Engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Contractor.

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

9.0 Making Good

The contractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

10.0 Commissioning and Testing

10.1 Commissioning

A documented method shall be followed whereby the electrical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

10.2 Performance Tests

The electrical contractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the electrical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the electrical contractor will supply documentary proof of full performance tests of all relevant equipment.

10.3 Acceptance Tests

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the electrical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not.

Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

10.4 Testing Equipment

Testing equipment required for the successful commissioning of the Works described herein is to be made available by the Contractor.

Details of the Contractor's testing equipment are to be stated in schedule Part A.16.6 "Schedule of Contractor's Testing Equipment". Should the Contractor not have suitable equipment for carrying out the tests at the time of testing, the Engineer will make the necessary arrangements for this equipment or instruct testing specialists to undertake this work. All arrangements for this equipment or instructing of testing specialists to undertake this work and all associated costs, including professional fees shall be deducted from money due to the Contractor.

11.0 Compliance with Regulations, Standards and Codes

The contractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:-

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards of the latest revision, where applicable.
- The Occupational Health and Safety Act of 1993 as amended.
- The Construction Regulations R1010 date July 2003 as amended.

12.0 Programme

The Contractor must conform to the programme as submitted by the principal Contractor. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

13.0 Drawings

General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

13.1 Bid Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed in Part 6: C5.1.1. It is the Bidder's responsibility to inform the Engineer as to the absence of any of these drawings.

13.2 Record / As-Built Drawings

The Contractor must prepare record/as-built drawings of the completed installation as constructed e.g. indicating actual cable runs, circuiting, distribution board details, final sleeve pipe positions, luminaire and

power point layout details. The contract will not be deemed complete until these drawings have been submitted.

13.3 Construction / Workshop Drawings

Unless otherwise stated in the Standard Specification and / or the Detailed Specification the Contractor shall submit, in triplicate, installation drawings within 21 (twenty one) days after the signing of the Contract, to allow the Consulting Engineer to examine and approve them before equipment manufacture is started, or material delivered to site.

Should the Consulting Engineer require that any drawing be amended, the Contractor shall make the necessary alterations and re-submit the drawing within 2 (two) weeks.

The Contractor shall provide the Main Contractor and the Consulting Engineers with complete layout, installation and shop drawings, together with any necessary descriptions and specifications. Sufficient details shall be given to permit a full appraisal of all parts of the installation and their relation to the building structure.

Drawings shall give details of all foundations, ducts, chases, pits and openings and shall set out all lines and levels for the work (where applicable).

Delays caused by the submission of drawings or by an error, omission or inadequacy in these drawings, shall not be considered a reason for an extension of the Contract time.

The successful Bidder shall submit construction drawings of manufactured equipment, such as distribution boards, panels, etc., for consideration by the Engineer prior to manufacture thereof.

The Engineers approval of construction or workmanship drawings does not relieve the contractor of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the contractor of responsibility for errors or omissions in the construction / workmanship drawings.

14.0 Sufficiency of Bid

The Bidder's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

The Bidder's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

15.0 Measurement

The Bidder shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

All outlet boxes up to 100 x 100mm are measured as one item regardless of the number of entries.

Conduit boxes shall always include the fixing to the conduit with lock and bush nuts as specified.

All switches and plug units shall include the fixing to conduit as specified.

Outlet boxes shall be without covers and draw boxes shall include covers, screws, etc.

Light switches, switch plugs, etc. shall include screws, cover plates and other equipment specified.

All fittings and accessories always include the connections thereto. All light fittings shall be complete with lamps and tubes, unless otherwise stated in the Bill.

300mm additional length per conductor has been measured for conductors drawn into conduit, per termination point. Tenderers must allow in their rate for any conductor lengths required for his own purposes, in addition to the 300mm measured.

All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

16.0 Monthly Certificates

Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the contractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

17.0 LV Distribution Boards

All distribution boards will be supplied, wired and complete with all equipment of quantities, types, sizes and ratings as specified on the distribution board schematics, which are included in this document. The distribution boards shall be manufactured in accordance with the Standard Specification for Electrical Building Services.

The Contractor shall ensure on site and on the drawings, before commencing with any work that sufficient space and access is available to install the DB's as specified. No additional claims for failure to check these details and rectify any default will be entertained.

Before handing over, the boards shall be thoroughly cleaned inside and outside. Finished surfaces shall be made good where necessary with identical paint to the original finish.

PVC sleeve pipes as indicated on the drawings shall be provided and built into the wall for incoming and outgoing cables.

18.0 LV Distribution Cables

All cables shall be in accordance with the Standard Specification. The cables shall be of sizes and construction as shown on the drawings.

The Contractor is advised to measure actual lengths of cable required on site before ordering as he will not be compensated for redundant cable or in fact any other material over supplied.

19.0 Earthing

It is the electrical subcontractor's responsibility to ensure that the complete earthing system of the building is in accordance with the code of practice.

To this end the subcontractor shall perform earth resistivity tests to ascertain which method of earthing is most suitable to ensure compliance with the code.

All metallic 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 screws at intervals not exceeding 150 mm.

The earth connection from the main earth bars of all the distribution boards must be made to the cold water mains and in the incoming service earth conductor or such conductor as the Engineer may direct. Where applicable all metallic roof sheeting as well metallic walkways and stairs shall be suitably earthed.

Furthermore, earth electrodes (earth spikes) of at least 1,5m long must be provided and driven in to the ground at least 1m from all the building's perimeter and shall clear all aprons and water channels. The earth spike must be driven into the ground at least 300mm below ground level. Only after final bonding and tests have been carried out must backfilling and compacting of same be executed.

The earth conductor must be bonded to the roof sheeting at intervals not exceeding 5m, ensuring that roof sheeting on both of the ridge are properly bonded.

The overall earth resistance at any distribution board shall not exceed 1 Ohm. The contractor shall access 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 the installation.

20.0 Conduit, Wireways and Accessories

20.1 Conduit

All conduit/outlet boxes and associated fittings for use in this installation will be SABS approved.

The electrical subcontractor must provide all conduit and accessories for the lighting, power, telephone, communications and computer, as shown on the drawings and as measured in the schedule of quantities.

Flexible metallic tubing of galvanized steel shall be used for connections to water heaters, fans and other similar equipment. The corrugations of the tubing shall have a rectangular cross section suitable to fit standard brass connections.

20.2 Powerskirting

Powerskirting has been utilised and shall be PVC with clip-on covers, structured light beige or an alternative colour chosen by the architect. The powerskirting shall be as specified in the “Conduit and Wireways Schedule”.

21.0 Wiring

Lighting and Power wiring in conduit and channel wireways shall comprise 600/1000V single core PVC insulated copper wire sized in accordance with the distribution board schematics. Conductor outer sheaths shall be of the following colours:-

- Phase Conductors : red, white, blue
- Neutral : black
- Earth : green or yellow/green

22.0 Wall Switches and Switch Socket Outlets

All wall switches to be of the flush type complete with cover plates and screws in 100 x 50 x 50 extension outlet boxes mounted on the wall surfaces. Colours of outlet boxes and cover plates to match.

All surfaces mounted switch socket outlets to be in 100 x 100 x 50 extension outlet boxes mounted on the wall surfaces. Colours of outlet boxes and cover plates to match.

All switched socket outlets mounted in power skirting to have matching cover plates.

Further details of these outlets are listed in the Switch, SSO and Isolator Schedule.

The electrical subcontractor will be responsible for the installation of power points to feed equipment such as water heaters, air-conditioners, fans, security equipment, etc. This equipment, if supplied and installed by others, will be connected by the electrical subcontractor.

The cover plates to all outlets shall be fixed AFTER the final coat of paint has been applied. The Tenderer shall allow for this in his programme and pricing of the Works.

Labelling

All light switches and sockets shall be permanently labelled with a circuit number eg

- Pn/m
- Ln/m

where n = circuit number (1, 2, 3, etc)
m = component number in the circuit

23.0 Luminaires, Standards and Photocells

The luminaires are detailed in the “Luminaire Schedule”.

The electrical subcontractor shall comply with the installation requirements of the luminaire manufacturer. The method of supporting the luminaires is to be approved by the Engineer prior to installation.

Photocells shall be installed in positions as indicated on the drawings. The photocell shall be mounted in a dummy luminaire as detailed in the luminaire schedule, or inside a kiosk behind a Perspex cover. The following specifics shall apply:-

- Activating Light Level : 50 lux
- De-activating Light Level : 90 lux
- Protection Rating : IP 44
- Rated Switching Load : 16 A

Protection against voltage surges will also be provided.

24.0 Lighting Protection Installation

The electrical contractor will be responsible for the employment of an accredited specialist sub-contractor to design and install the lightning protection system.

This specialist shall conduct a full survey on site and from the roof layout drawings in order to evaluate the type of lightning protection system (LPS) to be implemented. This survey must be conducted in accordance with the latest following SANS codes of practice.

- SANS 10313: Protection against lighting – Physical damage to structures & life hazard.
- SANS 62305-1: General Principals.
- SANS 62305-2: Risk management.
- SANS 62305-3: Physical damage to structures & life hazard.
- SANS 62305-4: Electrical & electronic systems within structures.
- SANS 1063: Earth rods, couplers & connections.
- SANS 10199: The design & installation of earth electrodes.

The LPS specialist shall provide a risk analysis spread sheet to conclude the buildings classification. The risk analysis shall take into account the following criteria.

Type of structure:
- Construction of walls.
- Roof construction.
- Roof covering.
- Equipment on the roof.

Contents of the structure:
- Risk of panic.
- Kind of contents.
- Value of contents
- Measures for reduction of damage.

Consequential losses:
- Danger to the environment.
- Loss of services to the public.
- Other consequential losses.

Based on the above results & in conjunction with location & accepted annual frequency of lightning flashes the required protection level must be established. The design methodology (protective angle, grid or rolling sphere) used for the system must be stated and it must be shown with the use of drawings etc that the building / structure falls within the shielding offered by the LPS.

The LPS specialist shall also provide drawings to indicate the positions of the air termination system & down conductors. Where applicable the down conductors are to be installed in existing down pipes. Each down

conductor should be bonded to the air termination system & be terminated to a 1,2m copper earth spike in the ground.

The issue of a Certificate of Compliance for the Lightning Protection Systems is compulsory on completion of the installation.

25.0 C-Bus Building Management System Installation

The purpose of the building management system (BMS) is to conserve power usage for lighting. The electrical contractor shall be required to employ of a specialist sub-contractor with proven tract record to install and commission this system.
Each controlled space (office, passages, boardrooms, etc) will be provided with occupancy sensors to be wired back to distribution boards through a C-bus looping system for the purpose of controlling lighting luminaires in respective spaces.
As a minimum requirement the BMS will operate as follows:

- When an occupancy sensor senses the absence of occupants for a predetermined period, it signals a BMS device in the distribution board (DB) to switch the lights off and the air-conditioner in the room. After 10min with the lights switched off a second signal will be sent by the BMS device in the DB to a relay to turn off the airconditioning unit.
- As soon as an occupant walks into the monitored space the sensor signals the device in the DB to switch lights on.
- Sensors will measure natural lighting entering perimeter spaces and reduce artificial lighting accordingly to save on power.
- The BMS will switch on and off all passage lighting circuits at a predetermined times in mornings and afternoons as discussed and agreed with the DPW and user departments.
- Outside lights also be controlled by the BMS system at predetermined times and will therefore not require photocells.
- Lights in fire escape stairs and passages must not be switched and are to stay on 24 hours a day.
- The BMS control / switching must be able to be manually overridden temporarily at the reception desk should this be required.

26.0 Telephone, Computer and Security Installations

The electrical contractor will be responsible for the installation for conduit only. This will include all distribution boards, outlet boxes with cover plates and draw wires, all as indicated on the layout drawings.

The equipment, cabling and wiring for these systems will be done by others.

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No facsimile bids will be accepted.

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Progress meetings will be held on site every month or as mutually arranged by all parties. The Contractor must arrange for his authorized representative, who must be approved by the Engineer, to attend these progress meetings when required to do so. All costs for these meetings, including testing, commissioning, snagging and handing over meetings, shall be deemed to have been covered by the Preliminary and General Costs.

C4.2.3: PARTICULAR WORKS SPECIFICATION

Number	Heading
1	SITE DATA
2	MATERIAL QUALITY SPECIFICATION
3	ELECTRICAL CABELING
4	MV CABLING
5	ABC CONDUCTOR
6	TRANSFORMERS
7	COMBINATION UNITS FOR CONNECTION TO THE EXISTING 11KV NETWORK
8	EARTHING
9	POLES AND STRUCTURES
10	BUNDLE (ABC) SERVICE PROTECTION POLE BOX
11	ABC CLAMPS
12	SERVICE CONNECTION CABLES
13	RESIDENTIAL UNITS AND RELATED
14	STREETLIGHTING MATERIALS
15	ACCESS FOR EQUIPMENT
16	SIGNS AND NOTICES

1 SITE DATA

Note that the following site data is for tender purposes only. It is the responsibility of the Contractor to verify the data for design purposes.

It is the Contractor's responsibility to acquaint himself with the site conditions as well as the nature and strata of material on site. No additional claims will be entertained over and above the tender rates as submitted by the Contractor due to the lack of knowledge by the Contractor about the site conditions.

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

Project Location	**Tsolo**

Electrical network status	**Value**
Maximum short circuit current at the Substation	22/11/ kV - 25 kA 400 V – 35 kA
System nominal voltage	22/11 / 0.400 / 0.230 kV
System highest voltage	24/12 / 0.45 / 0.26 kV
Contractual voltage	22/11 / 0.42 / 0.242 kV
Frequency + possible variation	50 Hz ± 1%
Neutral grounding system	Solid
Upstream protection	22/11kV circuit breakers

2 MATERIAL QUALITY SPECIFICATION

The Contractor shall ensure that all components and materials supplied are designed, manufactured and tested in accordance with the latest applicable IEC and SANS standards.

Equipment Products, Components and/or Accessories must conform to all applicable Product Safety Standards appropriate for the intended markets.

The Contractor shall ensure appropriate certification and independent testing has been carried out on any materials and products proposed.

The Contractor shall ensure materials and products used are suitable for the specified service conditions.

The Contractor shall ensure that all works, materials, parts, components etc. supplied shall be new.

The Contractor shall ensure materials and products delivered to site bear the manufacturer's name, brand name and any other data required to verify that their performance and specification complies with the requirements of this document and the Employer's Project Specific Requirements.

3 ELECTRICAL CABLING

All cable and cabling equipment and services supplied shall comply with the standards listed below:

- SANS 97 - Electrical Cables Impregnated paper insulated metal-sheathed cables for rated voltages 3,3 kV to 19/33kV.
- SANS 1213 Mechanical Cable Glands.
- SANS 1339 - Electric Cables Cross-linked polyethylene(XLPE) insulated cables for voltages from 3,8/6,6 kV to 19/33kV.
- SANS 1507 Part 1: General - Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V).
- SANS 1507 Part 2: Wiring Cables - Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V).
- SANS 1507 Part 3: PVC Distribution cables - Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V).
- SANS 1507 Part 4: XLPE Distribution cables – Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3300 V).
- SANS 1507 Part 5: Halogen-free Distribution Cables - Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V).
- SANS 1507 Part 6: Service cables - Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V).
- SANS 10198 Parts 1-14: 2004 The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 1 to 14.
- SANS 1213 Mechanical Cable Glands.
- NRS 074-1/2 Low Voltage cables systems.
- Requirements for cables for use in photovoltaic systems: 2Pfg1169” by TÜV.

4 MV CABLING

General: The selection, handling and installation of electric cables shall meet the requirements of SANS 10198 Part 1 to Part 14.

Trenching: The trench section requirements are indicated on the Drawing(s). Trenching for all cabling will be the responsibility of the Contractor.

All cable routes and positions must be confirmed on site by the Employer prior to trenching. The Contractor shall not commence with the backfilling of trenches without prior notification to the Employer so that the cable installation may be inspected. Should the Contractor fail to give a timeous notification, the trenches shall be re-opened at the Contractor's cost. Such an inspection by the Employer will not be unreasonably delayed.

MV cables: 300Al 11/11kV PILC Table 18 cable MV cable shall be used.

The cable shall be sealed at both ends.

Jointing and terminations shall be in accordance with the manufacturer's instructions by approved jointers experienced in this type of work.

The cables shall be delivered on drums in such lengths as to ensure that the cable lengths between terminations and joints, and between joints, will be approximately equal.

Cable Route Markers shall be placed at:

Approximately every 50 meters along a straight run;
Above every change in direction of the cable;
Above cable joints.

Survey Beacons and Benchmarks: The Contractor shall be responsible for the preservation of all land survey, or other pegs, benchmarks and beacons. If damage or disturbance of any such pegs or beacons is caused by the operations of the Contractor, or his subcontractor, the pegs or beacons are to be replaced by a registered Land Surveyor at the cost of the Contractor. Benchmarks will be replaced by the Employer at the Contractor's expense.

Information on the position of all such pegs will be made available to the Contractor by the Employer on request.

The Contractor is to ensure that no spoil is placed over an erf peg or benchmark and that these are adequately protected during the Contract Period.

Spoil Material: The indiscriminate spoiling of material will not be permitted. All surplus or unsuitable material removed from excavation shall be spoiled in designated areas, as directed by the Employer.

Marker Tape: PVC warning tape of nominal width 300 mm and conforming to the requirements of SABS 1500 SC paragraph 3.7 shall be laid over the 11 kV cable, accepting that tape need not be provided over cables where these pass through sleeves or ducts.

Cable Protection Slabs: Precast concrete protection slabs, 1000mm x 300mm x 60mm (40kg), or interlocking 1mm thick Polypropylene with a nominal width of 250mm and 1 meter standard length.

Type Testing of 11 kV Cables: If so required by the Employer, type tests results in accordance with SANS 97 shall be submitted to him before the manufacturer supplies the cable.

Electrical Tests on 11 kV Cables after Installation: The Contractor shall give the Employer at least two days' notice of when the completed installation will be ready for inspection and site testing.

Each cable including its joints and terminations shall be subject to the test as specified by SANS 97.

5. ABC CONDUCTOR

5.1 LOW VOLTAGE ABC

APPLICABLE STANDARDS

SANS 1418: ABC Conductor systems

SPECIFIC REQUIREMENTS

Dimensional, electrical and mechanical properties shall comply with the data for the corresponding cable sizes found in the tables published in SANS 1418 for 600/1000V ABC. LV ABC cables shall have hard-drawn, stranded and compacted aluminium conductors insulated with UV resistant, carbon-loaded XLPE.

The LV ABC cable shall be of the **Supporting Core** type (French system) consisting of 3 phase conductor cores of equal cross-section, and a single 25mm^2 streetlighting core, laid-up around a 54.6mm ^{2} aluminium alloy supporting neutral core insulated with UV resistant, carbon-loaded XLPE. When installed, the supporting core shall be the strain-bearing core from which the ABC cable is suspended.

The ABC shall be compatible and suitable for use with standard LV ABC splices, strain clamps, suspension clamps, end caps and 6kV insulation piercing Tee-off connectors to form a waterproof insulated system.

The handling, stringing and tensioning of the Aerial Bundle Conductor shall be strictly according to the manufacturer's specifications.

CABLE DRUMS

Cables in the range 35mm^2 to 120mm^2 shall be delivered in 300m lengths coiled on steel-reinforced wooden cable drums of **suitable strength** and dimensions to facilitate lifting and rotating by means of an axle inserted through the centre, without damaging the cable.

Cable drums shall be **suitably dimensioned** to ensure that the cable coils exceed the minimum bending radius and to ensure that coils are properly contained within the flanges. The full drum shall

be **properly enclosed** for transportation by means of planks nailed across the width round the complete periphery of the drum.

The inner and outer **ends** of the cable shall be **properly sealed** to prevent ingress of moisture during transport and outdoor storage. The cable drum shall be **clearly and indelibly marked** on the outside of the wooden flange with the following information: -

- Manufacturer
- Manufacturer's identification serial or stock number for the particular length of cable
- Date of cable manufacture
- Type of cable, drum length and conductor material and size
- Municipal Order/Project Number
- A curved arrow showing the correct direction for rolling the drum when installing the cable
- Gross mass of the full drum in kg.

5.2 MEDIUM VOLTAGE ABC

APPLICABLE STANDARDS

SANS 1713: MV ABC 3,8/6,6kV to 19/33kV

SPECIFIC REQUIREMENTS

Dimensional, electrical and mechanical properties shall comply with the data for the corresponding cable sizes found in the tables published in SANS 1713 for 3,8/6,6kV to 19/33kV ABC. MV ABC cores shall have hard-drawn, stranded and compacted aluminium conductors surrounded by an extruded conductor screen, XLPE insulation, an extruded insulation screen, a taped core screen and a copper screening tape, all enclosed in a UV protected PVC serving.

The MV ABC cable shall consist of 3 phase conductor cores of equal cross-section, laid-up around a galvanized steel wire catenary coated with a UV protected PVC serving. The 3 conducting cores shall be phase-identified by numerals 1, 2 & 3 embossed on the serving surface. When installed, the catenary wire shall be the strain-bearing core from which the ABC cable is suspended.

The ABC shall be compatible and suitable for use with standard MV ABC strain clamps, suspension clamps and MV splices and terminations to form a waterproof insulated system for operation at a service voltage of 11/22kV.

The handling, stringing and tensioning of the Aerial Bundle Conductor shall be strictly according to the manufacturer's specifications.

CABLE DRUMS

Cables in the range 50mm^2 to 95mm^2 shall be delivered in 300m lengths coiled on steel-reinforced wooden cable drums of **suitable strength** and dimensions to facilitate lifting and rotating by means of an axle inserted through the centre, without damaging the cable. Cable drums shall be **suitably dimensioned** to ensure that the cable coils exceed the minimum bending radius and to ensure that coils are properly contained within the flanges.

The full drum shall be **properly enclosed** for transportation by means of planks nailed across the width round the complete periphery of the drum. The inner and outer **ends** of the cable shall be **properly sealed** to prevent ingress of moisture during transport and outdoor storage. The inner sealed end shall be brought out through a hole in the side flange so that it can be inspected without uncoiling the cable.

The cable drum shall be **clearly and indelibly marked** on the outside of the wooden flange with the following information: -

- Manufacturer
- Manufacturer's identification serial or stock number for the particular length of cable
- Date of cable manufacture
- Type of cable, drum length and conductor material and size
- Municipal Order/Project Number
- Curved arrow showing the correct direction for rolling the drum when installing the cable
- Gross mass of the full drum in kg.

TEST CERTIFICATES

A copy of the Manufacturer's electrical test certificate for each drum of cable supplied must be forwarded to demonstrate compliance with the requirements of SANS 1713.

6 TRANSFORMERS

General Requirements

Transformers shall comply with the requirements of SANS 780 and NRS 005 and shall carry the SANS mark together with the relevant specification number on the outside of the tank. Newly manufactured transformers are required. **Re-built transformers as well as Aluminium foil windings will not be accepted.**

With reference to Appendix A of NRS 005 the following requirements shall apply: Construction Requirements

16kVA to 500kVA transformers shall be of the outdoor type and hermetically sealed by means of welded covers. 800kVA and 1000kVA transformers shall be of the indoor type.

Bushings for transformers up to and including 500kVA shall be provided with arcing horns. Transformers shall be of the low loss type. The rating of the low voltage neutral terminal shall be at least 50% of the rated current of the line terminals.

Rated voltages:	11000/420/242 volt.
	22000/420/242 volt
Vector Group:	DYN11
Insulation level:	95kV
The earthing method for both MV and LV system:	solid.
The prospective three phase MV fault level:	minimum 12kA.

All distribution transformers shall be provided with a MV off-circuit tapping switch which can be externally operated to vary the nominal voltage ratio by plus and minus 2 $^{1}/_{2}$% and 5%.

Specific Requirements

The complete tank of the 16kVA up to 500kVA transformers, including cooling tubes and radiator fins, as well as any fixing brackets, shall be galvanised in accordance with the requirements of SANS 763, or of 3CR12 steel. The rating plate must specifically indicate material as "Galvanised to SANS 763" or “CR12” The 800kVA and 1000kVA transformers shall have bolted covers.

100kVA up to and including 500kVA transformers shall have skid underbases. Transformers must be equipped with integral distribution kiosk (Peanut type) with internal Circuit Breaker switch as per Knysna Municipal specification

100kVA up to and including 500kVA transformers shall have mounting brackets for standard lightning arresters. Alternative offers which may be of technical or financial advantage to the purchaser may be submitted.

Transformers shall be externally painted as follows: -

Paint finish:

Primer: Calcium Plumbate (24 hours drying)

1st Coat: Chlorinated Rubber

2nd Coat Chlorinated Rubber

The colour of enclosures shall be C12 "AVOCADO" in accordance with SABS 1091.

7 COMBINATION UNITS FOR CONNECTION TO THE EXISTING 11KV NETWORK

The unit shall be similar or equal to Live Line Technology type.

The combined cut-out fuse and drop-out surge arrester unit, referred to as a combi unit, shall be a device that has the functionality of a standard cut-out fuse, as well as the functionality of a distribution class drop-out surge arrester, built into a single device.

The unit shall comply to the Eskom specification, DSP 34-1962: Distribution Specification – Part 4: Specification for a combined cutout fuse and drop-out surge arrester unit.

All surge arrestors to be earthed.

8 EARTHING

Reticulation Network

The neutral conductor of the Aerial Bundle Conductor system shall be earthed at various positions.

Earthing positions is as follows:

- The MV side of the transformer shall be earthed by means of 63mm earth conductor
- The LV side of the transformer shall be earthed by means of 63mm earth conductor ○ MV and LV earthing to be separated by 5m – see Eskom specifications
- The first pole on each feeder shall be earthed by means of 35mm earth conductor pole coil;
- The last pole on each feeder shall be earthed by means of 35mm earth conductor pole coil;
- Any T-off pole on each feeder shall be earthed by means of 35mm earth conductor pole coil;
- All 5.4m poles supplying residential units shall be earthed by means of 16mm earth conductor pole coil.

A pole coil is defined as a coil of earth conductor around the base of the distribution pole as well as under the pole, installed while the pole is being planted and connected to the neutral of the distribution network. The end of the earth conductor shall be connected to a copper coated earth spike by means of an approved clamp, should the required earth reading not be obtained.

The estimated length of the earth is as follows:

- Length of Pole: 9 m
- Pole Coil: 3 m
- Total Length : 12 m

The earth conductor shall be connected to the Aerial Bundle Conductor neutral by means of an approved clamp. The earth conductor shall be installed in a 20mm x 4m Bosal Galvanised kicker pipe, strapped to the poles.

Residential units

Earthing shall be generally in accordance with SANS 10142-1:2012 Code of Practice for the Wiring of Premises, the latest amendments and the Occupational Health and Safety Act (Act 85/1993) as amended to date and SABS 0199, Earth Electrodes, Design and Installation..

9 POLES AND STRUCTURES

Poles and structure to comply with dimensions and specifications as indicated on the drawings and the bill of materials.

All poles used for the distribution network, shall comply with the following minimum requirements:

Table of minimum diameters of pole tops corresponding to poles capable of withstanding fibre stress of 55 MPa.

LENGTH (m)	MIN. TOP DIAMETER (mm)
9	160
10	160
11	180
12	180
13	180
14	180
16	180

10 BUNDLE (ABC) SERVICE PROTECTION POLE BOX

The bundle box must be equal and similar to the Golnix pole top box type with door and warning sign. The box shall accommodate 1 to 6 or 1 to 9 – DIN rail mounted Conlog wBEC44 split Pre-Payment meters and CBI 5kA 30A SP Curve 1 circuit breakers for respective house service connections.

The Bundle Box must be equal or similar to the Golnix Ap1 (6-way) or Ap2 (9-way) pole mount type with lockable thru lock, top hinged door and manufactured from UV stabilized polyethylene material or glass reinforced polyester. The colour pigment incorporated into the enclosure shall be even. The colour shall be light grey or green in accordance with SANS 1019. The exterior finish of the enclosure shall be smooth. The danger sign shall be the mould in graphic type, no stickers or pop riveted danger signs allowed.

The box must be sized so as to accommodate 6/9 x 60 a single phase breakers (CBI type) for respective house connections and space only for 6/9 x split prepayment meters.

The box must be equipped with a clip rail for mounting the circuit breakers and one for the SPP meters. One 10 way earth bar must be supplied and fitted into the box.

One 10 way neutral bar must be supplied and fitted into the box.

10/13 x no 1 pvc black compression glands to be fitted to the underside of the box.

4 x 2.5 metre long 16mm tails, colour coded (r/w/bl/bk) to be supplied.

Two pole mounted brackets of 1.2mm thick type 316 stainless steel, must be mounted by means of stainless steel bolts, s/washer, f/washer and nuts to the rear of the box to accommodate 20mm strapping.

11 ABC CLAMPS

Connectors shall be Sicame or similar approved. **All Neutral connections shall be made with double clamps on Neutral conductor.**

The following clamps watertight insulated piercing connectors rated at 6kV shall be used:

ABC T-off:	Sicame TTD401F (or similar approved)
ABC Feeder to Yorkbox:	Sicame TTD151F (or similar approved)
ABC Feeder to ABC road crossing:	Sicame TTD201F (or similar approved)
ABC Feeder to Street Light:	Sicame TTD051F (or similar approved)

The following Strain and suspension clamps shall be used:

Complete Strain clamp assembly for 70mm^2 ABC or 95mm^2 ABC

- Including 70mm^2 ABC or 95mm^2 ABC strain clamp;
- Strain Pole Bracket
- Pigtail Bolt

Complete Suspension clamp assembly for 70mm^2 ABC or 95mm^2 ABC

- Including 70mm^2 ABC or 95mm^2 ABC Suspension clamp;
- Suspension Pole Bracket
- Pigtail Bolt

See schematic and BOQ for more information.

12 SERVICE CONNECTION CABLES

The service connection cables shall be Aberdare (or similar approved) Airdac SNE cables (with pilot cores) manufactured to SABS 1507 and NRS 063. All service connections shall be 10 mm^2 Cu.

The service connection cable shall be coiled on the roof with enough slack for the electrical contractor to install the cable up to the metering unit as well as to leave a loop to avoid water from entering the unit.

13 RESIDENTIAL UNITS AND RELATED

The successful contractor shall be responsible for the supply and installation of a pre-wired Small Power Distribution Unit (SPDU – Ready Board)

A registered accredited installation electrician shall exercise general control at all times and shall be responsible for issuing the COC.

General:

Copy of the contractor's registration with the Department of labour shall be attached to this tender.

A schematic representation of the required wiring for the residential units are indicated below:

PRE-WIRED SPDU

SPDU's:

The ready board shall be rated for use in a 240V system and shall comply with NRS 019. Ready boards must be manufactured of fibre or DMC and completely fitted and fully wired and tested to SANS 1619 and SANS 10142, with at least the following equipment:

In its basic form, the surface mounted Readyboard must be a robust construction and provide for

lighting, cooking and power usage. It must be compatible with all types of prepayment meters.

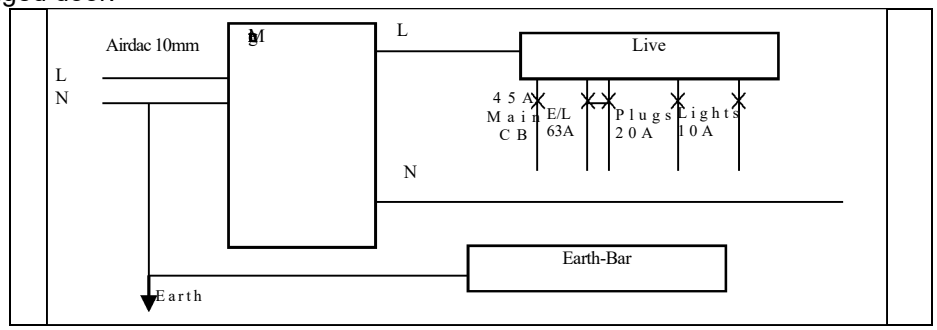
The Readyboard must be fully extendable for conduit or cable and must include a IP66 bulkhead light fitting (NOT PVC) rated at 100 watts, switched by a 10 -ampere switch fitted onto the bottom hinged door or the side of ready board.

3 x 16A (Three sixteen-ampere) earthing contact flush mounted socket outlets, must be fitted onto the bottom of the hinged door of the Readyboard.

1 x Socket outlet must be for a plug-in stove (High usage) and the 2 x Socket outlets for general power usage (low usage). The socket outlets must have the marked description of Plug-in stove (High usage) and General power usage (Low usage).

A tamper resistant sealing facility must be provided between the fixed portion of the board and the

hinged door.



The door must be secured by means of star-type screw heads.

The Readyboard must meet all National specifications and SANS 10142 standards.

The following recommended low voltage protection must be installed in the Readyboard fitted onto 13 mm galv. steel clip tray:

Main Breaker: 1 x 60A for main switch

Earth Leakage: 1 x 60A single pole earth leakage protective unit, 30mA, 2.5kA, useable as disconnector as per SANS 1 0142.

Light Breaker: 1 x 10A single pole 2.5 kA circuit breaker for lighting circuit.

Additional Breakers: 2 x 20A single pole 2.5 kA circuit breakers for the low wattage socket outlet circuits.

Faulty plugs should be replaced from the outside of the readyboard without opening the readyboard.

Provision must be made for knockouts for additional circuit breakers if so required.

The Readyboard must be fitted with a warning label and circuit identification labels mechanically fixed to the hinged cover.

Only SANS approved internal stranded wiring will be accepted and which must be correctly colour-coded.

The operating voltage of the Readyboard must be 240Volts, and must have a maximum interrupting capacity of 10kA.

Only approved material for Circuit breakers and Earth leakage, similar as the ABB or CBI type breakers are needed that adhere to SANS 1 0142.

An energy saving LED lamp of 6 Watt must be included

SANS test reports to be included, if not included, tender will be disqualified.

National Electrical Test Facility test certificates to be included for Plugs, Circuit Breakers, Earth Leakage and Ready board.

Provision should be made, to replace faulty Ready boards within the guaranteed period, when

the fault was not caused by the negligence of the owner.

Note: Guarantee period = 12 Months from installation.

Samples must be submitted with Tender document on date of closing, as stated in the advert.

Where any plaster, brickwork or any part of the structure is damaged during construction, the contractor will have to make good such damage as well as sealing off any holes to satisfaction of the consulting engineer.

Earthing:

Bonding and earthing of steel or copper water pipes, plugs, lights etc. to be to Municipal regulations and SANS 10142. The Municipality will supply as part of the reticulation network a TN-C earthing system, via the Airdac Service cable.

Electricity metering units:

The successful contractor shall install the Airdac supply cable directly to the dwelling from the split prepayment meter mounted on a DIN rail in the pole box. The service cable to the dwelling shall be wired directly to the readyboard which shall be mounted on two standard approved powder coated galvanized rails as base or wooden back board.

The main supply shall be connected to the meter before connection to the ready board. All installation requirements shall be adhered to and the meters shall be sealed after installation. All prepayment metering units supplied by the Tenderer shall be same as the current approved Municipal meters (Conlog wBEC44 Integrated wireless meter range).

The tenderer is to issue the Wireless User Interface Unit wUIU to the listed owner of the property with batteries installed when the CoC is completed and the supply is officially switched on. The listed owner is to sign a receipt for the wUIU that must be submitted to the municipality with the completed CoC and GPS co-ordinates.

Plaster and Brickwork:

Where any plaster and brickwork are damaged, the contractor will have to make good such damage as well as sealing off any holes to satisfaction of the consulting engineer. A 20mm PVC pipe will be installed through the wall for the service connection cable. Should this not be done, the electrical contractor shall drill a similar hole.

As Built | GIS information

The as built information shall be supplied to the electrical consulting engineer on a monthly basis. The GPS coordinates on all information shall be of an accuracy equal or better that 1m. This shall include all GPS positions of the prepayment metering units.

14 STREETLIGHTING MATERIALS

- Solar Street Lights, or similar approved, Luminaires side entry;
- LED globes;
- 600mm outreach arm to mount on reticulation network poles;
- Streetlight to be protected with 5A fly-fuse.

LUMINAIRES

General

All luminaires shall bear the SANS mark and the relevant specification number must appear on the outside of the luminaire. Streetlight luminaires shall comply with the requirements of SANS 1277 Luminares shall be supplied complete with lamps. Luminaires shall have a degree of protection that complies with SANS 60598-2-3. The categories shall be: Part 1- 1990 Code of Practice Table B-1. The categories shall be:

Lamp compartment : IP65

Control gear compartment : IP65

The IP rating shall be certified by an SANS Test Report tested in accordance with the latest edition of SANS 60598-2-3.

Housing:

The luminaire housing shall be made of die cast aluminium alloy or glass fibre reinforced polyester. The housing shall be tough, vandal resistant and absolutely corrosion resistant. All clips, hinges, crews, bolts, nuts etc. shall be of stainless steel or other corrosion resistant, unbreakable material. Gaskets sealing the lamp compartment shall be of silicon sponge rubber.

CONTROL GEAR

The following equipment shall be provided as indicated on the drawings:

- 63A, 5 kA, three phase, main breaker;
- 60A three pole contactor with 230V coil;
- 1A, 5kA circuit breaker for the photo cell and contactor;
- Three position bypass switch for selection between the following:
  - Isolate street lighting
  - Photo cell control
  - Switch contactor on

15 ACCESS FOR EQUIPMENT

The Contractor shall investigate each area/space through which equipment must be moved. Where necessary, equipment shall be shipped in sections of size suitable for moving through spaces available.

The Contractor is responsible for acquiring the necessary way leave to move equipment and material over non municipal property.

No trees, bushes, etc. may be damaged and/or removed before approval by the Engineer.

16 SIGNS AND NOTICES

16.1 Signs and notices shall comply with Knysna Municipal specifications.

16.2 All items that must be identified with non-corrosive non-fading labels in order to operate the Works effectively and safety. All labels shall be in English.

16.3 Note the following minimum labelling requirements:

- Transformers to be labelled as described above.
- All cable terminations shall be labelled with stainless steel Dymo type or similar approved, securely fixed with cable ties, indicating the destination of the cable in approved detail.
- All wiring terminations shall be labelled with approved markers.
- All service connections breakers to be labelled with erf numbers or as instructed by the Engineer.

Legal notices: The standard danger notice required in terms of the Occupational Health and Safety

C4.2.4: SCHEDULE OF MATERIAL OFFERED

Bidders shall complete the following schedule of materials and equipment offered and undertakes that the actual materials and equipment installed shall be in accordance with this schedule. Enter N/A if not applicable for that item / installation.

Bidders are to take note that if the material offered is not to specification, this may lead to the bid being disqualified.

Description	Information required	Particulars of equipment to be supplied
POLES		
11m wooden poles	Diameter of top	130mm
9m wooden poles	Diameter of top	120mm
EARTHING		
Earthing on Medium voltage side of transformer	Description of allowance	
Earthing on Low voltage side of transformer	Description of allowance	
35mm Cu Pole coil earth as per project specification	Description of allowance	
16mm Cu Pole coil earth as per project specification	Description of allowance	
Earthing of Residential unit to SANS 10142	Description of allowance	
DB Board & POLE BOXES		
Transformer, Distribution Board	Supplier	
	Allowance for main breaker	
Pole top box	Supplier	
Readyboards	Supplier	
CABLES		
11kV Arial Bundle Conductor	Supplier	
	SANS 1713 compliance	
LV Arial Bundle Conductor including streetlight Core	Supplier	
	SANS 1418 compliance	
600/1000 V PVC PVC SWA PVC cables	Supplier	
10 mm^2 Airdac service connection cables	Supplier	
	SABS 1507 compliance	

CIRCUIT BREAKERS		
Main and Feeder breakers in Main DB's	Supplier	
	SABS mark	
30A single phase circuit breakers wired into Pole box with all accessories required	Supplier	
	SABS mark	

SIGNATURE OF TENDERER:.....

NAME OF TENDERER:.....

POSTAL ADDRESS:.....

.....

DATE :..... **TELEPHONE NO:**.....

C 4.3

Drawings

EASTERN CAPE PROVINCIAL GOVERNMENT
DEPARTMENT OF AGRICULTURE

THE ELECTRICITY INFRASTRUCTURE REFURBISHMENT AT TARDI.

C.4.3 Schedule of contract Drawings

The following drawings form part of this contract:

1. **2527-TA-T-E-101**
2. **2527-TA-T-E-102**
3. **2527-TA-T-E-103**
4. **0342 LV & MV RETICULATION -STRUT ASSEMBLY – FLAT 45 DEG. BRACKET – 7M AND 9M POLES**
5. **0360 LV / SERVICE RETICULATION**
6. **0637 EARTHING (ALTERNATIVE 1) – LV ABC RETICULATION EARTHING (AT TRANSFORMER)**
7. **1100 LV RETICULATION - 3 PHASE BARE NUETRAL ABC SUSPENSION ASSEMBLY (0° - 30°) WOOD POLE**
8. **1120 LV RETICULATION - 3 PHASE BARE NEUTRAL ABC TERMINAL ASSEMBLY WOOD POLE**
9. **1121 LV RETICULATION - 3 PHASE BARE NEUTRAL ABC STRAIN ASSEMBLY (0° - 60°) WOOD POLE**
10. **1122 LV RETICULATION - 3 PHASE BARE NEUTRAL ABC STRAIN ASSEMBLY (60° - 90°) WOOD POLE**
11. **1140 LV RETICULATION - 3 PHASE BARE NEUTRAL ABC T-OFF ASSEMBLY FROM INTERMEDIATE WOOD POLE**
12. **1141 LV RETICULATION – 3 PHASE BARE NEUTRAL ABC CROSS INTERMEDIATE – INTERMEDIATE ASSEMBLY WOOD POLE**
13. **1142 LV RETICULATION – 3 PHASE ABC BARE NEUTRAL T-OFF ASSEMBLY FROM STRAIN WOOD POLE**
14. **1143 LV RETICULATION – 3 PHASE BARE NEUTRAL ABC CROSS INTERMEDIATE – STRAIN ASSEMBLY WOOD POLE**