# DAWID KRUIPER MUNICIPALITY
# UPINGTON

## CONTRACT TN036/2023
## ELECTRIFICATION PROJECT: 2023/24

## ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13

## TENDER DOCUMENT

**PROPOSED BY:**
The Municipal Manager
Dawid Kruiper Municipality
Private Bag X6003
**UPINGTON**
8800

Contact Person: Mr D Louw
Tel. No.: (054) 338 7000

**ISSUED BY:**

BVi Consulting Engineers
P.O. Box 1155
**UPINGTON**
**8800**

Contact Person: Mr J Schroeder
Tel. N0.: (054) 337 6600

**NAME OF TENDERER : .....**

**BID PRICE (incl. VAT) : .....**

The Tenderer is required to check the numbers of pages and should any be found to be missing or duplicated, or should any of the typing be distinct, or any doubt or obscurity arise as to the meaning of any description or particular of any item, or if the Tender Document contains any obvious errors, then the Tenderer must immediately inform BVi Consulting Engineers (Upington) and have them rectified or explained in writing as the case may be. No liability whatsoever will be admitted by reason of the Tenderer having failure to comply with the foregoing instructions.

# Contents

# 1: The Tender

# Part T1: Tendering Procedures

# DAWID KRUIPER MUNICIPALITY

## BID NOTICE TN036/2023

### ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13

Bids are hereby invited for Electrification of 260 Houses in Kameelmond, Louisvale Road, Couples Valley & Pabalello Ward 13. This tender comprises inter alia the following Works:

- Supply, delivery and installation of:
  - medium voltage infrastructure, up to 11 kV
  - low voltage infrastructure,
  - consumer connections.
  - consumer installations, including split pre-payment metering; and
  - associated works
- Testing, commissioning and handing over of completed infrastructure, including documentation
- Planning, implementation and management, including formal reporting, of the construction works
- **The Contractor is responsible to insure that all erf pegs must be secured and that those who were removed are being replaced by a professional land surveyor.**

Tender documents and specifications are available from BVi Consulting Engineers, 55 Bult Street, P.O. Box 1155, Upington, at an amount of R 500,00 in cash or electronic transfer per document, payable to BVi Consulting Engineers. This amount is non-refundable. Tender documents will be available for purchase from **08 December 2023.**

Sealed tenders marked, ***"CONTRACT TN036/2023: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13 "*** must reach the Municipal Manager or be placed in the tender box at the municipal offices before or on **Friday, 12 January 2024** at **14:00** and will be opened directly thereafter in the **Council Chambers** at the **Municipal Offices**.

A compulsory site verification meeting will be held at **11:00** promptly on **Friday, 08 December 2023** at the offices of **BVi Consulting Engineering Services, 55 Bult Street, Upington.** The doors will be locked at **11:00** promptly after which no further Tenderers will be allowed. The Certificate that the Tenderer has visited the site will at the same time be signed by the Engineer. For further information, contact the Consulting Engineers, at telephone number (054) 337 6600.

Representative(s) of the tenderer at the tender briefing session are assumed to be:
- Duly delegated to attend the tender briefing session on behalf of the tenderer, and
- Has adequate experience to comprehend the scope of works and the information presented.

The following conditions will apply including the Conditions of Tender or Tender Procedures contained in the Tender document: **These documents must be attached to the bid form. Bids not containing these documents will be deemed as incomplete and result in non-responsive declaration:**

1. Prices must be valid for one hundred and twenty (120) days from tender closing date.
2. Prices quoted must be inclusive of VAT. The Form of Offer must be properly and fully completed.
3. A firm delivery period must be indicated on the Form of Offer. Bidders are required to provide a realistic construction period, taking into account long lead delivery time items.
4. The tender document must be completed in black ink by means of a ball point pen. Pencil entries will render the tender offer non-compliant. Computerized/ typed tenders will be disqualified.
5. The tender document must be completed on the original tender document. Copies of the tender document or parts thereof will render the document non-responsive.
6. Bids that are late or non-compliant will not be considered, whilst the lowest or only bid will not necessarily be accepted. Bids submitted per fax, electronically or by e-mail will not be considered for award or acceptance.
7. Bids will be evaluated in accordance with the applicable Preferential Point Scoring System as set out in the Councils Supply Chain Management Policy. The following forms: MBD 1, MBD 4, MBD 5, MBD 6.1, MBD 6.2 including Annexures C, D & E, MBD 7.1, MBD 8 and MBD 9 must be completed and submitted with the bid.
8. Only tenderers with CIDB Grading of **5EP** or higher are eligible to submit offers for this Tender.
9. B-BBEE points shall be allocated if the following is attached to the bid document:
   9.1 a certified copy of the Tenderer's B-BBEE certificate. The B-BBEE certificate will only be accepted if the verification agency is accredited by South African National Accreditation System (SANAS); or
   9.2 an original Sworn Affidavit
   9.3 A copy of a DTI BBBEE certificate must be attached to the bid document**.**
10. The following documents are compulsory to be included with the tender submission and failure to submit the documents will render the bidder's bid non-responsive
    10.1 Contractor registration and grading issued by the Construction Industry Development Board (CIDB) with unique registration

number

10.2 Letter from SARS including access PIN to validate TAX clearance and VAT registration shall be submitted with the tender offer.

10.3 Tenderer must be registered at the National Treasury's Central Supplier Data Base (CSD) and proof must be submitted.

10.4 Letter of good standing in respect of Compensation for Occupational Injury and Disease from the Compensation Commissioner.

10.5 Municipal account for Tenderer's office premises, which is not older than 3 months, and not in arrears for more than 3 months on date of submission and/or valid lease agreement and/or sworn affidavit if not responsible for municipal services account.

11. The following compulsory documents must be submitted with the bid document and failure to submit the documents will render the bidder's bid non-responsive:

11.1 Proof of current and valid registration with the Department of Labour as an Electrical Contractor in terms of the Occupational Health and Safety Act, 1993, Electrical installation Regulation No. 6(4) (i.e. original or certified copy of registration certificate from the Department of Labour) for three-phase works.

11.2 Certified copy of the intended Electrician's Wireman's Licence as issued by Department of Labour. The intended electrician must be registered for three-phase type works.

11.3 Certified copy of designated personnel member's (preferably the intended Electrician) training and certification to work on Medium Voltage networks up to 11kV as per ORHVS Regulations.

11.4 Certified copy of valid registration with the SACPCMP as a Construction Health and Safety Officer's (CHSO). Candidates for registration as CHSO will not be accepted in this regard.

11.5 Certificates of completion and/or practical of completion certificates for electrification projects accumulating to at least 1000 houses in the last 4 years. The certificates must indicate the number of connections and the value of the contract specifically attributed to the Tenderer for that project, even if the project work was performed by the Tenderer under a sub-contract for or in joint venture with others.

12. Where certified copies of documents are required for inclusion in the tender submission, such certification must be of an originally certified copy of the original document, with certification dated within three months prior to closing date of the tender. Copies of previously certified copies of documents will be deemed non-compliant.

13. Functionality criteria and evaluation will be applied to this tender. Tenderers scoring below the stipulated minimum scoring requirement will not be considered for award or acceptance.

14. Where applicable, a duly completed and signed Joint Venture agreement must be submitted with the tender submission. Additional Joint Venture documents must be submitted as per Tender data.

15. Penalties will be applied for late completion of the Works according to the formula stated in the contract data.

16. Minimum threshold for local content:

| | | |
|---|---|---|
| 16.1 | Electrical cables | 90% |
| 16.2 | Transformers | 90% |
| 16.3 | Steel Value-added Products | 100% |
| 16.4 | Primary Steel Products | 100% |

Yours in development

E NTOBA
Municipal Manager
Dawid Kruiper Municipality
Civic Centre, Mark Street
Upington, 8801

## T1.2: Tender Data

| Clause number | |
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| | The conditions of tender are the Standard Conditions of Tender as contained in **Annex F of the CIDB Standard for Uniformity in Construction Procurement.** (see www.cidb.org.za) which are reproduced without amendment or alteration for the convenience of tenderers as an Annex to the Tender Data.)<br><br>**The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data will have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender.**<br><br>Each item of the Tender Data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies. |
| F.1.1 | The Employer is the Dawid Kruiper Municipality. |
| F1.4 (Addition) | **Communication and Employer's Agent**<br>Attention is drawn to the fact that verbal information, given by the Employer's Agent during site visits/clarification meetings or at any other time prior to the award of the Contract, will not be regarded as binding on the Employer. Only information issued formally by the Employer in writing to Tenderers will be regarded as amending the Tender Documents.<br><br>The Employer's Agent is:<br>Name: Mr J Schroeder<br>Address: BVi Consulting Engineers NC (Pty) Ltd<br>55 Bult str.,<br>UPINGTON<br>8801<br>Tel: 054 337 6600<br>Fax: 054 337 6699<br>E-mail: jeromes@bvinc.co.za or ricardoh@bvinc.co.za |
| F1.5<br><br>F1.5.3 | **The Employer's right to accept or reject any tender offer**<br>The Employer may reject a tender if, in the opinion of the Employer, the Tenderer will be unable to achieve the contract participation goal tendered, in the performance of the Contract. |
| F1.6.2 (Addition)<br><br><br>F1.6.3 (Addition) | **Competitive negotiation procedure**<br>A competitive negotiation procedure will not be followed.<br><br>**Proposal procedure using the two-stage system**<br>A two-stage system will not be followed. |
| F.1.2 | The tender documents issued by the Employer comprises:<br><br>**The Tender**<br><br>**Part T1: Tendering procedures**<br><br>T1.1 Tender notice and invitation to tender<br><br>T1.2 Tender data<br><br><br>**Part T2: Returnable documents**<br><br>T2.1 List of returnable documents<br><br>T2.2 Returnable schedules<br><br><br>**The Contract**<br><br>**Part C1: Agreements and Contract Data**<br><br>C1.1 Form of Offer and Acceptance |

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| | C1.2 Contract Data<br>C1.3 Form of Guarantee<br>C1.4 Occupational Health and Safety Agreement<br>C1.5 Pro-Forma Ownership of Plant<br>C1.6 Expanded Public Works Programme- Commitment and Undertaking<br><br>**Part 2: Pricing data**<br>C2.1 Pricing Instructions<br>C2.2 Summary of Prices<br>C2.3 Technical Schedules<br><br>**Part 3: Scope of work**<br>C3 Scope of Work (C3.1 - C3.5)<br><br>**Part 4: Site information**<br>C4 Site Information<br><br>**Annexure A: Bill of Quantities**<br>**Annexure B: Health and Safety**<br>**Annexure C: MBD Forms** |
| | Should it be necessary for a bidder to obtain clarity on any matter arising from or referred to in this tender document, please refer queries, in writing, to the Employer's Agent. Under no circumstances may any other employee within the Dawid Kruiper Municipality be approached for any information. Any such action may result to disqualification of a response submitted in competition to the tender process.<br><br>Enquiries shall reference specific page and or paragraph numbers, where appropriate.<br>• All questions/enquiries must be forwarded in writing not later than **14 December 2023**<br>• Questions/enquiries received after this date will not be considered. |
| F.2.1 | The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:<br><br>a) contractors who have 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 **5EP** class of construction work;<br>b) Joint ventures are eligible to submit tenders provided that<br>1. every member of the joint venture is registered with the CIDB;<br>2. the lead partner has a contractor grading designation higher than the minor partner; and<br>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 **5EP** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.<br>For eligibility refer to Notice and Invitation to Tender T1.1 |
| F.2.1 | **<u>Functionality criteria, points and evaluation</u>**<br><br>Tenderers are required to demonstrate their ability to undertake the work and provide proof of experience, expertise, personnel, plant and equipment to undertake work of this nature.<br><br>Tenderers are required to score a minimum overall average of 70% i.e. minimum 21 points out of a possible 30 points (i.e. 70 %) in order to qualify for the tender evaluation. |

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| | The onus rests with the Tenderer to supply sufficient, accurate, legible, current and valid information which is able to be validated, to allow for the proper scoring, evaluation and award of points. The required information must be in accordance with the required stipulations to be awarded points.<br><br>Where insufficient information is provided, zero points will be awarded for such particular criterion.<br><br>Tenderers will be evaluated according to administrative responsiveness, points scoring for functionality, pricing and preference (i.e. B-BBEE contribution level) |

**Functionality assessment criteria**

| Category | Description | Points |
|---|---|---|
| Financial | 1. Bank rating certificate issued by financial Institute not older than 60 days, Rating A<br>2. Bank rating certificate issued by financial Institute not older than 60 days, Rating B<br>3. Bank rating certificate issued by financial Institute not older than 60 days, Rating C<br>***Bank rating lower than C is regarded as a risk hence no points will be allocated.*** | 10<br>8<br>7 |
| Resources | 1. MV & LV testing equipment's (Pressure test, fault location, and megger)<br>2. Crane truck (with load testing certificates) (up to 4-Ton capacity)<br>3. Digger loader/TLB<br>4. Minimum 30 Ton excavator with pecker<br>5. Tipper Truck<br>6. Cable installation trolley and jacks<br>***Bidder must submit proof of plant and equipment he owns, as certified copy of original document. Alternatively, to submit pro forma lease agreement or letter(s) of intent for plant he intends to hire.***<br>***The MV & LV testing equipment must be Tenderer's own property, and tenderer must submit a current and valid calibration certificate from a recognised service provider, made out in the name of the Tenderer.*** | 2<br>2<br>2<br>2<br>1<br>1 |
| Technical Expertise | 1. Contracts Manager – min 5 years' experience.<br>2. Site Manager – min 5 years' experience.<br>3. Site Foreman – min 5 years' experience.<br>4. MV Cable Jointer.<br>***Points will be awarded for Technical Expertise applicable to the key personnel and individual construction staff members. Proof shall be submitted with the tender submission. Certificates shall be valid at time of tender submission. The various individuals shall each provide written declaration stating their personal confirmation of their intended involvement.*** | 3<br>3<br>2<br>2 |

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| F2.1 | Curriculum Vitae's (CV's) and certificates (training and registration) of the personnel that will be employed on this contract shall be submitted with the tender document. Proof of licensed Electricians, Health & Safety Officer and trained linesmen shall be submitted with the tender document. Certificates shall be valid at time of tender submission. |
| F.2.7 | For particulars regarding the compulsory pre-tender clarification meeting (site inspection meeting), see Notice and Invitation to Tender T1.1 |
| F.2.12 | No alternative proposals will be considered for tender evaluation. Main offers will be used for the tender evaluation. Bidders are allowed to provide alternative offers for consideration with the successful tenderer. |
| F.2.13.1 (Addition) | Where the tendering entity is a joint venture, it is recommended that the standard CIDB Joint Venture Agreement be used. |
| F.2.13.2 | Electronic tender offers/ Copies or tenders completed with pencil will not be accepted. |
| F.2.13.3 | Parts of each tender offer communicated on paper will be submitted as an original, plus Nil copies. |
| F.2.13.4 (Addition) | The tender will be signed by a person duly authorised to do so. Tenders submitted by joint ventures of two or more firms will be accompanied by the document of formation of the joint venture, authenticated by a notary public or other official deputed to witness sworn statements, in which is defined precisely the conditions under which the joint venture will function, its period of duration, the persons authorised to represent and obligate it, the participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. |
| F.2.13.5 | The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:<br>Location of tender box: Dawid Kruiper Municipality Head Office<br>Physical address: Mark Street<br>Identification details: Civic Centre<br>Postal Address: Private Bag X6003, Upington, 8800<br>Sealed tenders with the description "**TENDER NO. T000/2024: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13"** on the envelope must be placed in the appropriate official tender box at the above mentioned address.<br>Responsibility lies with the bidders to ensure the Tender offers are placed in the tender box of the Dawid Kruiper Municipality if tenders are posted or couriered. |
| F.2.13.10 (Addition) | By signing the offer part of C1.1 Form of Offer and Acceptance the tenderer declares that all information provided in the tender submission is true and correct. |
| F.2.15 | The closing time for submission of tender offers is as per Notice and Invitation to Tender T1.1. |
| F.2.15 | Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted. |
| F.2.16 | The tender offer validity period is 90 days. |
| F.2.19 | Access will be provided for inspections, tests and analysis as may be required by the Employer. |
| F.2.23 | **The tenderer is required to submit with his tender the following compulsory documents and failure to submit the documents will render the bidder's bid non-responsive**:<br>• Contractor registration and grading issued by the Construction Industry Development Board (CIDB) with unique registration number<br>• Letter from SARS including access PIN to validate TAX clearance and VAT registration<br>• National Treasury's Central Supplier Data Base (CSD) registration<br>• Certified copies of CIPC documents confirming valid registration for the Tenderer<br>• Letter of good standing in respect of Compensation for Occupational Injury and Disease from the Compensation Commissioner.<br>• A certified copy of the Municipal account not older than 3 months and not in arrears for more than 90 days on date of submission, and/or valid lease agreement and/or valid sworn affidavit if not |

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| | responsible for municipal services account. NB: Bidders may not be in arrears for more than three months with municipal rates and service charges for consideration of award of this tender.<br>• Valid and current Letter of Good Standing from the Compensation Commissioner<br>• Proof of valid and current registration with the Department of Labour as an Electrical Contractor in terms of OHS Act 85 of 1993, Electrical Installation Regulation 6.4 (for three phase works) (i.e. original or certified copy of registration certificate from the Department of Labour)<br>• Proof of valid and current registration with the Department of Labour as an Electrician (for three phase works). Certified copy of the intended Electrician's Wireman's Licence as issued by Department of Labour.<br>• Certified copy of designated personnel member's (preferably the intended Electrician) training and certification to work on Medium Voltage networks up to 11kV as per ORHVS Regulations, for ORHVS Regulations up to level of authorised operator.<br>• Certified copy of valid registration with the SACPCMP as a Construction Health and Safety Officer's (CHSO), alternatively as Construction Health and Safety Manager or Agent. Candidates for registration for any of the categories will be deemed non-compliant.<br>• Certificates of completion and/or practical of completion certificates for electrification projects of nature similar to the works of this tender, with the number of connections accumulating to at least **1000 houses** in the last 4 years. The submitted documentation must indicate the number of connections and the value of the contract specifically attributed to the Tenderer for that project, even if the project work was performed by the Tenderer under a sub-contract for or in joint venture with others. The submitted documentation shall be certified copies of the originals.<br>The above compulsory documents shall be valid and current at time of tender submission and shall remain valid for the entire tender validity period. Failure to include the compulsory documentation with validity as stated, shall prevent the Tenderer's submission from further evaluation and consideration.<br>Where certified copies of documents are required for inclusion in the tender submission, such certification must be of an originally certified copy of the original document, with certification dated within three months prior to closing date of the tender. Copies of previously certified copies of documents will be deemed non-compliant thus not accepted for evaluation. |
| F.3.4.1 | The time and location for opening of the tender offers are:<br>**14H00 on 08 January 2024 in the Council Chamber of Dawid Kruiper Municipality, Upington** |
| F.3.11 | The procedure for the evaluation of responsive tenders is Method 2.<br>The financial offer (price) will be scored using Formula 2 Option 1 where the value of W1 is:<br>80 where the financial value inclusive of VAT of all responsive tenders received have a value below<br>R 50 000 000.00 |
| F.3.13.1 | Tender offers will only be accepted if:<br>a) the Tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation;<br>b) the Tenderer or any of its directors 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;<br>c) the Tenderer has not:<br>i) abused the employer's supply chain management system;<br>or<br>ii) failed to perform on any previous contract and has been given a written notice to this effect; and<br>d) the Tenderer has completed the Compulsory Enterprise Questionnaire, MBD 1, MBD 4, MBD 5, MBD 6.1, MBD 6.2 (and Annexures), MBD 7.1, MBD 8, MBD 9 and there are no conflicts of interest |

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| | e) 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<br>the Tenderer has submitted the documentation listed in F2.23 |
| F.3.18 | Provide to the Contractor one copy of the signed contract document. |
| | **Additional Conditions of Tender** |
| F.4.1 | **Compliance with Occupational Health and Safety Act 1993 including Amendments and Revisions.**<br><br>Tenderers are to note the requirements of the Occupational Health and Safety Act No. 85 of 1993 and the Construction Regulations 2003 issued in terms of Section 43 of the Act. The tenderer will be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.<br><br>In this regard the Tenderer will submit with his tender, appended to Schedule 11: Health and Safety Plan in T2.2: Returnable Schedules, a detailed Health and Safety Plan in respect of the Works in order to demonstrate the necessary competencies and resources to perform the construction work all in accordance with the Act and Regulations. Such Health and Safety Plan will cover inter-alia the following details:<br><br>Management Structure, Site Supervision and Responsible Persons including a succession plan.<br>Contractor's induction training programme for employees, sub-contractors and visitors to the Site.<br>Health and safety precautions and procedures to be adhered to in order to ensure compliance with the Act, Regulations and Safety Specifications.<br>Regular monitoring procedures to be performed.<br>Regular liaison, consultation and review meetings with all parties.<br>Site security, welfare facilities and first aid.<br>Site rules and fire and emergency procedures.<br>Tenderers are to note that the Contractor is required to ensure that all sub-contractors or others engaged in the performance of the contract also comply with the above requirements.<br><br>The Contractor will prepare and maintain a Health and Safety File in respect of the project, which will be available for inspection on Site at all times and handed over to the Employer on Final Completion of the project.<br><br>The Contractor is required to submit to the Employer the Occupational Health and Safety Agreement (included in C1.4 of the Contract Document) and a letter of good standing from the Compensation Commissioner, or a licensed compensation insurer, within 14 days after the Commencement Date of the contract. |
| F.4.2 | **Claims arising after submission of tender**<br><br>No claim for any extras arising out of any doubt or obscurity as to the true intent and meaning of anything shown on the Contract Drawings or contained in the Conditions of Contract, Scope of Work and Pricing Data, will be admitted by the Employer/Employer's Agent after the submission of any tender and the Tenderer will be deemed to have:<br><br>1) Inspected the Contract Drawings and read and fully understood the Conditions of Contract.<br><br>2) Read and fully understood the whole text of the Scope of Work and Pricing Data and thoroughly acquainted himself with the nature of the works proposed and generally of all matters which may influence the Contract.<br><br>3) Visited the site of the proposed works, carefully examined existing conditions, the means of access to the site, the conditions under which the work is to be done, and acquainted himself with any limitations or restrictions that may be imposed by the Municipal or other Authorities in regard to access and transport of materials, plant and equipment to and from the site and made the necessary provisions for any additional costs involved thereby.<br><br>4) Requested the Employer or his duly authorised agent to make clear the actual requirements of anything shown on the Contract Drawings or anything contained in the Scope of Work and Pricing Data, the exact meaning or interpretation of which is not clearly intelligible to the Tenderer.<br><br>Before submission of any tender, the Tenderer shall check the number of pages, and if any are found to be missing or duplicated, or the figures or writing indistinct, or if the Pricing Data contain any obvious |

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| | errors, the Tenderer must apply to the Employer/Employer's Agent at once to have the same rectified, as no liability will be admitted by the Employer/Employer's Agent in respect of errors in any tender due to the foregoing.<br><br>5) Received any Addenda to the tender documents which have been issued in accordance with the Employer's Supply Chain Management Policy. |
| F.4.3 | **Imbalance in tendered rates**<br><br>In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are either excessively low or high or not in proper balance with other rates or lump sums, the Tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the Employer is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it.<br><br>The Tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other related amounts as are agreed on by the Employer, but this will be done without altering the tender offer as tendered or, if applicable, the corrected total of prices in accordance with F.3.9.3.<br><br>Should the Tenderer fail to amend his Tender in a manner acceptable to the Employer, the Employer may reject the Tender. |
| F.4.4 | **Invalid tenders**<br><br>Tenders will be considered invalid and will be endorsed and recorded as such in the tender opening record, by the responsible official who opened the tender, in the following circumstances:<br>a) if the tender offer (the tender price/amount) is not submitted on the Form of Offer and Acceptance bound into this tender document (form C1.1, Part C1: Agreements and Contract Data);<br>b) if the tender is not completed in non-erasable ink;<br>c) if the Form of Offer and Acceptance has not been signed;<br>d) if the Form of Offer and Acceptance is signed, but the name of the tenderer is not stated or is indecipherable. |
| F.4.12 | **Signing of the Contract**<br>The Contractor has to sign the Form of Agreement within the period of seven (7) days after being notified that his Tender had been accepted.<br><br>In the event where the Tenderer fails to take up the Contract when called upon by the Employer to do so, or withdrawing his Tender after the closing date and time, or failing to provide an acceptable guarantee, the Employer reserves the right to insist that the Tenderer will pay to the Employer the cost incurred by the Employer in having to award the Tender to another Contractor.<br><br>The contract will be in effect after both the Bidder has signed the Form of Offer and the Employer has signed the Form of Acceptance. |
| F.4.16 | **Cessions of Rights and Demands**<br>The Contractor undertakes herewith to assign none of his claims or rights with reference to money payable or which will become payable under the Contract. The Employer would not accept such a cession. |
| F.4.18 | All prices, deposits and payments will be in the currency of the Republic of South Africa (Rand) and cheques for the deposits have to be made out to Dawid Kruiper Municipality. |

**Annex F**
(normative)

## Standard Conditions of Tender

## F.1 GENERAL

### F.1.1 Actions

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

**F.1.1.2** The employer and the tenderer and all their agents and employees involved in the tender process will 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 will declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer will 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.

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

### F.1.2 Tender Documents

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

### F.1.3 Interpretation

**F.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.

**F.1.3.2** These conditions of tender, the tender data and tender schedules which are only required for tender evaluation purposes, will not form part of any contract arising from the invitation to tender.

**F.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 fulfil his or her duties impartially;

ii) An individual or organisation 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 organisation which employs that employee.

b) Comparative offer means the tenderer's financial offer after all tendered parameters that will affect the value of the financial offer have been taken into consideration in order to enable comparisons to be made between offers on a comparative basis.

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; and

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.

e) Organization means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public bod.

f) Quality (functionality) means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs

**F.1.4 Communication and employer's agent**

Each communication between the employer and a tenderer will be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications will be in the English language. The employer will 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.

**F.1.5 The employer's right to accept or reject any tender offer**

**F.1.5.1** The employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer will not accept or incur any liability to a tenderer for such cancellation and rejection, but will give written reasons for such action upon written request to do so.

**F.1.5.2** The employer may not subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received and such tender was returned unopened to the tenderer.

**F.1.6 Procurement procedures**

**F.1.6.1 General**

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.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.

**F.1.6.2 Competitive negotiation procedure**

**F.1.6.2.1** Where the tender data require that the competitive negotiation procedure is to be followed, tenderers will submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of F.3.4, the employer will announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers will not apply.

**F.1.6.2.2** All responsive tenderers, or not less than three responsive tenderers that are highest ranked in terms of the evaluation method and evaluation criteria stated in the tender data, will be invited in each round to enter into competitive negotiations, based on the principle of equal treatment and keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of F.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.

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

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

**F.1.6.3 Proposal procedure using the two stage-system**

**F.1.6.3.1 Option 1**

Tenderers will in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer will 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.

**F.1.6.3.2 Option 2**

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

**F.1.6.3.2.2** The employer will 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.

## F.2 TENDERER'S OBLIGATIONS

### F.2.1 Eligibility

**F.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.

**F.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.

### F.2.2 Cost of tendering
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.

### F.2.3 Check documents
Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

### F.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.

### F.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.

### F.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.

### F.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.

### F.2.8 Seek clarification
Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.

### F.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. **The contractor must make provision for all applicable insurances.**

### F.2.10 Pricing the tender offer

**F.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 14 days before the closing time stated in the tender data.

**F2.10.2** Show VAT payable by the employer separately as an addition to the tendered total of the prices.

**F.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.

**F.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.

### F.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 will initial all such alterations. Erasures and the use of masking fluid are prohibited.

**F.2.12 Alternative tender offers**

**F.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 **(The alternative is only considered if the main bid is the preferred bid).**

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

**F.2.13 Submitting a tender offer**

**F.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, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

**F.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.

**F.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.

**F.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 will state which of the signatories is the lead partner whom the employer will hold liable for the purpose of the tender offer.

**F.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 will 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.

**F.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 will 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.

**F.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.

**F.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.

**F.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.

**F.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.

**F.2.15 Closing time**

**F.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 will not be accepted as proof of delivery.

**F.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.

**F.2.16 Tender offer validity**

**F.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.

**F.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.

**F.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.

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

**F.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 F.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.

**F.2.18 Provide other material**

**F.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), preferencing 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.

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

**F.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.

**F.2.20 Submit securities, bonds, policies, etc.**

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.

**F.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.

**F.2.22 Return of other tender documents**
If so instructed by the employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the tender data.

**F.2.23 Certificates**
Include in the tender submission or provide the employer with any certificates as stated in the tender data.

## F.3 THE EMPLOYER'S UNDERTAKINGS

**F.3.1 Respond to requests from the tenderer**

**F.3.1.1** Unless otherwise stated in the Tender Data, respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

**F.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.

**F.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 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, will then notify all tenderers who drew documents.

**F.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.

**F.3.4 Opening of tender submissions**

**F.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.

**F.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, preferences claimed and time for completion for the main tender offer only.

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

**F.3.5 Two-envelope system**

**F.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.

**F.3.5.2** Evaluate the quality 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 quality evaluation more than the minimum number of points for quality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any references claimed. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for quality.

**F.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.

**F.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.

**F.3.8 Test for responsiveness**

**F.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.

**F.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.

**F.3.9 Arithmetical errors, omissions and discrepancies**

**F.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 will govern.

**F.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 F.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.

**F.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.

**F.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 will govern and the rate will be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted will govern, and the unit rate will 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 will 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.

**F.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.

**F.3.11 Evaluation of tender offers**

**F.3.11.1 General**

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

**F.3.11.2 Method 1: Financial offer**

In the case of a financial offer:
a) Rank tender offers from the most favourable to the least favourable comparative offer.
b) Recommend the highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.

c) Re-rank all tenderers should there be compelling and justifiable reasons not to recommend the highest ranked tenderer and recommend the highest ranked tenderer, unless there are compelling and justifiable reasons not to do so and the process set out in this sub clause is repeated.

**F.3.11.3 Methods 2: Financial offer and preference**

In the case of a financial offer and preferences:

a) Score each tender in respect of the financial offer made and preferences claimed, if any, in accordance with the provisions of F.3.11.7 and F.3.11.8.
b) Calculate the total number of tender evaluation points ($T_{EV}$) in accordance with the following formula:

$$T_{EV} = N_{FO} + N_P$$

where:
$N_{FO}$ is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
$N_P$ is the number of tender evaluation points awarded for preferences claimed in accordance with F.3.11.8.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points, and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub clause is repeated

**F.3.11.4 Method 3: Financial offer and quality**

In the case of a financial offer and quality:

a) Score each tender in respect of the financial offer made and the quality offered in accordance with the provisions of F.3.11.7 and F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.

b) Calculate the total number of tender evaluation points ($T_{EV}$) in accordance with the following formula:

$$T_{EV} = N_{FO} + N_Q$$

where: $N_{FO}$ is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
$N_Q$ is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub clause is repeated.

**F.3.11.5 Method 4: Financial offer, quality and preferences**

In the case of a financial offer, quality and preferences:

a) Score each tender in respect of the financial offer made, preference claimed, if any, and the quality offered in accordance with the provisions of F.3.11.7 to F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.
b) Calculate the total number of tender evaluation points ($T_{EV}$) in accordance with the following formula, unless otherwise stated in the Tender Data:

$$T_{EV} = N_{FO} + N_P + N_Q$$

where: $N_{FO}$ is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
$N_P$ is the number of tender evaluation points awarded for preferences claimed in accordance with F.3.11.8.
$N_Q$ is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub clause is repeated.

**F.3.11.6 Decimal places**

Score financial offers, preferences and quality, as relevant, to two decimal places.

**F.3.11.7 Scoring Financial Offers**

Score the financial offers of remaining responsive tender offers using the following formula:

$$N_{FO} = W_1 \times A$$

where: $N_{FO}$ is the number of tender evaluation points awarded for the financial offer.
$W_1$ is the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.
A is a number calculated using the formula and option described in Table F.1 as stated in the Tender Data.

**Table F.1: Formulae for calculating the value of A**

| Formula | Comparison aimed at achieving | Option 1a | Option 2a |
|---|---|---|---|
| 1 | Highest price or discount | A = (1+ (P – Pm)/Pm) | A = P / Pm |
| 2 | Lowest price or percentage commission / fee | A = (1 – (P – Pm)/Pm) | A = Pm / P |
| a where: *Pm* = the comparative offer of the most favourable tender offer. *P* = the comparative offer of tender offer under consideration. | | | |

**F.3.11.8 Scoring preferences**

Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences. Calculate the total number of tender evaluation points for preferences claimed in accordance with the provisions of the tender data.

**F.3.11.9 Scoring quality**

Score each of the criteria and sub criteria for quality in accordance with the provisions of the Tender Data. Calculate the total number of tender evaluation points for quality using the following formula:

$N_Q = W_2 \times S_O / M_S$

where: $S_O$ is the score for quality allocated to the submission under consideration;
$M_S$ is the maximum possible score for quality in respect of a submission; and
$W_2$ is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data

**F.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.

**F.3.13 Acceptance of tender offer**

Accept the tender offer, if in the opinion of the employer, it does not present any unacceptable commercial 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, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his 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.

**F.3.14 Prepare contract documents**

**F.3.14.1** If necessary, revise documents that will 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.

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

**F.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.

**F.3.16 Notice to unsuccessful tenderers**

**F.3.16.1** Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period.

**F.3.16.2** After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

**F.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.

**F.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 Schedules

## T2.1: Returnable Documents

**The complete tender document as received from the employer, together with all additional documentation as requested, must be submitted. No documentation must be removed from the tender document.**

The tenderer must complete the following returnable documents:

**1 Returnable Schedules required only for tender evaluation purposes**

Resolution of board of directors / members / partners

Resolution of Board of Directors / Members / Sole Proprietor/ Partners of Partnership (if applicable)

Special Resolution of Joint Venture Partners

Record of Addenda to Tender Documents

Proposed Amendments and Qualifications

Schedule of Subcontractors

Capacity of Tenderer

Project Team and their qualifications

Project experience (Current and previous)

Certificate of Attendance at Tender Briefing Meeting

Tender sum breakdown

**2 Other documents required only for tender evaluation purposes**

Contractor Registration and grading issued by the Construction Industry Development Board (CIDB) – Compulsory.

Central Supplier Database registration – Compulsory.

SARS letter containing access PIN – Compulsory.

A certified copy of a valid SANAS B-BBEE Status Level verification or an original Sworn Affidavit or DTI certificate

Letter of good standing from the Compensation Commissioner – Compulsory

**3 Items required for tender evaluation purposes and incorporated into contract**

C1.1 Offer and Acceptance (the offer portion of C1.1)

C1.2 Contract Data (Part 2)

C1.3 Form of Guarantee

C1.4 Occupational Health and Safety Agreement

C1.5 Pro Forma Ownership of Plant

C1.6 Expanded Public Works Programme- Commitment and Undertaking

C2.2 Bills of quantities summary page (As per tender document, completed in black ink)

C2.3 Technical Schedules

Annexure A: Bill of Quantities

**4 MBD Forms – Compulsory Submission**

MBD 1, MBD 4, MBD 6.1, MBD 6.2, Annexures C, D & E, MBD 7.1, MBD 8, MBD 9

This returnable schedule needs to be completed if the Tenderer is a company or other legal person.

## Resolution of Board of Directors / Members / Partners

**RESOLUTION** of a meeting of the Board of *Directors / Members / Partners of:

_____

_____
(*legally correct full name and registration number, if applicable, of the Enterprise)*

Held at _____ (*place)*

On _____ *(date)*

**RESOLVED that:**

1. The Enterprise submits a Tender to the Dawid Kruiper Municipality in respect of the following project:
   _____

   _____
   (*project description as per Tender Document)*

   Tender Number: _____*(Tender Number as per Tender Document)*

2. *Mr/Mrs/Ms: _____

   in *his/her Capacity as: : _____(*Position in the Enterprise)*

   and who will sign as follows: : _____

   be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to the Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprise mentioned above.

| | Name | Capacity | Signature |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |

***Note:***

1. ** Tenderer must delete which is not applicable*
2. ***NB**. This resolution must be signed by <u>all</u> the Directors / Members / Partners of the Tendering Enterprise*
3. *Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page*

| ENTERPRISE STAMP |
|---|
| |

This returnable schedule needs to be completed if the Tenderer is a joint venture. This form must be completed by each partner of the joint venture. The name of the Principal Partner must be stated under Point 2.

**Resolution of Board of Directors / Members / Sole Proprietor/ Partners of Partnership (i.e. of each legal person to comprise the Joint Venture Partnership)**

**RESOLUTION** of a meeting of the Board of *Directors / Members / Sole Proprietor/ Partners of:

_____

_____

(*Legally correct full name and registration number, if applicable, of the Enterprise)*

Held at _____ (*place)*

On _____ *(date)*

**RESOLVED that:**

3. The Enterprise submits a Tender, in Joint Venture with the following Enterprises:

   _____

   _____

   *(List all the legally correct full names and registration numbers, if applicable, of the Enterprises forming the Joint Venture)*

   to the Dawid Kruiper Municipality in respect of the following project:

   _____

   _____

   (*Project description as per Tender Document)*

   Tender Number: _____(*Tender Number as per Tender Document)*

4. The Principal Partner of the Joint Venture will be

   _____

   _____

   (*Legally correct full name and registration number, if applicable, of the Principal Partner of Joint Venture)*

5. *Mr/Mrs/Ms: _____

   in *his/her Capacity as: _____*(Position in the Enterprise)*

   and who will sign as follows: _____

   be, and is hereby, authorised to sign a joint venture agreement with the parties listed under item 1 above, and any and all other documents and/or correspondence in connection with and relating to the joint venture, in respect of the project described under item 1 above.

6. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the Dawid Kruiper Municipality in respect of the project described under item 1 above.

7. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the Dawid Kruiper Municipality in respect of the project under item 1 above:

   Physical address: _____

   _____

   _____

   _____ (code)

   Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____(code)

Fax number: _____(code)

| | **Name** | **Capacity** | **Signature** |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

| **Note**: | | **ENTERPRISE STAMP** |
|---|---|---|
| 1. * *Tenderer must delete which is not applicable*<br><br>2. ***NB**. This resolution must be signed by <u>all</u> the Directors / Members / Partners of the Bidding Enterprise*<br><br>3. *Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page* | | |

This returnable schedule needs to be completed if the Tenderer is a joint venture.

## Special Resolution of Joint Venture Partners

**RESOLUTION** of a meeting of the duly authorised representatives of the following legal entities who have entered into a joint venture to jointly tender for the project mentioned below: (*legally correct full names and registration numbers, if applicable, of the Enterprises forming a Joint venture)*

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

6. _____

_____

7. _____

_____

8. _____

_____

Held at _____ (*place)*

On _____ *(date)*

**RESOLVED that:**

A. The above-mentioned Enterprises submit a tender in joint venture partnership to the Dawid Kruiper Municipality in respect of the following project:

_____

_____

(*Project description as per Tender Document)*

Tender Number: _____(*Tender Number as per Tender Document)*

B. Mr/Mrs/Ms: _____
in *his/her Capacity as: _____*(Position in the Enterprise)*

and who will sign as follows: _____

be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to the Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprises in joint venture mentioned above.

C. The Enterprises constituting the Joint Venture, notwithstanding its composition, will conduct all business under the name and style of: _____

D. The Enterprises to the Joint Venture accept joint and several liability for the due fulfilment of the obligations of the Joint Venture deriving from, and in any way connected with, the contract entered into with the Dawid Kruiper Municipality in respect of the project described under item A above.

E. Any of the Enterprises to the Joint Venture intending to terminate the Joint Venture agreement, for whatever reason, will give the Dawid Kruiper Municipality 30 days written notice of such intention. Notwithstanding such decision to terminate, the Enterprises will remain jointly and severally liable to the Dawid Kruiper Municipality for the due fulfilment of the obligations of the Joint Venture as mentioned under item D above.

F. No Enterprise to the Joint Venture will, without the prior written consent of the other Enterprises to the Joint Venture and of the Dawid Kruiper Municipality, cede any of its rights or assign any of its obligations under the Joint Venture agreement in relation to the contract with the Dawid Kruiper Municipality referred to herein.

G. The Enterprises choose as the *domicilium citandi et executandi* of the Joint Venture for all purposes arising from the Joint Venture agreement and the contract with the Dawid Kruiper Municipality in respect of the project under item A above:

Physical address: _____

_____

_____

_____ (code)

Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____ (code)

Fax number: _____ (code)

| | Name | Capacity | Signature |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Note:***

1. ** Tenderer must delete which is not applicable*
2. ***NB**. This resolution must be signed by <u>all</u> the Duly Authorised Representatives of the Legal Entities to the Joint Venture submitting this Tender*
3. *Should the number of Duly Authorised Representatives of the Legal Entities joining forces in this Tender exceed the space available above, additional names and signatures must be supplied on a separate page*
4. *Resolutions, duly completed and signed, from the separate Enterprises who participate in this Joint venture must be attached to the Special Resolution*

## Record of Addenda to tender documents

I / We confirm that the following communications received from the Dawid Kruiper Municipality before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer: *(Attach additional pages if more space is required)*

| | Date | Title or Details |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |

| | | |
|---|---|---|
| Name | Position | Signed |

| | |
|---|---|
| Name of Tenderer | Date |

## Proposed Amendments and Qualifications

The Tenderer shall record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule.

| Page | Clause or item | Proposal |
|---|---|---|
| | | |

| | | |
|---|---|---|
| Name | Position | Signed |

| | |
|---|---|
| Name of Tenderer | Date |

## Proposed Subcontractors

In order to complete the Works under this Contract, I/we propose to employ the following subcontractors to carry out the portion/type of work as detailed.

(Note: All proposed subcontractors must be listed).

| Subcontractor: Name, Address and Telephone No. | Portion/type of work to be undertaken | Estimated value of work |
|---|---|---|
| | | |

| | | |
|---|---|---|
| | | |
| Name | Position | Signed |

| | |
|---|---|
| | |
| Name of Tenderer | Date |

## Capacity of Tenderer

1. **WORK CAPACITY:** *(The Tenderer is requested to furnish the following full particulars, attach additional pages if more space is required. Failure to furnish the particulars may result in the Tender being disregarded.)*

| **Skilled artisans employed** | | **Unskilled employees employed** | |
|---|---|---|---|
| **Categories of artisans** | **Number** | **Categories of employees** | **Number** |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| **Machinery and Plant – Please attach proof** | **MV and LV tools – Please attach proof** | **Workshops – Please attach proof** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

## 2. QUALIFICATIONS AND EXPERIENCE OF PROPOSED SITE SUPERVISION TEAM FOR THE PROJECT

**Tenderer to provide name(s), key qualifications and experience of site supervision team that will supervise the project on behalf of the Contractor.**

1. **Contracts and Project Manager**

   **Name and Surname :**

   **Qualification :**

   **No of years of experience :**

2. **Site Manager**

   **Name and Surname :**

   **Qualification :**

   **No of years of experience :**

3. **Site Foreman (Registered with Department of Labour as Three-Phase Electrician)**

   **Name and Surname :**

   **Qualification :**

   **Licence Registration no. :**

   **No of years of experience :**

**4. MV Cable Jointer (Joints and Terminations)**

**Name and Surname :**

**Qualification :**

**No of years of experience :**

**5. Health and Safety Officer (Registered with SACPCMP)**

**Name and Surname :**

**Qualification :**

**No of years of experience :**

**3. PARTICULARS OF COMMITMENTS WHICH THE TENDERER HAS PREVIOUSLY COMPLETED AND PRESENTLY ENGAGED WITH:**

**3.1 Current projects: (Please attached proof in terms of Appointment Letter and/or SLA)**

| | Project Name | Contact person | Contact Tel. No. | Contract amount | Contract period |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

**a. Previous projects: (Please attached proof in terms of Certificates of Practical Completion and/or Completion)**
Submission must be accompanied by adequate supporting information.

| Project | | Contact person | Contact Tel. No. | Contract amount | Contract period |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

## Certificate of Attendance at Tender Briefing Meeting and Site Inspection

| | |
|---|---|
| This is to certify that I, | |
| Representing Company | |
| Position | |
| Visited the site on | |

I have made myself familiar with all local conditions likely to influence the work and the cost thereof. I further certify that I am satisfied with the description of the work and explanations given at the site inspection meeting and that I understand perfectly the work to be done, as specified and implied, in the execution of this contract.

| | | |
|---|---|---|
| | | |
| Name Tenderer's Representative | Position | Signed |

| | |
|---|---|
| | |
| Name of Tenderer | Date |

| | | |
|---|---|---|
| | | |
| Name of Employer's Representative | Signature | Date |

## T2.2 Tender Sum Breakdown

**DAWID KRUIPER MUNICIPALITY**

**T036/2023: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

**SCHEDULE C2.2.1: SUMMARY OF PRICES FROM ANNEXURE A**

| Schedule No | Description | Total |
|---|---|---|
| A | Preliminary and General | |
| B | Medium Voltage Reticulation Network - Underground | |
| C | Low Voltage Reticulation Network - Underground | |
| D | Service Connections - Underground | |
| | | |
| | **Subtotal – 1** | |
| | **Contingency (15%)** | |
| | **Subtotal – 2** | |
| | **VAT (15%)** | |
| | **Total Tender Price** | |

Totals to be carried over to C1.1: Form of Offer and Acceptance

Signature …… Date ……

Name ……

Capacity ……

**For the tenderer**

Name and address of organization ……

……

……

……

Name and signature witnesses ……

……

# 2: The Contract

# Part C1: Agreement and Contract Data

## C1.1 Form of Offer and Acceptance

**OFFER**

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of:

**TN036/2023: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

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)

The scope of works will be completed by……., Number of weeks: ……

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning a copy of this acceptance form 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 …… Date ……

Name ……

Capacity ……

**For the tenderer**

Name and address of organization ……

……

……

……

Name and signature of witnesses ……

……

## 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 will pay the contractor the amount due in accordance with the conditions of contract identified in the Contract Data. Acceptance of the Tenderer's offer will form an agreement between the employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the Subject of this Agreement.

The terms of the contract, are contained in:

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

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

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

The Tenderer will 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 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 will 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 signed acceptance form, including the schedule of deviations (if any). Unless the Tenderer (now Contractor**)** within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement will constitute a binding contract between the parties.

Signature …… Date ……

Name ……

Capacity ……

**For the Employer**

Name and address of organization ……

……

……

Name and signature of witness …… Date ……

……

**Schedule of Deviations**

1 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .

2 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .

3 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .

4 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .

5 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .

By the duly authorized 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 tender 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 will have any meaning or effect in the contract between the parties arising from this agreement.

## 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 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 will have precedence in the interpretation of any ambiguity or inconsistency between it and the General Conditions of Contract.

Each item of data given below is cross-referenced to the Clause in the General Conditions of Contract to which it mainly applies.

The following variations, amendments and additions to the Clauses of the General Conditions of Contract are contract specific data applicable to this Contract:

### DATA PROVIDED BY THE EMPLOYER

| CLAUSE | DESCRIPTION / WORDING |
|---|---|
| 1.1 (Addition) | 1.1.1.35 "Conditions of Contract" mean the General Conditions of Contract as amended in the Contract Data.<br><br>1.1.1.36 "Schedule of Documents" means the documents so designated in and forming part of the Quotation Documents." |
| 1.1.15 & 1.2.1.2 | The Employer is, Dawid Kruiper Municipality<br><br>The Employer's address for receipt of communications and notices is:<br>**Physical address:**<br>Dawid Kruiper Municipality<br>Civic Centre<br>Market Street<br>UPINGTON<br>8801<br><br>**Postal Address:**<br>Private Bag X6003<br>Upington<br>8800<br>Telephone: (054) 338 7000<br>Facsimile: (054) 338 7020 |
| 1.1.16 & 1.2.1.2 | The Engineer is BVi Consulting Engineers (Pty) Ltd, Northern Cape<br><br>The Engineer's address for receipt of communications and notices is:<br>**Physical Address:**<br>55 Bult Street<br>Upington<br>8801<br><br>**Postal Address:**<br>PO Box 1155<br>Upington<br>8800<br>Telephone: (054) 337 6600<br>Facsimile: (054) 337 6699 |
| 4.3 (Addition) | "4.3.3 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 will apply between them to ensure compliance by the Contractor with the provisions of the Act:<br><br>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. |

| CLAUSE | DESCRIPTION / WORDING |
|---|---|
| | 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. 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.<br><br>The Contractor agrees that any duly authorised officials of the Employer will 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.<br><br>The Contractor will 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 will, on written demand, provide full details in writing, to the Employer and Engineer, of such investigation, complaint or criminal charge.<br><br>4.3.4 The Contractor will furthermore, in compliance with Constructional Regulations 2003 to the Act:<br><br>(i) Acquaint him with the requirements of the Employer's health and safety specification as laid down in Regulation 4(1) (a) of the Construction Regulation 2003, and prepare a suitably and sufficiently documented health and safety plan as contemplated in Regulation 5(1) of the Construction Regulations 2003 for approval by the Employer or his assigned agent. The Contractor's health and safety plan and risk assessment will be submitted to the Employer for approval within seven (7) days after the Commencement Date and will be implemented and maintained from the Commencement of the Works.<br><br>(ii) The Employer, or his assigned agent, reserves the right to conduct periodic audits, as contemplated in the Construction Regulations 2003, to ensure that the Contractor is compliant in respect of his obligations. Failure by the Contractor to comply with the requirements of these Regulations will entitle the Engineer, at the request of the Employer or his agent, to suspend all or any part of the Works, with no recourse whatsoever by the Contractor for any damages incurred as a result of such suspension, until such time that the Employer or his agents are satisfied that the issues in which the Contractor has been in default have been rectified." |
| 4.3 (Addition) | "With regard to the Compensation for Occupational Injuries and Diseases Act (Act no. 130 of 1993), where applicable, the Contractor will before commencement of the Works deliver to the Employer a letter, either<br><br>(a) from his insurance company certifying that the Contractor has effected insurance with the company for the full extent of his potential liability in respect of all workmen employed by him on the contract and undertaking to notify the Employer of the expiry date of the policy at least one calendar month before such date, or<br><br>(b) from the Compensation Commissioner certifying that the Contractor has complied with the requirements of the above-mentioned Act and is at present in good standing with the Compensation Fund." |
| 4.11.1 (Replacement) | "The Contractor shall employ for the purposes of the Contract, only such persons as are careful, competent and efficient in their various and/or several trades, professions and callings." |
| 5.3.1 | The Contractor will commence executing the Works within fourteen (14) days after the Commencement Date (i.e. Date that the Form of Acceptance is signed by the Employer).<br><br>In addition, the Contractor shall submit for approval the following documents prior to commencement of works:<br>a) Performance Guarantee.<br>b) Insurances and Professional Indemnity/ letters of intent from Insurer.<br>c) Construction Programme and detailed cash flow projections |

<table>
<tr><th>CLAUSE</th><th>DESCRIPTION / WORDING</th></tr>
<tr><td></td><td>d) Approval from Dept. of Labour for submitting “Notice for Construction of Work” and or Construction Works permit.<br>e) Health and Safety plan/ document.</td></tr>
<tr><td>5.4.1 (Addition)</td><td>The right of access to the Site shall be subject to the Contractor having an approved project specific health and safety plan in terms of the Occupational Health and Safety Act 1993: Construction Regulations (applicable version) and having complied with the initial requirements thereof.</td></tr>
<tr><td>5.5.1</td><td>Bidders must provide a realistic completion period, taking into account long leading items, soil composition for excavations and all possible interferences during construction.<br><br>The Due Completion Date shall be as indicated on the Form of Offer of Acceptance, alternatively the Due Completion Date shall be calculated from the Commencement Date and the period indicated on the Form of Offer of Acceptance.</td></tr>
<tr><td>5.6.1</td><td>The Contractor shall deliver his Works programme within fourteen (14) days after the Commencement Date.</td></tr>
<tr><td>5.6.2</td><td>The programme shall specifically show the ordering and delivery dates for the major material and equipment items, including but not limited to the long-lead delivery time items. The Employer reserves the right to apply delay penalties in the event that these programme dates are not achieved or complied with. The rate applicable to such penalty shall be the same as per clause 5.13.1.</td></tr>
<tr><td>5.8.1</td><td>None of the Works shall be carried out outside normal working hours and on the non-working and special non-working days stated in the Contract Data unless:</td></tr>
<tr><td>5.8.1</td><td>The special non-working days are all the applicable public holidays as well as the year-end break.</td></tr>
<tr><td>5.8.3 (Addition)</td><td>“Normal working hours shall be between 7h00 and 18h00. The cost of supervision by the Engineer or his representatives outside of normal (Monday to Saturday) working hours in accordance with this Clause will be for the Contractor’s account”.</td></tr>
<tr><td>5.12.2.2</td><td>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, extension of time shall be granted in accordance with the provisions of Clause 5.12 in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal conditions shall be deemed to exist. The number of working days quoted below for each calendar month shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions by the Contractor.<br><br>
<table>
<tr><th>Month</th><th>Working Days</th><th>Month</th><th>Working Days</th></tr>
<tr><td>January</td><td>0</td><td>July</td><td>3</td></tr>
<tr><td>February</td><td>0</td><td>August</td><td>3</td></tr>
<tr><td>March</td><td>0</td><td>September</td><td>1</td></tr>
<tr><td>April</td><td>1</td><td>October</td><td>0</td></tr>
<tr><td>May</td><td>3</td><td>November</td><td>0</td></tr>
<tr><td>June</td><td>3</td><td>December</td><td>0</td></tr>
</table>
<br>Extension of time in terms of Clause 5.12 based on abnormal rainfall or wet conditions shall be calculated separately for each calendar month or part thereof according to the formula given below, for the full contract period including any extension thereof.<br><br>
$$V = (N_w + N_n) + \frac{(R_w - R_n)}{X}$$
<br>V : Extension of time in calendar days regarding the calendar month under consideration.<br>Nw : Actual number of days during the calendar month whereupon a rainfall of Y mm or more was recorded.</td></tr>
</table>

| CLAUSE | DESCRIPTION / WORDING |
|---|---|
| | Nn : Average number of days during the relevant calendar month whereupon, according to existing rainfall data, a rainfall of Y mm or more was recorded.<br>Rw : Actual rainfall in mm, for the calendar month under consideration.<br>Rn : Average rainfall in mm, for the calendar month derived from existing rainfall data.<br>X : This is regional factor and shall vary from 5 mm/calendar month for dry areas to 20 mm/ calendar month for wet areas. Clay soil must have a lower value than a lower value as sandy granular soil, since it will take longer to dry out.<br>Y : This is the intensity of rain that will cause the cessation of work and can be about 10 mm/day.<br>▪ For the purpose of the contract, Nn, Rn, X and Y shall have the values as provided in the Annexures to the tender and/or the specifications.<br>▪ The total extension of time is the algebraic sum of the monthly totals for the subject period under consideration.<br>▪ Extension of time for part of a month shall be calculated by using the pro-rata values of Nn and Rn for the relevant calendar month. If the algebraic sum of the monthly totals is negative, no reduction in contract completion time will be applicable due to abnormal rainfall conditions.<br>The formula does not take into account any delays because of flood damage that will result in further or simultaneous delays. The delays because of flood damage must be handled separately for the purposes of extension of time on the completion time. |
| 5.13.1 | The penalty for failing to complete the Works within the abovementioned time limit, plus approved extensions of time or condonation hereof is **R 2 500.00 per calendar day** of the Tender award sum including VAT |
| 6.2.1 | The Contractor shall furnish the Engineer with a Performance Guarantee from a recognised, duly registered and accredited insurer or a commercial bank, subject to the Employer's acceptance and approval e.g. a commercial bank, Lombard's etc. |
| 6.2.1 | The security for due performance of the Contract shall be in the form of a Performance Guarantee to the value of 10% of the Contract Sum, which shall be delivered by the Contractor prior to Commencement of Works. The Contractor shall maintain the validity of the performance guarantee until the Certificate of Completion for the whole of the works is issued, and shall issue the necessary extended or replacement guarantee(s). |
| 6.3.4 (Addition) | The Employer retains the right to revise the scope of works to suit the available funding, if tender offers surpass the allocated available funding. |
| 6.8.2 | Contract Price Adjustment will not be applicable. |
| 6.8.3 | Price adjustments for variations in the cost of special materials will not be allowed on this Contract. |
| 6.10.1.3 (Replacement) | "Any amounts, by addition or deduction, to those referred to in this Clause which are due to the Contractor or the Employer and will include the deduction of penalties in terms of Clause 5.13.1." |
| 6.10.1.5 | The percentage limit of payment for Plant and materials not yet supplied to site or not yet built into the Permanent Works is 80%. Written agreements shall be concluded for such material, with signed agreement between the Employer and the Contractor, with and inclusive of conclusively substantiated and validated supporting motivation (e.g. letters of ownership, photographic evidence, verification visits, etc). All costs incurred and associated with such arrangements shall be for the Contractor's account. |
| 6.10.3 | The percentage retention on the amounts due to the Contractor is 10% of interim payment certificates. |
| 6.10.5 | 5% of the Contract Price shall be withheld upon completion of the project and be released upon lapsing of the defects and liability period after 12 months. |
| 6.2.1 | A retention money guarantee is not permitted. |
| 7.1.1 | "Unless otherwise directed in writing by the Engineer, all materials for the Permanent Works will be new and unused." |
| 1.1.1.13 & 7.8.1 | The Defects Liability Period is 12 calendar months, starting after the issue of a Certificate of Completion. |
| 8.6.1 | The Contractor shall provide proof of insurances for the duration of the contract as stipulated in 8.6 |

| CLAUSE | DESCRIPTION / WORDING |
|---|---|
| | and its sub-clauses. |
| 8.6.1.1.2 | The value of materials supplied by the Employer amounts to Zero rand. (R 0,00) |
| 8.6.1.1.3 | The amount to cover professional fees in terms of this Clause amounts to:<br>10% of the original Contract Price (Contract Sum). |
| 8.6.1.2 | Coupon policy for special risks insurances is not required. |
| 8.6.1.3 | The limit of indemnity will be R 10,000,000.<br>"The minimum amount of insurance required in terms of this Clause will be per event, the number of events being unlimited." |
| 8.6.1.5 | None. |
| 8.6.6 | The insurance policies and proof of due payment will be produced to the Engineer within fourteen (14) days after the Commencement Date. |
| 8.6.8 (Addition) | "In the event of any claim arising under the policies held in terms of this Clause, the Contractor will forthwith take all necessary steps to lodge his claim on the joint behalf of himself and the Employer, and to secure settlement of such claim, and he will submit to the Engineer copies of all claims and associated documents.<br>The claim submitted by the Contractor will cover the cost of repairing and making good as required in terms of Clauses 8.2.1 and 8.2.2." |
| 9.1.2 (Replacement) | "Up to the time of termination of the Contract by either party in terms of this Clause, or until the Contractor gives notice in terms of this Clause to terminate the Contract and the Contractor is precluded from exercising his right to terminate the Contract because the Employer agrees to bear any resultant additional costs provided for in the Contract, the Contractor:<br>a) will be entitled to an extension of calendar time for working days lost as may be approved by the Engineer, and<br>b) will be reimbursed the cost of delays per working day, where the number of working days will be determined pro rata the effect the delays have on the progress of the work as agreed with the Engineer. Payment in full and final settlement will be made at the rates tendered for the payment items specially provided in the Bill of Quantities.<br>Where the circumstances described in Clauses 9.1.1 are applicable only to a certain portion of the Contract, the Engineer will decide after consulting the Contractor, to what extent the Contract as a whole is affected and whether or not a claim in terms of this Clause can be submitted.<br>No payment will be made in terms of this Clause after the expiry of the Due Completion Date." |
| 9.2.1.3.6 | The Contractor's obligations under the Contract shall include compliance with approved programme and achievement of critical milestones of the programme. |
| 10.4 & 10.5 | Dispute resolution will be by amicable settlement or adjudication, as so decided by both parties in writing. |
| 10.7 | The determination of unresolved disputes in terms of Clauses 10.4 & 10.5 will be referred for final settlement to arbitration. |
| 10.7 | Special disputes will be referred for final settlement to arbitration. |

## C1.3 Form of Guarantee

WHEREAS THE CHIEF EXECUTIVE, DAWID KRUIPER MUNICIPALITY

(hereinafter referred to as "the Employer") entered into a Contract with . . . . . .

. . . . . .

(hereinafter called "the Contractor") on the. . . . . day of . . . . . 20. . . for **CONTRACT NO. TN036/2023** for the

**ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

AND WHEREAS it is provided by such Contract that the Contractor will provide the Employer with security by way of a guarantee for the due and faithful fulfilment of such Contract by the Contractor;

WHEREAS WE, . . . . . (*name of Insurance Company/Bank)*

have at the request of the Contractor, agreed to give such guarantee;

NOW THEREFORE WE do hereby guarantee and bind ourselves jointly and severally as Guarantor and Co principal Debtors to the Employer under renunciation of the benefits of division and excussion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

1. The Employer will, without reference and/or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the Due Completion Date of the Works under the said Contract, and that its rights under this guarantee will in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the Due Completion Date which the Employer may make, give, concede or agree to under the said Contract.
2. This guarantee will be limited to the payment of a sum of money.
3. The Employer will be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor.
4. This guarantee will remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee will remain in full force and effect until all such claims have been paid or liquidated.
5. Our total liability hereunder will not exceed the sum of . . . . . .

   . . . . . .(R . . . . . .)
6. The Guarantor reserves the right to withdraw from this guarantee by depositing the Guarantee Sum with the beneficiary, whereupon the Guarantor's liability hereunder will cease.
7. We hereby choose our address for the serving of all notices for all purposes arising hereof as . . . . . .

. . . . . .

IN WITNESS WHEREOF this guarantee has been executed by us at . . . . . .

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

As witnesses:

1. . . . . Signature

2. . . . . Duly authorized to sign on behalf of

. . . . . Address
. . . . . .

. . . . . .

## C1.4 Occupational Health and Safety Agreement

(To be completed and signed by all Mandatories)

OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 of 1993

Note: Section I (1)(xxviii) of the Act defines a "Mandatory" as including "an Agent, a Contractor or a Contractor for Work".

The Employer and the Contractor hereby agree, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act, Act No. 85 of 1993, herein after referred to as "the Act", that the Contractor as an employer in its own right and in its capacity as Contractor the execution of the works, shall have certain obligations and that the following arrangement shall apply between them to ensure compliance by the Contractor with the provisions of the Act, namely:

1. The Contractor undertakes to acquaint the appropriate officials and the employees of the Contractor with all relevant provisions of the Act, and the regulations promulgated in terms of the Act, and

2. The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with, and

3. The Contractor hereby accepts sole liability for such compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations and expressly absolves the Employer and the Employer's Consulting Engineers from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the work included in the Contract, and

4. The Contractor shall be obliged to report forthwith to the Employer any investigations, complaint or criminal charge with may arise as a consequence of the provisions of the Act and regulations pursuant to work performed on behalf of the Employer, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

As witnesses:

1. . . . . Signature

2. . . . . Duly authorized to sign on behalf of

on this . . . . . day of. . . . . 20….

. . . . . Address

. . . . . .

. . . . . .

## C1.5 Pro-forma Ownership of Plant

I/We, the undersigned, ……

…… (Name of the Contractor)

hereby declare that the materials for which payment is claimed in terms of the General Conditions of Contract that:

1. The material as listed in the Bill of Quantities supplied pursuant to the Contract shall become the property of the Client after payment.
2. The material and equipment paid by the Client are set aside and are marked as the property of the Client.
3. It is confirmed that such material and equipment are in the care of the Contractor solely for the purposes of the Contract and shall not be within the ownership of or disposition of the Contractor.
4. Any interim certificate issued by the Engineer shall be without prejudice of the exercise of any power of the Engineer contained in the Contract to reject material and/or equipment which is not in accordance with the Contract and upon any such rejection the property in the rejected material and/or equipment shall immediately revert to the Contractor.
5. That we shall be liable for loss of or damage to any of the Contractor's equipment which may happen otherwise than through the default of the Employer.

Address where the material/equipment will be held:

……

……

Signed in the presence of the subscribing witnesses:

At …… for and on behalf of the Contractor on this …..… day of ……..……..

1. . . . . Signature

2. . . . . Duly authorized to sign on behalf of

on this . . . . . day of. . . . . 20….

. . . . . Address

. . . . . .

. . . . . .

## C1.6 Expanded Public Works Programme- Commitment and Undertaking

I/We the undersigned,

……..…….

…….……..…… (Name of the Contractor),

hereby commits to the use local labour in the specific Wards wherein the proposed construction works/ developments for T000/2024: Electrification of 260 Houses in Kameelmond, Louisvale Road, Couples Valley & Pabalello Ward 13 will take place. Appointments will be done;

1. In conjunction with the specific Ward Councillor and CLO, if applicable.
2. According to the latest Guidelines from the Department of Labour and Occupational Health and Safety Act.
3. According to the lasted Guidelines from the Expanded Public Works Programme.
4. With proper and appropriate compensation according to the latest EPWP regulations and guidelines including amendments thereof for Civil works.
5. With Health and Safety inductions according to the Occupational Health and Safety Act and Construction Regulations.

Address where appointments will be managed:

……

……

Signed in the presence of the subscribing witnesses:

At ……. for and on behalf of the Contractor on this ……..… day of ……..……..

1. . . . . Signature

2. . . . . Duly authorized to sign on behalf of

on this . . . . . day of. . . . . 20….

. . . . . Address

. . . . . .

. . . . . .

**NOTE: EPWP REGISTRATION FORMS MUST BE SUBMITTED WHEN CONSTRUCTION STARTS. LABOUR REPORTS AND EPWP REPORTS MUST BE SUBMITTED AT THE END OF THE MONTHS DURING CONSTRUCTION IN WORD/ EXCEL.**

# Part C2: Pricing Data

## C2.1 Pricing Instructions

The measurement and payment clauses of the SANS 1200 Standardized Specifications and the Standard and Particular Specifications will be deemed to form part of and included in the Pricing Instructions.

### C2.1.1 General

**1.** The Contract Data, the Scope of the Work and the Site Information are to be read in conjunction with the Bill of Quantities. **The Bill of Quantities is attached as Annexure A.**

a. The Bill of Quantities comprises items covering the Contractor's profit and costs of general liabilities and of construction of temporary and permanent Works.

b. All rates in the Bill of Quantities should only include the rate for unskilled, semi–skilled and skilled labour employed full time by the Contractor's. All other Labour cost in terms of local labour temporarily employed as set out in the Tender Conditions is addressed in the Preliminary and General section of the Bill of Quantities.

c. The Tenderer is at liberty to insert a rate of his own choosing for each item in the Bill but his attention is drawn to the fact that the Contractor has the right, under various circumstances, to payment for additional works carried out and that the Engineer is obliged to base his assessment of the rates to be paid for such additional work on the rates inserted in the Bill.

d. The measurement and payment clauses of each Specification, read together with the relevant clauses of the Specification Data, set out what ancillary or associated activities are included in the rate for the operations specified.

2. The Bill of Quantities has been drawn up generally in accordance with the latest issue of the SANS Standardized Specifications. Descriptions in the Bill are abbreviated and must be read in conjunction with the measurement and payment clauses of the applicable Specifications.

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

4. Except that they will not include Value Added Tax (VAT), the prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices to the Employer for the work described under each item. Such prices will cover all costs and expenses that may be required in and for the construction of the work described and will cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based. Provision is made in the Summary to the Bill of Quantities for VAT to be added.

5. A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to have a price or rate of R 0,00.

6. The Bill of Quantities forms part of, and must be read in conjunction with the Specification and must be submitted, duly completed, on the closing date of tenders.

7. Tenderers must complete the Bill of Quantities and detail all required rates. The “Amount” will constitute the tender price for adjudication. Note: The Tenderer must price and extend each item, total each page and carry the total of each section in the Bill of Quantities to the Summary page. Arithmetical errors occurring in the priced Bill of Quantities will be corrected and the tender price adjusted accordingly.

8. No alteration, erasure or addition is to be made in the text. Should any alteration, erasure or addition be made it will not be recognized and the original wording and lettering (as issued to Tenderers) of the Schedule of Quantities will be adhered to. Any such alteration, erasure or addition may result in the tender being declared non-compliant and deemed non-responsive.

### C2.1.2 Construction

9. The Contractor must not order the quantities of materials stated in the Bill of Quantities until he has confirmed from the construction drawings or measurement on Site that such quantities are in fact the correct quantities.

10. Items in the Bill of Quantities are deemed to include supply, delivery, installation and connection where appropriate, unless stated to the contrary.

11. The quantities given in the Bill of Quantities will be considered as provisional and cannot be regarded as exact and are subject to measurement on site after completion of the service and adjustments will be made according to the unit rates given in the Bill of Quantities.

12. Only new, good quality materials may be used and where applicable materials must comply with the specifications of the South African Bureau of Standards SABS/SANS, the British Standards Specifications (BSS), the International Organization for Standardization (ISO) or the International Electro technical Commission (IEC).

13. In the event of discrepancies between the drawings, specifications and Bill of Quantities the Engineer will decide whether the work as executed will be measured on site or whether re-measurement will be effected from the working drawings only.

14. The excavations shall be measured according to the following types:
    a. Normal excavation
    b. Intermediate excavation
    c. Extra over item for hard rock excavation

    Tenderers may excavate test holes on the planned cable routes and/or positions to determine the type of excavation machines that will be used during construction, subject to appropriate approvals and/or permitting prior to excavations. The rates for the rock classifications (discussed in Items below) must be calculated according the appropriate machinery to reach the anticipated completion date.

15. The meaning of the above are as follows:
    a. Normal Excavation

    Normal excavation shall be all material not falling into the category of hard rock or intermediate excavation.

    b. Intermediate excavation

    No provision shall be made for the classification of Intermediate material for the purpose of this contract.

    c. Extra over item for hard rock excavation:

    Hard rock excavation shall be excavation in material (including boulders exceeding 0.15 cubic metres in individual volume) that cannot be efficiently removed without blasting or be in material, which cannot be excavated by Excavator up to a 30 Ton capacity and a flywheel power of approximately 150kW with rock-bucket, pecker attachment or by a scraper without prior ripping.

    Material shall be deemed to be hard rock when a track type back-acting excavator unit with a total mass of approximately 30t and a flywheel power of approximately 150kW fails to achieve a trenching production rate of 10m per hour.

    The responsibility rests with the Contractor on the method to be used to perform hard rock excavations and should the Contractor choose a method other than blasting, the rates for both the alternative method and for blasting must be provided for in the Bill of Quantities.

    The method of hard rock excavation must be agreed upon by the Contractor and the Employer or the Engineer after a written request with sufficient motivation is submitted to the Engineer before any hard rock excavations is performed by the Contractor on site.

    The Contractor shall bear full responsibility to provide any substantiating and/or necessary documentation with regards to blasting and/or alternative hard rock excavation methods to the Engineer in writing for his approval.

16. The following shall apply for excavation and measurement of excavations:
    a. Measurement shall be to the bottom side of cables and measurement in $m^3$ will be calculated from the minimum dimensions in accordance with the specification and drawings.
    b. The rates provided by the Tenderer shall allow for additional costs like storing, protection of other services, pumping to maintain dry excavation sites, smoothing of sides and bottoms, removal of rocks, bedding layer, clearing and removal of waste and all work incidental but not specifically mentioned in the schedule.
    c. The rates provided by the Tenderer shall allow for the closing of open excavations prior to installation of material, to satisfy health and safety requirements and protect against damage, with subsequent re-opening of excavations for installation of materials. Closing and re-opening of excavations shall not accrue towards payment in addition of payment for first excavation.

d. The rates provided by the Tenderer shall allow for frequent removal of unsuitable backfilling in trenches, barricading of excavations and general housekeeping of the construction site during the construction period. Backfill material shall be as described in specifications and on drawings.

e. The excavations shall be protected as required by health and safety requirements and construction regulations.

### C2.1.3 Tender Sums and Variation

17. Provisional sums shall be expended only as directed by Engineer and any balance remaining will be deducted from the amount of the contract Sum. Unused amounts and the remaining balance of provisioned amounts shall be omitted from the contract.

18. Where Prime Cost (P.C.) amounts are specified, no part of these amounts will be used without the written approval of the Engineer. Unused amounts and the remaining balance of such amounts shall be omitted from the contract.

19. No work, for which “Provisional” or “Prime Cost (PC sum)” items are provided, shall be commenced without written instruction from the Engineer.

20. Expenditure under "Provisional” or “Prime Cost (PC sum)” items shall require submission and acceptance of service provider invoicing, proof of payment from banking institution, and remittance advice from service provider, to ensure full and proper documentation of actual payments under these items.

21. Where variation orders are necessary, instructions will be issued by the Engineer and all variations will be calculated according to the priced Schedule of Quantities. All the items in the bill must be priced by the Tenderer. Non-compliance with this requirement will deem the tender as non-responsive.

    Where no provisions are made for rates pertaining to specific variation orders, the successful bidder will furnish the Engineer with at least three competitive quotes with accompanying specifications.

    All Variation orders shall be approved by the Employer and Engineer prior to execution of the scope of works of the Variation Order.

22. Additional Items

    Any additional items the Tenderer sees fit to add to the contract or tender must be motivated by means of a cover letter.

### C2.1.4 Other Requirements

23. Local Labour

    Tenderers are required to take the minimum wage according to the EPWP guidelines and code of good practice into consideration when determining excavation and other relevant labour rates. The Contractor shall submit full record of employment and payment to the labourers (individually and summarised) during the Works and at project closure.

24. Sub-Contracting and Sub- Contracting Agreements

    Tenderer’s rates shall include for the cost of managing for sub-contractors in the relevant sections or items defined for sub-contracting, alternatively as for any work or activity that will be sub-contracted. Rates shall be fixed once the tender offer is submitted. No rates shall be changed or additional items be added for sub-contractor mark ups or management costs.

25. Payment of fixed charges will be made as follows:

    a. EIGHTY PERCENT (80%) of the sum tendered will be paid when the facilities have been provided and approved; and

    b. The remaining TWENTY PERCENT (20%) will be paid when the Works have been completed, the facilities have been removed and the site of the Contractor’s establishment has been cleared and cleaned to the satisfaction of the Engineer.

    c. No adjustment will be made to the sum tendered for fixed charges should the value of the Works finally executed or the Time for Completion vary in any way from that specified in the Tender.

    d. Proportional payments will be made for obligations that are to be maintained throughout the duration of the Works, which proportion shall be according to the length of the duration of the works.

# C2.2 Summary of Prices

## C2.2 Summary of Prices

**DAWID KRUIPER MUNICIPALITY**

**T0036/2023: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

**SCHEDULE C2.2.1: SUMMARY OF PRICES FROM ANNEXURE A**

| Schedule No | Description | Total |
|---|---|---|
| A | PRELIMINARY AND GENERAL | |
| B | MEDIUM VOLTAGE RETICULATION NETWORK - UNDERGROUND | |
| C | LOW VOLTAGE RETICULATION NETWORK - UNDERGROUND | |
| D | SERVICE CONNECTIONS - UNDERGROUND | |
| | | |
| | **Subtotal – 1** | |
| | **Contingency (_15_%)** | |
| | **Subtotal – 2** | |
| | **VAT (15%)** | |
| | **Total Tender Price** | |

Completion of the Scope of Works::…… (Date) / …… Number of weeks.

Totals to be carried over to T2.2: Tender sum breakdown and the total tender price to C1.1: Form of Offer and Acceptance

Signature …… Date ……

Name ……

Capacity ……

**For the tenderer**

Name and address of organization ……

……

Name and signature witnesses ……

……

# C2.3 Technical Schedules

Tenderers must complete the technical schedules provided. A realistic delivery period for all items listed should also be provided.

### C2.3.1 Proposed Manufacturer/Supplier and Guaranteed Delivery Times

| Item no. | Description | Manufacturer and Model | Delivery Period (Weeks) |
|---|---|---|---|
| 1 | PILC STA MV Cable, Table 19 | | |
| 1.1 | 70mm² 3-core Cu | | |
| 1.2 | 120mm² 3-core Cu | | |
| 2 | 600/1000 V PVC SWA cables | | |
| 2.1 | 35 / 70 / 95 / 120 / 185 4-core Cu | | |
| 2.2 | 10mm² 2-core Cu | | |
| 3 | Equipment for Underground Infrastructure | | |
| 3.1 | Miniature Substations | | |
| 3.2 | LV Distribution Kiosks | PPS MK9 | |
| 3.3 | Ring Main Unit | | |
| 4 | Overhead Line Equipment | | |
| 4.1 | Wooden Poles, 9-14m | | |
| 4.2 | ACSR Conductor | | |
| 4.3 | Insulators, Intermediate (22kV) | | |
| 4.4 | Insulators, Strain (22kV) | | |
| 4.5 | Pole Top Distribution Boxes | | |
| 5 | House Connections/Installations | | |
| 5.1 | Ready Boards | CBI NBRCON003 | |
| 5.2 | Split Unit Pre-Paid Meter | Itron Sienna | |

### C2.3.2 11kV Cables

| | | |
|---|---|---|
| 1 | Name of Manufacturer | ……. |
| 2 | Name of Distributor / Wholesaler | ……. |
| 3 | Type of Cable according to SANS 97 | Table 19 |
| 4 | System Ratings | |

| | | | |
|---|---|---|---|
| 4.1 | Rated Voltage between Phases | kV | …… |
| 4.2 | Rated Voltage between Phases and screen | kV | …… |
| 4.3 | Frequency | Hz | 50 |
| 4.4 | Neutral point system | | Solid |
| 5 | Conductor details: | | |
| 5.1 | Conductor size | mm² | …… |
| 5.2 | Material | | Copper |
| 5.3 | Shape | | …… |
| 5.4 | No and size of strands | | …… |
| 5.5 | Diameter of conductor | mm | …… |
| 9 | Cable construction: | | |
| 9.1 | Insulation Compound used | | …… |
| 9.2 | No & approx. thickness of shield tapes | | …… |
| 9.3 | Cross-sectional area of sheath | mm² | …… |
| 9.4 | Armouring material | | Steel tapes |
| 9.5 | No & approx. thickness of armour tapes | | …… |
| 9.6 | Cross sectional area of armour tapes | m² | …… |
| 9.7 | Bedding Material between sheath and armouring | | …… |
| 9.8 | Outer sheath Compound | | PVC (black) |
| 9.9 | Approx. overall diameter of cable | mm | …… |
| 10 | Minimum bending radius of cable | m | …… |
| 11 | Approx. nett weight of finished cable | kg/m | …… |
| 12 | Test Voltage kV: | | |
| | a) AC Time/kV | | …… |
| | b) DC Time/kV | | …… |
| | c) Impulse 1,2/50 | kV | …… |
| 13 | Max admissible conductor temperature | ºC | …… |
| 14 | Admissible conductor temperature in emergency operation | ºC | …… |
| 15 | Additional information | …… | |
| | Tenderer wishes to submit: | …… | |

## C2.3.3 11kV Cable Joints and Terminations

| | | | |
|---|---|---|---|
| 1 | Name of Manufacturer | | CIP / 3M / TIS |
| 2 | Type no | | Crimped, Heat Shrink, Outdoor, |
| 3 | Type of Material | | …… |
| 4 | Type of Jointing Conductors | | …… |
| 5 | AC withstand voltage | kV | …… |
| 6 | Impulse withstand voltage | kV | …… |
| 7 | Creepage distance | mm | …… |
| 8 | Additional information Tenderer wishes to submit: | | …… |
| | | | …… |

## C2.3.4 Miniature Substation

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Name of Manufacturer | | | …… | | |
| 2 | Ratio | | | 11 kV/400 V / 230 V | | |
| 3 | kVA Rating | | kVA | 315 kVA | 500 kVA | |
| 4 | No Load Losses | | Watt | …… | Watt | …… |
| 5 | Full Load Losses (I2R+Stray) | | Watt | …… | Watt | …… |
| 6 | Impedance at full load and principal tapping | | <6% | …… | | |
| 7 | Measurement of Miniature Substations | | | | | |
| | a) | Length | mm | …… | mm | …… |
| | b) | Width | mm | …… | mm | …… |
| | c) | Height | mm | …… | mm | …… |
| 8 | Total Mass (with oil) | | kg | …… | kg | …… |
| 9 | Thickness of material | | | | | |
| | a) | HV Compartment | mm | …… | mm | …… |
| | b) | Transformer Compartment | mm | …… | mm | …… |
| | c) | LV Compartment | mm | …… | mm | …… |
| | d) | Doors | mm | …… | mm | …… |
| 10 | Describe methods of applying paint and treatment against corrosion | | | Powdercoating, except for transformer tank and radiator with wet application | | |

| | | | |
|---|---|---|---|
| 11 | MV Compartment: | | |
| a) | Manufacture and type of switchgear | | ABB Safering CCV |
| b) | Manufacture and type of earth fault indicating relay | | Woodward W1C |
| c) | Manufacture and ratio of (split core) C.T. | | …… …… |
| | | | …… …… |
| 12 | Manufacture and type of door locking system | | Internal to doors, minimum three-point locking …… |
| 13 | Describe proposed manner of obtaining access to cable terminations without removing HV compartment cubicle | | Integrated Cable Test Facility with mechanical lock-out …… …… |
| 14 | Low voltage compartment: State name of manufacturer and type of the following: | | |
| a) | Voltmeter (analogue) | 1 off, | With selector switch (R-N / W-N / B-N / R-W / R-B / W-B) |
| b) | Ammeters (analogue) | 3 off | With maximum demand indicator, resettable, selected scale |
| c) | Current transformers | | …… |
| d) | Fuses (for metering) | | …… |
| e) | Circuit breakers | | CBI large-frame |
| f) | Winding temperature indicator and alarm | | Yes, wired to MV switchgear relay (shunt trip) |
| 15 | Additional information | | …… |
| | Tenderer wishes to | | …… |
| | Submit | | …… |

## C2.3.5 Pole-mounted Transformers

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Name of Manufacturer | | | …… | | |
| 2 | Name of Distributor / Wholesaler | | | …… | | |
| 3 | Ratio | | | 11 kV/400 V / 230 V | | |
| 4 | kVA Rating | kVA | 50 kVA | kVA | 200 kVA | |
| 5 | No Load Losses | Watt | …… | Watt | …… | |
| 6 | Full Load Losses (I2R+Stray) | Watt | …… | Watt | …… | |
| 7 | Impedance at full load and principal tapping | <6% | …… | | | |
| 8 | Measurement of Transformers | | | | | |
| | a) Length | mm | …… | mm | …… | |
| | b) Width | mm | …… | mm | …… | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | c) | Height | mm | …… | mm | …… |
| 9 | Total Mass (with oil) | | kg | …… | kg | …… |
| 10 | Thickness of material | | | | | |
| | a) | HV Compartment | mm | …… | mm | …… |
| | b) | Transformer Compartment | mm | …… | mm | …… |
| | c) | LV Compartment | mm | …… | mm | …… |
| | d) | Doors | mm | …… | mm | …… |
| 11 | Describe methods of applying paint and treatment against corrosion | | | Powdercoating, except for transformer tank and radiator with wet application | | |
| 12 | MV Bushings | Type & Manufacturer | | …… | | |
| 13 | LV Bushings | Type & Manufacturer | | …… | | |
| 14 | 11kV Surge Arresters | Rating & Model | | …… | | |
| 15 | LV Neutral Surge Arresters | Rating & Model | | …… | | |

## C2.3.6 LV Cables

| | | | |
|---|---|---|---|
| 1 | Name of Manufacturer | | …… |
| 2 | Name of Distributor / Wholesaler | | …… |
| 3 | Number of cores | | …… |
| 4 | Core Material | | Copper |
| 5 | SANS Standard Applicable | | …… |
| 6 | Rated Voltage | V | 600/1000V |
| 9. | 1s Short Circuit rating | kA | …..... |

## C2.3.7 Consumer Installation

| | | |
|---|---|---|
| 1 | Ready board and LV breakers | CBi NRBCON003 |
| 2 | Circuit Breakers for Ready Boards | CBi 6kA |
| 3 | Earth leakage and surge protection devices | CBi |
| 4 | Prepaid metering | Itron Enlight Sienna DIN-R (PLC) with Common Base CIU |

## C2.3.8 Other Equipment

| | | |
|---|---|---|
| 1 | Pole top distribution box | Allbro AllTilt 6 |

| | | |
|---|---|---|
| 2 | Circuit Breakers for Pole Box | CBI, 6kA 1Ø |
| 3 | Transformer Kiosk Manufacturer | …… |
| 4 | Aerial Bundle Conductor: | |
| | Manufacturer | …… |
| | Name of Distributor / Wholesaler | …… |

### C2.3.9 Schedule of Variation Rates for Day Work

The rates will be applicable only if no rate exists in the Schedule of Quantities.

| Item | Description | | Rate |
|---|---|---|---|
| 1 | Labour charge for Foremen | per hour | …… |
| 2 | Labour charge for Artisan | per hour | …… |
| 3 | Labour charge for Apprentice | per hour | …… |
| 4 | Labour charge for Labourer | per hour | …… |
| 5 | All inclusive rate for Engineers | per hour | …… |
| 6 | Percentage profit charge on additional material | | …… |
| 7 | Charge for private car | per km | …… |
| | | per day | …… |
| 8 | Charge for truck not exceeding 1 ton, including driver | per km | …… |
| | | per day | …… |
| 9 | Charge for truck not exceeding 5 tons, including driver | per km | …… |
| | | per day | …… |
| 10 | Machinery and equipment: | | |
| | …… | | |
| | …… | | |
| | …… | | |
| | …… | | |

*Add more lines and information if deemed necessary*

……

……

……

# Part C3: Scope of Work

## C3.1 List of Applicable Specifications

Although not bound in nor issued with this document, the following standardized specifications, amendments thereof or updated versions for electrical engineering construction form part of this document and the edition specified below shall apply:

| Reference | Description |
|---|---|
| | **General** |
| SANS1200 A | General |
| SANS1200 C | Site clearance |
| SANS1200 HA | Structural steel work (Sundry items) |
| SANS1200 HB | Cladding and sheeting |
| SANS1200 HC | Corrosion protection for Steelworks |
| SANS1200 D | Earth works |
| SANS1200 CC1 & 2 | Concrete (building and small plants) |
| | |
| | **Electricity Distribution** |
| NRS 034-0 | Electricity distribution - Guidelines for the provision of electrical distribution networks in residential areas Part 0: Definitions. |
| NRS 034 -1 | Electricity distribution - Guidelines for the provision of electrical distribution networks in residential areas Part 1: Planning and design of distribution systems. |
| NRS 034 -3 | Electricity distribution - Guidelines for the provision of electrical distribution networks in residential areas Part 3: Overhead distribution in very low, low and moderate consumption areas, including rural areas and informal settlements |
| NRS 047-1 | Electricity supply - Quality of service Part 1: Minimum standards. |
| SANS 1019 | Standard voltages, currents, and insulation levels for electricity supply |
| SANS 61936-1 | Power installations exceeding 1 kV a.c. Part 1: Common rules |
| | |
| | **Earthing and Lightning Protection** |
| SANS 121 | Hot dip galvanised coating on fabricated iron and steel article – specifications and test methods. |
| SANS 1063 | Earth rods, couplers and connections |
| SANS 1213 | Mechanical cable glands |
| SANS 10142 - 1 | Part 1 – The wiring of premises |
| SANS 10313 | The protection of structures against lightning |
| SANS 62305 - 1 | Protection against lightning: Part 1: General principles |
| SANS 62305 - 2 | Protection against lightning: Part 2: Risk management |
| SANS 62305 – 3 | Protection against lightning: Part 3: Physical damage to structures and life hazard |
| SANS 62305 - 4 | Protection against lightning: Part 4: Electrical and electronic systems within structures |
| SANS 60227-1 | Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V. Part 1: General requirements. |
| | |
| | **Luminaires** |
| SANS 1277 | Street lighting luminaires |

| Reference | Description |
|---|---|
| SANS 1279 | Floodlighting luminaires |
| SANS 10225 | The design and construction of lighting masts |
| SANS 61547 | Equipment for general lighting purposes - EMC immunity requirements |
| SANS 61347 – 2 - 4 | Lamp control gear Part 2-4: Particular requirements for d.c supplied electronic ballasts for general lighting |
| SANS 60598 – 2 - 3 | Luminaires Part 2-3: Particular requirements - Luminaires for road and street lighting |
| SANS 10098 – 1 | Public lighting Part 1: The lighting of public thoroughfares |
| SANS 10098 – 2 | Public lighting Part 2: The lighting of certain specific areas of streets and highways |
| SANS 62612 | Self-ballasted LED lamps for general lighting services with supply voltages > 50 V - Performance requirements |
| SANS 62560 | Self-ballasted LED-lamps for general lighting services by voltage > 50 V - Safety specification |
| | |
| | **Surge Arresters** |
| SANS 60099-5 | Surge arresters Part 5: Selection and application recommendations |
| NRS 039-1 | Surge arresters for use in distribution systems Part 1: Guide for the application of gapless metal-oxide surge arrestors |
| SANS 60099-4 | Surge arresters Part 4: Metal-oxide surge arresters without gaps for a.c. systems |
| SANS 61643-1 | Low voltage lightning arrestors |
| | |
| | **Metering and Measurements** |
| IEC 62053 | Electricity metering equipment (A.C.) – particular requirements |
| IEC 60051 – 1 | Direct acting indicating analogue electrical measuring instruments and their accessories – definitions and general requirements common to all parts |
| IEC 61036 | Alternating current static watt-hour meters for active energy |
| NRS 057/ SANS 474 | Code of practice for electricity metering |
| NRS 049 | Advanced metering infrastructure (AMI) for residential and commercial customers |
| 240 - 56364444 | ESKOM Standard Metering Requirements for the Metering of Electrical Energy and Demand |
| | |
| | **Handling of Cables** |
| SANS 10198-1 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 1: Definitions and statutory requirements. |
| SANS 10198-3 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 3: Earthing systems – General provisions |
| SANS 10198-7 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 7: Safety precautions |
| SANS 10198-8 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 8: Cable laying and installation |
| SANS 10198-9 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 9: Jointing and termination of extruded solid dielectric-insulated cables up to 3,3 kV. |
| SANS 10198-10 | The selection, handling and installation of electric power cables of rating not exceeding |

| Reference | Description |
|---|---|
| | 33 kV Part 10: Jointing and termination of paper-insulated cables. |
| SANS 10198-11 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 11: Jointing and termination of screened polymeric-insulated cables. |
| SANS 10198-13 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 13: Testing, commissioning and fault location. |
| | |
| | **LV Cables** |
| NRS 074-1 | Low-voltage (600/1 000 V) cable systems for underground electrical distribution Part 1: Cables |
| SANS 60227-1 | Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V. Part 1: General requirements. |
| NRS 056-1 | Service distribution boxes - Meter kiosks and distribution kiosks Part 1: Low-voltage non-steel meter kiosks for use in underground networks |
| | |
| | **MV Cables** |
| NRS 012 | Cable terminations and live conductors within air-insulated enclosures (insulation co-ordination) for rated a.c. voltages of 7,2 kV and up to and including 36 kV. |
| NRS 013 | Medium-voltage cables |
| NRS 028 | Cable lugs and ferrules for copper and aluminium conductors. |
| NRS 053 | Accessories for medium-voltage power cables (3,8/6,6 kV to 19/33 kV) |
| SANS 60840:2006<br>IEC 60840:2004 | Power cables with extruded insulation and their accessories for rated voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV) -Test methods and. requirements |
| | |
| | **Miniature Substations** |
| SANS 1029 | Miniature substations for rated a.c. voltages up to and including 24 kV |
| SANS 10200 | Neutral earthing in medium voltage industrial power systems |
| SANS 60439-2 | Low-voltage switchgear and control gear assemblies Part 2: Particular requirements for bus bar trunking systems (bus ways**).** |
| SANS 60439-3 | Low-voltage switchgear and control gear assemblies Part 3: Particular requirements for low-voltage switchgear and control gear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards. |
| | |
| | **MV Ring Main Units** |
| SANS 1874 | Switchgear - Metal-enclosed ring main units for rated a.c. voltages above 1 kV and up to and including 36 kV |
| SANS 1885 | AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 36 kV |
| SANS 62271-105 | High-voltage switchgear and control gear Part 105: Alternating current switch-fuse combinations |
| SANS 62271-107 | High-voltage switchgear and control gear Part 107: Alternating current fused circuit-switchers for rated voltages above 1 kV up to and including 52 kV |
| | |
| | **Overhead Lines** |
| NRS 022 | Electricity distribution - Stays and associated components |

| Reference | Description |
|---|---|
| NRS 033 | Electricity distribution - Guidelines for the application design, planning and construction of medium voltage overhead power lines up to and including 22 kV, using wooden pole structures and bare conductors |
| NRS 034 – 2-3 | Electricity distribution - Guidelines for the provision of electrical distribution networks in residential areas Part 2-3: Preferred methods and materials for the installation of overhead power lines |
| NRS 066 | Medium-voltage insulators. (Covers the technical requirements for post and long rod medium-voltage insulators for use on overhead power lines with a nominal voltage of 11kV, 22 kV and 33 kV, and that are classified as class A insulators in accordance with SABS IEC 60383-1) |
| NRS 073 | Wood poles, cross-arms and spacer blocks |
| SANS 182-1 | Conductors for overhead electrical transmission lines Part 1: Copper wires and stranded copper conductors |
| SANS 182-2 | Conductors for overhead electrical transmission lines Part 2: Stranded aluminium conductors |
| SANS 182-3 | Conductors for overhead electrical transmission lines Part 3: Aluminium conductors, steel reinforced |
| SANS 182-5 | Conductors for overhead electrical transmission lines Part 5: Zinc-coated steel wires for conductors and stays |
| SANS 754:2007 | Eucalyptus poles, cross-arms and spacers for power distribution and telephone systems |
| SANS 10280 | Overhead power lines for conditions prevailing in South Africa |
| SANS 10324 | Inspection and supplemental treatment of treated wood utility poles |
| SANS 61089 | Round wire concentric lay overhead electrical stranded conductors |
| SANS 60471 | Dimensions of clevis and tongue couplings of string insulator units |
| SANS 61109 | Insulators for overhead lines - Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1000 V - Definitions, test methods and acceptance criteria |
| SANS 61466-1 | Composite string insulator units for overhead lines with a nominal voltage greater than 1 000 V Part 1: Standard strength classes and end fittings |
| | |
| | **Overhead Lines: Equipment** |
| NRS 031 | Alternating current disconnectors and earthing switches (up to 145 kV) |
| NRS 035-1 | Outdoor distribution cut-outs Part 1: Drop-out fuse-link assemblies or solid-link assemblies - Pole-mounted types - For nominal a.c. voltages up to and including 33kV |
| NRS 035-2 | Outdoor distribution cut-outs Part 2: Expulsion fuse-links - For nominal a.c. voltages up to and including 33 kV |
| NRS 036-1 | Auto-reclosers and sectionalizers - Pole mounted types Part 1: Auto-reclosers with local and remote-control capabilities for nominal a.c. voltages up to 33 kV |
| NRS 036-2 | Auto-reclosers and sectionalizers - Pole mounted types Part 2: Auto-reclosers that has programmable protection features and local control for nominal a.c. voltages of up to 33 kV |
| NRS 036-3 | Auto-reclosers and sectionalizers - Pole-mounted types Part 3: Sectionalizers for nominal a.c. voltages up to 33 kV. |
| NRS 039-1 | Surge arresters for use in distribution systems Part 1: Guide for the application of gapless metal-oxide surge arrestors |
| NRS 046 | Electricity distribution - Load-break switch-disconnectors - Pole-mounted type for rated A.C. voltages above 1 kV and up to and including 36 kV. |

| Reference | Description |
|---|---|
| SANS 60099-4 | Surge arresters Part 4: Metal-oxide surge arresters without gaps for a.c. systems |
| SANS 60099-5 | Surge arresters Part 5: Selection and application recommendations |
| SANS 60099-6 | Surge arresters Part 6: Surge arresters containing both series and parallel gapped structures - Rated 52 kV and less |
| SANS 61463-1 | Low voltage lightning arrestors |
| SANS 62271-111 | High-voltage switchgear and control gear Part 111: Overhead, pad-mounted, dry vault, and submersible automatic circuit reclosers and fault interrupters for alternating current systems up to 38 kV |
| | |
| | **Low Voltage Aerial Bundled Conductor Lines** |
| NRS 018-1 | Fittings and connectors for low-voltage overhead power lines using aerial bundled conductors Part 1: Strain and suspension fittings for self-supporting conductors |
| NRS 018-2 | Fittings and connectors for low-voltage overhead power lines using aerial bundled conductors Part 2: Strain and suspension fittings for insulated neutral supporting conductors. |
| NRS 018-3 | Fittings and connectors for low-voltage overhead power lines using aerial bundled conductors Part 3: Strain and suspension fittings for bare neutral supporting conductors. |
| NRS 018-4 | Fittings and connectors for low-voltage overhead power lines using aerial bundled conductors Part 4: Strain and suspension fittings for aerial service cables. |
| NRS 018-5 | Fittings and connectors for low-voltage overhead power lines using aerial bundled conductors Part 5: Current-carrying connectors and joints |
| NRS 020 | Electricity distribution - Cable ties for use with low voltage aerial bundled conductors |
| NRS 051 | Suspension and strain fittings for insulated neutral supporting conductors used in medium-voltage aerial bundled conductor systems |
| SANS 10198-14 | The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 14: Installation of aerial bundled conductor (ABC) cables |
| | |
| | **Service Connections** |
| NRS 032 | Service distribution boxes - Pole-mounted types for overhead single phase a.c. service connections at 230 V |
| SANS 1507-6 | Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 6: Service cables |
| NRS 062 | Concentric single-phase aerial service cable - For domestic service connections with a combined neutral-earth conductor |
| NRS 063 | Split-concentric single-phase aerial service cable - For domestic service connections with separate neutral and earth conductors |
| NRS 019 | Electricity distribution - Small power distribution units (ready boards) for single-phase 230 V service connections - Preferred requirements for applications in low-cost and subeconomic housing |
| SANS 1619 | Small power distribution units (ready boards) for single-phase 230 V service connections |
| SANS 1524-1 | Electricity payment systems Part 1: Payment meters |
| SANS 1524-1-1 | Electricity payment systems Part 1-1: Mounting and terminal requirements for payment meters |
| SANS 1524-1-2 | Electricity payment systems Part 1-2: Surge protective devices for the protection of payment meters |

| Reference | Description |
|---|---|
| SANS 1524-4 | Electricity payment systems Part 4: Payment electricity meter cards |
| | |
| | **Distribution Transformers** |
| SANS 780 | Power transformers |
| NRS 054 | Power transformers |
| SANS 1037 | Standard transformer bushings |
| SANS 62371 | Characteristics of hollow pressurized and unpressurised ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V |
| SANS 1371 | Ceramic hollow insulators for standard transformer bushings |
| SANS 60137 | Insulated bushings for alternating voltages above 1 000 V |
| NRS 079-1 | Mineral insulating oils (uninhibited) Part 1: Purchase, management, maintenance and testing |
| SANS 61558-1 | Safety of power transformers, power supplies, reactors and similar products Part 1: General requirements and tests |
| SANS 61558-2-1 | Safety of power transformers, power supplies, reactors and similar products Part 2-1: Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications |
| | |
| | **MV Indoor Equipment** |
| SANS 1885 | Metal-clad switchgear and controlgear for rated voltages above 1 kV and up to and including 36 kV: General requirements and methods of test |
| IEC 60255 | Electrical relays – All parts as applicable |
| IEC 61869-1 | Instrument transformers – Part 1: General requirements |
| IEC 61869-2 | Instrument transformers – Part 2: Additional requirements for current transformers |
| IEC 61869-3 | Instrument transformers – Part 3: Additional requirements for inductive voltage transformers |
| IEC 61869-5 | Instrument transformers – Part 5: Additional requirements for capacitor voltage transformers |
| IEC 61869-6 | Instrument transformers – Part 6: Additional general requirements for low-power instrument transformers |
| IEC 61869-10 | Instrument transformers – Part 10: Additional requirements for low-power passive current transformers |
| IEC 61869-11 | Instrument transformers – Part 11: Additional requirements for low power passive voltage transformers |
| IEC 62052-11 | Electricity metering equipment (a.c.) – General requirements, tests and test conditions – Part 11: Metering equipment |
| IEC 62271-1 | High-voltage switchgear and controlgear – Part 1: Common specifications for alternating current switchgear and controlgear |
| IEC 62271-3 | High-voltage switchgear and controlgear – Part 3: Digital interfaces based on IEC 61850 |
| IEC 62271-200: | High-voltage switchgear and controlgear – Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV |
| | |
| | **Guidelines and Recommended Practices** |
| ARP 063: | Quality management systems - Guidelines for the application of SANS 9001:2000 in |

| Reference | Description |
|---|---|
| IWA 4: | local government |
| ARP 077<br>ISO/TR 18492 | Long-term preservation of electronic document-based information |
| ARP 22399<br>ISO/PAS 22399 | Societal security - Guideline for incident preparedness and operational continuity management. |
| ARP 23081-2<br>ISO/TS 23081-2 | Information and documentation - Records management processes - Metadata for records Part 2: Conceptual and implementation issues |
| M 33 A | The international metric system (SI). Guide to the use of the SI in South Africa |
| NRS 002 | Graphical symbols for electrical diagrams |
| NRS 033 | Electricity distribution - Guidelines for the application design, planning and construction of medium voltage overhead power lines up to and including 22 kV, using wooden pole structures and bare conductors |
| NRS 034 -3 | Electricity distribution - Guidelines for the provision of electrical distribution networks in residential areas Part 3: Overhead distribution in very low, low and moderate consumption areas, including rural areas and informal settlements |
| NRS 040-1 | High voltage operating regulations Part 1: |
| NRS 040-2 | High voltage operating regulations Part 2: |
| NRS 040-3 | High voltage operating regulations Part 3: |
| NRS 040-4 | High voltage operating regulations Part 4: |
| NRS 040-5 | High voltage operating regulations Part 5: Standard procedure and terminology for the issuing of operating instructions |
| NRS 040-6 | High voltage operating regulations Part 6: Code of practice for earthing |
| NRS 044 | Working procedures and standards in respect of the installation of new electrical works and telecommunication facilities, or the extension or modification of such existing works and facilities. |
| NRS 047 – 2 | Electricity supply - Quality of service Part 2: Reporting guidelines |
| NRS 059 | Recommendations to minimize problems associated with the theft of transformer neutral and neutral earthing copper conductors |
| NRS 060 | Code of practice for clearances for electrical systems with rated voltages up to and including 145 kV, for the safety of persons. |
| NRS 080 | Quantifying and reporting of energy losses in electricity distribution networks |
| NRS 082 | Recommended maintenance policy for electricity networks |
| SANS 1019 | Standard voltages, currents, and insulation levels for electricity supply |
| SANS 100013<br>ISO/TR 10013 | Guidelines for quality management system documentation |
| SANS 10142-1 | The wiring of premises Part 1: Low-voltage installations |
| SANS 10142-2 | The wiring of premises Part 2: Medium-voltage installations above 1 kV a.c. not exceeding 22 kV a.c. and up to and including 3 MVA installed capacity |
| SANS 10280-1 | Overhead power lines for conditions prevailing in South Africa Part 1: Safety. |

## C3.2 Project Specifications – Part A: General Items

The Project Specification, consisting of three parts, forms an integral part of the contract

PART A contains a general description of the works, covers a general description of the project, the site and the geo-technical conditions.

PART B contains the requirements to be met, covers the available and required facilities, special characteristics of the Contract and the requirements with which the Contractor has to comply with

PART C named the Particular Project Specifications, contains additions to Standard Specifications,

Reference is also given in the different parts to other Specifications (if any) applicable on the Contract

In the event of a discrepancy between the specifications, (including the Project Specifications) and the drawings and/or the Bill of Quantities, the discrepancy shall be brought to the attentions of and resolved by the Engineer before the execution of the work under the relevant item.

### C3.2.1 General Description of the Works

This contract covers the electrification of approximately 260 residential houses in Kameelmond, Louisvale Road, Couple's Valley, Pabalello Ward 13 including both medium and low voltage infrastructure, as well as service connection infrastructure.

### C3.2.2 Scope of the Works

The contract provides for the supply of some or all of the materials required and the provision of labour and expertise for the installation of some or all of the materials in accordance with the requirements of the Project Specifications.

The scope of work comprises the following:

- Supply, delivery and installation of:
  - medium voltage underground infrastructure, including 11 kV cable feeders, miniature substation(s), ring main units, etc.
  - low voltage underground infrastructure, including low voltage cables, streetside kiosks, etc.
  - underground consumer connections.
  - medium voltage overhead infrastructure, including 11 kV line connection, pole mounted transformers, etc.
  - consumer installations, including split pre-payment metering, etc; and
  - associated works
- Testing, commissioning and handing over of completed infrastructure, including documentation
- Planning, implementation and management, including formal reporting, of the construction works
- Supply, delivery and installation of:
- Upholding, during the 12-month defects liability period, of all equipment referred to in this document either explicitly or implicitly and as shown on the drawings.

The scope specifically includes the ordering, management of orders and manufacturing, and delivery of long-lead delivery time material and equipment including but not limited to:

- miniature substations and/or distribution transformers – to be ordered within 14 days of appointment
- medium and low voltage cable – to be ordered within 14 days of appointment
- low voltage distribution kiosks – to be ordered within 14 days of appointment
- consumer connection cable
- split pre-payment meters – to be ordered within 14 days of appointment
- consumer ready-boards

### C3.2.3 Works Detail Description per Project Area

The scope of work in the respective project areas are described in summary in the following paragraphs.

#### C3.2.3.1 Kameelmond

- 62 stands in total
- Overhead infrastructure
  - Wooden poles (12m length) and MV t-off structure (cable to line connection)
  - Upgrade existing transformer installation
  - Transformer LV kiosk
  - 600/1000V PVC SWA PVC LV cable connections at transformer (70 & 95mm²)
- Underground infrastructure
  - Underground connections = 62
  - 11kV/400V 315kVA miniature substation
  - 6,35/11kV PILC DSTA 70mm² 3-core Cu MV cable with terminations
  - 600/1000V PVC SWA PVC cable feeders (50, 70, 95 & 120mm²)
  - Ground-mounted distribution kiosks
  - 600/1000V PVC SWA PVC service connection cable (10mm²)
- Consumer installations
  - Ready boards
  - Split prepayment meters

The infrastructure established will enable and accommodate future expansion of the serviced area of Kameelmond. The works include the upgrade, repair and/or refurbishment and/or incorporation of existing infrastructure.

#### C3.2.3.2 Louisvale Road – Rondomskrik

- 29 stands in total
- Underground infrastructure
  - Upgrade existing miniature substation ES1202A, to 11kV/400V 315kVA miniature substation
  - 600/1000V PVC SWA PVC cable feeders (70, 95 & 120mm²)
  - Ground-mounted distribution kiosks
  - 600/1000V PVC SWA PVC service connection cable (10mm²)
- Consumer installations
  - Ready boards
  - Split prepayment meters

The infrastructure established will enable and accommodate future expansion of the serviced area of Rondomskrik. The works include the upgrade, repair and/or refurbishment and/or incorporation of existing infrastructure.

#### C3.2.3.3 Couples Valley

- 132 stands in total
- Underground infrastructure
  - 6,35/11kV PILC DSTA 70mm² 3-core Cu MV cable with terminations
  - 11kV/400V 630kVA miniature substation
  - 600/1000V cable feeders (70, 95 & 120mm²)
  - Ground-mounted distribution kiosks
  - 600/1000V PVC SWA PVC service connection cable (10mm²)
- Consumer installations
  - Ready boards
  - Split prepayment meters

The infrastructure established is continuation of electrification projects from previous years.

#### C3.2.3.3 Pabalello Ward 13

- 37 stands in total, in multiple areas within the established neighbourhoods
- Vulindlela (4), Irene (7), King (2), Lovers Lane (11), Turquoise (9) and Roes (4) streets
- Tying into existing low voltage underground infrastructure
- Underground infrastructure
  - 600/1000V PVC SWA PVC cable feeders (70, 95 & 120mm²)
  - Ground-mounted distribution kiosks
  - 600/1000V PVC SWA PVC service connection cable (10mm²)
- Consumer installations
  - Ready boards
  - Split prepayment meters

### C3.2.4 Requirements at Tender

The following documentation must be provided with tender submission for the Electrical contractor/sub-contractor responsible for specific specialist installations:

- Written proof that he owns sufficient plant and equipment to complete the project timeously or alternatively list the plant he intends on renting,
- Written proof of his labour force he intends to utilize,
- Company organogram reflecting staff who will be committed to and active on the contract and site,
- Company profile,
- CV's & certificates of key personnel members he intends to utilize,
- Reference letters or completion certificates of similar installations completed.
- Information stated in the Project Specifications (Parts C3.3 and C3.4)

Tenderers are advised to visit the site and thoroughly acquaint themselves with the nature and extent of the work to be done.

## C3.3 Project Specifications – Part B: General Requirements

### C3.3.1 General Items

This part of the specifications gives the general requirements for electrical installation work. These requirements are based on the relevant quality specifications given in Part C3.3 and are augmented by the specific requirements for this contract given in Part C3.4.

#### C3.3.1.1 Interpretations

'Fixed charge': A charge that is not subject to adjustment on account of variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work.

'Time-related charge': A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract.

'Value-related charge: A charge, the amount of which varies pro rata with the final value of the measured work executed and valued in accordance with the provisions of the Contract.'

Payment of fixed charges will be made as follows:

(a) EIGHTY PERCENT (80%) of the sum tendered will be paid when the facilities have been provided and approved; and
(b) The remaining TWENTY PERCENT (20%) will be paid when the Works have been completed, the facilities have been removed and the site of the Contractor's establishment has been cleared and cleaned to the satisfaction of the Engineer.
(c) No adjustment will be made to the sum tendered for fixed charges should the value of the Works finally executed or the Time for Completion vary in any way from that specified in the Tender.

Payment for time-related items will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered contract period in months; provided always that the total of the monthly amounts so paid for the item is not out of proportion with the value of the progress of the Works as a whole.

#### C3.3.1.2 Safety

Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations there under, the Contractor shall at its own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items):

(a) Provide to its Employees on the Site of the Works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational Health and Safety Act (Act No 85 of 1993) as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times; and
(b) Provide, install and maintain on all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the Site, as well as the general public; and
(c) Implement on the Site of the Works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the Act at all times; and
(d) Implement all necessary measures as to ensure compliance of the Act by all subcontractors engaged by the Contractor and their employees engaged on the Works; and
(e) Comply fully with all other requirements pertaining to safety as may be specified in the Contract.

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the Site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act. For this purpose, the Contractor shall grant full access to the Site of all parts of the Site and shall co-operate fully in such inspections and shall make available for inspection, all such documents and records as the Employer's and/or Engineer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of the Conditions of Contract, be entitled to suspend progress on the Works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the Works or any part thereof is suspended by the Engineer in terms of this clause and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the

provisions of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified Due Date for Completion in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the Conditions of Contract.

All work and particularly work carried out in the proximity of buildings, bridges, tanks or other structures shall be carried out in conformance with the regulations framed under the Occupational Health and Safety Act, 1993 and the Minerals Act, (Act 50 of 1991) (including shoring where necessary) to ensure the safety of structures that are risk.

The Contractor shall make available for the duration of the contract safety helmets, appropriate footwear, gloves, protective eyewear and any other necessary safety equipment for sole use by the Engineer and his representative(s).

#### C3.3.1.3 Tendered Sums (Contracted Rates and Sums)

Except only where specific provision is made in the Specifications and/or the Schedule of Quantities for separate compensation for any of these items, the Contractor's tendered sums shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification; and
- head-office and site overheads and supervision; and
- provision of staff and resources, and
- profit and financing costs; and
- expenses of a general nature not specifically related to any item or items of the permanent or temporary work; and
- providing such facilities on Site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, for providing services such as water, electricity, sewage and rubbish disposal, for access roads and all other facilities required, as well as for the maintenance and removal on completion of the Works of these facilities and for the cleaning-up of the site of the Contractor's establishment and reinstatement to not less than its original condition; and
- providing the facilities for the Engineer and his staff as specified in the Contract and their removal from the Site on completion of the Contract.; and
- providing security for Contractor's Plant and Personnel; and
- compliance with Occupational Health and Safety requirements.

### C3.3.2 Standards

In view of the fact that this installation is to be operated and maintained by others it is a condition of this contract that the standard of workmanship and quality of materials shall comply with the relevant specifications and standards and shall be subject to the approval of the Engineer and the party finally responsible for the operation and maintenance of the system. All correspondence in this regard shall however be directed to the Engineer and the final approval shall only be granted by him.

### C3.3.3 Items Provided by the Employer

#### C3.3.3.1 Infrastructure provided by employer

A site will be indicated for the establishment of a site office and stores. The site is not serviced and the Contractor is required to make the necessary provision for sanitation, portable water and electricity.

#### C3.3.3.2 Plant supplied by employer for incorporating into the works

The Contractor must supply all Plant required for the erection and completion of the Works.

### C3.3.4 Management of the Works

#### C3.3.4.1 Additional Safety Requirements

The Contractor hereby agrees, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act, Act No.85 of 1993, hereinafter referred to as "the Act", to comply with the Act in all respects with specific reference to the Construction Regulations promulgated under the Act.

The Contractor has made provision for the cost of health and safety measures during the construction process.

The Contractor hereby 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 and the Engineer from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the work included in the contract.

The Contractor undertakes to acquaint all his officials and employees whether temporary or permanent with all relevant provisions of the Act and the regulations and specifically the Construction Regulations promulgated in terms of the Act.

The Contractor shall inter alia ensure that:

- Before starting on site present the Employer with an approved Health and Safety Plan based on the Health and Safety Specification compiled by the Agent (Consultant).
- Submit a copy of the Notification of the Construction Work to the Department of Labour (DoL) to the Client.
- Submit proof that he/she and every contractor is registered and in good standing with the compensation fund or a licensed compensation insurer prior to the commencement of work and that all employees are ensured with the Unemployment Insurance Fund
- Indicate who his/her competent Site Supervisor is. (Every contractor shall appoint a full-time competent employee designated in writing as the construction supervisor, with the duty of supervising the performance of the construction work as well as other employees to assist with the supervision work.)
- No principal contractor will appoint a contractor to perform construction work unless the principal contractor is reasonably satisfied that the contractor he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely.

Every contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of the Act and these Regulations, is opened and kept on site and made available to an inspector, client, client's agent or principal contractor upon request.

A principal contractor shall ensure that in addition to the documentation required in the health and safety file as determined in sub-regulations (7) and (8), a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done is included and available.

The principal contractor shall hand over a consolidated health and safety file to the client upon completion of the construction work and shall, in addition to the documentation referred to in sub-regulation (7), include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

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 on behalf of the Employer and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

The Contractor shall furthermore comply with all the Employer's requirements for security and safety. An active accident prevention programme shall be maintained. A responsible person shall be appointed in terms of the Occupational Health and Safety Act and he is to co-operate fully with the Engineer's Representative in all matters pertaining to accident prevention.

### C3.3.4.2 Limitations on the Contractor's Performance of the Work

The Contractor shall control his activities and processes in such a way as to ensure compliance with the specifications. He shall carry out, as a minimum requirement; all the tests laid down in the specifications and shall submit all the test results to the Engineer.

The Contractor shall be responsible for the relevant Quality Assurance requirements to be imposed on his Sub-Contractors and suppliers of materials.

The Employer's personnel as well as other Contractors will be active on site during the execution of this contract. The inherent problems associated with this type of interaction must be taken into account and shall be allowed fully for in prices. The program may or will be altered from time to time to accommodate the needs of the other Contractors and site conditions, everything to ensure the best co-ordination of the works in total, however not necessarily to the advantage of this Contract.

### C3.3.4.3 Division of the Works

It shall however be noted that the official take-over by the Client will only be at completion of this total contract and that partial take over may not be accommodated.

The exception is portions of the works, which are handed over to the Client after completion thereof.

### C3.3.4.4 Construction Program

A program will be finalised during a meeting within 14 days after appointment. The Contractor will only deviate from this program if the Engineer approves. However, the Engineer reserves the right to alter the program if necessary. This program shall be regarded as a binding document and the handover date shall be the date stipulated on the program. The penalty clause shall be applied from the "Due Completion Date".

The program will not be drawn up in isolation but the Contractor must take cognisance of the program of the civil and other Contractors on site and shall make provision to accommodate their requirements.

The programme shall be set up in collaboration with the Engineer:

In addition to the requirements of the General Conditions of Contract, the Contractor's programme shall:

i) be in a bar chart form programmed into MS Project Office 2003 or 2010 (or later version as approved)
ii) show the various activities related to the time-chart indicating the sequence of performing the works comprising the contract.
iii) indicate critical path activities

The Contractors programme shall take the following into consideration:

i) expected normal climatic weather conditions
ii) special non-working days as stipulated in the Contract Data
iii) annual builders' holiday from 15th December to 10th January (as officially announced by relevant body)
iv) expected value of the work performed for each activity
v) stipulate any other information required by the engineer.

### C3.3.4.5 Outages

Power outages will be required to perform some of the tasks involved on this project. Outages are to be planned allowing sufficient notice to the Employer and in compliance with any reasonable stipulations required. Liaison with the Engineer, Employer, other Contractors and the supply authority is compulsory.

### C3.3.4.6 Requirements Regarding Other Contracts

Co-ordination between other contracts, which may run concurrently, is of the utmost importance and thus in those cases the following procedure shall be followed:

The following will apply for multi-disciplinary contracts:

i) The contractors will have weekly meetings during which minor problems will be sorted out.
ii) The respective disciplines/contract will hold coordination meetings together, so that mutual problems can be addressed. The Contractor is to take cognizance of and participate in this and specify what restrictions (if any) are to apply.
iii) Any provision or pricing provided for this item in the bill, shall only be paid out at the end of the contract at the discretion of the Engineer.
iv) As soon as appointments are finalised, a meeting will be arranged during which the various construction programs will be co-ordinated to the satisfaction of the Employer, the Project Co-ordinator, the contractors and the consultants.

The Contractor shall have no claims against the Employer due to improper or inadequate planning and coordination on their part, which may or may not result in delays or disruptions, either of his own contract or those of other parties. Thus, if any delays are foreseen, the Contractor must give the Engineer early warning i.e. at least 7 days and shall act proactively to prevent such a delay.

A spirit of good co-operation is expected from the Contractor.

### C3.3.4.7 Existing Services

The Engineer will provide information regarding the location of the existing services where these are available, however:

The Engineer does not accept responsibility for the accuracy of this information and it shall be the full responsibility of the Contractor to obtain Wayleaves from the Local Authorities or any other Service Provider Institutions (Eskom, Telkom, etc.) regarding any existing services that will have an impact on the Works or the execution thereof. The Contractor shall make further investigations to determine the exact locality, size and depth of existing connections and/or pipelines before commencing with construction to ensure that no damage is done to any existing pipes or fittings.

The Contractor shall take all reasonable precautions to protect existing pipeline/services during construction and during relocation of such services.

Any pipe, cable, conduit or other services of any nature whatsoever indicated to the Contractor and subsequently damaged as a result of the Contractor's operations shall be repaired and reinstated forthwith by the Contractor or by the authority concerned, all at the expense of the Contractor and to the satisfaction of the Engineer.

Whenever services are encountered which interfere with the execution of the Works and which require removing and relocating, the Contractor shall advise the Engineer who will determine the extent of the work, if any, to be undertaken by the Contractor in removing, relocating, and reinstating such services.

Any work required to be undertaken by the Contractor in the moving and relocation of services for which no provision is made in the contract documents, or for which no applicable rates exist, will be classed and paid for as "Daywork" as prescribed in the General Conditions of Contract.

The Contractor shall work in close co-operation with personnel of the Service Owner controlling services that must be protected, removed or relocated. No undertaking can be given as to the exact time of commencement or of completion of the relocation, removal or protection of services, which have to be carried out, by the Service Owner or controlling authorities themselves. The Contractor is to make allowance in his programme for this contingency.

Where services have to be removed or relocated or protected the Engineer will at the request of the Contractor, notify or negotiate with the Service Owner or authorities controlling those services, but the Employer does not accept liability for any costs resulting from delays in the relocation, removal or protection of any service, or delays as a result of delays in negotiations. The sum allowed for in the Schedule of Quantities shall be deemed to be full compensation for the location and protection of existing services.

### C3.3.4.8 Location of Existing Services

Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent Contractor to be present on, under, over or within the Site.

Without in any way limiting its liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where it intends to work. Neither the Employer nor the Engineer offer any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of Site and the provision and utilization of suitable detecting and testing equipment.

Thereafter, the Contractor shall, by the use of appropriate methodologies carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the further requirements of Sub-clauses 4.4 and 5.1.2.2 of SABS 1200D (as amended) shall apply.

The aforesaid procedure shall also be followed in respect of services not shown on the plans but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the site.

All services, the positions of which have been determined as aforesaid at the critical points, shall henceforth be designated as 'Known Services' and their positions shall be indicated by the Contractor on a separate set of Drawings, a copy of which shall be furnished to the Engineer without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over

or within the Site, it shall henceforth be deemed to be a Known Service and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the Site shall apply. The Contractor shall notify the Engineer immediately any such service is encountered or discovered on the Site.

Whilst it is in possession of the Site, the Contractor shall be liable for all loss of or damage as may occur to:

(a) Known Services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviations in line and level which may reasonably be anticipated; and

(b) any other service which ought reasonably to have been a Known Service in accordance with the provisions of this clause;

as well as for consequential damage, whether caused directly by the Contractor's operations or by the lack of proper protection; provided always that the Contractor will not be held liable in respect of damages occurring to services not being Known Services.

No separate payment will be made to the Contractor in respect of its costs of providing, holding available on the Site and utilizing the said detecting and testing equipment, nor for any costs incurred in preparing and submitting to the Engineer, the Drawings as aforesaid and these costs shall be deemed included in the Contractor's other tendered rates and prices included in the Contract.

Payment to the Contractor's in respect of exposing services at the positions agreed by the Engineer and as described above will be made under the payment items (if any) as may be provided therefore in the respective sections of the Specifications pertaining to the type of work involved.

### C3.3.4.9 Protection During Construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all Known Services during the period which the Contractor has occupation and/or possession of the Site

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising there from for the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

### C3.3.4.10 Alterations and Repairs to Existing Services

Unless the contrary is clearly specified or ordered, the Contractor shall not carry out alterations to existing services. When this is necessary, the Contractor shall inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.
When the Contractor damages existing services, he shall immediately inform the Engineer or the relevant authority and obtain instructions as to who should carry out repairs. In urgent cases the Contractor shall take the necessary steps to minimize damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted.

The Employer will accept no liability for damages due to a delay in having such alterations or repairs effected. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services.

### C3.3.4.11 Damage to Other Services

The Contractor shall be held liable for all damage to other services and if such damage is not repaired and/or replaced to the satisfaction of the Engineer within a reasonable period the Engineer shall be entitled to appoint another Contractor to repair such damage and debit the account of the electrical contract. It is essential that the Contractor shall liaise with the Engineer and other Contractors on site in order to minimize such damage.

### C3.3.4.12 Repair of Structures at Consumer Premises

The Contractor shall be responsible for and must allow in his pricing for the repair of any damages to structures that resulted from the installation at consumer premises.

The Contractor shall take every reasonable caution when installing consumer connections to ensure minimum damage to the structures. The service connection cable must be installed against the wall of the structure.

1. In the vicinity of the proposed position of the ready board and meter a hole must be drill through which the cable will be drawn through the wall.
2. The cable must be fixed against the inside wall of the house with steel saddles and nylon anchors.

The wooden back board will be installed with nylon anchors and/or threaded bolts and nuts.

The Contractor's pricing shall make provision for drilling of holes, cleaning and repairs to damaged structures.

#### C3.3.4.12 Safeguarding of Material, Equipment and Property

The Contractor is responsible to provide the necessary precautionary measures to ensure the safety and protect the Works against any losses and vandalism that can occur. The Contractor shall make provision at his own cost for precautionary safeguarding measures for the duration of the contract as provided for in the Preliminary and General cost items.

#### C3.3.4.13 Procedures During Construction

The Contractor to supply, keep up to date and keep the following documents on site on a daily basis:

i) A full set of the latest construction drawings to be on site permanently for use by the Engineer and others.
ii) The Contractor to supply and keep on site and A4 triplicate site instruction book, which must be presented to the engineer at all site meetings and site inspections.
iii) The Contractor to supply an A4 duplicate diary on site to be signed off by Engineers representative.
iv) The Contractor to keep daily diary, with at least the following information.
- Weather condition
- Record of any accidents and detail
- Record of construction activities of the day with associated units measures of progress for each activity.
- Record of resources (labour, materials, plant, etc.) utilized for each day.
- Information of any strikes
- Any other relevant information

#### C3.3.4.14 Time Related Items

An approved extension of time (other than an extension of time granted in terms of Clause 5.12 of the Conditions of Contract) will entitle the Contractor to submit a claim for additional payment. Any such approved additional payment will be made for proven additional costs for each relevant time related item but will be limited to a maximum amount determined from the sum tendered for such item and from the designated operation, the period stated for the completion of the item or the tendered contract period, as applicable.

#### C3.3.4.15 Standing Time

Standing time will only be considered when work is suspended by the written order of the Engineer. The Contractor shall not be entitled to recover any standing costs unless he provides full details in writing to the Engineer within 48 hours of the Engineers order.

Standing time will not be considered when work is suspended as a result of inclement weather or default on the part of the Contractor.

#### C3.3.4.16 Abnormal Rainfall and Seepage

The occurrence of rainwater and/or seepage in pipe trenches after abnormal rainfall shall be removed and treatment of water shall be executed by the Contractor at his own cost. The extension of time granted for abnormal rainfall conditions shall be taken as sufficient compensation for the removal of rainwater or seepage and/or for the treatment of water in trenches and ponds, as a result of seepage or rainwater accumulation after the occurrence of abnormal rainfall.

#### C3.3.4.17 Training of Institutional Staff

Where applicable and as detailed in Part 3.4 of this specification allowance is to be made by the Contractor for the training of Institutional Staff in the setting up and operation of the various items of equipment supplied under the contract, as well as the full maintenance and upkeep of such equipment and the installation. At least three (3) full days shall be allowed for in the tender price.

#### C3.3.4.18 Minimum Nuisances to Persons from the Surrounding Area

The Contractor is to ensure that he causes an absolute minimum nuisance to persons from the surrounding area by

complying strictly with the following:

- Work to be executed only between the hours of 07h00 and 18h00.
- The works to be continuously and adequately watered as a means of dust suppression.
- No disruption of road traffic under any circumstances will be allowed. The Contractor must arrange his works in such a manner as to safely accommodate road traffic under all working conditions.

#### C3.3.4.19 Silencing of Plant

The Contractor's attention is drawn to the applicable regulations pertaining to noise and hearing conservation, framed under the Occupational Health and Safety Act (Act No. 85 of 1993) as amended.

The Contractor shall at all times and at its own cost, be responsible for implementing all necessary steps to ensure full compliance with such regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other Plant which would otherwise cause a noise level in excess of that specified in the said regulations.

Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise in order to comply with the said regulations.

### C3.3.5 Site Facilities

#### C3.3.5.1 Temporary Office and Communication Facilities

No office shall be specifically required for the Engineer or his representative, but the site office of the contractor must be made available and so equipped that the Engineer, his representative or the Community Liaison Officer can perform their work undisturbed at any time during the works. The Contractor shall make provision at his own cost for efficient communication between his site office and the office of the Engineer for the duration of the contract as provided for in the Preliminary and General cost items.

The Contractor's buildings, sheds and other facilities erected or utilized on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition.

One or more night-watchmen may be on the Site after hours.

#### C3.3.5.2 Sanitary Conditions

The Contractor shall ensure that, during the period of construction, sanitary conditions prevail on the site and surrounding areas. Unhygienic behaviour that may cause contamination of the works or the surrounding area is strictly prohibited and the Contractor shall bear full responsibility to provide sanitary facilities in accordance with the regulations of Local Authorities and Specifications within the contract. Especially during the construction of the pipe lines, the Contractor must ensure adequate portable ablution facilities along the working face.

The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 10 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil.

#### C3.3.5.3 Name Boards

When applicable an approved name-board will be erected and maintained by the Contractor at a position indicated by the Engineer or his representative.

The board shall be in English and shall bear the names of the Employer, the Consulting Engineer, the Contractor as well as the type of work being carried out.

#### C3.3.5.4 Source of Water Supply

The Contractor is to make his own arrangements for the supply of water. Limited water is available from the municipality's water network. The Employer does not guarantee the sufficiency or continuity of the supply and no claims shall be considered in this regard. The Contractor shall be held responsible for any wastage of water due to negligence.

#### C3.3.5.5 Source of Power Supply

The Contractor is to make his own arrangement for the supply of electrical power.

#### C3.3.5.6 Location of Camp and Depot

The Contractor shall NOT be allowed to erect a construction camp or accommodation for labour anywhere on private farms during the execution of this contract.

A Night Watchman will be allowed to stay on remote sites to guard equipment and materials, and suitable facilities must be provided to accommodate him only.

The Contractor must make his own arrangements for a Site Office or campsite in Upington. The Contractor shall make his own arrangements for the accommodation of all labour in Keimoes.

#### C3.3.5.7 Construction Plant

Construction plant, where the use thereof is permitted, shall be of a suitable type for carrying out the work for which it is required. Its capacity shall be sufficient to meet the requirements of the work within the contract time. It shall be kept at all times in full working order and repair.

#### C3.3.5.8 Security of Contractor's Plant and Personnel

The Contractor shall note that, notwithstanding any insurances which may be by the Employer, the Contractor shall be responsible for the effecting of safety and security of plant and personnel on and around the site of the works, and that no claims in this regard will be entertained by the Employer.

The sum entered by the Contractor in the Schedule of Quantities for effecting of safety and security of plant and personnel on and around the site of the works shall be deemed to include full compensation for all the necessary to effect the safety and security including, where necessary, the employment of the services of a security organization.

#### C3.3.5.9 Spoil Sites

No indiscriminate spoiling of material shall be allowed. All unsuitable surplus material shall be removed from the site and to a suitable spoil site indicated by the Employer, and approved by the Engineer and the EAP/ECO.

### C3.3.6 Materials and Management of Materials

#### C3.3.6.1 Ordering and Supply of Materials

The onus is on the Contractor to order material well in advance to ensure timely delivery. No extension of time shall be allowed for late delivery of material due to orders not placed on time.

The Contractor shall ensure that the work is not delayed, due to the lack of materials on the site of the works, by placing orders with suppliers for the materials required under his contract as soon as possible after the acceptance of this tender.

The Contractor shall, by producing copies of written orders or written enquiries for supplies, prove to the satisfaction of the Engineer that any delay occasioned by non- availability of materials has been caused by the ability of suppliers to supply and not by his own lack of timely ordering or lack of exhaustive enquiry for supplies, before any extensions of the contract time will be allowed due to such delays.

The quantities set out in the Schedule of Quantities have been clearly determined calculations based on data available at the time and should therefore be considered to be approximate quantities only. Before ordering materials of any kind the Contractor shall be solely responsible for determining, from the drawings issued or approved by the Engineer for construction purposes, the actual quantities of materials required for the execution of the Works. No liability or responsibility whatsoever shall be attached to the Employer for materials ordered by the Contractor except when ordered in accordance with written confirmation issued by the Engineer, and in accordance with the drawings issued or approved by the Engineer for construction purposes.

#### C3.3.6.2 Quality of Materials

Only new, good quality materials may be used and where applicable materials must comply with the specifications of

the South African Bureau of Standards SABS/SANS, the British Standards Specifications (BSS), the International Organization for Standardization (ISO) or the International Electro technical Commission (IEC).

All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified to be in accordance with SABS Specifications shall bear the SABS mark.

All materials are to be the best of their respective kinds, new, undamaged, sound and free from defects and shall comply with the relevant clauses of the Specification. All references to Standard Specifications are to be the latest amendment to such specifications.

Whether or not the material bears mark of certification or is tested, any material found not to be in accordance with the specification shall be rejected and replaced by the Contractor at his own cost.

The Contractor may be required, at their own expense to submit samples of the material offered to the Engineer for his approval and the material supplied under his contract shall be of a standard equal to that of the samples so submitted and approved. Any samples provided during tender stage will remain the property of the Tenderer(s), who shall remove them when called upon to do so by the Engineer.

#### C3.3.6.3 Items for Approval

Where the specification refers to a specific brand name “or similar and equivalent” or “Other approved type” and alternative equipment is offered in lieu of that specified the written approval must be obtained from the Engineer before such equipment is ordered, delivered and/or installed.
In certain cases, the Contractor may be required to submit samples and where necessary, tests will be performed to establish the quality of the material offered.

#### C3.3.6.4 Transport of Material

All costs for transporting materials, including overhaul to spoil, shall be included in the applicable prices and/or rates. All references in the specifications to transport, overhaul and haul distances shall be deleted irrespective of whether or not the deletion is included in these project specifications.

#### C3.3.6.5 Off-loading, Stacking and Liability for Breakages

The Contractor shall be required, at his own expense, to make all arrangements for off-loading and carefully stacking all plant and materials delivered under this contract on the Site of the Works. The off-loading and stacking shall be carried out strictly in accordance with the requirements of the Engineer so as to permit a thorough and careful examination and testing of all items for breakages, fractures, etc.

Plant and materials will be stored on site at the cost of the Contractor who shall be fully responsible for its protection against theft or damage by water, weather, fire and any interference until such time as it is erected and installed, put into satisfactory operation and accepted by the Employer as complete.

#### C3.3.6.6 Storage

Facilities for extended storage on site for plant and materials may not always be available and the Contractor shall therefore make his own arrangements for any off-site storage, which may be required for plant, and materials, which become available before delivery to the Site and installation thereof can be commenced.

No additional payment will be allowed for off-site storage.

#### C3.3.6.7 Inspection at Site

All plant and materials shall be carefully examined upon delivery at the site and all items showing defects or damage of any description shall be laid aside as not being in accordance with the requirements of the contract and these shall be removed and replaced by the Contractor at his own cost.

#### C3.3.6.8 Brand names

Brand names and references to catalogues are made to determine a standard for material to be delivered and may or may not be (as may be applicable) prescriptive as the exact type to be used. Alternatives may be presented for approval.

### C3.3.7 Installation

#### C3.3.7.1 Standard of Workmanship

All installation work in this Contract is to be executed by qualified electricians and cable jointers in accordance with modern techniques.

The Engineer shall have the right to reject any work, which does not meet with his approval.

#### C3.3.7.2 Setting-Out of Works and Preservation of Survey Beacons and Pegs

Setting out details of all the works are defined by offsets from pegs and benchmarks established by the Engineer. The Contractor shall be responsible for the setting out of the works with reference to these pegs and benchmarks. The Contractor will survey the area after completion of the works and supply the data to the Engineer. All costs for setting out and any surveys required as stated above shall be assumed to be included in the Contractor's rates.

The Contractor and the Engineer shall record their concurrence or disagreement (as the case may be) regarding the completeness and accuracy of the details recorded in survey information.

At the completion of the Contract, the Contractor shall expose all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor for the checking of the positions of all such pegs and the replacement of any thereof which the Land Surveyor's check reveals have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Engineer, a certificate from the Registered Land Surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act.

The costs of all checking, replacement and certification as aforesaid shall be entirely for the Contractor's account; provided always that the Contractor shall not be held liable for the cost of replacement of pegs which:

(a) cannot reasonably be re-established in their original positions by reason of the finished dimensions of the Permanent Works; and
(b) the Contractor can prove beyond reasonable doubt to the satisfaction of the Engineer, were disturbed, damaged or destroyed by others beyond its control.

#### C3.3.7.3 Erection, Installation, Adjustment and Operation

The erection and installation of the plant is to be carried out by skilled artisans, experienced in this type of work and under the personal supervision of the Contractor's site foreman, whose qualifications and experience to supervise this work must be acceptable to the Engineer. The plant, when erected and installed, shall be of neat and workmanlike appearance, solidly and evenly supported, true to line and level, plumb and in proper working order. The drilling and grouting of al structural bolts, channels, etc. shall be the responsibility of the Contractor under this contract.

Before handing over the Plant, the Contractor is to ensure that every component is operating satisfactorily. The Contract will not be deemed to have been completed until the Engineer is fully satisfied in this regard.

#### C3.3.7.4 Protection from Storms and Floods

The sum allowed for in the Bills of Quantities shall be deemed to be full compensation for any damage to the Works due to storms, rain, floods, storm water or subsurface water.

Under no circumstances shall the Contractor be entitled to any additional payment in this regard. The Contractor shall accept full responsibility and costs to handle water from any source on the Site. The preceding shall imply that the Contractor shall also be responsible for the necessary arrangements with regard to the provision of Special Risk Insurance to address any such of the abovementioned occurrences and sum allowed for in the Schedule of Quantities shall be deemed to be full compensation for maintaining any such insurance during the full period of the contract.

As the works will cross several water courses, this is of importance when flash floods do occur and a risk of damage to the works is possible.

#### C3.3.7.5 Construction in Confined Areas

It may be necessary for the Contractor to work within confined areas and no additional payment shall be made for work done in restricted areas. The method of construction in these confined areas will depend largely on the Contractor's construction plant. However, the Contractor shall note that measurement and payment shall be only in

accordance with the specified cross-sections and dimensions, and that the rates and amounts shall include full compensation for all special equipment and construction methods and for all difficulties encountered during working in confined areas and narrow widths, and at or around obstructions, and that no extra payment shall be made nor shall any claim for additional payment be considered in such cases.

### C3.3.8 Quality Management and Completion of Work

In view of the fact that this installation is to be operated and maintained by others it is a condition of this Contract that the standard of workmanship and quality of materials shall be subject to the approval of the Engineer and the party finally responsible for the operation and maintenance of the system. All correspondence in this regard shall however be directed to the Engineer and the final approval shall only be granted by him.

#### C3.3.8.1 Workmanship and Quality Control

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at its own expense, institute a quality-control system and provide suitably qualified and experienced Engineers, foremen, surveyors, technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times.

Construction plant and equipment shall be of a suitable type for carrying out the work for which it is required. Its capacity shall be sufficient to meet the requirements of the work within the contract time and shall be kept at all times in full working order and repair

The cost of supervision and process control, including testing carried out by the Contractor, shall be deemed to be included in the rates for the related items of work.

The Contractor's attention is drawn to the provisions of the various Standardized Specifications regarding the minimum frequency of testing required. The Contractor shall, at its own discretion, increase this frequency where necessary to ensure adequate control.

On completion and submission of every part of the work to the Engineer for examination and measurement, the Contractor shall furnish the Engineer with the results of the relevant tests, measurements and levels to demonstrate the achievement of compliance with the Specifications.

#### C3.3.8.2 Quality Control during Execution

Daily inspection of the works by the Contractor is expected to ensure that all work is executed in accordance with the drawings and specifications, an accredited 3-phase installation electrician, ORHVS trained and authorized technician, and the Contractor's manager.

These inspections will be monitored by the Engineer or his duly authorised representative.

The onus is on the Contractor to clarify any uncertainties with the Engineer to ensure that the work is executed as intended by the Engineer and to the required standards.

Failure to comply may result in the Contractor redoing unsatisfactory work for his own account.

#### C3.3.8.3 Maintenance of As-built Drawings

During execution of the contract the Contractor shall update a set of drawings daily with all the relevant information regarding cable routes, joints, sleeves, etc.

At the end of the contract, the Contractor shall provide the necessary information to enable the Engineer to prepare as-built drawings of the installation together with 3 sets of any other drawings, wiring diagrams, services and instruction manuals for equipment supplied by him.

All information in the possession of the Contractor that is required by the Engineer to complete the as-built drawings must be submitted to the Engineer before a Certificate of Completion will be issued.

#### C3.3.8.4 Setting of Protective Devices and Controls

All protective devices installed throughout shall be correctly adjusted by the Contractor to the approval of the Engineer before any circuit is energized. The Contractor is required to obtain all data necessary to establish the correctness of the settings. Where doubts exist the Engineer's confirmation is to be sought.

Data with regard to all commissioning documentation and diagrams of all control, alarm and indication circuits are to be provided for approval prior to their installation.
These diagrams will include:

- Wiring diagram.
- Schematic wiring diagram.
- Device operating sequence diagram.
- Operational narrative of the control and protective devices.

#### C3.3.8.5 Labelling

All new Switchgear, LV cubicles and attendant circuits, circuit breakers, transformers, cables, poles etc. shall be clearly labelled. The inscriptions to be used will be provided in the specification or during construction period.

### C3.3.9 Testing and Commissioning

All instrumentation and equipment necessary for testing shall be provided by the Contractor.

#### C3.3.9.1 Preliminary Testing of Major Equipment

All items of major equipment are where indicated, to be factory tested prior to delivery to site, and results of such tests, in a format to be agreed in advance, are to be produced before the equipment is delivered.

All such tests are to be in accordance with the relevant codes of practice, testing procedures and standards in relevant specifications, and with any other requirements as set out in this documentation.

#### C3.3.9.2 Completion of Installation

Before the commencement of any test or commissioning procedures, the Contractor is to ensure that the installation (or applicable section of the installation) is complete in all respects ad ready for inspection.

#### C3.3.9.3 Inspection and Testing: Reticulation Networks and Installations

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer the following minimum tests shall be carried out in the presence of the Engineer and the Employer.

Switchgear
(i) Factory test results and certificates (witnessed by Engineer and Employer in factory)

Miniature Substation/Ring Main Units
(i) Factory test results and certificates as required by SANS 1029 shall be furnished.
(ii) Megger testing (10000 V) of insulation (MV/LV and LV/E).
(iii) The recording and marking of phase rotation and voltage on the secondary side.
(iv) MV and LV transformer earth resistance.

Distribution Transformer
(i) Factory test results and certificates as required by SANS 780 shall be furnished.
(ii) Megger testing (10000 V) of insulation (MV/LV and LV/E).
(iii) The recording and marking of phase rotation and voltage on the secondary side.
(iv) MV and LV transformer earth resistance.

Cables
MV and LV cables shall be tested by the Contractor for:
(i) Continuity.
(ii) Insulation.
(iii) Phase rotation.

Low Voltage Installations
The tests on the LV system to be conducted are as follows:
(i) Operation tests of all circuit breakers.
(ii) Continuity tests.
(iii) Megger tests (not less than 1 000 volt).
(iv) Measuring and recording of clearances.

#### C3.3.9.4 Witnessing of Testing

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer, tests shall be carried out before commissioning, in full accordance with the current edition of the "Code of Practice for the Wiring of Premises", the manufacturers and/or the SANS/IEC specifications, in the presence of the Engineer and where required the Employer, or his authorized Representative(s).

#### C3.3.9.5 Tests

The Contractor shall note that where applicable at least the following test must be carried out:

i. Phase rotation tests
ii. Insulation test
iii. Continuity test
iv. Loop Line Earth Impedance Test
v. Polarity test
vi. Earth Leakage Circuit Breaker
vii. Earth termination test
viii. Any further tests to meet the Supply Authorities requirements or as deemed necessary by the Engineer.

#### C3.3.9.6 Documentation

The Contractor must clearly record, sign and hand the results of all the tests to the Engineer or his authorised Representative. Where applicable, standard or specifically designed forms should be used and in this regard. Where applicable, such forms shall be agreed to during the contract period.

The forms shall include the Certificate(s) of Compliance or any such form of forms required by the local supply authority or Engineer.

The Contractor is required to submit to the Engineer at least the following:

i) Certificate(s) of Compliance.
ii) Schedule of protection and control settings.
iii) Set of schematic wiring and function diagrams.
iv) Sequence diagram and control functional narrative for each control panel.
v) Drawings of the installation marked "As Built" and signed.
vi) File of distribution legends.
vii) Operating and maintenance instructions on equipment.
viii) List and description of clearance measurements at road crossings, Telkom crossings, between other services etc. all as per the OHS act, to determine compliance.
ix) Health and Safety file in accordance with the Construction Regulations
x) Guarantees ceded to the Employer.

Once the Engineer has inspected the complete installation and satisfied himself that all testing has been completed and the contract is complete in all aspects, written arrangements for hand-over can commence.

#### C3.3.9.7 Unacceptable Tests and Abortive Handing Over

Should the Engineer and/or Employer find at the time of handing over that work is defective to the extent that they have to return for further inspections and the handover aborted, then the Engineer and/or Employer reserves the right to claim expenses in whole or part from the Contractor.

### C3.3.10 Laying and Installation of Cables

This specification covers the excavations, storage, handling, installation, laying and backfilling of all cables installed underground.

#### C3.3.10.1 Handling

The storage, transportation, handling and laying of cables shall be according to first class practice. The Contractor shall provide adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

Cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused, and

must be adequately supported at short intervals during the whole operation.

Particular care must be exercised where it is necessary to draw cables through pipes and ducts, to avoid abrasion, elongation or distortion of any kind.

The ends of such pipes and ducts shall be sealed to approval of the Engineer after drawing in of the cables.

The manufacturer's recommended bending radii for cables shall be adhered to at all times.

Twisted, kinked or cables damaged in any way shall not be allowed and must be rejected.

Cables stored, installed, drawn, or handled incorrectly will be rejected.

During loading and off-loading the cable drums must be handled carefully to avoid damage to the inner layers of the cable. Drums must not be dropped onto or off the delivery vehicle. If no winch, hoist or other mechanical means is available then drums must be gently rolled down suitable ramp or rails.

When rolling a drum of cable on the ground, it must always be rolled in the direction of the arrow stencilled by the manufacturer on the drum flange.

Periodic rotation of wooden drums is essential to avoid drum timbers from rotting through rising damp.

Incorrect handling of drums could result in rejection of the cable by the Engineer, without additional time for the contract, or any other compensation being granted.

#### C3.3.10.2 Installed Route Plan and Cable Schedules

The Contractor is responsible to submit a final cable route plan (as installed) to the satisfaction of the Engineer.

Failure to comply with this requirement will result in the delay of the issuing of the acceptance certificate. No completion certificate shall be issued if these requirements are not met.

The following shall be indicated on this route plan in a satisfactory manner for all installed cables:

a) The route length for each cable as well as distances between joints.
b) Cable route with references to fixed points.
c) Cable joints with references to fixed points.
d) The cable drum number for each length.
e) Positions of cable route markers with reference to fixed points. The route markers shall be numbered and a separate drawing showing the face plates of all route markers (numbered), with North reference shall be submitted.

A site plan shall be provided to the Contractor for this work, who shall submit a plastic film and our (4) paper prints of the route plan.
Cable schedules shall be submitted on A1 sized sheets containing information as required by the Engineer.

Any uncertainty in this respect will be subject to clarification by Engineer.

#### C3.3.10.3 Positions of Cables

The centre line of the trench for a single cable shall be 1 000 mm from the official property boundary line pegs (fences may not be correct) unless written instructions to the contrary, are issued.

Where two or more cables are placed in a single trench and the cable are spaced at 150 mm centres, then the trench centre line shall be 1 000 mm from the official property boundary line pegs

#### C3.3.10.4 Depth of Cables

Existing and proposed Post & Telecommunications (GPO) cables are laid at a depth of 600 mm. The minimum or shortest distance between a P & T cable and any other service will be at least 300 mm. The provision of a vertical concrete slab with a P & T cable on one side and an electrical cable on the other side, would meet the above requirement.

Unless authorised otherwise in writing, cable depths to underside of cable will be as follows:

| Cable Type / Description | Single or 3 per trench (max) | When tiered |
|---|---|---|
| (i) MV Cables | 1000 mm | 1 050/900 mm |
| | | |
| (ii) Pipes/ducts under roads for cables | 900 mm | 900 mm |
| | | |
| (iii) LV Kiosk supply cables only | 800 mm | 900/750 mm |
| | | |
| (iv) Street-lighting, high mast or service connection cables only in street reserves | 750 mm | 900/750 mm |
| | | |
| (v) Cables in common trench with MV cables | 800 mm | 900/750 mm |
| | | |
| (vi) MV Cables, across domestic public open spaces, Church, schools, etc. sites | 1 200 mm | 1 200/1050 mm |
| | | |
| (vii) LV Cables across domestic, public open spaces, Church, school, etc. sites | 900 mm | 900/750 mm |
| | | |

Where the above conditions cannot be met, the Engineer may rove one of the following:
i) Cement slabs over the cables or
ii) Cable duct pipe encased in 300 mm square concrete.
Reference must be made to detailed specifications relative to road crossings and trenching.

### C3.3.10.5 Excavations

The excavations of cable trenches shall be carried out by the Contractor, along the routes and in the servitudes as shown on the drawings or as indicated on site.

The Contractor shall be responsible for setting and marking out cable routes, inviting affected service owners and the Engineer to inspect and confirm acceptance. The Contractor shall be responsible for adjustment of routes to the satisfaction of the service owners and Engineers.

The bottom of the trench shall be level throughout its length, and clear from rocks, stones, or other objects liable to cause damage to the cable.

The sides of the trench shall be plumb and straight throughout its length, and free from rocks, stones, or other objects liable to cause damage to the cable.

All MV cables, unless otherwise specified, shall be laid at a depth of at least 1000 mm.
All LV cables, unless otherwise specified, shall be laid at 800 mm below FINAL FINISHED GROUND LEVEL OR NATURAL GROUND LEVEL.

Trenches will not be less than 400 mm wide for one or two cables, and the width will be increased where more than two cables are to be laid together so that the cables may be placed at least 150 mm apart throughout the run.

Where the nature of the ground does not permit the excavation of cable trenches to the specified depth without excessive blasting, the matter shall be referred back to the Engineer, whose decision shall be final.

The Contractor must take all necessary precautions to prevent trenching work being in any way a hazard to the public or hampering the progress of other Contractors on site and to safeguard all structures, roads, railways, sewers, works or other property from any risk of subsidence and damage.

Volumetric measurements for excavations will not be done and trenches shall be measured per meter of trench, applying minimum required dimensions.

The Contractor shall be responsible to remove all excess ground left over after trenches have been backfilled. The Contractor shall ensure that the surface is left in the same condition in which it was handed to him.

No guarantee can be given that blasting will not be necessary. This item shall be the full responsibility of the Contractor and he shall be required to adhere to all laws, regulations and bylaws regarding this type of work. The onus is on the Contractor to visit the site before submitting his tender, to make an assessment of the soil type and to allow for blasting if deemed necessary as no extra claims will be considered.

### C3.3.10.6 Bedding

In all trenches a layer of at least 150 mm of clean approved bedding shall be laid below the cable/sleeve, followed by a layer of at least 150 mm clean approved bedding laid above the cable/sleeve.

The Engineer shall inspect the lower bedding layer and approve before the cable can installed.
The Engineer shall inspect the upper layer of bedding and approve before the trench can be closed.

The Contractor shall duly notify the Engineer to arrange for inspection of the bedding prior to installation, with notice periods applicable as per Contract Data or as per mutual agreement between the Contractor, Engineer and Employer.

### C3.3.10.7 Installation of Cables

The following points must be adhered to for the correct installation of cables.

Robust cable jacks with a spindle strong enough to carry the total load, shall be securely mounted and operated with the spindle lever.
The securing ropes must be cut so as to leave the inner end free to move, during unrolling operations.
Correct wire mesh pulling stockings shall be used for the drawing in of cables.
The use of adequate, (approximately every 2 metres) well-oiled cable rollers, of the correct size or larger, shall be used.

All pipe ducts shall be cleared of all foreign matter before cables are pulled in.
Adequate protection and attention at the entrance and exit to pipe ducts is essential.

Maximum pulling forces specified by the manufacturers shall not be exceeded.

No cables must be laid when temperature is 10°C or lower unless the special conditions as required by the Engineer, have been fully met.

The following bending radii are the absolute minimum and under no circumstances shall the radii be less than these dimensions for the size of cable specified.

| | |
|---|---|
| PVC insulated cable | = 10 x D |
| Paper insulated lead covered | = 12 x D |
| XLPE insulated cables | = 15 x D |

Where D = overall sheath diameter

The Engineer reserves the right to reject any cables which have been twisted, kinked or damaged in other way, without additional time being granted for completion of the contract.

When laying the cable, a certain “snaking” must be permitted so that contraction during cold weather will not detrimentally affect joints, etc. Due allowance for this has been made in this specification.

### C3.3.10.8 Cable Warning Tape

PVC cable warning tape will be installed at least 300 mm above all cables in trenches, to the satisfaction of the Engineer. The warning tape shall span at least the width of the cables below, plus 150mm to each side of the outer reaches of the cables installed below.

PVC Danger tape will be 300 mm wide (minimum 300mm width), 800 gauge thick and printed with the words, DANGER, GEVAAR, INGOZI, plus the skull and crossbones.

### C3.3.10.9 Backfilling

Backfilling shall not commence until the entire trench has been inspected by the Engineer, and the cable installation particulars recorded on the “As Built” drawings.
Backfilling after bedding and laying of warning tape and concrete slabs, where applicable, shall be done with a proper grading of material to ensure settling without voids. The material shall not include any stones or matter of more than 15mm diameter. The Contractor shall apply proper selection of material to the satisfaction of the Engineer.

The backfill material shall be properly compacted after every 150 mm layer added.

The surface shall be reinstated and made good to the satisfaction of the Engineer and the Service Owner.

The use of improper and/or incorrect material and backfill techniques shall not be allowed and remediation thereof shall be at the Contractor's expense.

The Contractor's price and rates shall fully allow for the reinstatement and making good of surfaces on and along the cable routes and wherever excavations are required.

The Contractor shall keep meticulous record (before, during and after) of all surfaces affected, excavations done, trenches inspected, backfill operations and surfaces repaired. The Contractor's price and rates shall fully allow for this function. The Contractor shall note and acknowledge that the absence of proper and adequate records may or shall impact claims, acceptance and satisfaction of the Service Owners and the Engineer.

### C3.3.10.10 Marking of Cables

All cable joint and route markers shall be approximately 300 mm long and 230 x 230 mm at the base and 150 x 150 mm at the top.

Cast into the top of the cable marker shall be a 100 x 100 mm x 1,6 mm stainless steel insert on which the details of the cable will be clearly stamped. Insert to be noticed to assist holding.

Letter sizes on route markers shall be approximately 10 mm minimum.

Joints shall be marked showing the size of the cable, well as the voltage, e.g.:
i) 150 mm² LV Joint
ii) 35 mm² 11kV Joint

Route markers shall show the direction of the cable run, the size of the cable and the number of cores.
i) 150 mm² LV Cable, 4-core
ii) 35 mm² 11kV Joint, 3-core

Cable markers will be placed at
i) Approximately every 30 metres along a straight run
ii) Above every change of direction of the cable, and
iii) Above every cable joint

Where cables terminate at a substation or a kiosk, the cable will be marked by means of 10 mm wide copper or stainless steel strap fixed approximately 500 mm above ground level showing the circuit designation with reference to the drawing. PVC or plastic markers shall not be permitted.

### C3.3.10.11 Protection of Cables

Where 11 000 Volt or higher voltage cables are installed then the cable will be covered with cement slabs or bricks as detailed in the schedule of quantities. The cement slabs shall be approximately 300 mm wide x 50 mm thick.

The cement slabs or bricks shall be approximately 300 mm above the MV cable.

All cables shall be covered with the 300 mm wide PVC danger tape irrespective of any other protection required.

### C3.3.10.12 Recording and Installation of Cable Markers

The Contractor shall be responsible for the recording of cable installation as follows.

Each length of power cable shall be numbered with the drum number and its exact position entered on a route drawing, and after site testing these numbers shall appear on the test sheet covering the respective length of cable and the test result.

The Contractor shall record and submit full details of all cable joints and each joint is to be numbered and the position, type and number recorded on the route drawing.

The Contractor shall record and submit the jointer's name and date of jointing as well as the weather conditions on a drawing and record certificate.

The Contractor shall install a concrete, pyramid type cable joint marker at every joint position.

The Contractor shall install a cable marker at every deviation and branch-off or as indicated on the drawings.

The position of each joint or cable marker must be exactly indicated on the “as built” cable route drawing.

### C3.3.10.13 Cable Sleeves

Sleeves shall be supplied and installed by the Contractor or by others (where indicated by the contract) where cable routes cross roads or permanent hard slab construction.

The Contractor shall be responsible to ensure that the installation is done in accordance with this specification where this work is performed by others.

All sleeves shall be installed at a final depth of 900 mm (to the bottom of the sleeve) below finished ground level, fitted with a galvanised steel draw wire and both ends must be sealed off with glass fibre cloth or lid before backfilling.

Sleeves shall consist of 110 mm, 160mm or 200m diameter PVC pipe and will extend to 1m on both sides of the road.

All damaged tarmac, concrete or other surfaces shall be reinstated by the Contractor at his cost or by the person responsible for the installation of the sleeves and early notice will be given to the Service Owner / Local Authority as to when this work is to be carried out.

### C3.3.10.14 General Requirements for the Jointing and Termination of Cables

All cable-jointing work and all cable termination work, shall only be done by qualified and experienced cable jointers.

Before commencing with the jointing work, the jointer shall ensure –

- that he has sufficient and suitable material at his disposal to make and to complete a proper and an effective joint;
- that the jointing chamber is dry;
- that all stones, loose soil, sticks, leaves, etc., are removed from the jointing chamber;
- that the walls and banks of the jointing chamber are reasonable solid and reasonable free from loose soil, stones, gravel, etc., that may fall into the jointing chamber;
- that the necessary coffer dams or retaining walls have been constructed to keep run-off water out of the jointing chamber;
- that the necessary tents or groundsheets have been secured over the jointing chamber at all times to effectively protect the chamber against unexpected rains and dust, and that sufficient lighting or illumination is available;
- that he has the necessary means to provide effective waterproof seals for the joint or for the termination if he is suddenly overcome by unexpected storms or heavy rains, regardless of how far the joint or the work has progressed;
- that the cable and other material are dry, undamaged and in all other ways suitable for jointing work or termination;

### C3.3.10.15 MV Cables

Medium voltage cables of the impregnated paper insulated type shall be manufactured according to SANS 97 as amended, and shall bear the SANS mark.

The following designation code will be used when identifying cables specified.

| Component / Type | Code Letter(s) |
|---|---|
| Impregnated paper dielectric | P |
| Lead sheath | L |
| Lead-alloy B Sheath | B |
| Lead-alloy E sheath | E |
| Fibrous helical bedding or serving | S |
| Fibrous braided serving | X |
| Double steel tape armour (DSTA) | T |
| Single wire armour (SWA) | W |
| Double wire armour (DWA) | D |

| | |
|---|---|
| Anti-corrosion bedding or over sheath | C |

NOTE: All cables shall have stranded copper conductors and shall have a dielectric voltage grading for “unearthed” systems, unless otherwise stated.

When there is any doubt about identifying a type of cable required for a particular project, the Contractor will immediately contact the Engineer for clarification of the code.

Training on MV cables, accessories or work will be provided as required as per NRS 053 when required.

### C3.3.10.15.1 MV Cable Accessories

Cable accessories shall comply with the requirements of NRS 053. Accessory kits include for the installation of joints and terminations in the medium voltage cable network comprising of copper and aluminium conductor, paper insulated cores and belted paper cable manufactured to SANS 97: Table 19. Cable accessories shall be suitable for cable with either double steel tape armouring or steel wire armouring (SWA) and Polyethylene outer sheath.

Cable accessories shall carry valid product certification in terms of compliance with NRS053, by an independent 3rd party product certification body which possesses the necessary international accreditation. Such certification will be issued in terms of the relevant certification body’s mark scheme. A copy of the relevant mark scheme permit and accompanying schedules shall be submitted as proof of compliance.

The supplier of the cable accessories shall have implemented quality management system (QMS), which meets with the minimum requirements of SANS 9001, and proof shall be submitted.

Cable joints and termination kits are required for use on the cable ranges indicated below:

| | **Joint kits** |
|---|---|
| 1 | 6.6/11kV 25 -35mm$^2$ 3C. |
| 2 | 6.6/11kV 50-95mm$^2$ 3C |
| 3 | 6.6/11kV 120-185mm$^2$ 3C |
| 4 | 22/22kV 25 -35mm$^2$ 3C. |
| 5 | 22/22kV 50 – 95mm$^2$ 3C |
| 6 | 22/22kV 120-185mm$^2$ 3C |
| | |
| | **Termination kits** with tail 1200mm length<br>(i) outdoor use and<br>(ii) for use within air insulated enclosures of outdoor substations**:** |
| 7 | 6.6/11kV 25 -35mm$^2$ 3C. |
| 8 | 6.6/11kV 50-95mm$^2$ 3C |
| 9 | 6.6/11kV 120-185mm$^2$ 3C |
| 10 | 22/22kV 25-35mm$^2$ 3C. |
| 11 | 22/22kV 50 – 95mm$^2$ 3C |
| 12 | 22/22kV 120-185mm$^2$ 3C |
| | |
| 13 | Screened terminations with 800mm tail length for use within air insulated enclosures fitted with current transformers for the outdoor ring main unit tee-off circuit for 6.6/11kV and 22/22kV cables: |
| | |
| 14 | Unscreened separable connectors (USC) for use within air insulated enclosures (aka concertina boot). (NRS 012) |
| | |
| 15 | Unscreened separable connector suitable for use with the Type C bushing (set of 3). |
| | |

Three-core cable joints required for item 1 to 3, shall be designed to accommodate crossing of cable cores within the joint. The method of core crossing will be indicated in the jointing instruction.

An installation instruction shall be provided with every accessory supplied.

All installation instructions shall clearly indicate how to install the crimped ferrules and lugs in the respective joints and terminations.

Cleaning material for cable joints, terminations and tri-furcating kits shall be provided with accessory kits, alternatively,

the Contractor shall provide these materials separately. The Contractor's rates shall be deemed to include this.

Where required, the Original Equipment Manufacturer's written approval for any locally manufactured materials that are supplied as MV cable accessories shall be provided by the Contractor, confirming that material electrical properties are not changed in any way due to different manufacturing processes. Proof of this written approval shall be provided by the Contractor prior to the ordering and purchase of material and equipment.

Where heat shrink materials are used for the purpose of electrical insulation, they shall have a minimum wall thickness of at least the same thickness of the cable insulation (PI, PVC) material after application.

Unscreened separable connectors (USC) shall be manufactured to form one piece of material.

#### C3.3.10.15.2 MV Cable Operating Conditions

All MV cables and accessories shall be suitable for operation under the following operating conditions:

| | | | |
|---|---|---|---|
| Nominal Voltages | 6.6 kV | 11 kV | 22 kV |
| Rupturing Capacity | 20 kA | 20 kA | 20 kA |
| Impulse Level | 95 kV | 95 kV | 125 kV |
| Highest System Voltage | 7.6 kV | 12 kV | 24 kV |
| Rated Short Time Current (3 s) | 15 kA | 15 kA | 15 kA |
| Frequency | 50 Hz | | |
| Phases | 3 | | |
| Atmospheric Temperature | -5°C minimum +45°C maximum | | |
| Altitude | 800 m minimum to 1 100m maximum | | |
| Lightning & Dust | severe | | |
| Average Power Factor | 0,8 | | |
| Maximum Humidity | 95% | | |

#### C3.3.10.15.3 Jointing of MV Cables

All cable jointing shall be done in a first-class workmanlike manner with particular attention paid to cleanliness, insulation and undue bending of the cable cores.

No cable end shall be made off ready for jointing and left open for any length of time, but shall be completely jointed and the sleeve filled with black compound immediately thereafter.

Prior to the jointing a plastic sheet shall be installed underneath the joint covering the sides and bottom of the trench to avoid dust or soil contaminating the joint from below.

The cable trench shall be widened where the joint will be done and at least 1,5 m of spare cable shall be provided on either side of the joint.

Designs of cable joints, indoor and outdoor terminations, as well as all materials to be used for the jointing or terminating of the cable shall be approved by the Engineer prior to ordering of such materials.

The joints and terminations shall comply with the following:

Voltage withstands level 36 kV
Impulse withstands level 95 kV

The Contractor shall forward to the Engineer for his approval, full particulars of the instructions issued to the Cable Jointer prior to jointing of terminating of cables.

#### C3.3.10.15.4 Requirements Prior to Jointing of Paper Insulated Cables

Paper-insulated cables shall be tested for moisture by means of a crackle test, viz by dipping a piece of the insulation into hot cable oil (110 –C - 135 ºC). If any moisture is present, a characteristic crackling or excessive foaming will result. The paper insulation around all three cables will be tested first, where after the filling material between the cores will be tested. Lastly the paper insulation around each core will be tested.

If the cable contains moisture or is found to be unsuitable in any other way for jointing or termination, the Engineer shall be notified thereof immediately and will issue the necessary instructions he may deem applicable. Once a joint has been commenced with, the jointer will continue with the work until the joint has been completed before leaving

the site.

The jointing or termination of paper-insulated cable may not be commenced with in rainy weather without prior permission or approval by the Engineer.

The jointing and termination instructions for accessories used with PILC cables shall clearly indicate the cable preparation required for cables having an outer sheath made of PVC.

Before paper insulated cables are made off, the following tests shall be applied:

i) A crackle test shall be carried out on a sample of paper from both ends of the cables. If moisture is present, the cables shall be cut back.
ii) A 5000V megger shall be used to assure continuity and earth resistance.

### C3.3.10.15.5 Jointing of Paper Insulated Cables

After stripping of the armour and lead sheath, the lead of the cable shall be slightly bell-mounted after which boiled linen tape 25 mm wide and of good quality shall be wrapped round the crutch of the cable, ensuring that the tape is partly under the bell-mouth. The belting shall now be stripped back and torn off against the boiled linen tape.

Each cable core shall be taped with four layers, half lap, of boiled linen tape after which a spreader shall be inserted between the cores of each cable end.

The jointing of all paper insulated cables shall be made either by means of crimping ferrules or sweating of the jointing ferrules onto the cable cores. If crimping is used, the ferrules shall be crimped on by means of a hexagon crimping tool.
Before the jointing ferrules are taped, care shall be taken that they are free of any sharp points or rough edges.

All joints on paper insulated cables shall be encased in a lead sleeve of sufficient diameter for the size of cable being jointed and this lead sleeve shall be “plumbed” on to the lead sheath of each cable.

The lead sleeve shall then be filled with a good quality black compound and topped up as the compound contracts on cooling. The black compound shall be of sufficiently high dielectric strength to withstand the voltage of the cable.

The armour and lead sheath of each cable shall be bonded together by means of plumbing on a flexible cable of adequate size in accordance with the size of the cable being jointed.

When jointing in earth trenches, a cast iron cable box shall be placed over the lead sleeve. The cable box shall also be filled with black compound.

### C3.3.10.15.6 Accessory Earthing

The main earthing conductor supplied with indoor and outdoor terminations will be 1000mm long and will be terminated with a tinned copper connector having an M12 fixing hole.

### C3.3.10.15.7 Termination Tails

Cable termination tail lengths for three-core cable terminations will be as specified in table below

| Rated voltage (U/U kV) | Tail length (mm) | |
|---|---|---|
| | Indoor | Outdoor/indoor |
| 6.6/11 | 800 (item 7/8/9) | 1200 (item 4/5/6) |
| 11/11 | 800 (item 7/8/9) | 1200 (item 4/5/6) |
| 22/22 | 800 (item 7/8/9) | 1200 (item 4/5/6) |

### C3.3.10.15.8 Installation of Terminations

Best practice shall be employed when making off the MV cable ends in the end boxes. Colours or numbers must be followed through and the phase rotation must be maintained.

The cable end boxes for all the transformers, outdoor or indoor, shall be wall or pole mounted and shall be complete with insulators with through connector rods, adapted for the aluminium cores on the inside when requested. The boxes shall be either C>I> or fabricated steel, compound filled with the filler and riser holes being the highest points in the box. Moisture gaps shall be provided in all joint boxes. The compound filling shall be done in one operation with toping up following at intervals as the compound settles.

Where the cables terminate on the transformers, the bushings shall be puttied and taped, together with the cable core.

The three screens for screened cables around each core shall be bonded to the lead and armouring by means of plumbing and connected to the earth bar by means of copper conductor of at least 70 mm². For belted cables the armouring and lead shall be bounded by means of plumbing and connected to the earth bar via a 70 mm² conductor.

The connection shall be executed carefully avoiding any heat generation at the termination under earth fault conditions.

If specified heat shrink terminations shall be used. It shall be noted that the Manufacturer's instructions shall be adhered to.

The termination shall be complete and the cable supported by means of a wooden block prior to the connection of the cable to the switch gear bushings.

The wooden block shall be installed around the cable in such a manner that the sleeves or tapes used for the termination are free from the wooden block.

Spare cables of at least 1,5 m length shall be left in the cable trench at each termination.

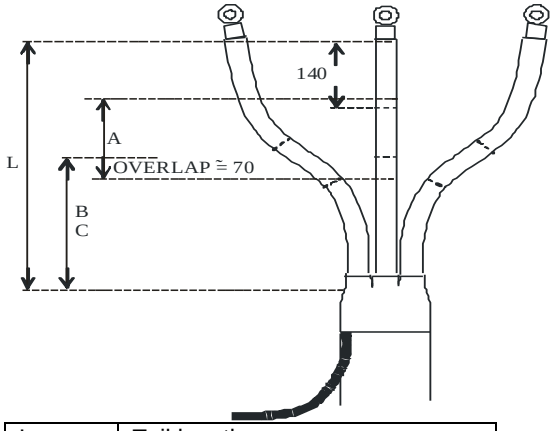
### C3.3.10.15.9 MV Cable Termination Dimensions and Requirements

The specific creepage for indoor and outdoor terminations shall be at least 31 mm/kV.
The actual creepage distance offered shall be stated in the Technical Schedules of the enquiry document.

Three-core (indoor and outdoor) cable terminations shall be designed to accommodate crossing of cable cores within the screened section of the three cores. The method of core crossing along with minimum clearances shall be indicated in the termination instructions

The design of (indoor and outdoor) cable termination shall ensure that no part of the armour or lead sheath of the cable is exposed once the termination is completed.

Minimum dimension for top-down measurement at MV cable terminations must be as shown in figure below




| | |
|---|---|
| L | Tail length |
| A | Stress control tube |
| B | Semi-conductive tube |
| C | Screened tube |
| 140 | Non-tracking tube |

Cable outdoor/indoor terminations

- Tail lengths "L" of 1200 mm.
- For impregnated paper-insulated cable, semi-conductive tubes that cover the paper core screen from the break-out boot to the stress control tube;
- Tinned copper braiding of length 1000mm for earthing. Cross sectional area 70mm².
- Outdoor cable terminations for paper-insulated cables shall be provided with crutch support to prevent damage to the cable crutch and core insulation from over tri-furcating.

- Cable terminations shall be provided with a method of sealing the interface between the termination tail insulating tube and the lug barrel by allowing for at least 140 mm of additional length of non-tracking tube that covers the lug barrel and overlaps the stress control tube. The method used and application shall be clearly indicated in the termination instruction.

The indoor termination for impregnated paper-insulated cable is to be used with:

- Conductive tubes that cover the paper core screen from the break-out boot to the stress control tube;
- Tail lengths' of 800mm, for use within air-filled enclosures fitted with low-voltage current transformers as indicated in drawing A9 of NRS 012 and outdoor stations.
- For impregnated paper-insulated cable, semi-conductive tubes that cover the paper core screen from the break-out boot to the stress control tube;
- Tinned copper braiding of length 1000mm. Cross sectional area 70mm².

### C3.3.10.16 LV Cables

All low voltage cables shall be manufactured according to NRS 074-1:2005 - Low-voltage (600/1 000 V) cable systems for underground electrical distribution Part 1: Cables and SANS 60227-1–006 / IEC 60227-1:1998 - Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V Part 1: General requirements, and shall bear the SABS/IEC mark.

The voltage gradient of the PVC dielectric shall be for 600/1 000 Volts and for general purpose use unless otherwise stated.

All low voltage PVC insulated cables shall have stranded copper annealed conductors unless otherwise called for.

The following code shall be used for identifying cables:

| Component / Type | Code Letter(s) |
|---|---|
| PVC di-electric | PVC |
| PVC sheath or extruded bedding | PVC |
| PVC tape bedding | PVCT |
| Single wire armour | SWA |
| Earth continuity conductor in armour | ECC/SWA |
| Double wire armour | DWA |
| Concentric neutral or earth conductor | N, NE or ECC as relevant |
| PVC outer sheath | PVC |
| Where a supplementary earth core is included | G/Y |

#### C3.3.10.16.1 Joints and Terminations of PVC SWA cables

The ends of these cables shall be made off in the conventional way with an earth bond between the armour, and the cores jointed through by means of crimping ferrules, colour to colour (taping may be required).

PVC jointing kits shall be used and these shall consist of a celluloid jointing mould which will be placed around the joint. Into this mould will be poured a clear plastic compound which will be allowed to set after which the jointing mould will be removed.

No joint shall be permitted in any run of LV cable unless specifically specified or specifically approved by the Engineer.

Terminating PVC cable shall only be by means of glands and shrouds. K-clamps shall be used at miniature substations and ground or plinth mounted distribution kiosks.

Connecting of cable cores to bolted type terminals shall be affected by means of suitably sized lugs which shall either be sweated or crimped onto the relevant conductor ends.

### C3.3.10.17 Measurement of Cables

Quantities as shown on the Schedule of Quantities are approximate and the Contractor will physically measure the route on site before ordering his cable.

All surplus cable at the end of the contract must be removed by the Contractor and the quantities for payment shall be adjusted accordingly.

Cables shall be measured by the clerk of works by means of a measuring wheel once the trenches have been closed.

In addition to the cable lengths measured in the trenches, the following slack will be allowed:

| | | |
|---|---|---|
| i) | Slack in cable trenches | + 0.5% |
| ii) | 6.6/11/22 kV miniature substations | + 3 m |
| iii) | 6.6/11/22 kV at brick substations (actual measurement) | |
| iv) | 6.6/11/22 kV at overhead poles | + 10 m |
| v) | LV cable at distribution kiosk | +2.5 m per cable end |
| vi) | Service connection cable | +3m per cable end |

### C3.3.10.18 Soil Thermal Resistivity

Cable current carrying capacity is affected by the thermal resistivity of the substances encountered.

The following table of values shall be used:

| Soil Type | Thermal Res in °Cm/W |
|---|---|
| Water logged ground | 0,50 |
| Concrete | 0,90 |
| Gravel | 1,00 |
| Sandy soil | 1,20 |
| Clay | 1,60 |
| Chalky soil | 1,80 |
| | |

Impurities such as slag, ash and intense vegetation in the cable trench cause an increase of thermal resistivity and must be avoided, particularly close to the cable.

### C3.3.10.19 Testing on Completion

Tests on completion shall be carried out on site in the presence of the Engineer, and the test results properly recorded by the Contractor and submitted to the Engineer in triplicate.

On each completed section of laid and jointed cable, the insulated resistance shall be tested on approval, with an approved “Megger” type instrument of not less than 10 000 Volts for MV and LV Low voltage has reference to 1 000 Volts and less while MV medium voltage has reference to more than 1 000 Volts.

The Contractor shall be responsible for all necessary test equipment and instruments and the necessary electricity supply to carry out the test.

On each completed section of laid and jointed MV cable a high voltage test shall be carried out.

The test shall be performed in the same manner as that described in clause 8.3 of SABS 97: 1959 (as amended) but alternating or direct current may be used. See the appropriate test voltages below.

All MV and LV switchboards shall be “Megger” tested to approval after erection and installation on site, using the applicable test voltages.

The following tests are required:

(a) Prior to jointing or termination, the insulation and continuity tests by means of resistance shall be done:
MV cable : 5000V
LV cable : 1000V

(b) Full testing shall be carried out after terminations on completed cable sections of laid and jointed cable:

(c) Test voltages for MV Cables are:

| System Voltage | Test Voltage, V (rms) | | | | | |
|---|---|---|---|---|---|---|
| | **Belted cables** | | | | **Single core, and screened cables** | |
| | **Between conductors** | | **Between any conductor and sheath** | | **Between any conductor and sheath or screen (as relevant)** | |
| | Cables for earthed systems | | | | | |
| | A.C. | D.C. | A.C. | D.C. | A.C. | D.C. |
| 11 000 | 20 000 | 30 000 | 11 500 | 17 500 | 12 000 | 18 000 |
| | Cables for unearthed systems | | | | | |

| System Voltage | Test Voltage, V (rms) | | | | | |
|---|---|---|---|---|---|---|
| | Belted cables | | | | Single core, and screened cables | |
| | Between conductors | | Between any conductor and sheath | | Between any conductor and sheath or screen (as relevant) | |
| 11 000 | 20 000 | 30 000 | 20 000 | 30 000 | 20 000 | 30 000 |

NOTE: Direct current tests shall NOT be applied on cross-linked polyethylene cables.
All cables shall be discharged immediately after each and every test.

(d) Paper insulated cables. A test voltage (either A.C. or D.C.) shall be applied between conductors and between each conductor and the metal sheath, which shall be held at earth potential. The voltage shall be increased to the full appropriate value, and maintained at this value for 15 minutes.

(e) PVC insulated cables:
A 2 000V Megger shall be used and the insulation between phases and phases and earth shall be measured.

(f) Rejected cables.
If breakdown of any cable occurs during testing it shall be replaced and/or the cable end shall be re-done, which shall be at the Contractor's expense.

### C3.3.11 Miniature Substations

#### C3.3.11.1 Scope

This specification covers the minimum requirements for the manufacture, testing and supply and delivery of miniature substations (mini-subs) suitable for use in areas accessible to the public.

Mini-subs shall comply with the requirements of SANS 1029:2008. Only new equipment and units shall be accepted. Each unit shall be supplied complete with a plinth of suitable design, rating and type.

The standard transformer power ratings for Minisubs will be:
a) 200kVA
b) 315 kVA
c) 400 kVA
d) 500kVA
e) 630 kVA
f) 800 kVA
g) 1000kVA

The Contractor shall comply with all the legislation and regulations, and in particular they shall be required to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and regulations as amended.

#### C3.3.11.2 System and Environmental Requirements

| System parameters | | | |
|---|---|---|---|
| Primary Nominal Voltage | 6.6kV | 11 kV | 22kV |
| Secondary nominal voltage | 420/230 | 400/240 | 400/240 |
| Rupturing Capacity | 25kA | 25kA | 25kA |
| Impulse Level | 95kV | 95 kV | 95kV |
| Highest System Voltage | 7.6kV | 12 kV | 24kV |
| Rated Short Time Current (3 s) | 20kA | 20kA | 20kA |
| Frequency | 50 Hz | 50 Hz | 50Hz |
| Phases | 3 | 3 | 3 |

The units shall be manufactured to be in use continuously under all weather and climatic conditions throughout the year, which conditions will be as follows:

| | |
|---|---|
| Atmospheric Temperature | -5°C minimum +45°C maximum |
| Altitude | 800 m minimum to 1 100m maximum |
| Lightning & Dust | Severe |
| Average Power Factor | 0,8 |
| Maximum Humidity | 95% |
| Earthing | Neutral earth. Max 1 Ohm |

### C3.3.11.3 Abbreviations

| | | |
|---|---|---|
| Minisub(s) | = | Miniature substation(s) |
| RMU | = | Ring main unit |
| HV | = | High Voltage |
| MV | = | Medium Voltage |
| LV | = | Low Voltage |
| EFI | = | Earth Fault Indicator |
| CT | = | Current Transformer |

### C3.3.11.4 Design Requirements

The Contractor shall submit full design detailed drawings and documentation, including relevant type testing certificates, manufacturer accreditation and the like, to the Engineer for approval, prior to ordering, manufacturing and delivery of material and delivery of the units.

### C3.3.11.5 Construction Requirements

Minisubs of type A layout shall comprise the following:

(a) A MV compartment for housing the RMU

(b) A transformer of one the following power ratings, CT ratios and fuse ratings on the RMU T-off is applicable:

| | | |
|---|---|---|
| i) | 200kVA | 300:5 |
| ii) | 315kVA | 500:5 |
| iii) | 400kVA | 600:5 |
| iv) | 500kVA | 800:5 |
| v) | 630kVA | 1000:5 |
| vi) | 800kVA | 1200:5 |

(c) LV Compartment with a rated voltage up to 1000V.

(d) Streetlight compartment reserved exclusively for streetlight control equipment. All of the above are to be mounted on a common 75mm channel iron galvanised steel base covered with black epoxy paint.

### C3.3.11.6 MV Compartment

(i) The RMU shall comply with the requirements of SANS 1874 for use with 11kV vacuum circuit breaker for the transformer feeder and two on load switches:

(ii) The RMU shall have integral cable test facility and an EFI shall be provided.

(iii) The RMU shall be supplied complete with one-piece unscreened separable connectors (ring switches and circuit-breaker).

(iv) Termination of MV cables: Provision shall be made for the support (clamping) of two incoming (ring) cables in the MV compartment.

### C3.3.11.7 Transformer

The transformer shall comply with the following requirements: -

- Insulation temperature class H – Sight-glass for monitoring (easily visible and discernible from compartment door)
- Breather with silica crystals
- Top cover bolted sealed
- Oil drainage facility at the bottom of the transformer
- Oil top up facility with cap (reachable from compartment door)
- Tap changer (off-load, lockable)
- Vector group Dyn 11
- Copper primary and secondary windings
- ONAN cooling
- Hermetically sealed
- Dial type thermometer with trip relay to Main LV circuit breaker
- Oil temperature indication with trip signal (and wires) to MV-side relay
- Pressure release switch and indication trip signal (and wires) to MV side relay

### C3.3.11.8 LV Compartment

(i) Provision shall be made for the installation of at least one main and eight outgoing LV circuit-breakers.
(iii) LV Indicating measurements- with thermal instantaneous, maximum demand ammeters for all three phases.
(iv) One voltmeter shall be provided, including a rotary selector switch. (Phase to Phase and Phase to Neutral)

Provision shall be made for mounting of LV circuit breakers having sufficient space between the rows for accommodating cable terminations. Cover plates with label channels shall be provided for both rows.

Digital Maximum Demand including statistical metering functionality shall be installed and programmed to utility supply authority specification.

### C3.3.11.9 Paint Colour

External colour shall be avocado green. Colour for all internal cover plates shall be white.

### C3.3.11.10 Plinth

The plinth for the miniature substations shall be cast with a minimum 25 MPa cement mixture and cured for the appropriate number of days to reach the desired strength. Test cube results shall be submitted to the Engineer on a frequent basis.

Plinths shall suit the specific equipment being installed on the surface of the plinth

The design of the plinth(s) shall be submitted by the Contractor to the Engineer for approval prior to ordering, manufacturing and delivery of material and installation or construction of the plinth(s)

Plinths shall be:

- Cast in undisturbed subsoil 150 mm beneath the natural ground level.
- Cast/placed with top surface150 mm above the natural ground level.
- Fitted with 12 mm galvanised bolts to facilitate fixture of the miniature substation/ ring main unit
- Chamfered to a 30° on the edges.
- Level and have a smooth and level finish.

The final measurements of the plinths shall be in accordance with the manufacturers' measurements and specifications in accordance with the related drawings.

The above requirements are also applicable to plinths for stand-alone ring-main-units.

### C3.3.11.11 Marking Labelling and Notices

The minisubs nameplate, having dimensions of 50 x 200mm, manufactured from Traffolite, shall be located on the inside of the MV compartment door.

The following notices shall be provided:

(i) The main circuit breaker shall have a Traffolite plate engraved with: "Alive", mounted on the supply side.
(ii) The LV busbars shall be color-coded in the colours of red, yellow, blue and black by a clearly visible paint-spot at least 20 mm diameter, at maximum 500mm interval.
(iii) The MV and LV compartment doors shall be labelled with "MV" and "LV", respectively. Note that "MV" and not "HV" shall be used for the MV compartment doors. The labels shall be clearly and indelibly stencilled on both the inside and outside of all the compartment doors.
(iv) The LV streetlight compartment door shall be labelled with "STREETLIGHT COMPARTMENT". The labels shall be clearly and indelibly stencilled on outside of the streetlight compartment door.
(v) A label depicting "Treatment and Full First Aid Instructions" shall be permanently attached to the inside of the kiosk compartment main access door, with rivets.
(vi) The letters MV shall be displayed clearly and indelibly in red on the inside of the door of the kiosk.
(vii) External Chromadek electrical symbolic warning signs (WW7, Table 2 of SABS 1186 (in English, Afrikaans and Xhosa) shall be permanently attached to all the doors.

Transformer rating plate information
In addition to the relevant requirements of SANS 780, the following information shall be clearly shown on the transformer rating plate:

(i) Client order number;
(ii) Mass of the Minisub;

(iii) Year of manufacture.

#### C3.3.11.12 Inspection

Factory test witnessing, Routine inspection, quality control and testing will be conducted by the Engineer and the Employer on all delivered units.

#### C3.3.11.13 Documentation and Drawings

Provision shall be made for the safe-keeping of all relevant documentation (i.e. the installation, operating and maintenance instructions for the ring main unit and all routine test certification) on the inside of the MV compartment door.

The following details shall be provided on an A4 hard copy protected by a plastic cover:

a) Volume of gas in RMU
b) Total mass of RMU
c) Volume of oil in Transformer
d) Mass of oil in transformer
e) Mass of plinth
f) Total mass of miniature substation

#### C3.3.11.14 Transport and Delivery

The miniature substations shall be delivered and off-loaded complete at the address specified.

### C3.3.12 Low Voltage Distribution and Metering Kiosks

#### C3.3.12.1 Scope

This specification covers the minimum requirements for the manufacture, supply and delivery of low voltage service distribution boxes (SDB), suitable for ground mounting and safe for use in areas accessible to the public.

The distribution kiosks shall be in accordance with specifications and detail of drawings issued.

#### C3.3.12.2 General

Any amendment to or deviation from the specification must be shown clearly in full and declared by the Contractor, prior to implementation of such amendment or deviation.

#### C3.3.12.3 System and Environmental Requirements

| System parameters | |
|---|---|
| Secondary nominal voltage | 400/240 |
| Rupturing Capacity | 6 kA / 10kA |
| Rated Short Time Current (3 s) | 6 kA / 10kA |
| Frequency | 50 Hz |
| Phases | 3 |
| Earthing | Neutral/earth |

The SDB shall be manufactured to be in use continuously under all weather and climatic conditions throughout the year, which conditions will be as follows:

| | |
|---|---|
| Atmospheric Temperature | -5°C minimum +45°C maximum |
| Altitude | 800m minimum to 1 100m maximum |
| Lightning | Severe |
| Dust/sand | Severe |
| Average Power Factor | 0,8 |
| Maximum Humidity | 95% |

#### C3.3.12.4 Cable Compartment

All incoming and outgoing cables to and from the SDB shall be connected to the busbar.

Service connection cables and supply cables shall be separated and separately identifiable within the compartment.

Service connection cables, normally 10-16mm², 2-core armoured cable for a single-phase supply or a 16mm², 4-core armoured cable with separate earth continuity conductors for a 3-phase supply

### C3.3.12.5 LV Cables

Provision shall be made for 4-core, three-phase, low voltage cable/s to be connected onto the busbars.

The SDB's must be designed to accept 10 - 300 mm² copper, 4-core armoured cables.

### C3.3.12.6 SDB Construction

(a) General

i) SDB's shall be manufactured from 2mm thick; 3CR12.
ii) The SDB shall include a door for access to the circuit breaker compartment of the SDB.
iii) The door's surround shall incorporate a splash proof channel.
iv) A rain sill that protrudes past the door shall be installed above the door, to prevent rain falling on to the top surface of the door when it is closed. This sill will be sturdy enough to assist lifting of the SDB.
v) The completed SDB shall have a minimum IP rating of 3 for protection against touching live parts and it shall have a minimum IP rating of 3 for protection against ingress of liquids [IP33].
vi) All cutting, forming, forging, machining, welding, fastening, annealing, stress relieving, post weld cleaning shall comply with the internal standards of the manufacturer of 3CR12 steel.
vii) Adequate vermin proof ventilation holes shall be provided in the SDB.
viii) The circuit breakers shall be installed vertically and be accessible from the front of the distribution kiosk.
ix) Cover plates shall be provided to prevent accidental contact with live parts, e.g. busbars and at circuit breaker terminals.

(b) Door

i) The door shall be fitted with minimum two "Bullet" hinges of non-ferrous metal.
ii) The hinges used shall be internal hinges, i.e. they will only be accessible from inside the SDB. The door will be hinged from the left-hand side.
iii) The door shall be mounted flush with the surface of the lid.
iv) The door shall be fitted with a night latch.
v) The locking mechanism shall make use of the 3-point locking mechanism, including guides, plates and fasteners. The rods used for the 3-point locking system shall be a minimum of 8 mm round bars. All the components of the locking mechanism shall be of pickled and passivated 3CR12 or stainless steel.
vi) The door shall be braced with 2 mm 3CR12 sheet metal and/or individual flat bars in order to improve its rigidity.
vii) A sturdy door stay shall be provided on the front door to ensure that the door can be kept in a 90º open position. This door stay shall be manufactured from a non-ferrous metal.
viii) The door shall be linked with minimum 16mm² copper conductor to the earth bar of the SDB, with suitable terminations on both ends.

### C3.3.12.7 Busbars and Connections

- The SDB shall be supplied with all busbars and insulators fitted, with suitable supporting insulators
- In the LV cable compartment, there shall be 3 x LV phase busbars, earth busbar and a neutral busbar.
- The phase and neutral busbars shall be constructed from minimum 15mm thick copper to carry minimum required current (load current) (minimum 400A) and rated correctly for short circuit current (minimum 15kA) and fastened by means of suitable insulators.
- The neutral busbar shall be connected to earth busbar with a 70 mm² insulated bridge piece. The neutral busbar shall be insulated from earth in the same manner as the phase busbars.
- The busbars shall come fitted with stainless steel set screws, complete with 20 tinned steel washers, a stainless steel spring washer and cadmium plated steel nut, in each pre-drilled hole.
- From top to bottom, the phase order of the busbars shall be red, yellow, blue and black.
- All connections to busbars shall be with crimped lugs of correct size and type, with correct mounting hole dimension. All lug terminals shall be insulated with heat-shrink insulation in the phase colour.
- All wiring connections to metering equipment shall be made by phase coloured 16 mm² PVC insulated copper conductors, lugged and connected to the correct busbars. The ends of the conductors that are intended for connection to equipment in the metering compartment shall not be stripped, and shall be protected with heat shrink end caps that can only be removed by cutting them off.

### C3.3.12.8 Circuit Breaker Mounting

- The SDB shall be designed to house rail-mounted circuit-breakers and large frame circuit breakers
- The rails shall conform to IEC 60715 and will be supplied and installed by the manufacturer.
- The breaker compartment shall be lockable with a separate lock as to prevent unauthorized access to the breakers.

### C3.3.12.9 Samples

If requested to do so, a sample of each SDB shall be provided for assessment and approval purposes, prior to batch delivery to site.

### C3.3.12.10 Marking and Labelling

Notices shall be provided as required by the Occupational Health and Safety Act. All notices shall be secured to the SDBs using rivets.

The following information shall appear in legible and indelible marking as follows:

- The manufacturer's name or trademark;
- A danger sign of minimum size 100 mm x 60 mm that forms an integral part of the housing and/or all doors. The sign shall be as specified in table1, WW7 of SANS 1186-1; and;
- Appropriate SANS mark(s) of approved performance.
- A label showing the name of the manufacturer and the date of manufacture shall be placed on the inside of the SDB door.
- Each circuit breaker must have a removable blank Traffolite label (typical 12mm height) to be engraved with feeder destination.
- Circuit breaker label must be of size compatible with label rail in the kiosk
- Circuit breaker label must be black text on white background, with text at least 12mm high
- One label must uniquely identify the intended component, and not overlap with the adjacent component

### C3.3.12.11 Drawings

The Contractor shall submit for approval a complete drawing and brochure information of every SDB and the equipment offered. The Contractor shall submit manufacturer's detailed information and workshop drawings for every SDB and kiosk, for acceptance and approval by the Engineer, prior to manufacturing and dispatch.

## C3.3.13 Earthing

### C3.3.13.1 Scope

This section covers the supply, installation, connection and testing of earthing systems of electrical installations in buildings or other structures. The total earthing system of any electrical installation shall be in complete accordance with SANS 10142.

This specification contains clauses that are generally applicable to substation installations, underground and overhead reticulation systems, and the wiring of premises.

### C3.3.13.2 Definitions and Abbreviations

Earth Continuity Conductor: An electrical conductor of copper, or other approved metal, of sufficient cross-sectional area as to ensure at all times an immediate discharge, without danger, of electrical energy to the general mass of earth through an earth point.

Earth Conductor and Earth Wire: Commonly accepted terms for an earth continuity conductor

Earth Point: A metallic device, usually of copper, that is in direct contact with earth. An earth point may consist of a spike, or a number of spikes, driven vertically (usually) into the ground to sufficient depth to make contact with soil strata of such resistivity that it can safely dissipate electrical energy. An earth point may also consist of a copper mat of sufficient area and buried at sufficient depth to achieve the same results. It may also be a combination of both spikes and mat.

Earth Spikes: A rod of bare copper, copper-coated steel, stainless steel or galvanised steel that can be driven into

the ground to a depth necessary to obtain the resistance values required. A spike may consist of a number of lengths of such rods mechanically joined together A low resistance earth may sometimes be obtained by driving multiple spikes at some distance from each other in order to provide parallel paths. In hard or rocky ground, it is usually necessary to drill holes into which earth spikes are inserted then packed with suitable soil.

Trench Earth: A length of bare copper or galvanised iron conductor buried in the earth at a depth of not less than 500mm and of sufficient length to obtain the resistance values required. A trench earth system is usually only employed as a main earth point when ground conditions preclude the use of spikes or mats. Trench earths are common when underground cables are installed.

Foundation earths comprise bare copper or galvanised iron conductors laid under the foundations of buildings, miniature substations, distribution pillars, bases of wooden, concrete or steel poles and structures.

Earth Electrode: A conductor buried or driven into the earth for the purpose of providing a connection with the earth, and the term encompasses earth spikes, earth mats, and trench earths.

Earth Bar: A length of copper or brass bar of appropriate or specified dimensions, or cross-sectional area, that has a sufficient number of connection points onto which earth continuity conductors or earth wires can be mechanically joined with bolts and nuts or machine screws as applicable.

BCEC: Bare Copper Earth Conductor
BCEW: Bare Copper Earth Wire
ECC: Earth Continuity Conductor

### C3.3.13.3 General Requirements

An effective earth must prevent dangerous over voltages arising between metallic structures, frames, supports or enclosures of electrical equipment and the ground during fault conditions.

An effective earth must be able to permit fault currents of sufficient magnitude to flow so as to operate protective devices to isolate the fault before damage can occur.

The ohmic resistance of an effective earth must be low enough to ensure that the step potential on the ground in the vicinity of the earthing point is within safe limits under fault conditions i.e. a voltage gradient not exceeding 40 V/m for fault durations exceeding 1s.

### C3.3.13.4 Materials for Earth Electrodes

Only material manufactured from or combined with, as appropriate electrolytic copper, shall be used for underground reticulation and internal wiring earthing systems.

Bare copper conductor or PVC insulated copper conductor shall be employed as may be specified or appropriate. Bare copper conductors of 16mm² and greater cross-sectional area that are intended to be buried in the ground shall, preferably be of the stranded type.

Aerial earth conductors in overhead reticulation systems may be of other metals such as aluminium alloy and galvanized steel wire as may be specified in the project specification.

Galvanised iron and steel electrodes shall not be buried in close proximity to bare copper.

### C3.3.13.5 Connections for Earth Electrodes

All connection of earth continuity conductors shall be made with brass bolts, nuts, washers, together with a star lock washer, on all outdoor equipment such as mini-subs and outdoor mounted switchgear. Connection to indoor equipment in brick-built substations and switch rooms may be made with high tensile cadmium plated bolts, nuts and washers, with a steel spring washer.

### C3.3.13.6 Earthing of Distribution Systems

Distribution equipment associated with transformer substations that are either ground mounted or pole mounted and fed by underground cable or overhead line, with or without an earth continuity conductor, (ECC), shall be installed, connected and earthed in accordance with the following requirements:

(a) Where the resistance to earth of the HV equipment earth is 1 ohm or less, it is permissible to earth the LV

neutral to the HV earth electrode.

(b) Where the HV equipment earth exceeds 1 ohm the LV neutral will be earthed at a minimum distance of 6m from the HV equipment earth (i.e. 6m from the HV electrode/s and also from any sealed metalwork connected thereto).
(c) Notwithstanding the requirements of (a) above, where transformers are associated with HV overhead lines, it is considered good practice to separate the HV and LV earth electrodes. The minimum earth separation shall be 6m or one LV span.
(d) The overall resistance to earth of the neutral of an LV distributor or distribution system must not exceed 10 ohms.
(e) The LV neutral may be connected to other supply neutrals, earth electrodes, cable sheaths and armouring and these connections used to obtain the required earthing value of 10 ohms or less specified in par. (d). above.
(f) The neutral of underground and overhead LV distributors must be earthed at the remote ends of each distributor.
(g) Where the overall resistance to earth of the neutral of the distribution system exceeds 10 Ohms, the neutral will be earthed at intermediate positions on the distributor/s to reduce its resistance to earth to below this limit.
(h) The cross-sectional area of the neutral of all LV distributors must not be less than that of a phase conductor.
(i) No circuit-breakers, isolators, fuses, switches or removable links will be installed in the neutral between the transformer star point and the remote end of any LV distributor or service connection.
(j) All metallic sheathing and armouring of cables and all metalwork associated with meter cabinets, fuse pillars, etc., supporting or enclosing LV cables will be bonded to the distributor neutral conductor.
(k) Where a Separate Neutral Earth (SNE) cable is part of an MEN or PME system, the armouring and/or metallic sheath and any ECC will be bonded to the neutral at the supply end of the cable.
(l) To ensure the integrity of the neutral, it is recommended that all connections and joints on or to overhead line conductors be made by compression fittings or, alternatively double bolted connectors.
(m) MEN or PME may be applied to any single LV distributor without alterations to other LV distributors supplied from the same transformer.

### C3.3.13.7 Service connections

#### C3.3.13.7.1 MEN (Multiple Earthed Neutral) System

The following conditions apply to consumers' service connections as well as service connections to traffic signals, road signs, street lighting and other power-consuming equipment installed in public places:

(a) All service connections must be by means of cable with an insulated phase, an insulated neutral conductor and an ECC.
(b) A single-phase service connection comprises a live, a neutral and an ECC.
(c) A polyphase service connection comprises two or three phase conductors, a neutral and an ECC.
(d) The service neutral and ECC must be solidly and separately connected to neutral at the tee-off point.
(e) The consumer's earthing lead is connected to the Supply Authority's earth terminal which is in turn connected' to the ECC in the service cable at the consumer's supply point.
(f) The neutral must not be connected to earth at the consumer's supply point.
(g) If required by the Supply Authority, an earth electrode must be installed at the consumer's supply point.
(h) In a service connection to traffic signals, street light and other power-consuming equipment installed in public places, such equipment is earthed to the ECC of the service connection.

#### C3.3.13.7.2 PME (Protective Multiple Earthing) System

(a) All service connections must be by means of a cable with an insulated phase and an insulated neutral conductor.
(b) A single-phase service connection comprises a live conductor and a neutral.
(c) A polyphase service connection comprises two or three phase conductors and a neutral.
(d) The consumer's earthing lead is connected to the supplier's neutral and to an earth electrode at the consumer's supply point.
(e) A label must be attached at the consumers supply point on his premises indicating that the installation is part of a PME system.

Note: It is not recommended that the PME system be applied to supply traffic signals, street signs or other power-consuming equipment installed in public places, because the PME system is inherently unsafe under "broken neutral" conditions

### C3.3.13.8 Earthing of an Electrical Installation

#### C3.3.13.8.1 General

All earth conductors shall be stranded copper with or without green (alternatively green and yellow) PVC insulation. The conductors will be determined in accordance with SANS 10142, par. 4.6 where the earth does not form an integral part of the cable.

#### C3.3.13.8.2 Switchboards

A separate earth connection will be supplied between the earth busbar of the main switchboard and the earth busbar of every sub-switchboard. These connections will consist of bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors.
Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised.

#### C3.3.13.8.3 Sub-circuits

The earth conductors of all sub-circuits will be connected to the earth busbar in the switchboard in accordance with SANS 10142.

#### C3.3.13.8.4 Connections

Under no circumstances will connection points, bolts, screws, etc. used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the ends will be tinned and lugged. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirements.

#### C3.3.13.8.5 Non-metallic conduit

Where non-metallic conduit is specified or allowed, stranded copper earth conductors will be installed in the conduits and fixed securely to all metal appliances and equipment, including switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaries, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

#### C3.3.13.8.6 Flexible conduit

An earth conductor will be installed in all non-metallic flexible conduits. This earth conductor will not be installed external to the flexible conduit but within the conduit with the other conductors. The earth conductor will be connected to the earth terminals at both ends of the circuit.

#### C3.3.13.8.7 Water pipes

Metal cold water mains will be bonded to the earth bus-bar in the Main Switchboard by solid 15 x 2mm copper strapping. All other hot and cold water pipes will be connected by 12 x 0,8mm perforated or solid copper strapping (not conductors) to the nearest switchboard. The strapping will be fixed to the pipe work by brass nuts and bolts and against walls be brass screws at 150mm centres. In all cases where metal water pipes, down pipes, flues, etc. are positioned within 1,6 m of switchboards, an earth connection consisting of copper strapping will be installed between the pipe work and the board. In vertical building ducts accommodating both metal water pipes and electrical cables pipes will be earthed at each switchboard.

#### C3.3.13.8.8 Roofs

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10mm² copper conductor will be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor of each switchboard. The roof and gutters will be connected at 15m intervals to this conductor by means of 12 x 0,8mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

### C3.3.13.9 Installation

All necessary equipment for the driving of earth spikes in the ground, and for excavation for burying earth mats and

conductors, shall be provided on site by the Contractor.

#### C3.3.13.9.1 Distribution Circuit Earth Conductors

Earth continuity conductors shall run with all cables constituting a low voltage distribution system. All earth conductors shall be bare copper wire complying with the appropriate Regulations, unless specific sizes are specified. A single earth conductor may be used where two or more cables run together, providing the earth conductor cross-sectional area is based on the largest size cable in the run, and that the branch earth wires being solidly connected to the main earth conductor where required. The earth continuity conductor shall be terminated on the main earth bar.

An earth conductor of 70mm² bare stranded copper shall be connected to the copper earth jumper and to the earth continuity conductor (ECC) which runs with the distribution cables. The connection to the ECC shall be made by using copper welding only.

The connection of branch earth wires to main earth conductors shall be by copper welding. Brazing is not acceptable.

#### C3.3.13.9.2 Earth Points

At each item of M.V. switchgear, transformer, cradle termination, mini-sub and set of lightning arrestors, or in any instance where maintenance may be required to be done to equipment mounted on a pole, e.g. a recloser or gang links, 1,5m long and 16mm minimum diameter “Copper weld” or equivalent earth spikes shall be driven vertically into the ground, as close to the equipment as possible. No earth spike shall be within 6m of any other such spike. The number of spikes required to obtain the resistance set out below will be dependent upon the soil resistivity, but there shall be no less than three spikes at each sub-station and not less than two spikes at each outdoor switchboard, mini-sub and transformer. One spike shall be provided at cradle earthing points, reclosers, or set of lightning arrestors.

Ganged links are to be earthed by an earth electrode installed 2m from the isolator handle, on the opposite side of the pole or structure and connected to the pole top steel work by means of 35mm² PVC insulated earth conductor. An earth mat 1m x 1m with a 200mm mesh fabricated from 20mm x 3mm flat copper tape is to be provided at a depth not exceeding 150mm below ground at the operating position and connected to the operating handle with 35mm² PVC insulated earth conductor.

At all mini-subs, a minimum length of 30m of 70mm² bare copper conductor shall be laid below the plinth and shall be connected to the earth bar within the mini-sub.

The top of earth spikes or uninsulated earth conductor shall not be less than 500mm below ground level. Above this level all earth conductors shall be insulated.

A marker similar to a cable marker shall be installed above each earth spike or earth mat and labelled “Earth Spike” or “Earth Mat” as appropriate.

#### C3.3.13.9.3 Earth Point Values

The maximum values of earth electrode resistance required are 1 ohm at any mini-sub or transformer neutral, 2 ohms at any indoor or outdoor switchboard, or M.V. gang links and 3 ohms at cradle earthing points, lightning arrestors or other pole mounted equipment. Where the number of spikes stated above does not achieve these values, the Engineer is to be advised and he will give further instructions for the improvement of the values obtained. The contribution of all connected underground earth continuity conductor is to be included in the resistance value measured.

#### C3.3.13.9.4 Earth Point Connections

The connection to each earth spike shall be by means of at least two non-ferrous mechanical clamps of an approved type for this duty. Brazing will not be accepted.

A 70mm² minimum, green insulated stranded copper earth conductor shall connect the earth electrodes to one another and a single main earth conductor of the same size shall connect on the earth electrodes of the earth mat to the main bar at the sub-station, mini-substation, equipment, transformer or cradle as appropriate.

A terminal lug shall be crimped onto the end of the main earth conductor for bolting to the main earth bar of a sub-station or mini-sub or any other outdoor equipment. Two mechanical clamps shall be used for connection onto cradles or other equipment, as appropriate.

The neutral terminal on the L.V. side of each transformer shall have an uninterrupted connection by means of a stranded copper green insulated conductor to the main earth bar, or earth spike in the case of a pole mounted

transformer, the size being in accordance with the appropriate Regulations. In the case of transformers or mini-subs feeding distribution systems, the neutrals of which are multiple earthed, the transformer neutral must be earthed.

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

Earth connections must not, in any circumstances, be carried through metal conduits or sleeves.

#### C3.3.13.9.5 Earth Bars

The main earth bar for a substation shall consist of minimum 50mm x 6mm (thickness) copper bar of a length sufficient to accommodate at least six (6) connection points at 40mm centres. The bar shall be mounted on porcelain, or equal insulators in a suitable position on a wall or plinth or wall of the cable trench, and shall be readily accessible for inspection. Connections from equipment to the bar shall be 70mm² conductor, terminated in compression type lugs.

Where equipment is bolted together, as in the case of an M.V. switchgear panel, there is to be a 25mm x 3mm copper earth strap extending the whole length of the equipment. All earth bars shall be run in one continuous length as far as possible, and shall not be bent or be de-formed in any way that requires hammering or severe distortion. Any joints shall be lapped with at least two bolts with nuts and washers of suitable size. The lapped ends shall be pre-tinned. If multiple straps are used, they shall be bolted and fixed together at not more than 750mm intervals.

#### C3.3.13.10 Tests on Site

The Contractor shall test the earth resistance of each earth system, using the respective earth bar or termination as the reference point. As stated above, should the required values not be achieved, the Engineer shall be informed, and he will then give the required instructions.

### C3.3.14 Overhead Power Lines

This section covers the supply, delivery, erection and commissioning of overhead transmission lines up to 22kV on wooden and steel poles. An overhead line shall comprise the wooden poles, cross-arms, stays, conductors, insulators, isolators, sectionalising links, transformers, lightning arrestors and any other auxiliary equipment specified.

All materials and fittings used shall be new and of high quality.

Overhead lines shall be erected in accordance with SANS 10280.

#### C3.3.14.1 General

The installation shall comply with the SA Code of Practice on overhead lines, for conditions prevailing in Southern Africa and with Machinery and Occupational Health and Safety Act.

Any further requirements lay down by various statutory bodies such as the Department of Posts and Telecommunications, the S.A. Transport Services, Eskom etc., shall also be observed, when applicable. Any Municipal by-laws will also be applicable.

The following documentation must be provided with tender of electrical contractor/sub-contractor responsible for this specific specialist installation:

- Plant and Equipment,
- Labour content,
- Company organogram,
- Company profile,
- Proof of labour force,
- CV's & certificates,
- Reference letters,
- Completion certificates.

#### C3.3.14.2 Statutory Requirements

The following statutory legislative and regulatory requirements are listed here as representation of framework governing or impacting on construction of overhead lines. This list is not to be considered as exhaustive. Reference to specific editions of a document implies and indicates application of any subsequent amendments of the document.

- Occupational Health and Safety act. (1993) Act 85 of 1993 and regulations issued there under.
- No. 50 of 2003: Environmental Conservation Amendment Act, 2003
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965);
- National Building Regulations and Standards Act, 1977 (Act 103 of 1977);
- Electricity Act, 1996 (Act 88 of 1996);
- National Water Act, 1998 (Act 36 of 1998);
- National Environmental Management Act, 1998 (Act 107 of 1998);
- Post Office Act, 1998 (Act 124 of 1998) (telephone installations);
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- Fire Brigade Services Act, 2000 (Act 14 of 2000);
- Local Government Ordinance 1939 (Ordinance 17 of 1939);
- The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises";
- The Fencing Act, No. 31 of 1963.
- The Forest Act, Article 34 of Act No. 72 of 1968.
- The Advertising on Roads and Ribbon Development Act, No. 21 of 1940 and No. 16 of 1962.
- The Air Navigation Regulations promulgated in terms of the Aviation Act, No. 74 of 1962.
- Act 103 of 1996: Telecommunications Act
- The South African Transport Services Safety Regulations. and all Regulations and Bylaws promulgated under the above Acts

### C3.3.14.3 Operating Conditions

| | | |
|---|---|---|
| Nominal Voltages | 11 kV | 22kV |
| Rupturing Capacity | 20 kA | 20kA |
| Impulse Level | 95 kV | 125kV |
| Highest System Voltage | 12 kV | 24kV |
| Rated Short Time Current (3 s) | 20 kA | 20kA |
| Frequency | 50 Hz | 50Hz |
| Phases | 3 | 3 |

| | | |
|---|---|---|
| Atmospheric Temperature | -5°C minimum | +45°C maximum |
| Altitude | 0 m minimum to | 1100m maximum |
| Lightning & Dust | Severe | |
| Average Power Factor | 0,8 | |
| Maximum Humidity | 95% | |

### C3.3.14.4 Notices and Precautions

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, Telkom, Transnet, S.A. Transport Services, Provincial and/or National Road Authorities, Department of Environmental Affairs, Department of Water Affairs, Department of Forestry and other authorities as may be required with respect to the installation of overhead lines.

The Contractor shall take all the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees are not endangered.

The Contractor shall acquaint himself with the position of all existing services and infrastructure prior to commencing the installation. The Contractor shall acquaint himself with the position of all storm water pipes, water mains, sewer mains, gas pipes, telephone cables, etc. before any excavations are commenced.

The Contractor will be held responsible for damage to any existing services and will be responsible for the cost of all repairs.

### C3.3.14.5 Equipment Necessary

All plant, labour, materials and equipment required in adhering to the various standards, acts and regulations mentioned above, although not necessarily detailed in the specification, shall be provided for under this Contract and shall be to the approval of the Engineer.

The stringing method shall be submitted to the Engineer for approval prior to construction. Tension stringing shall be

employed as directed by the Engineer. The Contractor shall provide suitable dynamometers, thermometers, etc. for proper checking of the conductor tensioning.

### C3.3.14.6 Danger Notices and Phase Identification Discs

Danger notices according to the applicable standard, and with the wording "DANGER-GEVAAR-and the word for “Danger” in the local language" shall be fitted to all structures with transformers, mechanically operated switchgear and fuses.

Danger notices shall be fitted at all structures equipped with transformers, remote mechanically operated switchgear, cable or other apparatus, and at other positions as may be decided by the Engineer.

Danger notices shall be fitted at a height approximately 3 meters above ground level.

Where indicated by detailed drawings, anti-climb devices shall be installed on structures.

Phase identification discs corresponding to the colour of the phases shall be fitted at all terminal or tee-off structures.

### C3.3.14.7 Surveying and Pegging

The routes of the overhead power lines are shown on the drawings and where applicable, the necessary way leaves or servitudes shall be obtained by the Contractor.

The Contractor shall be responsible for ensuring that the route is accurately followed and that the best locations are selected for poles, taking into account topographical conditions, road crossings, telephone crossings, buildings, gates, etc. All requests for deviations shall be properly motivated and accompanied by a cost analysis by the contractor and must be authorized by the engineer.

The drawings show the layout generally after on-site investigation and the pole positions indicated take into account the above requirements within the limits of scale. Where the Contractor is in any doubt regarding routing or pole location, he shall, after having obtained the approval of the Engineer, employ the services of a registered Surveyor to obtain the correct locations. Reimbursement for the cost of such services will, subject to granting of approval, be made from the provisional sum included for this purpose. Any major deviation considered necessary must be approved by the Engineer.

The Contractor may not enter private property without the Land Owner’s consent. Where such consent is withheld, the Engineer is to be immediately notified.

The requirements of the National Environmental Management Act, 1998 (Act 107 of 1998); shall be followed in all instances.

The Employer reserves the right to alter the line route at any time prior to the installation of the overhead wires. Payment in respect of any additional or abortive work involved shall be in accordance with conditions of contract.

The Contractor shall ensure that the line route complies with the dedicated servitude registered.

### C3.3.14.8 Bush Clearance

This Contract is to include for the removal of all trees and bush within 5, 0 m of the centre line of the line, and for the lopping of branches encroaching within this area. Trees beyond these limits are also to be removed where they constitute a danger to the line or as necessary for construction. The extent of such clearance is to be checked on site prior to tendering, as no extra payment will be made due to lack of knowledge in this regard. All material cleared is to be removed from the site. However, the Contractor shall not be deemed to have ownership of any such material.

### C3.3.14.9 Line Impulse Level

The line Basic Impulse Level (B.I.L.) shall be maintained at the full voltage, namely:

| Line Voltage (kV) | Impulse Level (kV) |
|---|---|
| Up to 6,6 | 75 |
| 11 | 95 |
| 22 | 125 |

### C3.3.14.10 Line configuration

Single circuit lines shall generally be configured utilising H-poles and A-frame configurations.
Alternative configurations (e.g. Vertical inline, Staggered Vertical, Horizontal, Delta) shall be submitted to the Engineer for approval.

Double circuit lines shall be generally be configured utilising steel poles and structures, of horizontal arrangement with suspension attachment. Alternative configurations shall be submitted to the Engineer for approval. Armour rods shall be provided where required.

### C3.3.14.11 Poles and Supports

Wood poles shall be used unless otherwise specified, with the various constructional arrangements being indicated on the drawings.

Wooden poles shall normally be used and shall comply with SANS 753, Group strength "A" and shall bear the SABS mark of approval. Preservatives of the poles shall comply with the requirements for Type AI of SANS 1290 and the impregnation shall be carried out in accordance with SANS 10005 using the empty-cell pressure process. Poles shall be loop-tension banded at both ends where required. Wooden poles shall be capable of withstanding a minimum fibre stress of 55 MPa and shall conform to SABS 753 – 1982 and subsequent amendments.

Poles with a top diameter less than the values specified shall only be considered if these are capable of withstanding a fibre stress greater than 55 MPa such that the equivalent strength requirements are maintained. Nevertheless, the use of poles having a smaller top diameter than those mentioned shall be subject to the approval of the Engineer.

All wood poles are to be bound approximately 25 mm below the top with 3 turns of 3 mm diameter galvanized steel wire wrapped tightly around the pole, fixed with galvanized staples.

All poles shall have pole caps firmly fixed to the pole. These may either be in the form of PVC caps or comprise minimum 1 mm thick conical galvanized steel caps attached with clout nails to chamfered tops.

A template shall be used for marking off and drilling holes required for securing insulator brackets, supports, bolts, cross arms, cradle supports, etc. All drilling of wood poles and wood structures shall be done prior to erection and all drilled holes, cut surfaces and pole tops, etc. shall be properly coated with a creosote/tar mixture.

Dressing of poles (insulators, crossarms, attachments, bonding wire, downwire, etc.) shall be in accordance with detailed drawings provided by the Engineer.

Table of minimum diameters of wooden pole tops corresponding to pole lengths

| Length (m) | Min top diameter (mm) |
|---|---|
| 9,0 | 160 |
| 10,0 | 160 |
| 11,0 | 180 |
| 12.0 | 180 |
| 13,0 | 180 |
| 14,0 | 180 |
| 16,0 | 180 |

Poles for 11 kV and 22 kV lines shall generally be spaced not more than 120m apart and poles for LV lines shall generally be spaced not more than 55m apart. The spacing of LV lines in suburban areas shall be arranged to suite the requirements of city blocks and street lighting.

All the poles shall be installed with the marking tags facing the roadside where applicable or shall face in the same direction where a road does not exist alongside the overhead line.
Concrete poles, where specified shall comply with SANS 470.

### C3.3.14.12 Steel Poles and Structures

Steel poles and structures for overhead lines shall comply with SANS 10162 and SANS 10280.
Design guidelines for steel poles and structures are contained in SANS 10280.

Steel poles shall be suitable for use as self-supporting structures, and no stays shall be used.

The foundations for the poles or method of planting the poles are to be of the Contractor's own design. The Contractor shall take full responsibility to assess the soil conditions to ensure that the foundations meet the necessary

requirements.

The poles shall be of tapered design, and may be manufactured in circular hollow or angular sections. The design of poles shall appropriately consider environmental and aesthetical concerns.

Where specified, the poles shall be fitted with access doors and cable entry ports.
Poles may be equipped with either removable ladders or removable steps, as per particular specifications. Steps shall be vertically spaced at 300mm and shall allow the climber a comfortable climbing path.

All poles shall be vertical within a tolerance at the top of the pole of 0,3% of the overall pole height, before the erection of the pole. Proper precautions shall be taken that poles are not strained or damaged in any way during erection.

Documentation to be submitted for each structure must clearly demonstrate that the submitted equipment, pole and structure fully meet the requirements of the specification. Documentation shall indicate at minimum:
- Design moments at the base and at slip joints and at any other critical points along the pole, including the effects of the secondary moments due to deflection
- Deflections along the pole
- Calculated and allowable stresses at each level
- Ground line reactions
- PLS Pole (or similar software) files and output reports, which shall include sufficient detailed modelling such as pole sections, junction plates, insulators and base plates

Outline drawings shall be submitted which shall include the following information:
- Basic design information: Conductor, Earth-wire, Wind/ Weight/ Electrical Span
- Geometry: Attachment height, length, thickness, top and bottom outside diameters across flats for all pole segments and crossarms
- Steel grade and corrosion protection for all elements
- Overlap length for all slip joints
- Crossarms: Distance between crossarms, Crossarms overhang, Crossarm connection details
- Base plate and holding down bolt details (OD, ID, PCD, bolt grade, diameter and number).
- Insulators/ hardware assemblies: Type, material, number, dimensions, length of combined assembly, connectors, attachments
- Earth conductors shielding angles
- Design overturning moments
- Recommended raking angles for line angles in increments of 5-10 degrees

### C3.3.14.13 Pole Numbering

All poles are to be numbered from North to South and from East to West starting at pole number 1 nearest to the substation. Feeder numbering shall be as agreed with the Engineer (or as shown on issued drawings).

Number plates are to be 20mm x 70mm aluminium plates, with stencilled letters of minimum 10mm height.

The number plates shall be fixed to the pole by means of 2 nails at a minimum height of 1,5m above finished ground level.

T-offs to the left shall be numbered with the pole number from which it takes off and additionally numbered alphabetically. If a t-off in the opposite direction is also installed the numbering shall continue with the alphabet from where the last pole in the other t-off has stopped.

### C3.3.14.14 Excavations for Poles and Stays

Excavations for poles, stays and trench earths shall remain open for as short a period as possible. The Contractor shall erect and maintain guards, warning notices and lights at open excavations and soil heaps.

Poles and stays shall be installed in undisturbed soil.

After poles and stays have been planted, the holes shall be backfilled and well compacted. Compaction shall be executed in layers of not more than 300mm to obtain a high compaction density.

Poles shall not be installed in clayey soil or in swampy conditions without the necessary precautions to stabilize the installation. If unsatisfactory conditions for the installation of poles and stays are encountered during the excavations, the Engineer shall be informed without delay in order to facilitate alteration of the foundation design or alteration of the route of the line.

If wooden poles are installed in a concrete or other water retaining foundation, the pole shall protrude through the concrete to ensure adequate natural drainage to prevent rotting of the wooden pole in the foundation due to the accumulation of water between the pole and the foundation.

#### C3.3.14.14.1 Pole Holes

It is preferred that pole holes be auger drilled wherever this is possible.

Where pole holes are hand-excavated, the material is to be set aside in layers to ensure that during back-filling the material is replaced in its original strata. Compaction is to comply with the requirements set out under “Compaction” elsewhere in this specification.

The poles shall be planted at the following minimum depths:

| Length | Planting depth (m) |
|---|---|
| 9,0 | 1.7 |
| 10,0 | 1.8 |
| 11,0 | 1.8 |
| 12,0 | 2.0 |
| 13,0 | 2.2 |
| 16,0 | 2.6 |

When calculating the cubic capacity of hand excavated pole and stay holes for payment purposes, the following measurements will be applied:

| | | |
|---|---|---|
| 9, 0 m Poles | : | 1, 2 x 0, 62 x 1, 7 m deep |
| 10, 0 m Poles | : | 1, 2 x 0, 62 x 1, 8 m deep |
| 11, 0 m Poles | : | 1, 2 x 0, 62 x 1, 8 m deep |
| 12, 0 m Poles | : | 1, 2 x 0, 62 x 2,0 m deep |
| 13, 0 m Poles | : | 1, 2 x 0, 62 x 2,2 m deep |
| Stays | : | 1, 2 x 0, 62 x 1, 8 m deep |

Poles shall be planted vertically plumb and in line and sufficiently stayed to maintain that position.

#### C3.3.14.15 Cross-arms

Cross arms shall be of wood or steel cross-arms as specified. Cross-arms shall be of dimensions adequate to accommodate the insulator spacing.

Wood cross-arms shall be of suitable lengths and diameter for their purpose or as further detailed elsewhere in this specification. Wooden cross-arms shall comply with SANS 753, Group Strength "A" and shall be straight in grain. Preservatives shall comply with requirements above. Cross-arms shall be loop tension banded at both ends

Steel cross-arms where specified shall be manufactured from standard steel sections, and be galvanized. Steel cross-arms shall be hot dipped galvanized rolled steel channel section not less than 100 mm x 50 mm x 6 mm, unless otherwise specified and of suitable length for the particular purpose.

Table of minimum diameters of wooden cross arms

| Length (m) | Min top diameter (mm) |
|---|---|
| 1,2 | 140 |
| 2,0 | 140 |
| 2,5 | 140 |
| 3,0 | 140 |
| 3,5 | 160 |
| 4,5 | 160 |
| 6,0 | 160 |

Contact between cross arm and pole surfaces shall be such as to ensure no possible movement of cross arm, either longitudinal or rotational. Where necessary, suitable braces shall stabilize cross arms. Braces or Tie straps shall be manufactured of galvanized mild steel of suitable strength

Cross arms supporting strain insulators or cradles shall be mounted so that they pull towards the pole, no tension being taken by the attachment bolts.

Cross-arms and tie straps shall be bolted to poles using galvanized bolts, nuts and washers. Curved wood pole washers shall be fitted between bolt heads and the poles and between cross-arms and the poles. Back straps and

U-bolts may be used to attach wooden cross-arms to the poles.

Curved wood pole washers shall be galvanized malleable cast iron or mild steel with a minimum thickness of 6 mm and shall have a minimum square outside dimension of 63 mm.

### C3.3.14.16 Insulators

#### C3.3.14.16.1 MV Insulators

Insulators shall be chosen to provide the mechanical strength and insulation level required by the line at every point.

The voltage ratings of insulators shall be as follows:

| | | | |
|---|---|---|---|
| • | System Voltage | 11kV | 22kV |
| • | Flashover voltage | | |
| | ○ Dry | 95kV | 110kV |
| | ○ Wet | 53kV | 80kV |
| • | Puncture withstand voltage | 95kV | 130kV |
| • | 50% lightning impulse voltage | | |
| | ○ Positive | 140kV | 170kV |
| | ○ Negative | 165kV | 215kV |

Insulators shall be spaced to provide the conductor clearance required.

Pin insulators and their pins complying with SANS 60383 shall be used in straight line intermediate positions only. Longrod insulators shall be used in all strain, tension or angle positions, Clevis-and-tongue or ball-and-socket type insulators complying with SANS 60383 shall be used.

Curved wood pole washers shall be fitted between the collars of insulator pins and the cross-arm or pole and between the pin nut and the cross-arm or the pole, the washers shall comply with paragraphs above.

All steel or ironwork i.e., fittings, cross-arms, bolts, nuts, washers, etc., shall be hot dip galvanized to SANS 32 & 121. Insulators, complete with all fittings, shall not exhibit excessive or localized corona formation at voltages less than 1,3 times nominal phase-to-neutral voltage

Pin insulator shall be of Class B to SANS 60383.

Wherever string insulators are required, a single insulator shall be used on 11 kV systems and two insulators on 22 kV systems.

All metal parts shall be hot-dip galvanized in accordance with SANS 32&121 excluding the split pins for the securing of the gudgeon pin which shall be of phosphor bronze or stainless steel.

The insulators for nominal system voltages of 11kV and 22kV shall be designed to limit radio interference and the marking "RIF" shall appear on the insulator.

LV Insulators shall be white glazed porcelain complying with SABS 161. LV Strain insulators shall be type S.05 mounted in S.05/MD brackets, LV intermediate insulators being either S.05 insulators mounted on the side of poles in a vertical formation or P.05 insulators on P.05/M vertical spindle in a horizontal formation. Type S.05 insulators shall be provided with felt washers.

All spindles shall be correctly sized for the cross arms used.

All spindles mounted on wooden poles or cross arms are to be bonded with stranded galvanised steel wire.

The type of construction, method of insulator supports, details of brackets, spacing, etc., together will details of insulators for other duties or voltages are specified in detail elsewhere in this specification.

#### C3.3.14.16.2 LV Pin Insulators

Low voltage insulators shall be with top and side grooves. The groove sizes shall be suitable for the size of conductor used

Insulators shall be supplied complete with mild steel straight spindles, fibrous or neoprene washers, washers and nuts.

### C3.3.14.16.3 LV Shackle and Reel Insulators

All low voltage shackle and reel insulators shall have a side groove. The groove size shall be adequate to accept the conductor size used.

Where these insulators are specified for tension or angle points, hot-dip galvanized mild steel straps or "D" brackets and bolts, nuts and washers shall be provided. Two fibrous or neoprene washers shall also be provided for each insulator.

### C3.3.14.16.4 Stay Insulators

The minimum dry and wet flashover voltages shall be 35 kV and 30 kV respectively.
The ultimate breaking strength of the insulators shall be at least 110kN.

### C3.3.14.17 Fittings

All fittings shall be selected to ensure that their factor of safety is in compliance with the Code of Practice at the maximum design voltage. All fittings such as clamps, tower hooks, spindle brackets, eye nuts, rods, nuts, washers, stay rods, turnbuckles, etc., shall be hot dip galvanized mild steel, the galvanizing complying with the requirements elsewhere in this specification.

### C3.3.14.17.1 General Requirements for Fittings

Where metal parts are secured by bolts and nuts, single flat mild steel washers shall be used at both the bolt head and nut sides.

Bolts shall be locked by means of locknuts or other approved methods.

All line, earth conductor and stay wire fittings shall not employ screw threads loaded in tension with the exception of cross-arm eye bolts and turnbuckle type stay rods.

Adequate bearing areas between fittings shall be provided. Point or line contacts shall be avoided where possible without adversely affecting the flexibility of the fittings.

All split pins shall be of phosphor bronze or stainless steel and shall be backed by flat steel washers.

### C3.3.14.17.2 Tension Clamps

Tension clamps shall be of the bolted type "snail" clamps. The clamps shall be manufactured in compliance with SANS 61284.

Tension clamps shall not permit slipping of or cause damage to or failure of the complete line conductor or any part thereof at a load less than 95% of the ultimate strength of the line conductor for which it is intended.

The tension clamps shall be designed so that relative movement between individual conductor layers shall not occur during assembly.

All bolts or U-bolts shall be provided with locknuts.

The clamps shall match the clevis and tongue string insulator units without additional adaptors and shall also be suitable for the specified conductor type and size.

### C3.3.14.17.3 Thimble Clevises

Thimble clevises shall be used with preformed dead-ends. Thimble clevises shall be made of malleable cast iron. The radii of the thimble clevis shall be suitably designed to accept the preformed dead-ends.

The thimble clevises shall match the clevis and tongue string isolating units without any additional fittings.

### C3.3.14.17.4 Cross-arm Attachments, Shackles, Links, Adaptors and Yoke-Plates

These fittings shall be made of malleable cast iron and manufactured in compliance with SANS 61284.

The fittings shall match the specified immediate adjacent fitting or string insulator unit without the use of additional adaptors.

#### C3.3.14.17.5 Pole Washers

All bolts used in wood pole construction, all bracket fixing bolts, “A”-frame fixing bolts, cross arm bolts and insulator brackets are to be fitted with suitable heavy duty galvanized pole washers below the nut.

#### C3.3.14.17.6 Anti-Climbing Devices

Anti-climbing devices shall be fitted to all stays and all poles carrying transformers or mechanically operated fuses or switchgear.

Anti-climbing devices shall be provided on the poles for at least 1m at a height of 2m above ground for this purpose.

#### C3.3.14.17.7 Cradles

Where HV overhead lines cross roadways, railways and other supply lines, important communication lines and where an HV line is run above an LV line, an earthed cradle shall be installed or a double line configuration, as per instruction from Engineer. The longitudinal wires of the cradle shall not be less than 7,2mm² area and the cross lacing not less than 4mm².

### C3.3.14.18 Conductors

Full details of the conductors required are given elsewhere in this specification. Steel reinforced aluminium conductors to SANS 182, Part 3 shall be used for overhead lines.

Manufacturer's stringing and tensioning charts shall be used to erect conductors. Before making off, the conductors shall be strained to the initial sag or tension for the given temperature as specified by the Manufacturer.

Conductor running blocks shall be installed on all pole positions to run out the conductors. Conductors shall not be dragged along the ground.

The minimum conductor to ground clearances as stipulated in Occupational Health and Safety Act shall be closely observed.

Conductors shall be prestressed for not less than one hour before binding in. Binding-in at intermediate MV insulators shall be carried out using approved type proprietary binders. The binding-in shall be done strictly in accordance with the Manufacturer’s instructions. Care shall be taken to ensure that the binder is correctly sized for both the insulator and conductor. Binding-in at LV intermediate supports shall follow accepted good practice for the conductor used. For binding-in of aluminium conductor, armour-rods shall always be used except where armouring is automatically provided by the use of the proprietary binder installed. In this case, extreme care should be taken to ensure that all recommended conductor protection pads are properly in place.

Mid span joints shall be kept to a minimum and where unavoidable, shall be made with approved full tension line splices.

Conductor joints at non-tension points shall be made with two bolt parallel groove clamps. The current carrying capacity of the clamps shall be at least equal to that of the conductor.

Non-oxidising conducting paste shall be liberally applied to the inside of these clamps.

Where aluminium to copper connections is made, suitable bimetal clamps shall be used.

Where slack spans are employed, care is to be taken to ensure that conductors are free of kinks, bends, etc. and that the span has a neat and tidy appearance.

#### C3.3.14.18.1 Mid-Span Joints

Approved type proprietary mid-span joints (pre-formed or mechanical) shall be used for copper to copper or for aluminium-to-aluminium conductors. Such joints shall be made strictly in accordance with the Manufacturer’s instructions by persons trained in the use of the equipment and material. Mid-span joints of dissimilar conductors will not be permitted.

### C3.3.14.18.2 Connections and Joints

Connections shall be suitable for the particular conductors, and shall comply with the conductor Manufacturer's recommendations.

For aluminium to aluminium or copper to copper, non-voltage joints, these shall be parallel groove clamp, double lined tap or compression sleeve joints made with a hydraulic tool. Extreme care shall be taken to ensure that only compatible materials are used for jointing aluminium conductors. Terminating lugs shall be of the cold compression type.

Where aluminium to copper connections are to be made, either from line to line or line to cable tail, these shall be made using sacrificial tails. These tails, which shall be of the same material as the line, shall be joined by means of bi-metal connectors to prevent electrolytic corrosion occurring, and installed in accordance with the Manufacturer's recommendations. Where copper cables not larger than 25 mm² are to be connected to aluminium lines, grease tubes and aluminium line taps must be used. In all cases where joints are made between different metals, the copper conductor must be below the aluminium to reduce the risk of electrolytic corrosion. All aluminium-to-aluminium joints are to be coated with "Denso" paste regardless of the method of jointing, and are to be wrapped in "Denso" tape.

Any long tail or other connection is to be supported by stand-off pin insulators where likely to come into contact with any other line or earthed art of the installation. In all cases where connections exceed 1, 5 m in length, a stand-off insulator must be used.

Any cable box made off to equipment or line supported by "H" pole construction shall be attached at the centre of a suitable cross arm such that it is directly below the centre phase. The cable is to follow a gradual sweep from one of the poles.

### C3.3.14.18.3 Conductor Terminations

Cold compression, bolted snail clamps or preformed terminations shall be used. Suitable thimble clamps shall be used with the preformed terminations.

Trails and bridge wires must be neatly disposed and connected with clamps or line taps with a minimum of two per connection or by means of other approved mechanical connectors.

### C3.3.14.18.4 Connections between Conductors

Once an IPC connector has been applied to an ABC phase conductor (or any insulated conductor) it shall not be removed. The ABC insulation cannot be repaired by the use of grease and tapes and the ABC conductor and connector are best left as a now incorporated system.

Cut away phase conductors shall have their ends sealed. If the connection is in the wrong place leave it where it is and make a new connection at the desired point.

Non-tension connections between two ABC's shall be made using a 95/35 - 95/35 IPC.

Connection between cables including meter box cable and ABC shall be made using suitably sized bi-metallic connectors, with UV-resistant covering.

Connection between bare wire systems and ABC shall be made using suitably sized connectors of parallel groove bolted to IPC bolted type.

Connection between two bare wire conductors shall be made using two suitably sized PG clamps or suitably sized crimp connectors. All workers performing crimp connections shall be trained and certified as competent.
All bolted clamps used for connections shall have non-oxide grease applied.

### C3.3.14.19 Stay and Strut Pole Assemblies

Stays or struts shall be installed at every terminal support and at other points where it is necessary to ensure stability of the overhead line. Stay wires shall protrude at the bottom of the guy-grip and shall be tied to the stay rod with binding wire to ensure neatness. Stays shall be installed at an angle of at most 60º. Stay rods shall be installed at this angle and shall under no circumstances be bent to appear as being installed at the correct angle.

Strain insulators shall be provided in all stay wires (HV and LV).

Both HV stays and LV stays shall be adjustable with adjusting nuts and threaded rods.

HV stay rods shall be M20 size and LV stay rods shall be M16 size.

Strut poles shall be used on both HV and LV only where no other option exists. It is preferred that freestanding poles be used, baulked as described in the General Specification. Each strut pole shall be installed with a soil anchor assembly to prevent twisting and distortion of the supported pole.

Where strut poles are approved, these shall be complete with an anti-climbing device consisting of 3 x 500mm long anti-invasion pins secured 120° around the pole by 2 roof bolts that fits snugly around the pole and then wrapped with barbed wire.

The attachment bracket of the strut pole shall be as per relevant design and/or standardized drawings.

### C3.3.14.20 Stays

The position of stays shall be at least at every tenth pole in a straight line and at every turning point as instructed on the design drawings.

Wind stays must also be provided for straight lines in exposed positions. Struts shall not be used if this can be avoided by the use of aerial stays and pillar stays.

The angle between the stay and the pole must be between 35° and 45°. The stay must be made off on the pole, as near as practicable to the point of resultant stress, with at least one and a half complete turns around the pole, supported by a suitable clamp.

Stays shall in all cases be looped twice around the pole at a point mid-way between the two bolts in the case of an “A” frame construction or at the level of the middle conductor in the case of a vertical construction. Where two stays are called for, these shall be between vertical conductors, or at top and bottom bolts of an “A” frame.

For terminal poles of vertical line arrangements, at least two stays shall be used to prevent deformation of the pole; with the stay plates buried at least 1,8 m apart.

Stay holes shall be vertical, not less than 1,5 m deep and no wider than necessary to accommodate the base-plate, with a narrow side channel cut to embed the rod at the correct angle.

The base plate and portion of rod within the stay pole shall be firmly packed with hard material or concrete where necessary.

Stay pillars shall be concreted into the ground with top and bottom kicking blocks where required by the nature of the soil.

Stay insulators shall be installed as high as possible above ground level but far enough away from the structure to ensure that the portion of the stay below the insulator does not become alive.

Stay wire shall be of galvanized steel and the individual steel strands shall have a breaking stress of not less than 695 MPA and shall comply with SANS 182, Part 5. Stay wire make-offs shall be painted with bitumastic paint on completion.

Galvanized steel stay plates shall be painted with bitumen paint as well.

All stays are required to be fitted with stay guards.

Where MV and LV lines are supported on common poles, double stays shall be employed. Double stays must be installed one above the other, unless the Engineer approves otherwise.

Stay rods shall be galvanized steel of 400/500 MPa UTS of circular section with turnbuckle to BS 16 pattern 1. These shall have at least 30% take up remaining after the line has been energized. Except where specified to the contrary elsewhere in the Specification, stay rods shall be 20 mm diameter and 2, 5 m long and base plates shall be 600 mm square.

### C3.3.14.21 Earthing of Structures

Earthing requirements are specified in the standard specifications.

In cases where overhead earth wires are specified, a low impedance earth as determined by the Basic Impulse Level

of the line shall be provided at every pole along the line.

An earth connection is not required at every pole along a line with wooden poles and without overhead earth wires. Lines with metal poles shall be earthed at every pole.

Steelwork on wooden poles shall generally not be earthed except at structures for transformers, isolators, fuse-links, cable boxes, lightning arresters or other equipment which impairs the impulse flashover value of the insulation provided by the wooden structure.

All metal work to be bonded and earthed.

The connection between the overhead conductors and lightning arrestors and between the arrestors and the earth down lead shall consist of copper conductors of the required size. The connecting leads shall have smooth bends and shall follow the shortest possible route.

The earth down lead conductor shall be stapled to the pole at intervals not exceeding 1m. Where atmospheric conditions are likely to cause galvanic action, staples shall be of non-ferrous metal and an earth clip used where possible.

The earth conductor shall be threaded through a black polyethylene sleeve for at least 3m above the ground.

The earth conductor shall not be installed in steel conduit nor shall the conductor be wrapped around the pole at any point since this will increase the reactance of the down lead.

A trench earth shall be installed at earthed structures carrying equipment such as transformers, fuse-links, lightning arresters, etc. extending on at least two sides of the structures to achieve the required earthing values.

The earth resistance shall be determined following the installation of the trench earth. Earth resistance values specified or required by protective devices shall be checked. The earth resistance values required to maintain the B.I.L. of the line as specified above (assuming an average lightning current value of 25 kA), are as follows:

| | Impulse Level (kV) | Earth Resistance (ohm) |
|---|---|---|
| Up to 6,6 | 75 | 3.0 |
| 11 | 95 | 3.8 |
| 22 | 150 | 6.0 |

Should the earth resistance be higher than specified or required, additional earthing shall be provided. Trench earths shall not exceed 50m. Proprietary clays may be used for soil treatment to improve the earth resistance.

### C3.3.14.22 Earthwire on LV Systems

Where specified, a continuous earth wire shall be installed along LV (up to 1000 V) overhead lines in order to provide earth continuity between installations served by the line (ECC).

The earth wire shall be connected to every earth along the route in addition to the substation earth.

All metalwork and the top positions of stay wires shall be bonded to the earth wire.

The earth wire shall be above the conductors.

### C3.3.14.23 Fused Equipment Links

Expulsion type fused equipment links shall be installed at all transformers and where specified, as per correct ratings agreed with the Engineer.

Links shall be mounted on steel or wooden crossarms as per applicable design drawing.

The Contractor shall take care to ensure adequate support when installing conductor jumpers to links, and shall add support insulators where necessary.

Allowance shall be made for the supply of six fuses per set, three being spare. A maximum of 6 spare fuses of each size shall be provided, per installation. When specified, a link stick for the particular equipment provided with torch attachment is to be supplied under this Contract.

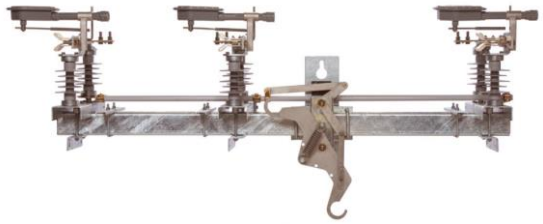
### C3.3.14.24 Gang-Operated Links

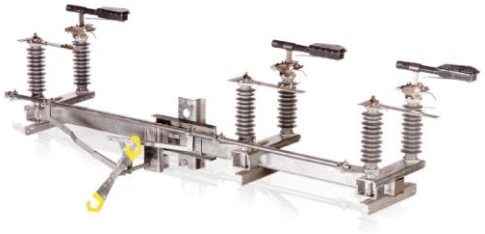
These are to comprise three phase on-load or off-load units (as specified), operated by means of a pole mounted handle. The unit is to be mounted on suitable steel cross arms on an "H" pole construction. The ganged links shall be mounted on single steel support crossarm, with interlinking mechanism and all fixtures and fittings.

The operating link mechanism, rods, handle, etc. shall be hot dip galvanized. The handle shall be lockable in both the "OPEN" and "CLOSED" positions and a suitable padlock shall be provided as specified under "Padlocks", elsewhere in this Specification. The operating rod shall be fitted with an insulated section to prevent danger to the Operator.

An earth electrode is to be installed 2 m from the isolator handle, on the opposite side of the pole and is to be connected to the pole top steel-work by means of a 35 mm² PVC insulated earth conductor. An earth mat is to be provided at a depth, not exceeding 150 mm deep at the operating position and is to be connected to the operating handle. Both spike and mat are to comply with the requirements under "Earthing" elsewhere in this Specification.

Alternatively, the ganged links may be operable by link-stick hook mechanism as shown in images below. The mechanism must securely rest in either "OPEN" or "CLOSED" position when switched. Indication of position must be provided at or close to the hook position and must be clearly visible from ground level.





The Contractor must submit full details of the ganged links proposed for purchase and installation to the Engineer for approval prior to ordering and delivery to site.

### C3.3.14.25 Surge Arrestors

Surge arresters shall be installed at all points where the steelwork has to be earthed and where specified.

The arresters shall be connected to the overhead conductors by the equivalent of 16mm² (minimum) copper conductors minimum.

Surge arresters shall be placed on all the phase conductors:
- At each termination of a cable on the overhead line.
- At every line sectionalizer or recloser.
- At each connection point to secondary lines.

Surge arresters shall be mounted below the overhead conductors in order to reduce the length of the discharge path.

An earth shall be supplied and installed at each point where surge arresters are installed.

Surge diverters for installations with a rated voltage above 1000V shall conform to SANS 60099-1 "Non-Linear Resistor Type Arresters for AC Systems" and shall be 10 kA Series A arresters of the heavy-duty type.

Surge diverters for installations with a rated voltage of up to 660V shall comply with SABS 171. The voltage rating for these surge diverters shall be 250V, 500V or 660V with an insulation resistance of not less than 50 mega ohms.

The surge arrestors shall, unless specified to the contrary elsewhere in this specification, have a rated current of 10kA and rated voltage of 36kV rms: minimum flash-over voltage of 48kV rms at 50 Hz and 48 kV peak with a 1,2/50 wave form and peak discharge voltage with 8/20 µs current wave.

A set shall comprise three units, complete with suitable steel cross arm mounting bracket.

Earthing shall be to an earth spike, as specified under "Earthing" elsewhere in the Specification. Where the arrestors have a connection of a metal not compatible with the earth conductor, a sacrificial tail shall be used, generally as specified under "Overhead line – Connections and Joints" elsewhere in this Specification.

### C3.3.14.26 Transformer Mountings

Transformers with a power rating of up to 100kVA may be mounted on a single pole with the mounting brackets as specified in SANS 780.

Transformers with a power rating in excess of 100kVA and with a maximum of 315kVA shall be mounted on a platform between two poles.

The transformer platform for pole mounting shall consist of galvanized steel channels bolted to the two poles.

Transformer mounting arrangements shall be in accordance with the issued drawings.

### C3.3.14.27 Auto-Recloser and Sectionalizer Installation

The respective Auto reclosers shall be installed in the positions as indicated on the design layout drawings.

Refer to relevant design and/or standardized drawings for the installation details of a pole mounted auto reclosers. The earthing requirements shall be the same as for transformer structures.

In-line 3-pole (where low voltage control is required), and 2-pole structures (where no low voltage control is required) shall only be considered if there is no space for 4-pole structures.

### C3.3.14.28 Supply to a Consumer

The connection between the main line and the branch line to the consumer shall be done by means of a jumper and crimped T-ferrule. Fuses can be installed in the bridge connection if required and the installation can be made neat and practical.

Alternatively, if the 11 kV line to the consumer is longer than 2 spans, 11 kV fuses for the branch line shall be installed at the first pole of the branch line. If the 11 kV line to the consumer is 2 spans or less, 11 kV fuses for the branch line shall be installed at the transformer installation or on the pole before the transformer.

Refer to the relevant drawings for installation details of a single branch (T-branch) and a double branch (cross branch).

## C3.3.15 Aerial Bundled Conductor Lines

### C3.3.15.1 Scope

This specification covers the construction of the aerial bundled transmission lines as indicated on the design drawings. All material and construction tools and equipment shall be provided by the contractor.

All the appropriated regulations detailed in the Occupational Health and Safety Act, Act No 85 of 1993 shall be complied with.

### C3.3.15.2 General

The construction and installation of LV overhead lines and stays shall correspond to the foregoing specifications for Overhead Power Lines.

Wooden poles and crossarms shall be used throughout the feeder lines

All clearances shall be in accordance with the Electrical Machinery Regulations (Regulation 1593) of the OHSA. The table in the Regulation is repeated hereunder, but shall be read with the provisions in the Act and the Regulations, as well as any amendments which may occur from time to time.

The area of all servitudes of 6m wide, 3m on either side of the centre line of the route of the 11kV and 22kV overhead lines, shall be cleared of trees, plants, shrubs and other vegetation.

All galvanized metal work that is cut on site shall have anti-corrosion treatment applied immediately i.e. cold galvanizing.

### C3.3.15.3 System and Environmental Requirements

System parameters

| | |
|---|---|
| Primary Nominal Voltage | 420/240V |

| | |
|---|---|
| Impulse Level | 75kV |
| Highest System Voltage | 420V |
| Rated Short Time Current (3 s) | 15kA |
| Frequency | 50Hz |
| Phases | 3 |

The overhead lines shall be operating continuously under all weather and climatic conditions throughout the year, which conditions shall be as follows:

| | |
|---|---|
| Atmospheric Temperature | -5°C minimum +45°C maximum |
| Altitude | 0 m minimum to 1100m maximum |
| Lightning & Dust | Severe |
| Average Power Factor | 0,8 |
| Maximum Humidity | 95% |
| Height above sea-level | 0m - 50m above sea level |
| Maximum environmental temperature | 45º C |
| Ultra violet radiation | Severe |

#### C3.3.15.4 Aerial Bundle Conductors

Conductor shall be of type and size as specified in the Project Specifications and Bill of Quantities.

#### C3.3.15.5 ABC Fittings and Clamps

ABC shall be fitted to poles via an ABC bracket fitted to the pole with threaded or pigtail bolts as per the material specifications and detailed drawings. Strain clamps shall be tied in, in the closed position with three additional cable ties on the clamp itself and one additional cable tie on the wedge. These cable ties ensure the wedge will not release when the strain on the clamp is released.

Cable ties shall be installed on both sides of the strain clamps to ensure the ABC does not untangle and to ensure neatness of the installation. A minimum of three cable ties shall be used. This applies to both strain and suspension clamps.

All clamps shall be fixed to the neutral of the ABC.
Care shall be taken to ensure suspension clamps are locked in place after installation.

All IPC's shall be fastened until the plastic nut strips. No IPC shall be removed once installed. If installed incorrectly the secondary conductor connected to the ABC shall be cut off and sealed with a suitable end cap. IPC's shall be installed at least 100mm apart with a cable tie fastening all conductors in between. Care shall be taken when installing IPC to ensure no damage is done to other conductor insulation when the IPC is closed and fastened. Any damage to conductor insulation shall be reported to the Engineer. Conductor separation equipment shall be left in place until the IPC is fully tightened.

#### C3.3.15.6 Installation of Conductors

The line servitude shall be free of trees and any other foreign material from ground level to 3m above and around the LV overhead lines.

Poles shall not be spaced more than 55m apart for single ABC configuration and 30m for double ABC configuration.

#### C3.3.15.6.1 Planning

The installation shall be planned in such a way that the remnants/off cuts can be used for other installations to minimize the quantity of conductor wasted. The cost of unnecessary off cuts will not be for the account of the Employer.

#### C3.3.15.16.2 Installation Method

The cable drum shall be broken during running out to prevent overrun and damage to the conductor. The conductor shall not be dragged on the ground when being drawn between the poles.

A pulley shall be mounted below each ABC bracket on the intermediate poles. Conductor shall not be drawn over the brackets. After the conductor has been drawn up to a terminal pole, it shall be lifted to the brackets with suspension clamps from the pulleys.

The conductor shall be tensioned to the prescribed tension. Manufacturers' stringing and tension charts shall be used. Initial tensioning of conductors shall be by means of suitable rated winches or chain ratchet pullers and "come along" designed for the type and size of conductor specified.

The slack in the conductor shall be rolled onto the conductor drum.

Care shall be taken to ensure that the LV conductors shall have the same sag as the HV conductors on any particular route where they are running along a common route. Records of temperature sag and tension for each strain section shall be kept and three copies of such a record shall be submitted on completion.

The contractor shall make suitable arrangements for temporary staying of poles and anchoring of conductors when necessary.

Complete drum lengths of conductor shall be used as far as possible without cutting to reduce the number of joints.

All cable and bundle ends shall be supported onto the pole to prevent tension on the conductor and to control the bending radius. Bundle conductor ends shall be strapped with 6 x PVC banded straps before rolled from the drum to prevent uncoiling.

The minimum bending radius of each bundle shall not exceed the radius prescribed by the manufacturer. Care shall be taken that the bundle maintains its' normal coil after installation.

Phase rotation shall be the same on each transformer connection.

#### C3.3.15.16.3 Joints and Terminations

All joints of conductors shall be of approved materials only but shall be limited to the absolute minimum.

No mid-span joints shall be made without the approval of the Engineer, and no joints shall be made in spans crossing roads, railway lines or other overhead services.

No joints shall be permitted in a service connection unless specifically approved by the Engineer.

The Contractor shall keep a record of the spans in which joints are made, as well as drum numbers and position in line during the stringing. Three copies of the records are to be submitted and incorporated into the as-built drawings on completion of the project.

### C3.3.16 Consumer Connections and Installations

#### C3.3.16.1 Pole Mounted Circuit Breaker Boxes

Circuit breaker box must be installed on a single wooden pole. The construction of the box shall be weatherproof and vandal resistant. The back of the kiosk shall consist of brackets and clamps for the fitment on the wooden pole. The front of the pole mounted circuit breaker box shall be accessible with a door that can be locked with a padlock.

The circuit breaker box shall have sufficient dimensions to accommodate the equipment specified in the Project Specifications and detailed drawings.

The following shall be installed in the pole mounted circuit breaker box:

1. Busbar(s) for the connection of phase conductor(s), equal to number of phases indicated on design drawings.
2. A neutral busbar with a 200A rating on which neutral conductors can be connected and terminated.
3. A busbar on which all earth conductors can be connected and terminated.
4. Installation brackets for the mounting of 6kA/10kA circuit breakers similar to the CBi QF series.
5. The Circuit breaker boxes shall make provision for the amount of service connections specified in the Project Specifications and detailed drawings.
6. Installation of split unit prepaid meters with the circuit breakers.
7. The bottom of the circuit breaker box shall have knock-out cable entries. The cable feeders for the circuit breaker boxes are for aluminium conductors insulated with XLPE and or equivalent. Service connection feeders are for 10mm² concentric "Airdac" cable or 10mm² 2-core armoured cable.

A danger sign of minimum size 100 mm x 60 mm that forms an integral part of the lid shall be provided (WW7 of SANS 1186).

### C3.3.16.2 Service Connection Cable

The service connection cables shall be appropriate for installation on a kicker pole and for connection in the pole mounted distribution kiosk and consumer installations.

The maximum length over which the cable may be installed is 80m.

Additional 7m wooden kicker poles will be required where house structures are at the far side of each stand, or where structures are deemed to be inadequate to accommodate strain exerted by the overhead connection, or where clearance requirements are to be met.

The service connection cable shall adhere to SANS 1507-6 and shall have a separate neutral and earth (SNE).

The composition of the cable must be as follow:

1. 10mm² stranded copper conductor insulated with XLPE
2. Seven insulated copper conductors with an effective cross-sectional area of 10mm² for the neutral conductor.
3. Three bare copper electrical conductors with an effective cross-sectional area of 7.5mm²
4. Outer cable sheath covered with ultraviolet stabilized polyethylene.

### C3.3.16.3 Airdac Strain Clamps

The strain clamps for the service connection cable shall be installed on the pole on which the pole mounted circuit breaker box is installed, the kicker pole and at the dwelling where the cable is terminated at the consumer installation inside the dwelling.

The strain clamps shall be fitted with wedges and installed so that the cable is fastened as the strain on the cable increases. The inside surface of the wedges must be lined to prevent insulation damage of the “Airdac” cable.

The construction of the strain clamps must make provision for installation on a pig tail or eye nut bolt and be of the Sicame PP63R17 range or similar.

### C3.3.16.4 Airdac Suspension Clamp

Suspension clamps must be installed where the Airdac cable is suspended without deviation in the line route. The suspension clamp must be installed onto a pigtail bolt.

Suspension clamps shall be of the Sicame BD63 range or similar.

### C3.3.16.5 Airdac Cable Terminations

Terminations shall be done where the “Airdac” cable is terminated at the consumer connections and at the pole mounted circuit breaker boxes. The cable terminations must provide firm clamping and seals of the cable entries.

Entries into dwelling shall include drip loop on the outside of dwellings, and conductor shall be fixed to the dwelling with suitable cable saddles at 250mm spacing.

## C3.3.17 Pole-Mounted Transformers

This specification covers the manufacture of distribution transformers for general reticulation and distribution systems in normal environmental conditions for 50 Hz, three-phase, 11kV or 22kV (nominal) primary and three-phase four-wire 420 V (nominal) secondary systems. The transformers shall be of the low loss type.

This specification covers the minimum requirements for the manufacture, testing and supply and delivery of distribution transformers suitable for use in for the specified application.

The transformers shall comply with the requirements of SANS 780. Only new transformers will be accepted. Pole mounted transformers shall be provided complete with all the necessary brackets for fitment onto wooden structures.

### C3.3.17.1 Power Rating

The rated power of the transformer shall be as specified and shall be one of the standard values given below in accordance with SANS 780.

Single-phase Transformers (kVA): 16, 25.

Three-phase Transformers (kVA): 25, 50, 100, 200, 315, 500, 630, 800, 1000.

### C3.3.17.2 System and Environmental Requirements

System parameters

| | | |
|---|---|---|
| Primary Nominal Voltage | 11 kV | 22kV |
| Primary/Secondary configuration | Delta/Star | Delta/Star |
| Secondary nominal voltage | 400/242 | 400/242 |
| Rupturing Capacity | 20 kA | 20kA |
| Impulse Level | 95 kV | 95kV |
| Highest System Voltage | 12 kV | 24kV |
| Rated Short Time Current (3 s) | 18.3 kA | 15kA |
| Frequency | 50 Hz | 50 Hz |
| Phases | 3 | 3 |
| Insulation temperature | class H | class H |
| Vector group | Dyn 11 | Dyn 11 |
| Method of cooling | ONAN | ONAN |
| Earthing | Neutral earthed | Neutral earthed |

The transformers shall be manufactured to be in use continuously under all weather and climatic conditions throughout the year, which conditions shall be as follows:

| | |
|---|---|
| Atmospheric Temperature | -5°C minimum +50°C maximum |
| Altitude | 0 m minimum to 1100m maximum |
| Lightning & Dust | Severe |
| Average Power Factor | 0,8 |
| Maximum Humidity | 95% |

### C3.3.17.3 Breathing

Single-phase transformers shall be of the hermetically sealed type, with the tank covers welded to the tank.
Three-phase transformers shall be of the hermetically sealed type up to the power ratings of 500kVA.
Sealed transformers above 500kVA rating shall be fitted with a pressure relief device, secured to the welded tank cover.

### C3.3.17.4 Construction Details and Fittings

The transformer shall be fitted with the recommended standard fittings for transformers as specified in Table 1 of SANS 780 and as specified below:

An off-load tapping switch shall be provided on all transformers, including miniature substation transformers when specified.

Single-phase and pole mounted transformers up to 50kVA shall be fitted with mounting brackets and supplied with attachment material for single pole mounting. Transformers of sizes exceeding 50kVA must be mounted between two poles on a steel platform.

Longitudinal skid underbases shall be provided on all transformers of power ratings of 500KVA and above.

The Contractor shall submit full design details of transformers to the Engineer for approval, prior to manufacture and delivery to site.

### C3.3.17.5 Bushings and Cable Terminations

Open bushings and outdoor terminals shall be provided on both the primary and secondary sides of the transformers.

### C3.3.17.6 Terminals for Three-Phase Transformers

Bolted connections only are acceptable.

### C3.3.17.7 Technical Information

All the relevant technical information i.e. outline drawings, test cards, drawings of rating plate, etc. as specified in SANS 780 shall be submitted to the Engineer and the Employer.

In addition, a test certificate stating the average breakdown voltage of the oil at time of filling shall be submitted to the Engineer and the Employer.

## C3.4 Particular (Project) Specifications

### C3.4.1 General

Information regarding the scope of the project, the site, alterations and additions to the General Specification and other aspects relevant to the construction are given below.

Tenderers must take due cognisance of these and tender rates must make provision for any additional costs due to the factors mentioned.

Notwithstanding the information given, it remains the responsibility of the Tenderer to ascertain the actual conditions on site before submitting a tender.

The various items and materials will adhere to the standardised specifications listed in section C3.1.

### C3.4.2 Supply authority

Dawid Kruiper Municipality is the Supply Authority and they will be responsible for the operation and maintenance of the electrical infrastructure on completion.

### C3.4.3. Other contractors

No development is currently planned on the proposed site of works. The Engineer will notify the successful bidder of such developments.

### C3.4.4 Project/Site Specific Requirements for OHS&E

#### C3.4.4.1 Health and Safety Plan

The contractor, his/her management and/or any of his/her personnel must comply with all the regulations as shown in the Occupational Health and Safety law 85 of 1993 before any access to the site may be granted by the Employer or the Employer's agent. The necessary documentation in accordance with these regulations must be submitted in writing to the Dawid Kruiper Municipality.

In compliance with the Construction Regulations the Contractor shall, after performing a risk assessment, prepare a health and safety plan for approval by the Employer or the Employer's agent and which will be kept and maintained on site by the Contractor for the full duration of the works.

The health and safety plan shall include, but not be limited to, the following:

- The safety management structure including the names of all designated persons such as the construction supervisor and any other competent persons;
- Safety method statements and procedures to be adopted to ensure compliance with the OHSA. Aspects to be dealt with shall include, but not be limited to:
  - Public vehicular and pedestrian traffic accommodation measures;
  - Control of the movement of construction vehicles;
  - The storage and use of materials;
  - The use of tools, vehicles and plant;
  - Temporary support structures;
  - Dealing with working at height;
  - Environmental conditions and safety requirements in working hazardous materials including asbestos cement products;
  - Security, access, control and the exclusion of unauthorised persons.
- The provision and use of temporary services;
- Compliance with way-leaves, permissions and permits;
- Safety equipment, devices and protective clothing to be employed;
- Emergency procedures;
- Provision of welfare facilities;
- Induction and training;
- Provision and maintenance of the health and safety file and other documentation;
- Arrangements for monitoring and control to ensure compliance with the safety plan during execution of the

works.

### C3.4.4.2 Specific Activities and Considerations

The following is a list of specific activities and considerations that have been identified for the project and site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor:

a) Clearing and Grubbing
b) Earthworks
c) Site Establishment
    i) Offices
    ii) Secure / safe storage for materials, plant and equipment
    iii) Ablutions & Sheltered eating areas
    iv) Vehicle access to the site
d) Location & dealing with existing structures
e) Installation and maintenance of temporary construction electrical supply
f) Adjacent land uses / surrounding property exposures
g) Boundary and access control public liability exposures
h) Health risks arising from neighbouring as well as own activities
i) Exposure to noise & vibration
j) Protection against dehydration and heat exhaustion
k) Protection from wet and cold conditions
l) Dealing with HIV/Aids and other diseases
m) Use of portable electrical equipment
n) Excavations including:
    i) Ground/soil conditions
    ii) Trenching
    iii) Shoring
    iv) Drainage
    v) Daily inspections
o) Welding
p) Loading and offloading of trucks
q) Aggregate/Sand and other Materials Delivery
r) Driving and operation of construction and mobile plant
s) Mobile cranes and the ancillary lifting tackle
t) Use and storage of flammable liquids and other hazardous substances
u) Layering and bedding of trench floor
v) Installation of Pipes in trenches
w) Installation of bends, valves, air valves, non-return valves etc. as per bill of quantities, drawings, and specifications,
x) As discovered by the principal contractor's hazard identification exercise
y) As discovered from any inspections and audits conducted by the client or by
z) the principal contractor or any other contractor on site.
aa) As discovered from any accident / Incident Investigation

### C3.4.4.3 Particular Requirements

The following are in particular requirements depending on scope of works and will form a basis for compliance audits.

1. Administrative & Legal Requirements
2. Education, Training & Promotion
3. Public Safety & Emergency Preparedness
4. Personal Protective Equipment
5. Housekeeping
6. Scaffolding, Formwork & Support work
7. Ladders
8. Electrical Safeguarding
9. Emergency/Fire Prevention & Protection
10. Excavations & Demolition
11. Tools
12. Cranes
13. Personnel & Material Hoists
14. Transport & Materials Handling
15. Site Plant & Machinery
16. Plant & Storage Yards/Site Workshops Specifics
17. Health & Hygiene

#### C3.4.4.4 Environmental Requirements

The Contractor's program shall make allowances for the continuous adherence to the requirements of the Construction Environmental Management Plan. Special attention should be paid to items such as demarcation of work areas as well as the maintenance of said demarcation.

Removal of solid waste from campsites to a licensed municipal solid waste site should be conducted for the duration of the contract.

Sufficient temporary sanitation facilities (including the maintenance thereof) of a type approved by the Engineer should be made available at the pipe line workface as well as on the static sites for the duration of the contract.

### C3.4.5 Requirements for Traffic Management

This specification relates to the procedures and equipment required to supply, install and maintain temporary road safety signage, delineators, traffic cones and other traffic management measures for the duration of this contract.

#### C3.4.5.1 Requirements

During all his operations and when using his machinery, plant and equipment, the Contractor shall at all times take the necessary care to protect the public and to facilitate the traffic flow. The Contractor's rates and pricing is assumed to make provision under the designated tariff in the Preliminary and General cost to allow for the following:

i) To create temporary access for both vehicles and pedestrians
ii) To provide detours where necessary
iii) To provide, install and maintain traffic- and warning signs as required

A large portion of the works for this contract are to take place primarily within the road reserves of the residential areas of Keimoes.

In order for these works to be conducted, a wayleave has to be obtained from the Dawid Kruiper Municipality's Technical Services Department. Wayleaves for work in road reserves are granted only when both parties agree to the conditions set out in the wayleave approval.

Accordingly, this specification deals with the requirements in terms of signage, access onto or off any provincial road, maximum working width allowed and traffic management in general.

#### C3.4.5.2 Temporary Road Safety Signage

The Contractor shall supply, install and maintain temporary road traffic signage for a distance of 1km (one) on either side of the workplace in the road reserve as per the drawings in this document. Should the contractor choose to operate more than one site in the road reserve at the same time, sufficient signage will be required for multiple sites.

All road signs will be fitted to light metal stands which will be erected during working hours and laid flat during non-working hours. Signs are to be anchored on the road side by means of sandbags. Rocks and other material will not be acceptable and will be subject to penalties. Signage must be of the diameter and sizes as specified on the drawings and commensurate with the traffic speed on the road.

<u>Materials of manufacture:</u>
Retro reflective materials recommended for use on temporary road signage are as follows:

- Black – semi-matt finish
- Yellow background – Class I retro reflective material
- Red - Class I retro reflective material

<u>Maintenance of signage:</u>
Contractors are required to make their on-site Safety Officer responsible for the maintenance of all road signage. This means that signs have to be kept in a clean, serviceable condition for the duration of the contract. Scraped, dusty and damaged signs shall be rejected and will need to be replaced at the contractor's cost.

#### C3.4.5.3 High Visibility Equipment:

The following high visibility equipment is to be supplied, used and maintained on site for the duration of the contract:

- Worker's clothing (overalls and/or hardhats) to be red-orange, orange or yellow in colour
- All flagmen and workers involved in direct traffic control operations shall wear a high visibility retro reflective

waist coat at all times.

- All site vehicles such as tipper trucks, LDV's, Front end loaders, etc. shall be equipped with amber flashing lights which shall be operational at all times.
- All vehicles and equipment utilizing the road must be equipped with rear panels with black lettering on a yellow background marked: CONSTRUCTION VEHICLE

#### C3.4.5.4 Access Onto or Off the Provincial Road

Contractors are to take note that temporary on-ramps and off-ramps are only allowed at intervals of one access per 500m. Non-compliance with this requirement will lead to penalties being imposed on the contractor.

#### C3.4.5.5 Working Width Inside the Road Reserve

A working width of maximum 20m has been allowed within the road reserve. This implies that the contractor should erect a temporary demarcation at a distance of 20m measured from the road reserve fence line. Failure to comply with this requirement will lead to penalties being imposed. There are numerous instances that the available working width will be less than 20m, and the works activities will encroach onto the road surface. All required measures are to be taken to regulate traffic accordingly in such instances.

#### C3.4.5.6 Protection of the Environment

In accordance with the Environmental Management Plan attached to this document, no vegetation may be removed or damaged outside of the demarcated areas. There may be protected tree species within the allowed working width for which removal permits need to be obtained from the Department of Forestry. Contractors are implored to modify the alignment of the pipe line within the demarcated area as far as is practical to avoid the removal and/or damage to protected tree species. Negligence in this regard will be met with penalties.

#### C3.4.5.7 Penalties

Should the contractor at any time during the contract fail to:

- Provide the correct signage at the workface;
- Provide insufficient signage or flagmen;
- Anchor temporary signage with anything except sandbags;
- Operate vehicles without flashing lights;
- Conduct works outside the allowed working area;
- Unnecessarily remove protected tree species;
- Transgress on any of the requirements of this specification

The Contractor may be imposed with a penalty fine which will be determined by the Engineer and/or the Environmental Consultant with fines ranging from R100-00 for minor transgressions to a maximum of R25 000-00 for more serious transgressions.

#### C3.4.5.8 Measurement and Payment

The items for this specification are measured in the Preliminary and General section of the Schedule of Quantities. The items for payment include:

Fixed Cost Items:
Supply and erection of suitable temporary road safety signage and ancillaries for the duration of the contract at the workface: Unit: Sum

Time related Cost Items:
Maintenance and repair of all temporary road traffic safety signage employed on the works for the duration of the contract: Unit: Sum

### C3.4.6 General Items Applicable

#### C3.4.6.1 No Limitation by Description

Nothing appearing in the specification or Schedule of Quantities shall limit the obligations and liabilities of the Contractor, the Engineer, or the Employer under the conditions of contract.

### C3.4.6.2 Approval

No approval or acceptance of any material or equipment and its operation, or of any installation procedure to be used, or of any Contractor's drawings or instructions, shall imply any relaxation of the requirements governing the quality of the materials or of the finished work, or relieve the Contractor of his responsibilities under the Contract.

### C3.4.6.3 Items in Schedule of Quantities

The rate or price tendered by the Contractor for a scheduled item shall be deemed to cover the Contractor's profit plus the cost to him of all labour, materials, plant, equipment and facilities required by him to carry out the operations or activities required by the applicable standard specification or in the measurement and payment clause of the Project Specification.

The Contractor's charges for completing a preliminary and general item scheduled in the Schedule of Quantities, shall be interpreted to be his rate or price to cover his direct costs plus overheads, and to include his profit and all costs and expenses that he requires for the item specified and for all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based.

### C3.4.6.4 Tools and Spares

As part of the equipment supplied, the Contractor shall supply all special tools or keys required for adjustment to any parts of such equipment. Where ordered by the Engineer, the Contractor shall supply standard spanners and a cabinet to the size and details ordered. The Contractor shall supply such spares, if any, ordered by the Engineer from those listed in the Spares Schedule that forms part of the Detail Sheets.

### C3.4.6.5 Defective Items

Any parts or items found to be defective shall be replaced or repaired at the Contractor's expense, to the Engineer's approval.

### C3.4.6.6 Storage of Goods on Site

In the event of the Engineer not being satisfied with the provisions for storage provided by the Contractor on Site, he may order all goods and erection equipment to be delivered to the Employer's stores and stored therein at the Contractor's risk and cost. Whether goods are stored at the Employer's stores on the order of the Engineer or on the request of the Contractor, the Contractor shall provide all handling and transport to move the goods and erection equipment to the Site of the Works when required.

### C3.4.6.7 Interim Storage

If the Engineer gives notice that physical delivery to the point stated in the Project Specification is temporarily inadvisable, delivery shall be delayed until authorized by the Engineer. The giving of such notice shall not relieve the Contractor of any obligations undertaken by him in regard to physical delivery at the point stated in the Project Specification but, as an interim measure, for the purpose of vesting ownership of such goods in the Employer, the Engineer will either:

a) order the Contractor to deliver the goods to the Employer at:
   i) the Employer's main store, or
   ii) a store provided in the vicinity of the Site by the Employer, in which event the Contractor shall so deliver the goods to be stored there at the Contractor's risk, or
b) order the Contractor to store the goods for the Employer in suitable premises provided by the Contractor, in which event the Contractor shall store the goods for the Employer at the Contractor's risk.

### C3.4.6.8 Inspection and Vesting of Ownership

The Engineer or a person appointed by him will inspect the goods for provisional approval as soon as possible after they are stored in terms of the Engineer's order. Notwithstanding that any of the goods are stored, ownership therein shall pass to and vest in the Employer upon payment therefore.

### C3.4.6.9 Contractor's Draft Programme

Within the time stated in the Contract Data, the Contractor shall submit to the Engineer for approval a draft proposed programme for the manufacture, installation, testing and commissioning of his equipment.

### C3.4.6.10 Contractor's Final Programme

The Contractor, in conjunction with the civil and other contractors, if any, and the Engineer, shall draw up a detailed installation and finishing programme showing the installation, testing and painting of the equipment and structures and the commissioning of the Works.

Should the Contractor deviate from the agreed programme he shall be liable for any costs arising from such deviation.

### C3.4.6.11 Setting Out

The Contractor is responsible for setting out the works to the dimensions shown on the drawings, and the Contractor shall do all surveying of any supply lines. Contractor shall allow for a qualified surveyor in his pricing.

### C3.4.6.12 Office, Workshops and Stores

The Contractor shall erect and maintain at his own cost all covered storage and offices that he may require. The yard shall be fenced by the Contractor and maintenance of the yard shall be his responsibility. The yard shall at all times be kept in a clean and tidy condition, to the satisfaction of the Engineer.

On completion of the project, all structures and installations shall be removed from site, to the satisfaction for the Engineer.

### C3.4.6.13 Provision of Standard Specifications

Where any specification is listed and makes reference to other published standards, or specifications of a similar nature, the Contractor shall arrange at the request of the Engineers, to make available at least one complete set of the latest edition of all documents so referenced.

The documents shall be kept in the Contractor's site office where they shall be available for reference at all times by the Contractor's personnel or the Engineer until completion of the Works.

### C3.4.6.14 Community Liaison Officer (CLO)

If and when required by the Employer, the CLO shall be identified and recruited by the Employer to act as a liaison person between the Contractor, the community and the persons to be employed. The CLO must be appointed in writing and the description of duties and responsibilities (as available from the Employer) must be communicated to the CLO at the time of appointment. The CLO's salary will be paid by the Contractor and a Provisional Sum has been allowed for this purpose under the Preliminary & General Items.

### C3.4.6.15 Labour Intensive Activities

The normal rules and regulations in terms of the Labour Act must be adhered to. Agreed wages for the local region must be paid the recruited labourers, and formal labour contract documentation must be in place prior and during their period of employ.

The appointment of Local Labour shall adhere as far as possible to the requirements stipulated by the EPWP Requirements for the full duration of the works.

Reporting of Job Opportunities:
The Contractor shall be responsible to submit together with his monthly performance claims a complete detailed record of all labour on site to the Engineer for the processing of monthly payment certificates and failure to do so will result in a breach of contractual compliance and nor the Employer nor his agent will be held liable for late payments to the Contractor.

When reporting labour, the Contractor shall provide a name, identity number, signed employment contract, and signed payslip for each and every temporary labourer employed during each month. A template will be provided to the contractor to record this information on a monthly basis.

The following activities must be executed with local labour:

i. Normal excavations
ii. Placing and preparation of bedding and backfill
iii. Handling and installation of poles and cables
iv. Compaction of bedding and backfill.
v. Building of manholes, brick and concrete structures

vi. Repairs to fences and gates
vii. Environmental rehabilitation and Final site clearance
viii. General labour

### C3.4.6.16 Quality Control by the Engineer

Except for the quality control measures that must be applied by the Contractor, the Engineer can arrange and execute separate quality control inspections. In the event where the Contractor fails to comply with the quality control measures, inspections, equipment testing, installation testing and any identified remedial measures during the execution of the works, the Contractor shall be liable for all costs resulting from repeated effort carried out by the Engineer in this regard. Invoices will be forwarded to Contractor for payment on monthly basis, alternatively the appropriate deductions shall be made from amounts due to the Contractor.

### C3.4.6.17 Access to Properties

The Contractor shall organize the work to cause the least possible inconvenience to the local property owners. This contract takes place on municipal commonage, including road reserves within the town.

Special attention must be paid to works taking place in the road reserves. The Contractor shall be responsible for the necessary traffic management along the entire length within the road reserve.

Works over private property shall be done in close co-operation with the specific landowners. Contractors must liaise with the landowners prior to occupying the site.

Where wayleaves are obtained for the works, the Contractor shall take notice of the conditions and adhere to them strictly. Non-compliance will be dealt with severely in the form of penalties.

Likewise, written consent has to be obtained from any private landowners involved. The Contractor shall be responsible for the maintenance and repair of any stock fencing as well as for the actions of his personnel who occupy this site.

### C3.4.6.18 Restricted Areas

The contractor and his workers shall remain within the demarcated area of the construction site. No persons shall in particular be allowed in adjacent areas actively used by the landowners for agricultural operations.

Turn-offs from the farm roads onto the route shall be limited to one turn-off per 2 kilometres. Said turn-offs to be adequately marked and provided with the necessary safety signage. Failure to comply with this arrangement will lead to penalties being applied. The purpose of this arrangement is to limit the destruction of natural vegetation as far as possible.

### C3.4.6.19 Site Meetings

The Engineer shall hold monthly site meetings and keep and circulate minutes of these proceedings. The Contractor or its authorized agent shall be required to attend the site meetings, which shall normally be held twice a month on dates and at times determined by the Engineer, but in any case, whenever reasonably required by the Engineer. The Contractor shall attend and will ensure that all sub-contractors are represented.

Unless otherwise indicated in the Contract or instructed by the Engineer, such meetings shall be held at the Contractor's offices on the Site. At such monthly meetings, matters such as general progress on the Works, quality of work, problems, claims, payments, and safety etc., shall be discussed, but not matters concerning the day-to-day running of the Contract.

### C3.4.6.20 Borrow Pits

No borrow pits or sand quarries have been specifically allocated for this contract. For the majority of this works, the excavation is considered soft and material of suitable quality will be able to be recovered from screening the excavated material to be used as bedding and blanket.

Tenderers are to take note that the commercial exploitation of quarries/dry river beds requires a mining license from the Department of Minerals and Energy Affairs.

The provision of a suitable supply of bedding material is entirely the Contractor's responsibility and he must make all necessary arrangements in this regard. All costs in relation to the supply of such materials must be included in his

rates entered into the Bill of Quantities. No additional payments in this regard shall be made over and above that measured.

#### C3.4.6.21 Notices, Signs, Barricades and Advertisements

The Contractor shall erect the necessary signs, notices and barricades for the duration of the contract to safeguard the works, municipal operational staff, other contractors and the public.

The Contractor must make provision for one (1) project name boards as per the drawings bound in document and the position of the name boards will be as follows:

- At or close to the DKM Electro-Technical Offices (Alpha Substation)

Notices, signs and barricades as well as advertisements may be used only if approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Engineer has the right to have any sign, notice or advertisement moved to another position or to have it removed from the site of the works should it in anyway prove to be unsatisfactory, inconvenient or dangerous to the parties mentioned.

Such notices, signs and barricades shall be provided and erected at the Contractor's own expense.

#### C3.4.6.22 Subcontractors (Nominated or Approved)

The Contractor shall be responsible for work carried out by both nominated and approved sub-contractors on his behalf.

The Engineer will not liaise directly with such sub-contractors. Problems related to payments, programming, workmanship, etc., shall be the concern of the Contractor and the sub-contractor, and the Engineer will not become involved.

#### C3.4.6.23 Clearing Up and Vacating of Site

After completion of the Contract and after approval has been obtained from the Engineer, the Contractor will remove everything he has brought to the site or has handled in the execution of the Contract, as well as all excavated material which cannot be backfilled again, and will leave the site in a clean and neat condition to the satisfaction of the Engineer.

### C3.4.7 Excavations and Backfill

#### C3.4.7.1 Trenches

The maximum allowable open trench length is 300m and provision must be made by the Contractor for the safe enclosure of open trenches according to the relevant regulations for the full duration of the contract.

Trench widths to be strictly in accordance with the requirements of specifications

Bedding shall be aligned to form smooth transitions of levels from point to point to avoid local high points

#### C3.4.7.2 Bedding Materials

The trench excavations are foreseen to be mostly in soft/normal materials. It is envisaged that 40% of the bedding and blanket material can be recovered from the excavated materials. This is to be achieved by screening the excavated material from the trench as far as possible. The Contractor shall familiarise himself with commercial supplies of sand or backfill material in the vicinity of the site.

Negotiations for the supply of river sand from farmers, property owners or businesses in the vicinity is allowed, but the Contractor must take cognizance of the fact that permits are required for commercial sand mining.

The Schedule of Quantities makes provision for the importation of a limited portion of the bedding and blanket material from commercial sources. The nearest commercial source will be taken as within the boundaries of the town.

The term "commercial source" indicates that a transaction MUST take place between the Supplier and the Contractor. Subsequently, if a Contractor claims material as being imported from a "commercial source", the Engineer may require proof of such a transaction before certifying payment.

The onus rests fully on the Contractor for the supply of sand or material suitable for use as bedding and blanket. No overhaul will be paid for the supply of this material, and each Bidder must secure his own source of sand and price the rates accordingly.

### C3.4.7.2 Spoil Material

No indiscriminate spoiling of material is permitted. The Contractor shall make arrangements with the Employer and/or private landowners along the routes for sites suitable for spoiling surplus or unsuitable materials.

Spoiling shall comply with the applicable statutory and regional regulations. Access roads to spoil sites shall comply with the requirements of the Construction Environmental Management Plan and the Contractor even at tender stage must ensure that they are aware of these requirements.

No overhaul shall be paid for the removal of excess spoil material, and rates for this item shall be deemed to include the cost of hauling the full distance required.

Rocks and rubble removed from the trench exceeding 150mm in diameter shall be deemed unsuitable for backfilling above the bedding and should be separated and removed to spoil.

"It is the Contractors responsibility to level the disposed spoil heaps and tip the following loads on the levelled material. The Contractor shall not be permitted to dispose of unsuitable material by just dumping it onto the horizontal surface. Excess material which cannot be flattened sufficiently shall be removed from site to an approved spoil site. All excavated rock material exceeding 150mm in diameter is to be removed to an approved spoil site

Contractors are advised to make their own arrangement to find suitable sites to spoil excess materials, blasted rock, etc. including borrow pits. Borrow pits may be located on private land and the Contractor will have to enter into negotiations with landowners to obtain permission to utilize these old borrow pits as spoil sites. All spoil sites must be approved by the Environmental Control Officer on this site.

The Contractor shall be responsible to identify possible spoil sites have been identified as follows:

### C3.4.7.3 Backfilling

Where suitable backfilling material is available in layers of 150mm or more, it shall be separated during excavation and utilized for backfilling. Should this material not be utilized, an estimation of the available quantity shall be made and deducted from the material which was imported.

### C3.4.7.4 Measurement and Payment

Excavations, bedding, and backfill shall be measured and paid as listed in the Schedule of Quantities. No extra payments shall be made in this regard except for the items as allowed for in the Schedule of Quantities which will be measured and paid for.

Classifying of excavations shall be as included under Pricing Instructions. The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Engineer shall decide on the classification of the materials.

All equipment used for excavation and backfill operations shall be in a good mechanical condition and be operated efficiently by an experienced operator. "Efficiently" meaning "in a manner that can reasonably be expected of a contractor, having regard for the production achieved.

### C3.4.7.5 Classes of Excavation

Estimated quantities of expected hard rock excavations are provided in the Schedule of Quantities and materials shall only be classified as either soft excavation or hard rock material for the purpose of this contract and shall be classified as such by the Engineer on site.

All material encountered in any excavations for any purpose including restricted excavation shall be classified as follows:

i. Hard rock excavation

Hard rock excavation shall be excavation in material (including boulders exceeding 0.15 cubic metres in individual

volume) that cannot be efficiently removed without blasting or without wedging and splitting or be in material, which cannot be excavated by Excavator up to a 30 Ton capacity and a flywheel power of approximately 150kW with rock-bucket or by a scraper without prior ripping.
Material shall be deemed to be hard rock when a track type back-acting excavator unit with a total mass of approximately 30t and a flywheel power of approximately 150kW fails to achieve a trenching production rate of 10m per hour.
The responsibility rests with the Contractor on the method to be used to perform hard rock excavations and should the Contractor choose a method other than blasting, the rates for both the alternative method and for blasting must be provided for in the Schedule of Quantities.
The method of hard rock excavation must be agreed upon by the Contractor and the Employer or the Employers Agent after a written request with sufficient motivation is submitted to the Engineer before any hard rock excavations is performed by the Contractor on site.
The Contractor shall bear full responsibility to provide any substantiating and/or necessary documentation with regards to blasting and/or alternative hard rock excavation methods to the Engineer in writing for his approval.

ii. Intermediate excavation
No provision shall be made for the classification of Intermediate material for the purpose of this contract.

iii. Soft excavation
Soft excavation shall be all material not falling into the category of hard rock excavation.

### C3.4.7.5.1 Method of Classifying under SABS 1200 DA => Not Selected

When so indicated by the Engineer, in case of excavation by hand, the following method of classification may be used:

SABS 1200 DA 3.1.2 (a) Soft excavation shall be classified as material which can be excavated with a pick and shovel. Should this material be measured with a DCP testing apparatus, the density of the material shall be such that a penetration of not less than 10mm per blow will occur for every layer of 150mm.
SABS 1200 DA 3.1.2 (b) Intermediate excavation shall be classified as material which can be excavated with a pick and shovel and the penetration of a DCP testing apparatus is less than 10mm per blow.
SABS 1200 DA 3.1.2 (c) Hard Rock excavation shall be classified as material which can only be removed with compressed air equipment, wedging and blasting.

### C3.4.7.5.2 Method of Classifying under SABS 1200 DA => Not Selected

The excavation of material will be classified as follows for purposes of measurement and payment:

(a) Normal/Soft excavation
- Soft excavation shall be excavation in material that can be efficiently removed or loaded, without prior ripping, by the following plant: a track type back-acting excavator unit of total mass of up to approximately 30t and flywheel power approximately 150kW.

(b) Hard rock excavation
- Material shall be deemed to be hard rock when a track type back-acting excavator unit with a total mass of approximately 30t and a flywheel power of up to approximately 150kW fails to achieve a trenching production rate of 10m per hour.
- Hard rock excavation shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting.
- Small quantities of hard material which can be removed by means of pneumatic equipment such as an excavator mounted hydraulic hammer or pneumatic hand tools may also be classified as hard rock.

(c) Intermediate excavation
- There shall be no intermediate classification of material for this contract. Material shall be either normal/soft excavation or hard excavation and shall be classified as described in (a) and (b) above.

(d) Approval for Blasting
- Permission for the use of explosives shall only be given once the Engineer has been notified that hard excavation conditions have been encountered and when he has verified that excavation by conventional means is not possible.
- All blasting shall take place in accordance within the safety and security regulations applicable to such activities. Certificates of Competency and Permits must be available and should be produced for inspection

at the request of the Engineer.

### C3.4.8 Electrical Installation

#### C3.4.8.1 Building Reticulation and Lighting

Building reticulation and internal and external lighting are specified elsewhere in this document.

#### C3.4.8.2 General Installation Guidelines for Specialised Plant Equipment

All electrical works shall comply with the specifications. No cables or conductors may be fixed directly to the plant floor. All cable work to motors and equipment will be fixed to horizontal or vertically installed galvanized cable trays. Said cable trays may be fixed to walls, roof trusses, inside pipe/cable channels or on specially manufactured support brackets.

All domestic fittings such as light switches, contact sockets, light fittings etc. will be surface mounted. All supply conductors to domestic fittings shall be surface mounted inside galvanized electrical conduits. All surface work shall be horizontal and plumb and unnecessary conduit crossings should be avoided.

#### C3.4.8.3 Motor Control Centres

Motor control centres shall comply with the specifications as described in the Project Specifications. Contractors are advised to read these with care as the type and manufacturers of equipment are specifically mentioned.

#### C3.4.8.4 Manholes and Chambers

The rates for both chambers and manholes shall be measured as a unit and shall cover the cost of all items excluding pipe work. Included would be excavation, concrete work, brickwork and/or precast concrete slabs with manhole cover and frame.

#### C3.4.8.5 Colour Scheme for Electrical Items

| Item | Colour |
|---|---|
| Delay and tap change panels | Grey (SABS G29) |
| Eskom equipment | Grey |
| Essential supply sections of boards | Orange (BS 557) |
| H.V. Switchgear and boards | Grey (SABS G29) |
| L.V. switchgear | Light stone (SABS C37) |
| Name tags | White lettering on black |
| Outdoor kiosks | Avocado green |
| Transformers | Dark admiralty grey (BS 632) |
| | |

### C3.4.9 Reticulation System Earthing

Steel wire armouring must be bonded to the earth bar of each LV enclosure, directly and continuously from the supporting clamp or gland up to the individual terminal (crimped lug onto bolt) at the earth bar.

All cable feeders will be installed with an appropriate bare copper electrical conductor; refer to detailed drawings for the LV and MV reticulation layouts for cable routes and the appropriate bare copper sizes.

### C3.4.10 MV Cable Feeders

#### C3.4.10.1 General

An underground MV cable feeder is used to connect the new ring main units and/or miniature substations to the nearest supply point. The planned medium voltage network will have an operating voltage of 11 000 V.

#### C3.4.10.2 Cables

The 11 000 V cable feeder consists of 35/70/95/120/185/300 mm² x 3 core copper, lead insulated, steel taped armoured, screened, PVC sheathed, cables. Refer to drawings for the cable routes and cable sized for each cable route.

#### C3.4.10.3 Bare Copper Earth Conductor

An annealed and stranded conductor of high conductivity copper with cross diameter as indicated on the drawings will be installed at the bottom of the trench at a depth of 100 mm directly underneath or alongside the full route length of the MV cable. All joints in the BCEC must be cad welded.

The BCEC will have a cross sectional area of 35/70 mm² and installed as shown on the enclosed drawings. The BCEC terminates onto the RMU and miniature substation's earth studs were applicable.

#### C3.4.10.4 Cable Joints

MV cable joints will be permitted based on 300 m drum lengths. All cable joints are to be carried out by certified cable jointing artisans in the presence of the Engineer. Positions of cable joints are indicated on drawings. Cable joints shall be made at a distance of minimum 6 meters from MV equipment and from pole positions with overhead cable terminations.

Cable joints will be marked with a cable marker with the appropriate symbol and size of cable.

#### C3.4.10.5 Cable terminations

Cable terminations at miniature substations and RMU's shall be unscreened separable connector type, suitable for use with the Type C bushing, suitable for the terminals and the type of cable specified. Full particulars for the proposed termination will be submitted to the Engineer for approval.

#### C3.4.10.6 Proposed Cable Route

The proposed MV cable route is shown on drawings and will be established on site by the Contractor and the Engineer. The proposed cable route will be inspected for crossings with existing underground services before any excavations are done. Where service crossings are indicated the excavation will be done by hand for all existing services.

### C3.4.11 Miniature Substations

The scope of works allows for the supply, delivery, installation and commissioning of miniature substations with concrete foundations:

- 315/500/630 kVA 11000/400 V, each including a 3-way ABB Ring Main Unit with vacuum type circuit breaker for the transformer feeder

#### C3.4.11.1 General

All miniature substations will be Type-B substations and only manufacturers, which carry the SABS mark, will be acceptable.

Outline drawings as well as drawings of the rating and diagram plate shall be submitted for the miniature substations prior to final ordering and manufacturing for approval by the Engineer.

Test certificates for the miniature substation will be submitted prior to dispatch.

The miniature substation external colour will be Avocado Green. The miniature substation designation will be engraved on a steel plate in 50 mm stencilled letters. The plate will be riveted to the door of the high voltage compartment door.

Sheet-metal shall be carefully braced and supported to ensure that warped surfaces do not occur. Unacceptable metal or welding works, warped sheet-metal, inadequate bracing or other metal-work issues identified at any time, shall result in rejection of the unit, and shall be replaced and/or redone without cost to the Employer and Engineer. All costs incurred by the Employer and Engineer in regards the remedial actions for issues of this nature, shall be for the Contractor's account.

#### C3.4.11.2 MV Compartment

The medium voltage compartment of miniature substations will be equipped with a vacuum-type insulated ring main unit with a circuit breaker for the transformer feeder, equipped with CT-powered relay. Detailed specifications and drawings will accompany the miniature substation drawing for approval by the Engineer.

The switch disconnections for the cable feeders and transformer feeder breaker combination must be suitable for the specified system and shall include all labels as specified.

The cable connection cubicles shall be suitable for terminating a 300/185/120/70/35 mm² x 3 core PILCSTA cable by means of separable connectors, including a galvanized support frame with wooden cable blocks/cleats. The support frame will be designed in such a way that it will be possible to install the wood block at 500 mm, 600 mm or 700 mm below the switchgear bushings.

Any departure from the requirements of these specifications will be specifically stated by the Contractor, else it shall be assumed to comply with specifications and if found to be otherwise, the units will be replaced with compliant units, which cost shall be at the Contractor's account in all respects.

| Specification | Feeder Switches | T- off Feeder Switch |
|---|---|---|
| Maximum Service Voltage | 12kV | 12kV |
| Impulse Level | 95kV | 95kV |
| Switch Rated Current | 630A | 200A CB |
| Unit Fault Rating | 350MVA | 350MVA |
| Short Time Current: Main Contacts (3s) | 25kA | 25kA |
| Peak Making Current: Main Contacts | 50kA | 50kA |
| Load Break Capacity | 630A | 630A |

The transformer feeder circuit breaker shall be provided with a label reading "TRANSFORMER".

### C3.4.11.3 Transformer Compartment

The transformers shall comply with the following detail:

- Specification: SABS 780 as amended
- Number of Phases: 3
- Frequency: 50 Hz
- Voltage, Primary: 11 000 kV
- Voltage, Secondary: 400/ 231 V
- Secondary and Primary Windings - Copper
- Connections: MV Bushings at RMU & LV Busbars
- Vector group Dyn11 according to NRS 005 and SABS 780
- No Load Loss: SABS, normal loss group
- Tapping: Off load, ±2.5 %, ±5 %
- Ambient: 55º C
- Dial type thermometer with trip contacts for connection to the main circuit breaker by means of a relay.

### C3.4.11.4 LV Compartment

The LV compartments of the respective miniature substations will house all equipment as detailed in the single line diagrams as per the List of Drawings.

(a) 11 000 / 400 V, Fault Level 20 kA.

| Item | Description | Quantity |
|---|---|---|
| Main Breaker with Trip Relay | 600 -1000 A adjustable,<br>20 kA, 3 pole MCCB | As per design |
| Busbars | HD Copper Bus Bars (R, W, B & N)<br>HD Copper Bus Bars, pre-drilled (Earth) | As per design |
| Surge Protection | FLT-CP-3C-350, Class 1 & 2<br>Remote Indication | As per design |
| Trip Supply | 10 A HRC Fuse | As per design |
| Voltage Indication | 2A HRC Fuses<br>5A selector Switch (3 positions)<br>0–500 V Voltmeter | As per design |
| Current Indication (Analogue) | 1000/ 5 A class 5 VA CT's<br>0–1000 A ammeters with max. demand and instantaneous indication | As per design |
| Bulk Metering | Digital Meter with appropriate CT's and VT's, with statistical metering functionality | As per design |

| | | |
|---|---|---|
| Oil Temperature Indication and Alarm | Direct mount thermometer, mounted in tank pocket housing<br>Resettable maximum temperature pointer<br>Integrated switches for alarm and control functions, adjustable settings<br>Alarm contact wired to MV protection relay | As per design |
| **Miniature Substation Feeder Description** | | |
| Feeder Breaker # 70 x 4C | J25S, 150 A, 25 kA, 3 pole MCCB | As per design |
| Feeder Breaker # 95 x 4C | J25S, 200 A, 25 kA, 3 pole MCCB | As per design |
| Feeder Breaker # 120 x 4C | J25S, 225 A, 25 kA, 3 pole MCCB | As per design |
| Feeder Breaker # 185 x 4C | J25S, 300 A, 25 kA, 3 pole MCCB | As per design |
| | | |

#### C3.4.11.5 Labelling

The miniature substations including all equipment in the different compartments shall be labelled as per detail drawings and labels and text sizes will be according to Part C3.2, General Technical Specifications.

All labels will consist of galvanized or stainless steel metal strips fixed with pop-rivets. Circuit breaker designations and other equipment will be engraved on the metal strip with black letters and numbers.

#### C3.4.11.6 Earthing

Earth resistivity tests at the miniature substation position will be conducted by the Contractor to the Engineer's satisfaction.

At the miniature substation positions there shall be bonding of the BCEC trench earth to the RMU and the substation earth bar.

### C3.4.12 LV Cable Reticulation

#### C3.4.12.1 General

All cables, terminations and BCEC necessary are measured in the Schedule of Quantities, and are indicated on the detailed drawings. The cable routes are indicated on drawings.

All incoming and outgoing cables to and from the distribution kiosks will be connected to the busbar.

Bare copper electrical conductors will be connected to the earth bar.

Terminations, wiring and installations will be carried out by electricians in possession of a valid wiremen's license.

All wiring of installations will be carried out by a certified 3 phase electrician or installation electrician. Installations wired by unauthorized personnel or found to be not satisfactory will be rejected.

#### C3.4.12.2 Cables and BCEC

All low voltage cables consist of SWA PVC Cu cables as per SANS 1507-3. The required cable sizes will be as shown on the applicable drawing.

An annealed and stranded conductor of high conductivity copper with cross diameter as indicated on the drawings will be installed at the bottom of the trench at a depth of 100 mm directly underneath or alongside of all LV cables for the full route length. Where the MV cable is installed in the same trench, the MV earth may be used for earth purposes by utilising Cadweld T-joints or suitable line taps between the MV and LV BCEC, where approved by the Engineer and the Supply Authority.

The BCEC will be installed between each distribution kiosk and miniature substation as shown on the enclosed drawings. The BCEC terminates onto the distribution kiosks and miniature substation's earth studs by means of a suitably sized crimped lug, solidly bolted to the earth bar.

#### C3.4.12.3 Terminations

Cables will be terminated by means of K-clamps on the cable mounting rail at the bottom of the LV kiosk, while the armouring will be terminated onto the earth bar by means of a suitable lug, in continuous piece from cable at mounting rail up to the earth bar.

#### C3.4.12.4 LV Distribution Kiosks

The low voltage distribution kiosk and pole boxes will be installed at the positions as indicated on the detailed drawings. The kiosks shall be equipped as per the detailed drawings.

The Contractor shall submit outline drawings, detailed shop drawings, and single line diagram for each respective distribution kiosk to the Engineer for his approval prior to final ordering and manufacturing.

The Contractor shall fully wire one kiosk on site for inspection by the Engineer for approval, prior to continuation with other kiosks.

All wiring of installations will be carried out by a certified electrician or installation electrician. Installations wired by unauthorized personnel or found to be not satisfactory shall be rejected.

### C3.4.13 Pole-Mounted Transformers

This specification has reference to distribution transformers for pole-mounted outdoor use. Transformers will be installed on inline or terminal structures depending on the size of unit required.

Detailed outline drawings as well as drawings of the rating and diagram plate shall be submitted for every transformer prior to manufacturing for approval by the Engineer.

Test certificates of each transformer shall be submitted prior to dispatch. Only manufacturers which carry the SABS mark shall be acceptable.

Transformer colour shall be Avocado Green – C12.

Sheet-metal shall be carefully braced and supported to ensure that warped surfaces do not occur. Unacceptable metal or welding works, warped sheet-metal, inadequate bracing or other metal-work issues identified at any time, shall result in rejection of the unit, and shall be replaced and/or redone without cost to the Employer and Engineer. All costs incurred by the Employer and Engineer in regards the remedial actions for issues of this nature, shall be for the Contractor's account.

#### C3.4.13.1 Specification

Except where otherwise specified, this equipment with auxiliaries and fittings shall comply with the General Technical Specifications and the following specifications and amendments: Distribution transformers SABS 780

Any departure from the requirements of these specifications shall be specifically stated in the tender otherwise it will be assumed to comply with specifications and if found to be otherwise, the units shall be replaced for the suppliers/Contractor's account including consequential loss.

#### C3.4.13.2 Technical Details

The transformers shall comply with the following detail:

- kVA Rating 50, 100, 200kVA (Alternative for 315kVA is also required.)
- Number of Phases 3
- Frequency 50 Hz
- Ratio, Primary 11kV
- Ratio, Secondary 400/240V
- Vector group Dyn11 according to NRS 005 and SABS 780
- No Load Loss SABS, normal loss group
- Tap changer Off load, ±2.5%, ±5.0%
- Ambient 50ºC

#### C3.3.13.3 Transformer Mechanical Details

The transformers shall comply with the following detail:

- Tank Construction — Sealed type
- Tank Material — 3CR12, 2.0mm
- Tank Type — Welded Sealed, Platform Mounting
- MV Bushing Type — Elastimold Type C Bushing & Elbow Connector
- LV Bushing Type — Porcelain
- Lifting Lugs — Yes

### C3.4.14 Transformer Distribution Kiosks

All transformers will be supplied with a distribution kiosk mounted underneath the transformer installation. The kiosk must be dust and weather proof with a lockable door in front. The kiosk must be supplied with all brackets required for the installation onto the single pole structure.

The size of the kiosk must be adjusted to accommodate all equipment and the kiosk must be equipped with the following:

- Three isolators for the connection of the phase wires (Red, White and Blue)
- Minimum 300 Amp Neutral and live bars for the connection of the neutral wire and phase conductors.
- Earth bar for the connection of the earth wire
- Mounting plate for 20kA circuit breakers, CBI LB/JS range. Kiosk must make provision for the amount and type of circuit breaker specified on the attached drawings.
- Surge Protection – Type: FLT-CP-3C-350, Class 1 & 2 with Remote Indication
- Cable entry to and from the kiosk is done from the bottom. Cable sizes can vary from 10mm² to 95mm².

The Transformer Distribution Kiosk will house all equipment as detailed in the single line diagrams as per the List of Drawings.

<u>Pole Mounted Kiosk at Transformer (Typical):</u>

- 1 x CBi 25KA, 80A/160A/300A/450A triple pole circuit breaker (main)
- Up to 5 x Cbi 25kA, ≤200A triple pole circuit breaker (feeders)
- 3CR12 ≥1,5mm thickness, enclosure with lockable door, three-point locking mechanism, pole mounted
- 1 x LV bulk meter Itron SL7000 complete with CT's and VT's, analogue instruments, fuses
- See illustration below:

Detailed outline drawings as well as drawings of the schematic layout shall be submitted for every kiosk prior to manufacturing for approval by the Engineer.

Sheet-metal shall be carefully braced and supported to ensure that warped surfaces do not occur. Unacceptable metal or welding works, warped sheet-metal, inadequate bracing or other metal-work issues identified at any time, shall result in rejection of the unit, and shall be replaced and/or redone without cost to the Employer and Engineer. All costs incurred by the Employer and Engineer in regards the remedial actions for issues of this nature, shall be for

the Contractor's account.

### C3.4.15 ABC Overhead Line

All new Aerial Bundle Conductor lines will be of ABC conductor with insulated neutral that complies with the General Technical Specifications in. The type and size of ABC conductor are shown on the detailed drawings.

The standard types are:

- 120ABC = 120mm² x 3 + 70 mm²
- 95ABC = 95mm² x 3 + 54,6 mm²
- 70ABC = 70mm² x 3 + 54,6 mm²
- 35ABC = 35mm² x 3 + 54,6 mm²

The ABC line shall be erected on 9m wooden poles with pole top diameters between 140 and 160mm.

Stays for the low voltage ABC lines shall be adjustable.

### C3.4.16 Pole-Mounted Distribution Boxes

Circuit breaker box must be installed on a single wooden pole. The construction of the box shall be weatherproof and vandal resistant.

Installation shall include the mounting and wiring of 6kA circuit breakers of CBi QF series type, and the control units of the split prepayment meters.

The distribution boxes shall make provision for the amount of service connections specified in the Project Specifications and detailed drawings.

Standard Pole Box:

- Up to 8-way Pole Top Box, Allbro Tilt 6
- ≤ 8 x CBi QA-1 6kA, 20A Single Pole Circuit breaker
- ≤ 8 x Itron Split unit PLC prepayment meters (Model: Enlight Sienna SSP DIN - R PLC with Common Base CIU
- See illustration below:


The Contractor will wire 1 x kiosk with breakers meters and cables in the presence of the engineer or a representative of the Engineer for approval.

### C3.4.17 Service Connections

Where applicable, the scope of work makes provision for the installation of the underground service cables from the low voltage distribution kiosk to the house structures as well as from pole box to the structure, split-unit prepaid metering and consumer installations in the house structure.

The cable for the service connections shall be 10 mm² x 2 Core PVC SWA (underground) and 10 mm² Airdac (overhead). The required cable, Airdac and circuit breaker sizes are as follows:

| CB Supply | Cable Size |
|---|---|
| 50A, 1Ø | 10 mm² x 2 Cu + 6 mm² BCEC |
| 50A, 1Ø | 10 mm² Airdac |

Service connections will be done by means of underground cables from the new distribution kiosks and Airdac cable from the new pole mounted boxes.

Each kiosk and pole box will be fitted with the required amount of 50 A Single Pole, 6 kA, single phase curve 1 Mini-Rail type breakers and the pre-paid meter. The control panel of the prepaid meter will be installed in each respective house on the wooden backboard as specified.

Each circuit breaker and pre-paid meter must be clearly and indelibly marked with the specific stand number it is connected to. Number plates will consist of a galvanised or stainless steel strip fixed with pop rivets. The number and phase connection of the pole-mounted distribution box must be marked on the front lid of the box.

The Airdac cables must be installed with strain clamps on the poles and at the houses by means of pigtails and eye nuts. Inside the dwellings the Airdac cable must be neatly installed with J Bolts and terminated on the ready board.

The service connection cables will be installed using galvanised K-clamps on the cable mounting rail at the bottom of the LV kiosk. Service connection Airdac will be terminated with an appropriate PVC gland.
All concentric cable entries shall be sealed with the appropriate size PVC gland.

### C3.4.18 Consumer Installations

No consumer installations shall be carried out without permission from the home owners or tenants. Unpermitted installations shall be repaired, redone and remedied at the Contractor's expense.

The Contractor shall present a sample of a complete installation to the Engineer for his approval, prior to implementation of the remainder of the consumer installations.

The Contractor shall be responsible for the capturing of customer data, according to requirements of the supply authority, i.e. stand number, ID number, full names, etc.

#### C3.4.18.1 Metering

Metering shall be as indicated in the Schedule of Quantities in terms of type and number.

The Contractor shall provide for the supply, delivery, installation and commissioning of the specified meters.

The control panel of split prepayment meters must be installed with 4 x 6mm self-tap screws against the wooden back board as indicated by drawings.

#### C3.4.18.2 Readyboards

The Contractor must make provision for the supply, delivery, installation and connection of ready boards.

Ready boards shall be CBi new generation type, or equally approved (with approval being prior to purchase and dispatch to site).

The construction of the ready board shall allow for the replacement of faulty components.

Ready boards must be installed with 4 x 6 mm self-tap screws against the wooden back board, as indicated by detailed drawings.

The ready boards will consist of the following:

- Earth bar
- Neutral bar
- 30A Main circuit breaker
- 63A Earth leakage switch
- 20A Circuit breaker
- 3 x 16A Switch power outlets
- 10A Circuit breaker
- 16A Light switch
- 11Watt energy saver light bulb

The readyboard and meter shall be connected with a 20 mm Ø conduit in which 2 x 16 mm² insulated copper conductors and a 10mm² earth conductor will be used for connection.

#### C3.4.18.3 Wooden Backboard

Wooden backboards shall be used for the installation inside houses.

The wooden back board will consist of 15 mm compressed “Supa-Wood”. The edges of the wooden back board will be finished in order to prevent chipping. The wooden back board shall be treated with a mixture of Linseed Oil and Turpentine to prevent deterioration of the back board and to provide protection from termites.

The Contractor must present samples to the Engineer of the backboards prior to manufacturing and delivery.

Wooden backboards shall be attached to the dwellings by nail-in screw-out anchors (brick walls) or threaded rods and nuts (all other structures)

### C3.4.19 Testing

The Engineer reserves the right to test all installed equipment before handover takes place. All equipment shall comply with the requirements as stated in the Specifications. In the case of non-compliance to the Specifications or deviation from what was presented by the Contractor, the Engineer reserves the right to not accept the said equipment. Any work required to be done to improve the equipment to comply with the Specification shall be for the Contractor’s cost.

On completion the Contractor shall commission all the equipment installed to ensure proper and safe functioning. The Contractor shall provide all records and documentation of all factory and site testing to the Engineer.

#### C3.4.19.1 Procedure for Inspection and Correction

a) Once the Contractor has completed the installation, the Contractor shall give written notice to the Engineer and Employer in order that a mutually acceptable date can be arranged for a joint inspection.
b) During the course of the inspection, the Engineer will compile a list of items (if any) requiring further attention, correction, remediation, replacement or the like. A copy of this list will be provided to the Contractor.
c) The Contractor shall rectify the offending items of the installation within the period indicated by the Engineer.
d) The Contractor shall provide written notice that he is ready for an inspection of the remedial work as per the list previously compiled.
e) This procedure will continue until the entire installation has been correctly completed to the satisfaction of the Engineer.

#### C3.4.19.2 Procedure for Testing and Operational Inspection

a) In addition to the above the Contractor shall present the complete installation for testing and approval by the Engineer and Employer where applicable, which will be subsequent to the above testing, correction as required and approval.
b) The Contractor will in the presence of the Engineer and Employer test all circuits and equipment for proper functioning, settings and all other aspects
c) The Engineer has the right to call for or to execute any reasonable additional tests that may be necessary to render proof of the specification requirements having been met. The Contractor will render all the necessary assistance to have such tests carried out without delay.
d) All tests will be carried out in the presence of the Engineer and the costs will be included in the unit prices for the installation thereof.
e) Upon completion of the installation and within 3 months of the handover date, the Contractor will provide and make available a recording instruments to record the voltage at three locations of the project over a period of 48 hours each, if so required by the Employer. The Contractor shall submit instrument readings and record to the Engineer and Employer for their review and approval.

#### C3.4.19.3 Documentation upon Completion

a) As each portion of the work is completed, the Contractor shall provide the Engineer with as-built drawings showing the all sizes and the exact locations measured from fixed points and reference points of all equipment and infrastructure.
b) The Contractor shall permanently mount the safety posters as required by the OHSA inside substation buildings and on the outside of all housings of electrical equipment.
c) The Contractor shall provide a complete reticulation diagram showing all supply cables and switchboards behind a plastic cover in the substation or adjacent to the Main Switchboard if not located in a substation

as well as a schematic diagram of the main supply system.

d) Upon completion of the work, the Contractor shall appoint a land surveyor to check all the pegs along the route and to reinstate where necessary. The land surveyor shall submit a certificate confirming that all beacons and reference pegs are in order.
e) The Contractor shall submit the final Health and Safety file containing all documentation as required in the Construction Regulations promulgated under the OHSA.
f) The Contractor shall submit all commissioning testing information to the Engineer.
g) The Contractor shall submit copies of all Certificates of Compliance of the completed to the Engineer
h) Brochures of all equipment supplied must be provided for record purposes.

Documentation shall include:

- Type test certificates
- Factory acceptance documentation and certificates
- Original manufacturer's test certificates and reports
- Routine test certificates (RMU, switchgear, transformers, etc.)
- Quality control inspection records
- Technical Schedule and the Deviation Schedule

Deviations/modifications/alterations from the requirements specified or the rest of the specification shall be documented in the deviation schedule.

The submitted documentation shall be reviewed and approved by the Engineer and Employer. The Contractor shall be required to submit corrected and/or additional information as required.

### C3.4.20 Project Handover to Client

The installation will be formally handed over to the Client on completion by means of a written hand-over certificate.

The installation will not be regarded as complete and handed over to the Employer until all requirements have been met to the satisfaction of the Engineer

#### C3.4.20.1 Clearing up and vacating of site

After completion of the Contract and after approval has been obtained from the Engineer, the Contractor will remove everything he has brought to the site or has handled in the execution of the Contract, as well as all excavated material which cannot be backfilled again, and will leave the site in a clean and neat condition to the satisfaction of the Engineer.

## C3.5 List of Drawings

### C3.5.1 Design services and activity matrix

Works designed by, per design stage:

| | |
|---|---|
| Concept, feasibility and overall process | Consulting Engineers for Employer |
| Basic engineering and detail layout to tender stage | Consulting Engineers for Employer |
| Final design to approved for construction stage | Consulting Engineers for Employer |
| Temporary works | Contractor |
| Preparation of “as built” drawings | Contractor |

### C3.5.2 Drawings

The drawings listed below are attached in order to give an overview of the project.

Additional construction drawings will, in terms of Clause 13 of the General Conditions of Contract (2004), be issued to the Contractor by the Engineer/Employer on the commencement date and from time to time as required.

#### C3.5.2.1 Drawings attached

**Drawing No.** **Title**

Drawings for tender purposes will be made available at the compulsory tender briefing session.

| DRAWING NO. | TITLE AND DESCRIPTION | SIZE |
|---|---|---|
| | | |
| | | |
| | | |
| D-DT-0307-1-1-4 | LV RETICULATION BARE NEUTRAL ABC INTERMEDIATE SUSPENSION WITHOUT SERVICE DISTRIBUTION | A3 |
| D-DT-0341-5-1-17 | STAY ASSEMBLY (LV-35kN) WOOD/CONCRETE POLES | A3 |
| D-DT-0342-1-1-4 | LV AND MV RETICULATION STRUT ASSEMBLY FLAT 45 DEG. BRACKET 7m AND 9m POLES | A3 |
| D-DT-0343-1-1-4 | LV AND MV FLYING STAY ASSEMBLY | A3 |
| D-DT-0360-5-1-14 | LV SERVICE CONNECTION TO HOUSE | A3 |
| D-DT-0364-6-1-4 | LV-SERVICE FOUR WAY POLE TOP DISTRIBUTION BOX 59 AMP CUSTOMER CONNECTION | A3 |
| D-DT-0366-1-1-3 | SERVICE CONNECTION FOR CONCENTRIC SUSPENSION ASSEMBLY | A3 |
| D-DT-0395-1-1-2 | ESKOM STREET LIGHTING ABC/CONCENTRIC CABLE DIRECT CONNECTION DETAILS | A3 |
| D-DT-0399-2-1-6 | MV EQUIPMENT MOUNTING ASSEMBLY ANTI-CLIMBING DEVICE-BARBED WIRE | A4 |
| D-DT-0399-2-2-6 | MV EQUIPMENT MOUNTING ASSEMBLY ANTI-CLIMBING DEVICE-BARBED WIRE FOR STAY ASSEMBLYS | A3 |
| D-DT-0627-2-1-7 | EARTHING TRANSFORMER SINGLE MOUNTING (MV & LV ELECTRODE AT TRANSFORMER) | A3 |
| D-DT-0627-2-2-7 | EARTHING TRANSFORMER SINGLE MOUNTING (MV & LV ELECTRODE AT TRANSFORMER AND LV ELECTRODE ONE SPAN WAY) | A3 |

| DRAWING NO. | TITLE AND DESCRIPTION | SIZE |
|---|---|---|
| D-DT-0637-2-1-7 | ESKOM EARTHING (ALTERNATIVE 1) LV ABC EARTHING (AT TRANSFORMER) | A3 |
| D-DT-0637-2-2-7 | ESKOM EARTHING (ALTERNATIVE 2) LV ABC EARTHING (ONE SPAN WAY) | A3 |
| D-DT-0642-1-1-3 | EARTHING MV AND LV EARTH ELECTRODES DETAILS | A3 |
| D-DT-0831-6-1-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) ≤25mm SQ. 2 CORE, 3 CORE AND 4 CORE INTERMEDIATE STRUCTURE. | A3 |
| D-DT-0831-6-2-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) 35mm SQ. 2 CORE. 35mm-70mm SQ, 3 CORE AND 35mm-50mm SQ, 4 CORE INTERMEDIATE STRUCTURE. | A3 |
| D-DT-0831-6-3-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) 70mm SQ. 4 CORE INTERMEDIATE STRUCTURE. | A3 |
| D-DT-0831-6-4-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) ≤25mm SQ. 2 CORE, 3 CORE AND 4 CORE TERMINAL STRUCTURE. | A3 |
| D-DT-0831-6-5-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) 35mm SQ. 2 CORE. 35mm-70mm SQ, 3 CORE AND 35mm-50mm SQ, 4 CORE TERMINAL STRUCTURE. | A3 |
| D-DT-0831-6-6-1 | LV OUTDOOR CABLE TERMINATION TO ABC LINE (UNFUSED) 70mm SQ. 4 CORE TERMINAL STRUCTURE. | A3 |
| D-DT-0833-3-1-0 | LV OUTDOOR CABLE TERMINATION TO TRANSFORMER (UNFUSED) ≤35mm SQ. 2 CORE ≤70mm SQ. 3 CORE ≤50mm SQ. 4 CORE | A4 |
| D-DT-0833-3-2-0 | LV OUTDOOR CABLE TERMINATION TO TRANSFORMER (UNFUSED) 1x70mm - 185mm SQ. 4 CORE | A3 |
| D-DT-0833-3-3-0 | LV OUTDOOR CABLE TERMINATION TO TRANSFORMER (UNFUSED)2x70mm SQ. 4 CORE OR 2-3x150mm SQ. 4 CORE | A3 |
| D-DT-0848-10-1-2 | LV DISTRIBUTION KIOSK ASSEMBLY STRUCTURE | A3 |
| D-DT-0848-10-2-2 | LV DISTRIBUTION KIOSK ASSEMBLY STRUCTURE SHOWING CIRCUIT BREAKERS AND SUPPORT BRACKETS | A3 |
| D-DT-0848-10-3-2 | LV DISTRIBUTION KIOSK ASSEMBLY STRUCTURE SHOWING VERTICAL FUSE HOLDERS | A3 |
| D-DT-0848-10-4-2 | LV DISTRIBUTION KIOSK ASSEMBLY STRUCTURE SHOWING CIRCUIT BREAKER COVER PLATES AND SIMONA BOARD | A3 |
| D-DT-0848-10-5-2 | LV DISTRIBUTION KIOSK ASSEMBLY STRUCTURE ATTACHMENT TO KIOSK AND GLAND PLATE | A3 |
| D-DT-0848-10-6-2 | LV DISTRIBUTION KIOSK ASSEMBLY PARTS MANUFACTURING DETAILS | A3 |
| D-DT-0848-10-7-2 | LV DISTRIBUTION KIOSK ASSEMBLY PARTS MANUFACTURING DETAILS KIOSK (ITEM 17) | A3 |
| D-DT-0848-10-8-2 | LV DISTRIBUTION KIOSK ASSEMBLY PARTS MANUFACTURING DETAILS BASE, FOOT AND ROOF | A3 |
| D-DT-0848-10-9-2 | LV DISTRIBUTION KIOSK MANUFACTURING DETAILS COVER PLATES, GLAND PLATE AN SIMONA BARRIERS | A3 |
| D-DT-0848-10-10-2 | LV DISTRIBUTION KIOSK MANUFACTURING DETAILS DOOR | A3 |
| D-DT-1100-1-1-4 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC SUSPENSION ASSEMBLY (0º - 30º) | A3 |
| D-DT-1122-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC STRAIN ASSEMBLY (60º - 90º) WOOD POLE | A3 |
| D-DT-1121-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC STRAIN ASSEMBLY (0º - 60º) WOOD POLE | A3 |
| D-DT-1148-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC T-OFF ASSEMBLY FROM INTERMEDIATE WOOD POLE | A3 |
| D-DT-1141-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC CROSS INTERMEDIATE-INTERMEDIATE ASSEMBLY WOOD POLE | A3 |

| DRAWING NO. | TITLE AND DESCRIPTION | SIZE |
|---|---|---|
| D-DT-1142-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC T-OFF ASSEMBLY FROM STRAIN WOOD POLE | A3 |
| D-DT-1143-1-1-5 | LV RETICULATION THREE PHASE BARE NEUTRAL ABC CROSS INTERMEDIATE-STRAIN ASSEMBLY WOOD POLE | A3 |
| D-DT-1710-1-1-2 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING INTERMEDIATE - 0 DEG DEVIATION | A3 |
| D-DT-1711-1-1-2 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING INTERMEDIATE SMALL - 1-10 DEG DEVIATION | A3 |
| D-DT-1712-1-1-3 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING INTERMEDIATE MEDIUM - 15-20 DEG DEVIATION | A3 |
| D-DT-1713-1-1-1 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING STRAIN - 0 DEG DEVIATION | A3 |
| D-DT-1714-1-1-2 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING STRAIN SMALL 1-30 DEG DEVIATION | A3 |
| D-DT-1715-1-1-2 | ESKOM MV RETICULATION THREE PHASE STAGGERED VERTICAL 600 SPACING STRAIN LARGE - 30-90 DEG DEVIATION | A3 |
| D-DT-1716-1-1-2 | ESKOM MV RETICULATION THREE PHASE VERTICAL 600 SPACING STRAIN - TERMINAL | A3 |
| D-DT-1801-1-1-3 | ESKOM MV RETICULATION THREE PHASE TAKE-OFF VERTICAL (600mm SPACING) | A3 |
| D-DT-1860-2-1-2 | MV RETICULATION TRANSFORMER 5-100kVA / SINGLE POLE MOUNTED GENERAL ARRANGEMENT | A3 |
| D-DT-1860-2-2-2 | MV RETICULATION TRANSFORMER 5-100kVA / SINGLE POLE MOUNTED EARTHING DETAILS | A3 |
| D-DT-1861-2-1-2 | MV RETICULATION TRANSFORMER 100-200kVA / 2- POLE PLATFORM MOUNTED (H-POLE) GENERAL ARRANGEMENT | A3 |
| D-DT-1861-2-2-2 | MV RETICULATION TRANSFORMER 100-200kVA / 2- POLE PLATFORM MOUNTED (H-POLE) EARTHING DETAILS | A3 |
| D-DT-1861-2-2-2 | MV RETICULATION TRANSFORMER 100-200kVA / 2- POLE PLATFORM MOUNTED (H-POLE) GENERAL ARRANGEMENT | A3 |
| D-DT-1862-1-1-3 | MV RETICULATION TRANSFORMER 300-500kVA / 5- POLE DOUBLE PLATFORM MOUNTED GENERAL ARRANGEMENT | A3 |
| D-DT-1863-1-1-2 | MV RETICULATION TRANSFORMER 100-200kVA / 2- POLE PLATFORM MOUNTED (IN-LINE) GENERAL ARRANGEMENT | A3 |
| D-DT-1864-2-1-0 | MV RETICULATION TRANSFORMER 300-500kVA / 5- POLE DOUBLE PLATFORM MOUNTED OU IF LINE GENERAL ARRANGEMENT | A3 |
| D-DT-1864-2-2-0 | MV RETICULATION TRANSFORMER 300-500kVA / 5- POLE DOUBLE PLATFORM MOUNTED OU IF LINE TOP VIEW | A3 |
| D-DT-1865-1-1-3 | MV RETICULATION TRANSFORMER 100-200kVA / 2- POLE PLATFORM MOUNTED (OUT OF LINE) GENERAL ARRANGEMENT | A3 |
| D-DT-1866-1-1-3 | MV RETICULATION TRANSFORMER 5-100kVA / SINGLE POLE MOUNTED OUT OF LINE GENERAL ARRANGEMENT | A3 |

# Part C4: Site Information

## C4: Site Information

### C4.1 Location

The site(s) where the installation(s) will take place is/are located at or in Upington
The design drawings confirm the layouts and feeder routes through the respective areas.

### C4.2 Description of Site and Access

The sites are located near access roads within the residential areas of the town, with roads being tar and gravel surface. There are sections of line that traverse dormant land and storm-water runoffs, where the vehicle route may be of soft material and not accessible to normal passenger vehicles. Vehicle drivers must take care to avoid punctures and be prepared for tyre repairs at all times.

### C4.3 Familiarising with Site Conditions

At time of tender, Tenderers shall familiarise themselves with the site, soil and subsoil conditions during and after the compulsory tender meeting at the proposed construction site.

### C4.4 Site Features Requiring Special Attention

#### C4.4.1 Access for Others

The Contractor shall allow safe access for other contractors, the Engineer and the Employer as well as their personnel during the contract period.

#### C4.4.2 Disposal

The Contractor shall make his own arrangements, to the Engineer's satisfaction, for the disposal of unsuitable excavated material, surplus material and construction waste resulting from the Works.
The Contractor shall submit details of such arrangements to the Engineer prior to disposal.

#### C4.4.3 Weather Data

Limited weather data is included in this specification and the Contractor is referred to the Weather Bureau, Department of Transport, Private Bag X097, Pretoria 0001 for detail information.

### C4.5 Site Facilities to be Provided by the Contractor

#### C4.5.1 Office, Workshops and Stores

The Contractor shall erect and maintain at his own cost all covered storage and offices that are required. The Contractor's yard (including site camp and storage facilities) shall be fenced by the Contractor and maintenance thereof shall be his responsibility. The yard shall at all times be kept in a clean and tidy condition and to the satisfaction of the Engineer. The Contractor shall maintain security access control to the yard for the duration of the Works.

On completion of the project, all structures, installations, and rubble/waste will be removed from site, to the satisfaction of the Engineer.

#### C4.5.2 Sanitary Facilities and Refuse Disposal

Temporary and/or portable toilet facilities shall be provided at the Contractor's yard and on site by the Contractor and removed on completion of the Works.

A refuse control system shall be established by the Contractor. All waste shall be collected and disposed of as required by the Engineer.

#### C4.5.3 Telephone and Telecommunications

The Contractor shall be responsible for the supply on site of his own telephone or cellular phone.

#### C4.5.4 Accommodation of Employees

The Contractor shall make his own arrangements for the provision of adequate accommodation for his employees.

# Annexure A – Bill of Quantities

**DAWID KRUIPER MUNICIPALITY**

**TN036/2023 (35087.00) - ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

**SCHEDULE A : PRELIMINARY AND GENERAL**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| A.1 | **Fixed Charge Items** | | | | |
| A.1.1 | Contractual requirements, establish and maintain facilities on site: | | | | |
| a) | Office and storage sheds | Sum | 100% | | R - |
| b) | Living accommodation | Sum | 100% | | R - |
| c) | Ablution and latrine facilities | Sum | 100% | | R - |
| d) | Water supplies, electric power & access | Sum | 100% | | R - |
| A.1.2 | Remove Contractor's site on completion | Sum | 100% | | R - |
| A.1.3 | Allow for project notice board | Sum | 100% | | R - |
| A.1.4 | Allow for co-operation and programming with other parties that may be working on site | Sum | 100% | | R - |
| A.1.5 | Allow for submission and revisions of Works programme | Sum | 100% | | R - |
| A.1.6 | Allow for the submission of instruction manuals and record drawings | Sum | 100% | | R - |
| A.1.7 | Guarantees | | | | |
| A.1.7.1 | Allow for the required Advanced Payment Guarantee of 90% of the Contract Amount, from banking institution approved by Employer | Sum | 100% | | **Rate Only** |
| A.1.7.2 | Allow for the required Performance Guarantee of 10% of the Contract Amount, from registered insurer or banking institution approved by Employer | Sum | 100% | | R - |
| A.1.8 | Allow for compliance with all statutory requirements as specified | Sum | 100% | | R - |
| A.1.9 | Occupational Health and Safety<br>The Contractor shall, as a condition of the contract, ensue that the Site of the Works and the Works at all times comply with all relevant legislation regarding health and safety of employees, as well as public legitimately on the Site or in the vicinity of the Site, while preventing unauthorized access to the Site of the Works. Contractor to list all items of health and safety included in the lump sum cost and provide the Employer with the aforementioned list | | | | |
| A.1.9.1 | Health and Safety Plan | | | | |
| (a) | Provide and demonstrate a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification contemplated in regulation 5(1)(b) | Sum | 100% | | R - |
| (b) | Review and update of health and safety plan by the contractor as work progresses | Sum | 100% | | R - |
| A.1.9.2 | Health and Safety File | | | | |
| (a) | Open, keep and maintain on site a health and safety file, which must include all documentation required in terms of the Act and Construction Regulations 2014 | Sum | 100% | | R - |
| (b) | Hand over of consolidated health and safety file upon completion as per Regulation 7(1)(e) | Sum | 100% | | R - |
| (c) | Valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 for all employees to be employed on the project | Sum | 100% | | R - |
| | | | | **Carried forward** | **R -** |

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**SCHEDULE A : PRELIMINARY AND GENERAL**

**Date** October 2023
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| Item no. | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | | | | **Brought forward** | **R -** |
| (d) | Risk Assessment before and during construction work (Performed by a competent Person appointed in writing) | Sum | 100% | | R - |
| (e) | Fall Protection Plan | Sum | 100% | | R - |
| A.1.9.3 | Management and supervision of construction work, throughout the duration of the works: | | | | |
| (a) | Appointment of one full-time competent person as the construction manager | Sum | 100% | | R - |
| (b) | Appointment of one or more assistant construction managers for different sections, considered the size of the project | Sum | 100% | | R - |
| (c) | Appointment of a full-time or part time construction health and safety officer, considered the size of the project and the degree of danger likely to be encountered or the accumulation of hazards or risks on | Sum | 100% | | R - |
| (d) | Appointment of construction supervisors | Sum | 100% | | R - |
| (e) | Demolition work : Appoint competent person in writing to supervise and control all demolition work on site (if applicable) | Sum | 100% | | R - |
| A.1.9.4 | Construction employees' facilities: | | | | |
| (a) | Shower facilities : At least one shower facility for every 15 persons | Sum | 100% | | R - |
| (b) | Sanitary facilities : At least one for each sex and for every 30 workers | Sum | 100% | | R - |
| (c) | Sheltered eating areas | Sum | 100% | | R - |
| (d) | Reasonable and suitable living accomodation for the workers at construction sites who are far removed from their homes | Sum | 100% | | R - |
| A.1.9.5 | Personal Protective Equipment (PPE): | | | | |
| (a) | Head Protection : Hard Hats | Sum | 100% | | R - |
| (b) | Hand Protection : Protective gloves | Sum | 100% | | R - |
| (c) | Foot Protection : Safety boots | Sum | 100% | | R - |
| (d) | Respiratory Protection : Respirators | Sum | 100% | | R - |
| (e) | Fall Prevention Equipment : Suitable Safety Belts | Sum | 100% | | R - |
| (f) | Eye and Face Protection : Goggels, Face Shields, Welding Helmets, etc. | Sum | 100% | | R - |
| (g) | Hearing Protection : Muffs, Plugs, etc. | Sum | 100% | | R - |
| (h) | Protective clothing: Reflective Vests, Overalls, Rain Wear, Welding Aprons, etc.) | Sum | 100% | | R - |
| (i) | Health and Safety Induction Training pertaining to the hazards prevalent on the site at the time on entry | Sum | 100% | | R - |
| (j) | First Aid Boxes to be made available on site for injuries | Sum | 100% | | R - |
| (k) | Fire extinguishers to be made available on site | Sum | 100% | | R - |
| A.1.9.6 | Health and Safety Audits: | | | | |
| (a) | Conduct periodic health and safety audits at least once every month | Sum | 100% | | R - |
| A.1.9.7 | Health & Safety - Preventive Measures | | | | |
| (a) | Prevention of heat exhaustion in heat stress problem areas | Sum | 100% | | R - |
| (b) | Barricading : At least one metre in height & warning illiminants or any other clearly visible boundary indicators at night or when visibility is poor | Sum | 100% | | R - |
| | | | | **Carried forward** | **R -** |

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**SCHEDULE A : PRELIMINARY AND GENERAL**

**Date** October 2023
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| Item no. | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | | | | **Brought forward** | **R -** |
| A.1.10 | FAT test for the Engineer and two (2) municipal personnel upon completion of manufacturing of transformers prior to dispatching | P.C | 100% | 40 000.00 | R 40 000.00 |
| A.1.11 | Registered Surveyor | | | | |
| a) | Services of a registered surveyor for the establishment of erven pegs for construction purposes. | P.C | 100% | 150 000.00 | R 150 000.00 |
| A.1.12 | ORHVS Training and Skills Training | P.C | 100% | 200 000.00 | R 200 000.00 |
| A.1.13 | Allow for Profit and Attendance on items A.1.10; A.1.11; A.1.12 | % | | 0.00 | R - |
| A.2 | **Time-related Items** | | | | |
| A.2.1 | Allow for the following insurances, for the duration of the works | | | | |
| a) | Of the Works | Sum | 100% | | R - |
| b) | Public liability | Sum | 100% | | R - |
| c) | Plant and equipment | Sum | 100% | | R - |
| d) | Common law liability | Sum | 100% | | R - |
| e) | Any other insurance | Sum | 100% | | R - |
| f) | Specify: ..... | Sum | 100% | | R - |
| g) | Specify: ..... | Sum | 100% | | R - |
| h) | Specify: ..... | Sum | 100% | | R - |
| A.2.2 | Supervision and Maintenance: | | | | |
| a) | Allow for supervision on site | Sum | 100% | | R - |
| b) | Allow for head office oversight and support | Sum | 100% | | R - |
| c) | Allow for maintenance and auditing of Health and Safety requirements | Sum | 100% | | R - |
| A.2.3 | Contractual requirements, establish facilities on site: | | | | |
| a) | Site offices | Sum | 100% | | R - |
| b) | Vehicles | Sum | 100% | | R - |
| c) | Living accommodation | Sum | 100% | | R - |
| d) | Telephone and fax facilities | Sum | 100% | | R - |
| | Note. Claims for payment will only be accepted on receiving written substantiated evidence from the Contractor. | | | | |
| | | | | **TOTAL FOR SCHEDULE A : PRELIMINARY AND GENERAL** | **R -** |

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**SCHEDULE B: MEDIUM VOLTAGE RETICULATION NETWORK - OVERHEAD**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| **B.** | **MV RETICULATION NETWORK - OVERHEAD** | | | | | |
| B.1 | Route Clearance and Setting Out | Sum | 100% | ------- | | R - |
| B.2 | Excavations and backfilling of cable trenches | | | | | |
| | Excavate cable trench (600 mm wide x 1100 mm deep), supply bedding, backfill, compaction, disposal of surplus material, selection and disposal of unsuitable material: | | | | | |
| (a) | Normal excavation | m³ | 600 | | | R - |
| (b) | Hard excavation (over and above) | m³ | 150 | | | R - |
| (c) | Blasting of hard rock excavation | m³ | 1 | | | **Rate Only** |
| (d) | Soft red soil bedding (300 mm deep) | m³ | 170 | | | R - |
| (e) | Remove unsuitable excavation materials | m³ | 70 | | | R - |
| (f) | Import suitable material for backfill | m³ | 70 | | | R - |
| (g) | Danger tape (300 mm above cable) | m | 860 | | | R - |
| (h) | 160 mm Ø Cable conduit | m | 160 | | | R - |
| B.3 | Paper Insulated Lead Covered PVC Bedded and sheathed, Double Steel Tape Armoured Cables - 6,35/11kV to SANS 97, and BCEC | | | | | |
| | Supply, install, terminate and connect PILC DSTA MV armoured cable 11kV and BCEC as specified: | | | | | |
| (a) | 70 mm² x 3 core Cu, SANS 97 | No | 900 | | | R - |
| (b) | 35 mm² x 3 core Cu, SANS 97 | No | 1 | | | **Rate Only** |
| (c) | 70 mm² BCEC | No | 900 | | | R - |
| (d) | 25 mm² BCEC | No | 1 | | | **Rate Only** |
| B.4 | Jointing and Termination of MV Cables | | | | | |
| (a) | MV cable joints for 70 x 3 Core PILC cables based on 300 m drum lengths | No | 2 | | | R - |
| (b) | MV cable joints for 35 x 3 Core PILC cables based on 300 m drum lengths | No | 1 | | | **Rate Only** |
| (c) | MV cable termination, outdoor for 70 PILC 3 core cable | No | 1 | | | R - |
| (d) | MV cable termination, indoor for 70 PILC 3 core cable | No | 6 | | | R - |
| (e) | BCEC termination at Minisub and Equipment | | | | | |
| | i) all sizes | No | 7 | | | R - |
| B.5 | Ring Main Unit | | | | | |
| | Supply and installation of a ground-mounted outdoor-type enclosure ring main unit, as specified; complete with ABB Safering Vacuum Ring Main Unit (3 way, VVV), with integral cable testing facility, including labelling | | | | | |
| (a) | Labelling per Ring Main Unit and Existing as specified | No | 1 | | | R - |
| (b) | Earthing at RMU (crow-foot arrangement, 70mm² BCEC) | No | 1 | | | R - |
| (c) | 25 MPa Concrete foundation, pre-cast, for ring main unit | No | 1 | | | R - |
| | | | | | **Carried forward** | **R -** |

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**SCHEDULE B: MEDIUM VOLTAGE RETICULATION NETWORK - OVERHEAD**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| | | | | | **Brought forward** | **R -** |
| B.6 | Miniature Substation | | | | | |
| | Supply and installation of a Type B miniature substation, as specified; complete with ABB Safering Vacuum Ring Main Unit (3 way, CCV), with integral cable testing facility, with thermal shunt trip (OTI connected to MV relay) complete with low voltage MCCBs; with Maximum Demand digital meter; including labelling | | | | | |
| (a) | 315 kVA, 11kV/420/242V, Dyn11 | No | 1 | | | R - |
| (b) | 500 kVA, 11kV/420/242V, Dyn11 | No | 1 | | | R - |
| (c) | 630 kVA, 11kV/420/242V, Dyn11 | No | 1 | | | **Rate Only** |
| (d) | Labelling per Miniature New Substation and Existing as specified | No | 1 | | | R - |
| (e) | Earthing at minisub (crow-foot arrangement, 70mm² BCEC) | No | 2 | | | R - |
| (f) | 25 MPa Concrete foundation, pre-cast, for miniature substation | No | 2 | | | R - |
| B.7 | Testing and commissioning | | | | | |
| (a) | Testing of MV cables (per section / length) | No. | 3 | | | R - |
| (b) | Testing of MV feeders (per feeder) | No. | 3 | | | R - |
| B.8 | Miscellaneous Material | | | | | |
| (a) | Allow small materials eg. cable shoes, saddles, bolts, nuts, washers, solder etc. for the completion of consumer connections | Sum | 1 | -------- | | R - |
| (b) | Fastening of BCEC to the cable with cable ties | Sum | 1 | -------- | | R - |
| (c) | Concrete cable markers | No. | 40 | | | R - |
| (d) | Standard municipal locks for MV and LV access doors of miniature substation | No. | 8 | | | R - |
| B.9 | Provisional budgetary amounts | | | | | |
| (a) | Allow amount to tie into existing network complete with 11kV cable joints | P.C Sum | 1 | -------- | 50 000.00 | R 50 000.00 |
| (b) | Allow for Profit and Attendance on item a) | % | | -------- | 0.00 | R - |
| (c) | Allow budgetary amount for modifications and repairs to existing MV overhead line as instructed by Engineer | P.C Sum | 1 | -------- | 60 000.00 | R 60 000.00 |
| (d) | Allow for Profit and Attendance on item (c) | % | | -------- | 0.00 | R - |
| (e) | Allow budgetary amount to tie into existing to existing MV overhead line as instructed by Engineer | P.C Sum | 1 | -------- | 25 000.00 | R 25 000.00 |
| (f) | Allow for Profit and Attendance on item (e) | % | | -------- | 0.00 | R - |
| | **TOTAL FOR SCHEDULE B: MEDIUM VOLTAGE RETICULATION NETWORK - OVERHEAD** | | | | | **R -** |

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**SCHEDULE C : LOW VOLTAGE NETWORK - UNDERGROUND**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| **C.** | **LOW VOLTAGE NETWORK - UNDERGROUND** | | | | | |
| C.1 | Route Clearance and Setting Out | Sum | 1 | ------- | | R - |
| C.2 | Excavations and backfilling of cable trenches | | | | | |
| | Excavate cable trench (600 mm wide x 900 mm deep), supply bedding, backfill, compaction, disposal of surplus material, selection and disposal of unsuitable material: | | | | | |
| (a) | Normal excavation | $m^3$ | 1690 | | | R - |
| (b) | Hard excavation (over and above) | $m^3$ | 430 | | | R - |
| (c) | Blasting of hard rock excavation | $m^3$ | 1 | | | **Rate Only** |
| (d) | Soft red soil bedding (200 mm deep) | $m^3$ | 380 | | | R - |
| (e) | Remove unsuitable excavation materials | $m^3$ | 160 | | | R - |
| (f) | Import suitable material for backfill | $m^3$ | 160 | | | R - |
| (g) | Danger tape (300 mm above cable) | m | 2970 | | | R - |
| (h) | 110 mm Ø Cable conduit | m | 320 | | | R - |
| C.3 | PVC Insulated PVC Bedded SWA PVC Sheathed 600/1 000V Cables to SANS 1507-3 | | | | | |
| | Supply, install, terminate and connect PVC SWA LV cable and BCEC | | | | | |
| (a) | 120 $mm^2$ x 4 core Cu | m | 590 | | | R - |
| (b) | 95 $mm^2$ x 4 core Cu | m | 1115 | | | R - |
| (c) | 70 $mm^2$ x 4 core Cu | m | 900 | | | R - |
| (d) | 50 $mm^2$ x 4 core Cu | m | 290 | | | R - |
| (e) | 35 $mm^2$ x 4 core Cu | m | 1 | | | **Rate Only** |
| (f) | 70 $mm^2$ BCEC | m | 590 | | | R - |
| (g) | 50 $mm^2$ BCEC | m | 1115 | | | R - |
| (h) | 35 $mm^2$ BCEC | m | 900 | | | R - |
| (i) | 25 $mm^2$ BCEC | m | 291 | | | R - |
| C.4 | Termination of PVC SWA PVC Sheathed 600/1000V Cables to SANS 1507-3 | | | | | |
| | Complete with glands, galvanized K-clamps and lugs as specified, for termination at Kiosk and Minisub: | | | | | |
| (a) | 120 $mm^2$ x 4 core Cu | No. | 4 | | | R - |
| (b) | 95 $mm^2$ x 4 core Cu | No. | 12 | | | R - |
| (c) | 70 $mm^2$ x 4 core Cu | No. | 20 | | | R - |
| (d) | 50 $mm^2$ x 4 core Cu | No. | 6 | | | R - |
| (e) | 35 $mm^2$ x 4 core Cu | No. | 1 | | | **Rate Only** |
| (f) | BCEC termination at Kiosk and Minisub | | | | | |
| | i) all sizes | No. | 26 | | | R - |
| (g) | Cadweld of BCEC, all sizes | No. | 1 | | | **Rate Only** |
| | | | | | **Carried forward** | **R -** |

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**SCHEDULE C : LOW VOLTAGE NETWORK - UNDERGROUND**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| | | | | | **Brought forward** | **R -** |
| C.5 | LV cable jointing complete: | | | | | |
| (a) | 120 mm² x 4 core Cu | No. | 1 | | | **Rate Only** |
| (b) | 95 mm² x 4 core Cu | No. | 1 | | | **Rate Only** |
| (c) | 70 mm² x 4 core Cu | No. | 1 | | | **Rate Only** |
| (d) | 50 mm² x 4 core Cu | No. | 1 | | | **Rate Only** |
| (e) | 35 mm² x 4 core Cu | No. | 1 | | | **Rate Only** |
| C.6 | Ground Mounted Distribution Kiosk<br>PPS MK9<br>Supply and installation kiosks, made of 2mm thickness sheet-metal 3CR12, as specified; complete with labelling for kiosk, circuit breakers and meter numbers | | | | | |
| (a) | 12 Way kiosks | No. | 45 | | | R - |
| (b) | Labelling per kiosk as specified | No. | 45 | | | R - |
| C.7 | Low voltage circuit breakers<br>Supply and install of circuit breakers as specified: | | | | | |
| (a) | CBI QF Double Pole 50A 6kA, 1Ø, Curve 1 | No. | 260 | | | R - |
| (b) | CBI JS25 Triple Pole 150A, 3Ø, Curve 1 | No. | 5 | | | R - |
| (c) | CBI JS25 / L20B Triple Pole 250A, 3Ø, Curve 1 | No. | 5 | | | R - |
| (d) | Labelling of CB per LV kiosk | m | 270 | | | R - |
| C.8 | Testing and commissioning | | | | | |
| (a) | Testing of LV cables (per section / length) | No. | 10 | | | R - |
| (b) | Testing of LV feeders (per feeder) | No. | 10 | | | R - |
| C.9 | Miscellaneous Material | | | | | |
| (a) | Allow small materials eg. cable shoes, saddles, bolts, nuts, washers, solder etc. for the completion of consumer connections | Sum | 1 | -------- | | R - |
| (b) | Fastening of BCEC to the cable with cable ties | Sum | 1 | -------- | | R - |
| (c) | Standard municipal locks for LV access doors of kiosks | No. | 45 | | | R - |
| C.10 | Provisional budgetary amounts | | | | | |
| (a) | Allow budgetary amount to connect to existing LV network | Sum | 1 | -------- | 175 000.00 | R 175 000.00 |
| (b) | Allow for Profit and Attendance on item (a) | % | | -------- | 0.00 | R - |
| C.11 | Transformer Earthing<br>Supply, delivery and installation of earthing material complete as shown and specified | | | | | |
| (a) | Earthing rod, 16 mm diameter x 1 500 mm long | No. | 4 | | | R - |
| (b) | Earth conductor, 16 mm² stranded and insulated copper conductor. | m | 80 | | | R - |
| (c) | Galvanized steel pipe, 4 meter in length suitable for 25mm² - 95mm² x 4C cable | No. | 2 | | | R - |
| | | | | | **Carried forward** | **R -** |

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**SCHEDULE C : LOW VOLTAGE NETWORK - UNDERGROUND**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| | | | | | **Brought forward** | **R -** |
| C.12 | Transformer (pole-mounted)<br>Supply, delivery and installation of a power transformer and drop out fuses complete and connect to low voltage kiosk as specified complete with accessories, labels and nameplates | | | | | |
| (a) | 200 kVA, 11000/420V Dyn11 pole mounted power transformer | No. | 1 | | | R - |
| (b) | 100 kVA, 11000/420V Dyn11 pole mounted power transformer | No. | 1 | | | **Rate Only** |
| (c) | Transformer platform, 2 Pole, In-line | No | 1 | | | R - |
| (d) | Surge arrestor and bracket, 12kV/10kA | Set | 1 | | | R - |
| (e) | Equipment link, fuse element and bracket | Set | 2 | | | R - |
| (f) | Steel crossarm for equipment - 1,7m | No | 1 | | | R - |
| C.13 | Transformer Low Voltage Kiosk<br>Pole mounted transformer low voltage kiosk complete with galvanized mounting brackets, galvanized steel pipe, including supply cable to transformer as specified: | | | | | |
| (a) | Replace Existing Kiosk - 3 out-going feeders, 4x160A 25KA , 1x250A 25KA triple pole circuit breakers | No. | 1 | | | R - |
| | **TOTAL FOR SCHEDULE C : LOW VOLTAGE NETWORK - UNDERGROUND** | | | | | **R -** |

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**SCHEDULE D : SERVICE CONNECTIONS - UNDERGROUND**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| **D.** | **SERVICE CONNECTIONS - UNDERGROUND** | | | | | |
| D.1 | Route Clearance and Setting Out | Sum | 100% | ------- | | R - |
| D.2 | Excavations and backfilling of cable trenches | | | | | |
| | Excavate cable trench (300 mm wide x 700 mm deep), supply bedding, backfill, compaction, disposal of surplus material, selection and disposal of unsuitable material: | | | | | |
| (a) | Normal excavation | m³ | 1860 | | | R - |
| (b) | Hard excavation (over and above) | m³ | 470 | | | R - |
| (c) | Blasting of hard rock excavation | m³ | 1 | | | **Rate Only** |
| (d) | Soft red soil bedding (200 mm deep) | m³ | 540 | | | R - |
| (e) | Remove unsuitable excavation materials | m³ | 220 | | | R - |
| (f) | Import suitable material for backfill | m³ | 220 | | | R - |
| (g) | Danger tape (300 mm above cable) | m | 8400 | | | R - |
| (h) | 110 mm Ø Cable conduit | m | 620 | | | R - |
| D.3 | PVC Insulated PVC Bedded SWA PVC Sheathed 600/1 000V Cables to SANS 1507-3 | | | | | |
| | Supply, install, terminate and connect PVC SWA LV cable and BCEC | | | | | |
| (a) | 10 mm² x 2-core Cu, SANS 1507-3 | m | 12000 | | | R - |
| (b) | 16 mm² x 2-core Cu, SANS 1507-3 | m | 1 | | | **Rate Only** |
| (c) | 10 mm² BCEC | m | 12000 | | | R - |
| D.4 | Termination of PVC SWA PVC Sheathed 600/1000V Cables to SANS 1507-3 | | | | | |
| | Complete with glands or K-clamps and lugs as specified: | | | | | |
| (a) | Galvanized K-clamp for termination at Kiosk for: | | | | | |
| | i) 10 mm² x 2 core cable | No. | 260 | | | R - |
| (b) | Cable gland and shroud for termination at DB for: | | | | | |
| | i) 10 mm² x 2 core cable | No. | 260 | | | R - |
| (c) | BCEC termination at Kiosk and DB | | | | | |
| | i) all sizes | No. | 260 | | | R - |
| (d) | Cadweld of BCEC, all sizes | No. | 1 | | | **Rate Only** |
| D.5 | Testing and commissioning | | | | | |
| (a) | Testing of service cables (per connection) | No. | 260 | | | R - |
| (b) | Pairing and testing of meters | No. | 260 | | | R - |
| D.6 | Itron Sienna PLC Split Unit Prepaid kWh-meters | | | | | |
| | Supply, deliver and installation of prepaid kWh consumer meters including all accessories for installation and programing as specified: | | | | | |
| (a) | Single phase consumer energy meter + key pad | No | 260 | | | R - |
| D.7 | Ready-board | | | | | |
| (a) | Supply, delivery and installation of ready boards as specified with 40A consumer circuit breaker | No | 260 | | | R - |
| | | | | | **Carried forward** | **R -** |

**DAWID KRUIPER MUNICIPALITY**

**TN036/2023 (35087.00) - ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

**SCHEDULE D : SERVICE CONNECTIONS - UNDERGROUND**

**Date** October 2023
**Rev** 00

| Item no. | Description | Unit | Qty | Rate Supply | Rate Install | Amount |
|---|---|---|---|---|---|---|
| | | | | | **Brought forward** | **R -** |
| D.8 | Wooden back-board<br>Supply, delivery and installation of wooden back board for assembly of meter and ready board, as specified: | | | | | |
| a) | Wooden backboard. To be chamfered and dipped in a mixutre of linseed oil and turpentine | No. | 260 | | | R - |
| b) | Energy saving lamp for each ready board | No. | 260 | | | R - |
| (c) | Assemblying of complete ready board onto the wooden backboard | No. | 260 | | | R - |
| D.9 | Earthing for Consumer Point of Supply<br>Provide earthing as including bonding of earth conductors as specified: | | | | | |
| (a) | Earthing rod, 16mm² x 1 500 mm long | No. | 260 | | | **Rate Only** |
| (b) | Earth conductor, 6 mm² stranded and insulated copper conductor | m | 3900 | | | **Rate Only** |
| (c) | Earth conductor, 6 mm² stranded bare copper conductor | m | 3900 | | | **Rate Only** |
| (d) | Kicker pipe, galvanized steel, 10mm diameter, 3m length including saddles for installation | No. | 260 | | | **Rate Only** |
| D.10 | Testing and Commissioning<br>Testing and commissioning of consumer installations installation including readyboards and prepaid meters and the issuing of a Certificate of Compliance as specificied for each installation. | | | | | |
| (a) | Testing of each consumer installation | No. | 260 | -------- | | R - |
| (b) | Issuing of Certificate of Compliance | No. | 260 | -------- | | R - |
| D.11 | Miscellaneous Material | | | | | |
| (a) | Allow small materials eg. cable shoes, saddles, bolts, nuts, washers, solder etc. for the completion of consumer connections | Sum | 1 | -------- | | R - |
| (b) | Fastening of BCEC to the cable with cable ties | Sum | 1 | -------- | | R - |
| D.12 | Provisional budgetary amounts | | | | | |
| (a) | Allow budgetary amount for Client Engineers for unforseen changes/ re-design to installations | P.C | 1 | -------- | 50 000.00 | R 50 000.00 |
| (b) | Allow for Profit and Attendance on item (a) | % | | -------- | 0.00 | R - |
| (c) | Allow budgetary amount for route / site clearance & demolition works with suitable machinery (CAT D6 Bulldozer, TLB, Tipper, Lowbed haul) | P.C | 1 | -------- | 50 000.00 | R 50 000.00 |
| (d) | Allow for Profit and Attendance on item (c) | % | | -------- | 0.00 | R - |
| | | | | **TOTAL FOR SCHEDULE D : SERVICE CONNECTIONS - UNDERGROUND** | | **R -** |

**DAWID KRUIPER MUNICIPALITY**

**TN036/2023 (35087.00) - ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

**SCHEDULE E : SUMMARY OF PRICES**

| | |
|---|---|
| **Date** | **October 2023** |
| **Rev** | **00** |

| Item | Description | TENDER AMOUNT | |
|---|---|---|---|
| A | PRELIMINARY AND GENERAL | R | - |
| B | MEDIUM VOLTAGE RETICULATION NETWORK - UNDERGROUND | R | - |
| C | LOW VOLTAGE RETICULATION NETWORK - UNDERGROUND | R | - |
| D | SERVICE CONNECTIONS - UNDERGROUND | R | - |
| | **Subtotal - 1** | **R** | **-** |
| | **___% Contingency** | R | - |
| | **Subtotal - 2** | R | - |
| | **VAT @ 15%** | R | - |
| | **Total Contract Price** | **R** | **-** |

# Annexure B – Health and Safety

## HEALTH AND SAFETY SPECIFICATION

## ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13

### FOREWORD

This health and safety specification has been compiled under the guidelines of the Occupational Health and Safety Act no. 85 of 1993 as amended (herein after referred to as The Act).

It must be clear that this document is a management tool and should be used at work in order to comply with the aforementioned Act.

Should there be any contradiction between this document and the Act; the Act must take preference except where explicitly stated.

Similarly where this document is silent on a specific health and safety requirement, the Act must be used as the minimum requirement.

Should you be unclear about anything set out in this document, please contact us.

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Tel: +27 (0) 54 337 6600

### 1. INTRODUCTION

1.1. In terms of Construction Regulation 5(1)(*b*) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), **Dawid Kruiper Municipality**, as the Client and/or its Agent on its behalf, shall be responsible to prepare Health & Safety Specifications for any intended construction project and provide any Principal Contractor who is making a bid or appointed to perform construction work for the Client and/or its Agent on its behalf with the same.

1.2. The Principal Contractor and contractors shall be responsible for the Health & Safety Policy for the site in terms of Section 7 of the Act and in line with Construction Regulation 7 as well as the Health and Safety Plan for the project.

1.3. This 'Health and Safety Specifications' document is governed by the "Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), hereinafter referred to as 'The Act'. It should be noted that no single Act or its set of Regulations be read in isolation. Furthermore, although the definition of Health and Safety Specifications stipulates 'a documented specification of all health and safety requirements pertaining to associated works on a construction site, so as to ensure the health and safety of persons', it is required that the entire scope of the Labour Legislation, including the Basic Conditions of Employment Act be considered as part of the legal compliance system. With reference to this specification document this requirement is limited to all health, safety and environmental issues pertaining to the site of the project as referred to here-in. Despite the foregoing it is reiterated that environmental management shall receive due attention.

1.4. Due to the wide scope and definition of construction work, every construction activity and site will be different, and circumstances and conditions may change even on a daily basis. Therefore, due caution is to be taken by the Principal Contractor and contractors when drafting the Health and Safety Plan based on these Health and Safety Specifications.

1.5. Prior to drafting the Health and Safety Plan, and in consideration of the information contained here-in, the contractor shall set up a Risk Assessment Program to identify and determine the scope and details of

any risk associated with any hazard at the construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard. *This Risk Assessment and the steps identified will be the basis or point of departure for the Health and Safety Plan.* The Health and Safety Plan shall include documented 'Methods of Statement' (see definitions under Regulation 1 of Construction Regulations) detailing the key activities to be performed in order to reduce as far as reasonably practicable, the hazards identified in the Risk Assessment.

1.6. Every effort has been made to ensure that this specification document is accurate and adequate in all respects. Should it however, contain any errors or omissions they may not be considered as grounds for claims under the contract for additional reimbursement or extension of time, or relieve the Principal Contractor and contractors from his responsibilities and accountability in respect of the project to which this specification document pertains. Any such inaccuracies, inconsistencies and/or inadequacies must immediately be brought to the attention of the Agent and/or Client.

## 2. SCOPE OF HEALTH AND SAFETY SPECIFICATION DOCUMENT

The Health and Safety Specifications pertaining to the project; **TN036/2023: Electrification of 260 Houses in Kameelmond, Louisvale Road, Couples Valley & Pabalello Ward 13.**

These specifications are contained in the index and intend to specify the normal and specific requirements of **Dawid Kruiper Municipality** pertaining to the health and safety matters (including the environment) applicable to the project in question. These Specifications should be read in conjunction with the OHS Act 85, 1993 and its Regulations with specific reference to the Construction Regulations. This will also include any Safety Standards which were or will be promulgated under the Act or incorporated into the Act and be in force or come into force during the effective duration of the project. The stipulations in this specification, as well as those contained in all other documentation pertaining to the project, including contract documentation and technical specifications shall not be interpreted, in any way whatsoever, to countermand or nullify any stipulation of the Act, Regulations and Safety Standards which are promulgated under, or incorporated into the Act.

## 3. PURPOSE

The purpose of this specification document is to provide the relevant Principal Contractor (and sub-contractor) with any information other than the standard conditions pertaining to construction sites which might affect the health and safety of persons at work and of persons in connection with the use of plant and machinery. It further aims to protect persons other than its employees against any potential hazards to their health and safety arising out of or in connection with the activities of persons at work during the construction work for **Dawid Kruiper Municipality.**

3.1 To brief the Principle and Sub-Contractor on the significant health and safety requirements and aspects of the project. This shall include the provision of the following information and requirements namely:

a) safety considerations affecting the site of the project and its environment;
b) health and safety aspects of the associated structures and equipment;
c) required submissions on health and safety matters required from the Principal Contractor (and Sub-Contractor);
d) and the Principal Contractor's (Sub - Contractors) health and safety plan.

3.2 To serve to ensure that the Principal Contractor (and Subcontractors) is fully aware of what is expected from them with regards to the Occupational Health and Safety Act, 85 of 1993 and the Regulations made there-under including the applicable safety standards, and in particular in terms of Section 8 of the Act.

3.3 To inform the Principal Contractor that the Occupational Health and Safety Act, 85 of 1993 in its entirety shall apply to the contract to which this specification document applies. The Construction Regulations

promulgated on 7 February 2014 and incorporated into the above Act by Government Notice R 84, published in Government Gazette 37305 shall specifically apply to all persons involved in the construction work pertaining to this project.

## 4. DEFINITIONS

"Purpose of the Act" –To provide for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

"Agent" –means a competent person who acts as a representative for a client;

"Client" –means any person for whom construction work is performed;

"Construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction site" means a workplace where construction work is being performed;

"Construction supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction work" means any work in connection with -

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

"Contractor" –means an employer who performs construction work;

"Designer" means-

(a) a competent person who-
    (i) prepares a design;
    (ii) checks and approves a design;
    (iii) arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or
    (iv) designs temporary work, including its components;
(b) an architect or engineer contributing to, or having overall responsibility for a design;
(c) a building services engineer designing details for fixed plant;
(d) a surveyor specifying articles or drawing up specifications;
(e) a contractor carrying out design work as part of a design and building project; or an interior designer, shop-fitter or landscape architect;

"Health and Safety File" –means a file, or other record containing the information by the Construction Regulations;

"Health and Safety Plan" –means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" –means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Method Statement" –means a document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment;

"Principal contractor" means an employer appointed by the client to perform construction work;
"Risk Assessment" –means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard.

## 5. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

### 5.1 Roles and organisation of Health and Safety Responsibilities

All responsibilities fall under the legal requirement of legal appointment letters – each responsible person must have an appointment letter.

| ROLE | RESPONSIBILITIES |
|---|---|
| Client<br><br>Client Agent | **The Client and/or its Agent** shall ensure that the Principal Contractor, appointed in terms of Construction Regulation 5(1) (l), implements and maintains the agreed and approved Health and Safety Plan. Failure on the part of the Client or Agent to comply with this requirement will not relieve the Principal Contractor from any duties under the Act and Regulations. |
| CEO – Principal Contractor | The **Chief Executive Officer** of the Principal Contractor in terms of Section 16 (1) of the Act to ensure that the Employer (as defined in the Act) complies with the Act. The pro forma Legal Compliance Audit may be used for this purpose by the Principal Contractor or his/her appointed contractor. |
| Person responsible for Health and Safety<br><br>Section 16(2) | All OHS Act (85 /1993), **Section 16 (2)** appointee/s as detailed in their respective appointment forms shall regularly, in writing, report to management on health and safety matters or deviations identified during routine or ad hoc inspections/ audits. All reports shall be made available to the principal Contractor to become part of their site records (Health & Safety File). |
| Construction Manager Or Assistant | **The Construction Manager and Assistant Construction Manager** appointed in terms of Construction Regulation 8 shall regularly, in writing, report to their managers on health and safety matters or deviations identified during inspections. All reports shall be made available to the principal Contractor to become part of site records (Health & Safety File). This manager must be registered with SACPCMP. |
| SHE Representatives | **All Health and Safety Representatives (SHE-Reps)** shall act and report as per Section 18 of the Act. She Representatives shall inspect and monitor activities on a daily basis and report finding to the Client and Health and Safety manager immediately. These safety representatives have the right to stop any unsafe work or work due to unsafe conditions and report findings and reason immediately to Employer's Management. |
| Other Legal Appointees | **Further (Specific) Supervision Responsibilities for OH&S** |

| ROLE | RESPONSIBILITIES |
|---|---|
| | Several appointments or designations of responsible and /or competent people in specific areas of construction work are required by the Act and Regulations. The following competent appointments, where applicable, in terms of the Construction Regulations are required to ensure compliance to the Act, Regulations and Safety Standards. |

| LEGAL APPOINTMENTS AS REQUIRED IN THE CONSTRUCTION REGULATIONS | | | |
|---|---|---|---|
| **Item** | **Construction Regulation** | **Appointment** | **Responsible Person** |
| 1. | 5(1)(h) | Principal contractor for each phase or project | Client |
| 2. | 7(1)(c)(v) | Contractor | Principal Contractor |
| 3. | 7(2)(c) | Contractor | Contractor |
| 4. | 8(1) | Construction Manager | Principal Contractor |
| 5. | 8(2) | Construction Manager sub-ordinates | Principal Contractor |
| 6. | 8(5) & (6) | Construction Safety Officer | Principal Contractor & Contractor |
| 7. | 9(1) | Person to carry out risk assessment | Principal Contractor & Contractor |
| 8. | 9(4) | Trainer/Instructor | Principal Contractor & Contractor |
| 9. | 10(1)(a) | Fall protection planner | Principal Contractor & Contractor |
| 10. | 13(1)(a) | Excavation supervisor | Principal Contractor & Contractor |
| 11. | 13(2)(b)(ii)(bb) | Professional engineer or technologist | Principal Contractor & Contractor |
| 12. | 13(2)(k) | Explosives expert | Principal Contractor & Contractor |
| 13. | 16(1) | Scaffold supervisor | Principal Contractor & Contractor |
| 14. | 23(1)(d)(i) | Construction vehicle and mobile plant operator | Principal Contractor & Contractor |
| 15. | 23(1)(k) | Construction vehicle and mobile plant inspector | Principal Contractor & Contractor |
| 16. | 24(d) | Temporary electrical installations inspector | Principal Contractor & Contractor |
| 17. | 24 (e) | Temporary electrical installations controller | Principal Contractor & Contractor |
| 18. | 28 (a) | Stacking and storage supervisor | Principal Contractor & Contractor |
| 19. | 29 (h) | Fire equipment inspector | Principal Contractor & Contractor |

**This list may be used as a reference or tool to determine which components of the Act and Regulations would be applicable to a particular site, as was intended under paragraph 3 & 4 of the Chapter "Introduction" (page 4) above. This list shall not be assumed to be exclusive or comprehensive.**

**5.2 Communication**

5.2.1 Communication between the Employer, the Principal Contractor, Sub-Contractors, Project manager, Architect and other concerned parties shall take place in the SHE Committee or Project meeting.

5.2.2 In addition to the above, communication may be directed to the Client or Client Agent, in writing, as and when the need arises.

5.2.3 The workforce may consult on Health and Safety matters with their Supervisor or SHE Representative

5.2.4 The Principal Contractor shall be responsible for the dissemination of all relevant Health and Safety information to Sub-Contractors and other Contractors e.g. design changes agreed with the Client and its Agent; instructions issued by the Client agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations etc.

## 6. INTERPRETATION

6.1 The Occupational Health and Safety Act and all its Regulations, with the exception of the Construction Regulations, distinguish between the roles, responsibilities and functions of employers and employees respectively. It views consultants and contractors as employees of the "owner" of a construction or operational project, the "owner" being regarded as the employer. Only if formally agreed to by way of the written agreement in this regard between the "owner(s)" and consultant and /or between the "owner(s)" and the contractor(s), will these assumptions be relinquished in favour of the position agreed upon between the relevant parties.

6.2 In terms of the Construction Regulations the "owner", in terms of its instructions, operates (has to operate) in the role of client as per relevant definition.

6.3 The contractors working for the "client" are seen to be in two categories, i.e. the Principal Contractor and Sub Contractors. The Principal Contractor has to take full responsibility for the health and safety on the site of the relevant project / contract. This includes monitoring health and safety conditions and overseeing administrative measures required by the Construction Regulations from all contractors on the project site.

6.4 Subcontractors are required to operate under the control (in terms of all health and safety measures which are covered in the Construction Regulations) of the Principal Contractor. Where, for the work the Principal Contractor will have to execute himself, practical health and safety measures are applicable, he will also be subject to the relevant requirements with which Subcontractors have to comply. The Principal Contractor will, however, not have to actually fulfill such requirements in respect of any of the work / functions of any (ordinary / sub) Contractors on the site for which he has been appointed as Principal Contractor. However, he has to monitor / oversee such processes, ensuring that the requirements are complied with and that the required appointments / evaluations / inspections / assessments and tests are done and that the records are duly generated and kept as prescribed in the Construction Regulations. This has to feature clearly in the Principal Contractor's Health and Safety Plan.

## 7. RESPONSIBILITIES

### *7.1 Client*

a) The Client or the appointed Client Agent will appoint each Principal Contractor for this project or phase/section of the project in writing for assuming the role of Principal Contractor as intended by the Construction Regulations.

b) The Client or the appointed Client Agent shall discuss, negotiate and approve the contents of the specified project health and safety plan submitted by the Principal and Sub Contractor.

c) The Client or his Agent will take reasonable steps to ensure that the health and safety plan of the Principle and Sub Contractor is correctly implemented and maintained. Periodical audits agreed between the client and the principal and any contractor (audits to take place at least every 30 days CR5.1(o)) shall be conducted to monitor the compliance.

d) The Client or his appointed Agent on his behalf, will prevent the Principal Contractor and/or the Contractor from commencing or continuing with construction work should the Principal Contractor and/or the Contractor at any stage in the execution of the works be found to:

- have failed to have complied with any of the administrative measures required by the Construction Regulations in preparation for the construction project or any physical preparations necessary in terms of the Act;
- have failed to implement or maintain their health and safety plan;
- have executed construction work which is not in accordance with their health and safety plan;
- have acted in any way which may pose a threat to the health and safety of any person(s) present on the site of the works or in its vicinity, irrespective of him/them being employed or legitimately on the site of the works or in its vicinity.

### *7.2 Principal Contractor*

a) The Principal Contractor shall accept the appointment under the terms and Conditions of Contract. The Principal Contractor shall sign and agree to those terms and conditions and shall, before commencing work, notify the Department of Labour of the intended construction work in terms of Regulation 4 of the Construction Regulations. Appendix F of this Specification contains a "Notification of Construction Work" form. The Principal Contractor shall submit the notification in writing prior to commencement of work and inform the Client or his Agent accordingly.

b) The Principal Contractor shall ensure that he is fully conversant with the requirements of this Specification and all relevant health and safety legislation. This Specification is not intended to supersede the Act nor the Construction Regulations or any part of either. Those sections of the Act and the Construction Regulations which apply to the scope of work to be performed by the Principal Contractor in terms of this contract (entirely or in part) will continue to be legally required of the Principal Contractor to comply with. The Principal Contractor will in no manner or means be absolved from the responsibility to comply with all applicable sections of the Act, the Construction Regulations or any Regulations proclaimed under the Act or which may perceivable be applicable to this contract.

c) The Principal Contractor shall provide and demonstrate to the Client a suitable and sufficiently documented health and safety plan based on this Specification, the Act and the Construction Regulations, which shall be applied from the date of commencement of and for the duration of execution of the works. This plan shall, as appendices, include the health and safety plans of all Sub-contractors for which he has to take responsibility in terms of this contract.

d) The Principal Contractor shall provide proof of his registration and good standing with the Compensation Fund or with a licensed compensation insurer prior to commencement with the works.

e) The Potential Principal Contractor shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and Construction Regulations. (Note: This shall have to be contained in the conditions of tender upon which a tenderer's offer is based.)

f) The Principal Contractor shall consistently demonstrate his competence and the adequacy of his resources to perform the duties imposed on the Principal Contractor in terms of this Specification, the Act and the Construction Regulations.

g) The Principal Contractor shall ensure that a copy of his health and safety plan is available on site and is presented upon request to the Client, the Client's agent, an Inspector, Employee or Sub-contractor.

h) The Principal Contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of this Specification, the Act and the Construction Regulations, is opened and kept on site and made available to the Client or Inspector upon request. Upon completion of the works, the Principal Contractor shall hand over a consolidated health and safety file to the Client.

i) The Principal Contractor shall, throughout execution of the contract, ensure that all conditions imposed on his Sub-contractors in terms of the Act and the Construction Regulations are complied with as if they were the Principal Contractor.

j) The Principal Contractor shall from time to time evaluate the relevance of the Health and Safety Plan and revise the same as required, following which revised plan shall be submitted to the Client and/or his/her Agent for approval.

## 8. SCOPE OF WORK

These specifications are applicable to the specific scope of work pertaining to the TN036/2023: Electrification of 260 Houses in Kameelmond, Louisvale Road, Couples Valley & Pabalello Ward 13 project as detailed in the tender document, Part C3.

The scope of work comprises the following:

(a) 11 kV overhead and underground feeders,
(b) Ground mounted miniature substations and Pole mounted transformers,
(c) Low voltage underground and overhead reticulation feeders,
(d) Low voltage distribution kiosks,
(e) Consumer connections with prepaid split unit metering.

This Specification covers the requirements for eliminating and mitigating incidents and injuries on construction site for Project No. **TN036/2023** of **Dawid Kruiper Municipality: Electrification of 260 Houses in Kameelmond, Louisvale Road, Couples Valley & Pabalello Ward 13**

The scope also addresses legal compliance, hazard identification and risk assessment, risk control and promoting a health and safety culture amongst those working on the project. The health and safety specification also make provision for the protection of persons other than employees of the Principal Contractor and Contactor.

If at any time after commencement of the project changes are brought about to the design or construction, sufficient health and safety information and appropriate resources are to be made available to the Principal Contractor to execute the work safely.

According to Construction Regulation 7(1)(c)(ii) all potential contractors submitting tenders must make provision for the cost of health and safety measures during the construction process. When submitting a tender the Principal Contractor shall therefore, make provision for the cost of health and safety measures in terms of their documented Health and Safety Plan and Client's Health and Safety Specifications. The

cost shall be clearly specified and quantified within the tender document under a section for health and safety.

**THE HEALTH AND SAFETY PLAN IS THEREFORE TO BE INCLUDED WITH THE TENDER DOCUMENTS WHEN TENDERS ARE INVITED FOR THE PROJECT.**

## 9. HEALTH AND SAFETY FILE

The Principal Contractor must, in terms of Construction Regulation 7(2)(b), keep a Health & Safety File on site at all times that must include all documentation required in terms of the Act and Regulations and must also include a list of all Contractors on site that are accountable to the Principal Contractor and the agreements between the parties and details of work being done. A more detailed list of documents and other legal requirements that must be kept in the Health and Safety File is attached as an addendum to this document.

**IMPORTANT:**
The Health and Safety File will remain the property of the Client and/or its Agent on its behalf throughout the period of the project and shall be consolidated and handed over to the Client and/or its Agent on its behalf at the time of completion of the project.

## 10. OH&S GOALS AND OBJECTIVES AND ARRANGEMENTS FOR MONITORING AND REVIEWING OH&S PERFORMANCE

The Principal Contractor is required to maintain an acceptable disabling incident frequency rate (DIFR) and report monthly on their performance to the Client or its Agent.

## 11. IDENTIFICATION OF HAZARDS AND DEVELOPMENT OF RISK ASSESSMENTS, STANDARD WORKING PROCEDURES (SWP) AND METHOD STATEMENTS

The Principal Contractor is required to perform risk assessments, compile Standard Working Procedures (SWP) and Method Statements for each activity executed in the contract or project (see 4. below "Project/Site Specific Requirements")
The identification of hazards is over and above the hazards identification program and those hazards identified during the drafting of the Health and Safety Plan.

## 12. ARRANGEMENTS FOR MONITORING AND REVIEW

### *12.1 Periodical Audit by Client or its Agent*

The Client and/or its Agent on its behalf will be conducting Periodic Audits at times agreed with the Principal Contractor to comply with Construction Regulation 7(1)(*c*)(vii) to ensure that the principal Contractor has implemented, is adhering to and is maintaining the agreed and approved OH&S Plan (audits must be done at least once every 30 days).

### *12.2 Other audits and inspections by client or agent.*

The Client or its Agent reserves the right to conduct any ad hoc audits and inspections as it deems necessary.

A representative of the Principal Contractor and the relevant Health and Safety Representative(s) (SHE-Reps) must accompany the Client and/or its Agent on all Audits and Inspections and may conduct their own audit/inspection simultaneously. Each party will, however, take responsibility for the results of

his/her own audit/inspection results. The Client or its Agent may request a copy of the Principal Contractor SHE Committee meeting minutes, reflecting possible recommendations made by that committee to the Employer for reference purposes.

### *12.3 Incident Investigation and Reporting*

12.3.1 The Principal Contractor shall report all incidents where an employee is injured on duty to the extent that he/she:

- dies
- becomes unconscious
- loses a limb or part of a limb
- is injured or becomes ill to such a degree that he/she 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 continue with the activity for which he/she was usually employed
  **or where:**
  - a major incident occurred
- the health or safety of any person was endangered (this could be a near miss) and
- where a dangerous substance was spilled
- the uncontrolled release of any substance under pressure took place
- machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- machinery ran out of control,
  **to the Provincial Director of the Department of Labour within seven days and at the same time to the Client or its Agent.**

Refer in this regard to Section 24 of the Act & General Administrative Regulation 8.

12.3.2 The Principal Contractor is required to provide the Client and/or its Agent on its behalf with copies of all statutory reports required in terms of the Act and the Regulations.

12.3.3 The Principal Contractor is required to provide the Client and/or its Agent on its behalf with a monthly "SHE Risk Management Report".

12.3.4 The Principal Contractor is required to provide a.s.a.p. the Client and/or its Agent on its behalf with copies of all internal and external accident/incident investigation reports including the reports contemplated in 12.7, 12.8.2, 15, 16, 17, 21 and 22 below. As soon as the occurrence of any accident/incident of whatever nature comes to the notice of the Principal Contractor, it shall be reported immediately to any of the following:

- Project Manager / Client Agent
- Health and Safety Manager.

### *12.4 Review*

- The Principal Contractor is to review the Hazard Identification, Risk Assessments and Standard Work Processes at each Construction Planning and Progress Report meeting as the construction work develops and progresses. Each time changes are made to the designs, plans and construction methods and processes. These items must be reviewed.
- The Principal Contractor must provide the Client and/or its Agent on its behalf, other Contractors and all other concerned parties with copies of any changes, alterations or amendments as contemplated in the above paragraph.

### *12.5 Site Rules and other Restrictions*

**12.5.1 Site OH&S Rules**

The Principal Contractor must develop a set of site-specific Health and Safety Rules that will be applied to regulate the Health and Safety Plan and associated aspects of the construction project.
When required for a site by law, visitors and non-employees upon entering the site shall be issued with the proper Personal Protective Equipment (PPE) as and when necessary.

**12.5.2 Security Arrangements**

- The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must include the rule that non-employees shall at all times be provided with fulltime supervision while on site.
- Additional Access Rules may be imposed by the Project Manager or Client Agent in the interest of the safety of (Company Name) employees, visitors and customers.
- The Principal Contractor must develop a set of Security rules and procedures for their allocated site and maintain these throughout the construction period. These security rules must be submitted to the Client for approval. Additional security measures or rules may be specified for risk minimisation purposes.

- If not already tasked to the H&S Officer appointed in terms of Construction Regulation 8(5), the Principal Contractor must appoint a competent Emergency Controller who must develop contingency plans for any emergency that may arise on site as indicated by the risk assessments. These must include a monthly practice/testing programme for the plans e.g. January: trench collapse, February: flooding etc. and practiced/tested with all persons on site at the time, participating.

### *12.6 Training*

The contents and syllabi of all training required by the Act and Regulations including any other related or relevant training as required must be included in the Principal Contractor's Health and Safety Plan and Health and Safety File.

**12.6.1 General Induction Training**

All employees of the Principal and other Contractors must be in possession of proof of Induction training

**12.6.2 Site Specific Induction Training**

All employees of the Principal and other Contractors must be in possession of Site Specific Occupational Health and Safety Induction or other qualifying training.

**12.6.3 Other Training**

- All operators, drivers and users of construction vehicles, mobile plant and other equipment must be in possession of valid licenses and proof of training.
- All employees performing jobs requiring specific training in terms of the OHS Act 85, 1993 and Regulations must submit proof of such training.
- Occupational Health and Safety Training Requirements: (as required by the Construction Regulations and as indicated by the Health and Safety Specification Document & the Risk Assessment/s and recommendations by the Health and Safety Committee):

    - General Induction (Section 8 of the Act)
    - Site/Job Specific Induction (also visitors) (Sections 8 & 9 of the Act)
    - Site/Project Manager

- Construction Supervisor
- OH&S Representatives (Section 18 (3) of the Act)
- Training of the Appointees indicated in 12.6.1 & 12.6.2 above
- Operation of Cranes (Driven Machinery Regulations 18 (11)
- Operators & Drivers of Construction Vehicles & Mobile Plant (Construction Regulation 23)
- Basic Fire Prevention & Protection (Environmental Regulations 9 and Construction Regulation 29)
- As a minimum basic First Aid to be upgraded when necessary (General Safety Regulations 3)
- Storekeeping Methods & Safe Stacking (Construction Regulation 28)
- Emergency, Security and Fire Coordinator

### *12.7 Incident Investigation*

The Principal Contractor is responsible to oversee the investigation of all incidents. This will include first aid, medical treatment by a doctor and hospital or clinic cases. (General Administrative Regulation 9)

All incidents must be recorded in the Accident/Incident Register. (General Administrative Regulation 9)

The Principal Contractor is responsible for the investigation of all incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the corrective action to prevent similar incidents in future.

The Principal Contractor is responsible for the investigation of all road traffic accidents relating to the construction site and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

Notwithstanding the requirements of Section 24 of the Act, All incidents shall be investigated and reported on in writing, irrespective of whether such incident gave rise to injury or damage.

### *12.8 SHE Representatives and SHE Committees*

**12.8.1 Designation of SHE Representatives**

- Where the Principal Contractor employs more than 20 persons (including the employees of the Sub-Contractors) he has to appoint a minimum of one SHE Representatives, then he must appoint one for every 50 employees or part thereof. (OHS Act85, 1993 - Section 17 and GAR 6; 7.)
- These SHE Representatives shall be designated in writing.

**12.8.2 Duties and Functions of the H&S Representatives** *(This is based on the Construction norms and is not an exhaustive list)*

- The Principal Contractor must ensure that the designated SHE Representatives conduct a formal weekly inspection of their respective areas of responsibility using a checklist. All findings must be reported to the Principal Contractor. The reports shall be submitted to the Health and Safety Committee for action. Record shall be kept in the form of minutes.
- SHE Representatives must take part in incident investigations.
- SHE Representatives shall be members of at least one SHE Committee and attend all the SHE Committee meetings.

**12.8.3 Establishment of H&S Committee(s)**

The Principal Contractor must establish H&S Committees consisting of designated H&S Representatives together with a number of Employers Representatives appointed as per Section 19(3) that are not allowed to exceed the number of H&S Representatives on the committee. The persons nominated by the employer on a H&S Committee must be designated in writing for such period as may be determined by him. The H&S Committee shall co-opt advisory (temporary) members (who are not allowed to vote on issues discussed) and determine the procedures of the meetings including the chairmanship.

Legally, the H&S Committee must meet minimum every 3 months but it is advised that they meet at least once a month and consider, at least, the following Agenda for the *first meeting*. Thereafter the H&S Committee shall determine its own procedures as per the previous paragraph.

*Agenda*:

1) Opening and determining of chairmanship (only when necessary)
2) Facilities and Hygiene
3) Housekeeping
4) Incidents and incident investigation
5) Inspection checklists and Registers:
   a H&S Rep. Inspections
   b. Matters of First Aid
   c. Scaffolding
   d. Ladders
   e. Excavations
   f. Portable Electric Equipment
   g. Fire Equipment
   h. Explosive Power Tools
   i. Power Hand tools
   j. Incident Investigation reports
   k. Pressure Equipment and vessels under pressure
   l. Personal Protective Equipment
6) Safety Statistics
7) Health and Safety Awareness / Training / Posters and Symbolic signs
8) First Aiders and First Aid equipment
9) Demarcation of work- /hazardous-/safe areas/walkways
10) Safety Suggestions
11) Environmental Management
12) General
13) Date of Next Meeting
14) Closing

## 13. PROJECT/SITE SPECIFIC REQUIREMENTS

The following is a list of specific activities and considerations that have been identified for the project and site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor:

- ✓ Clearing & Grubbing of the Area/Site
- ✓ Site Establishment including:
  - Office/s
  - Secure/Safe Storage and storage areas for materials, plant & equipment
  - Ablution facilities
  - Sheltered dining area
  - Vehicle access to the site
- ✓ Dealing with existing Structures.
- ✓ Location of existing Services
- ✓ Installation and Maintenance of Temporary Construction Electrical Supply, Lighting and Equipment
- ✓ Adjacent properties and surrounding building exposures
- ✓ Boundaries and Access control/Public Liability Exposures
- ✓ Exposure to Noise
- ✓ Exposure to Vibration

- ✓ Protection against dehydration and heat exhaustion
- ✓ Protection from the elements.
- ✓ Use of Portable Electrical Equipment
- ✓ Excavations
- ✓ Loading and Offloading of Trucks
- ✓ Manual and Mechanical Handling
- ✓ Lifting and Lowering Operations
- ✓ Driving & Operation of Construction Vehicles and Mobile Plant
- ✓ Use and Storage of Flammable Liquids and other Hazardous Substances
- ✓ Layering and Bedding of trench floor
- ✓ Installation of Cables in trenches
- ✓ Backfilling of Trenches
- ✓ Use of Explosives - the client and/or its Agent on its behalf to be informed of this prior to commencing of the project
- ✓ Protection from Overhead Power Lines
- ✓ As discovered by the Principal Contractor's hazard identification exercise
- ✓ As discovered from any inspections and audits conducted by the Client and/or its Agent on its behalf or by the Principal Contractor or any other Contractor on site
- ✓ As discovered from any accident/incident investigation.

13.1 **The following are in particular requirements depending on scope of works and will form a basis for compliance audits.**

1. Administrative and Legal Requirements
2. Education, Training & Promotion
3. Public Safety and Emergency Preparedness
4. Personal Protective Equipment
5. Housekeeping
6. Scaffolding & Ladders
8. Electrical Safeguarding
9. Emergency Procedures /Fire Prevention and Protection
10. Excavations
11. Tools
12. Cranes and other driven machinery
13. Transport and Materials Handling
14. Site Plant and Machinery
15. Stacking and Storage Site/ Yards/ Site Workshops Specifics
16. Health and Hygiene
17. Facilities

## 14. OUTLINED DATA, REFERENCES AND INFORMATION ON CERTAIN AND/OR SPECIFIC OBLIGATORY REQUIREMENTS TO ENSURE COMPLIANCE

### *14.1 Administrative & Legal Requirements*

| *OHS Act Section / Regulation* | *Subject* | *Requirements* |
|---|---|---|
| Construction. Regulation 4 | Application for Notice of carrying out Construction work | Department of Employment & Labour must be notified by the contractor. Copy of Notice available on Site. |
| General Admin. | Copy of OH&S Act (Act 85 | Updated copy of Act & Regulations available on site. |

| OHS Act Section / Regulation | Subject | Requirements |
|---|---|---|
| Regulation 4 | of 1993) | Readily available for perusal by employees. |
| COID Act Section 80 | Registration with Compensation Insurer | Written proof of registration/Letter of good standing available on Site |
| Construction. Regulation 5(1) | SHE Specification and Program | SHE Spec received from Client and/or its Agent<br>SHE Program developed and updated. |
| Section 8(2)(d) of the OH Act and Regulation 5(1) of the Construction. Regulation | Hazard Identification & Risk Assessment | Identifications of hazards/Recorded<br>Risk Assessment and – Plan drawn up/Updated<br>Risk Assessment Plan available on Site<br>Employees/Sub-Contractors informed/trained |
| Section 16(2) | Assigned duties (Managers) | Responsibility of complying with the OH&S Act assigned to other person/s by CEO. |
| Construction. Regulation 8(1) | Designation of Person Responsible on Site | Competent person appointed in writing as<br>Construction Manager with job description |
| Construction. Regulation 8(2) | Designation of Assistant for above | Competent person appointed in writing as<br>Assistant Construction Manager with job description |
| Section 17 & 18 General Administrative Regulations 6 & 7 | Designation of SHE Representatives | More than 20 employees - one H&S Representative, one additional H&S Rep. for each 50 employees or part thereof.<br>Designation in writing, period and area of responsibility specified in terms of GAR 6 & 7<br>Meaningful H&S Rep. reports.<br>Reports actioned by Management. |
| Section 19 & 20 General Administrative Regulations 5 | Health & Safety Committee/s | SHE Committee/s established.<br>All SHE Reps shall be members of SHE Committees<br>Additional members are appointed in writing.<br>Meetings held monthly, Minutes kept.<br>Actioned by Management. |
| Section 37(1) & (2) | Agreement with Mandatories/ Sub Contractors | Written agreement with (Sub-)Contractors<br>List of Sub Contractors displayed.<br>Proof of Registration with Compensation Insurer/Letter of Good Standing (COID)<br>Construction Manager designated<br>Written arrangements regarding SHE Reps and Committee (OHSA Section 17,18)<br>Written arrangements for First Aid (COID) |
| Section 24 & General Admin. Regulation 8 COID Act Sect.38, 39 & 41 | Reporting of Incidents (Dept. of Labour) | Incident Reporting Procedure displayed.<br>All incidents in terms of Sect. 24 reported to the Provincial Director, Department of Employment & Labour, within 3 days and to the Client and/or its Agent on its behalf<br>Cases of Occupational Disease Reported<br>Copies of Reports available on Site<br>Record of First Aid injuries kept |
| General Admin. Regulation 9 | Investigation and Recording of Incidents | All injuries which resulted in the person receiving medical treatment other than first aid, recorded and investigated by investigator designated in writing.<br>Copies of Reports available on Site<br>Tabled at H&S Committee meeting<br>Action taken by Site Management. |
| Construction. Regulation 10 | Fall Prevention & Protection | Competent person appointed to draw up and supervise the Fall Protection Plan<br>Proof of appointees competence available on Site<br>Risk Assessment carried out for work at heights<br>Fall Protection Plan drawn up/updated and available on Site |
| Construction. | Structures | **Information re. the structure being erected received from the** |

| OHS Act Section / Regulation | Subject | Requirements |
|---|---|---|
| Regulation 11 | | **Designer including:**<br>- geo-science technical report where relevant<br>- the design loading of the structure<br>- the methods & sequence of construction<br>- anticipated dangers/hazards/special measures to construct safely<br>Risk Assessment carried out<br>Method statement drawn up<br>All above available on Site<br>Structures inspected before each shift. Inspections register kept |
| Construction Regulations 12 | Temporary Works | **Competent persons appointed in writing to:**<br>- Inspect structures<br>- Ensure that design are followed |
| Construction. Regulation 13 | Excavations | Competent person/s appointed in writing to supervise and inspect excavation work<br>Written Proof of Competence of above appointee/s available on Site<br>Risk Assessment carried out<br>Inspected:<br>- before every shift<br>- after any blasting<br>- after an unexpected fall of ground<br>- after any substantial damage to the shoring<br>- after rain. Inspections register kept<br>Method statement developed where explosives will be/ are used |
| Construction. Regulation 16 | Scaffolding | **Competent persons appointed in writing to:**<br>- erect scaffolding (Scaffold Erector/s)<br>- act as Scaffold Team Leaders<br>- inspect Scaffolding weekly and after inclement weather (Scaffold Inspector/s)<br>Written Proof of Competence of above appointees available on Site<br>Copy of SABS 085 available on Site<br>Risk Assessment carried out<br>Inspected weekly/after bad weather. Inspection register/s kept |
| Construction. Regulation 19 | Materials Hoist | **Competent person appointed** in writing to inspect the Material Hoist<br>Written Proof of Competence of above appointee available on Site.<br>Materials Hoist to be inspected weekly by a competent person. Inspections register kept. |
| Construction. Regulation 22/ Driven Machinery Regulations 18 & 19 | Cranes & Lifting Machines Equipment | Competent person appointed in writing to inspect Cranes, Lifting Machines & Equipment<br>Written Proof of Competence of above appointee available on Site.<br>Cranes & Lifting tackle identified/numbered<br>Register kept for Lifting Tackle<br>Log Book kept for each individual Crane<br>**Inspection**:<br>- All cranes - daily by operator<br>- Tower Crane/s - after erection/6monthly<br>- Other cranes - annually by comp. person<br>- Lifting tackle(slings/ropes/chain slings etc.) - daily or before every new application |
| Construction. Regulation 24 / Electrical Machinery Regulations 9 & 10 / Electrical Installation Regulations | Inspection & Maintenance of Electrical Installation & Equipment (including portable electrical tools) | **Competent person appointed** in writing to inspect/test the installation and equipment. Written Proof of Competence of above appointee available on Site.<br>Inspections:<br>- Electrical Installation & equipment inspected after installation, after alterations and quarterly. Inspection Registers kept Portable electric tools, electric lights and extension leads must be uniquely identified/numbered. |

| OHS Act Section / Regulation | Subject | Requirements |
|---|---|---|
| | | Weekly visual inspection by User/Issuer/Storeman. Register kept. |
| Construction Regulation 25 | Use of temporary storage of flammable liquids on construction site | Flammable liquids must be stored in a way that it does not cause a fire or explosion hazard, and that the workplace is well ventilated. Suitable notices to be posted. |
| Construction Regulation 27 | Housekeeping | Suitable housekeeping measures must be implemented to reduce the risk of injuries and damage to the structures, machinery, etc. Debris must be removed with a chute from a high place. Construction area must be fenced off. |
| Construction. Regulation 28 / General Safety Regulation 8(1)(a) | Designation of Stacking & Storage Supervisor. | **Competent Person/s** with specific knowledge and experience designated to supervise all Stacking & Storage<br>Written Proof of Competence of above appointee available on Site |
| Construction. Regulation 29 / Environmental Regulation 9 | Designation of a Person to Co-ordinate Emergency Planning And Fire Protection | Person/s with specific knowledge and experience designated to co-ordinate emergency contingency planning and execution and fire prevention measures<br>Emergency Evacuation Plan developed:<br>- Drilled/Practiced<br>- Plan & Records of Drills/Practices available on Site<br>Fire Risk Assessment carried out<br>All Fire Extinguishing Equipment identified and on *register*.<br>Inspected weekly. And inspection register kept. Serviced annually |
| Construction Regulation 30 | Employees Facilities | The contractor must provide and maintain in hygienic condition facilities for employees that include:<br>• Showers (1 for every 15 employees)<br>• Sanitary facilities for each sex (1 for every 30 employees)<br>• Changing facilities for each sex<br>• Sheltered eating areas |
| General Safety Regulation 3 | First Aid | Every workplace provided with sufficient number of First Aid boxes. (Required where 5 persons or more are employed)<br>First Aid freely available<br>Equipment as per the list in the OH&S Act.<br>One qualified First Aider appointed for every 50 employees. (Required where more than 10 persons are employed)<br>List of First Aid Officials and Certificates<br>Name of person/s in charge of First Aid box/es displayed.<br>Location of First Aid box/es clearly indicated.<br>Signs instructing employees to report all Injuries/illness including first aid injuries |
| General Safety Regulation 2 | Personal Safety Equipment (PPE) | PPE Risk Assessment carried out<br>Items of PPE prescribed/use enforced<br>Records of Issue kept<br>Undertaking by Employee to use/wear PPE. PPE remains property of Employer, and is not to be removed from the premises GSR 2(4) |
| General Safety Regulation 9 | Inspection & Use of Welding/Flame Cutting Equipment | **Competent Person/s** with specific knowledge and experience designated to Inspect Electric Arc, Gas Welding and Flame Cutting Equipment<br>Written Proof of Competence of above appointee available on Site<br>All new vessels checked for leaks, leaking vessels NOT taken into stock but returned to supplier immediately<br>Equipment identified/numbered and entered into a register<br>Equipment inspected weekly. Inspection Register kept<br>Separate, purpose made storage available for full and empty vessels |
| Regulations for Hazardous Chemical Agents (HCA) | Control of Storage & Usage of HCA and Flammables | **Competent Person/s** with specific knowledge and experience designated to Control the Storage & Usage of HCA (including Flammables) |

| OHS Act Section / Regulation | Subject | Requirements |
|---|---|---|
| Construction Regulation 25 | | Written Proof of Competence of above appointee available on Site<br>Risk Assessment carried out<br>Register of HCA kept/used on Site<br>Separate, purpose made storage available for full and empty containers |
| Pressure Equipment Regulations | Pressure Equipment | **Competent Person/s** with specific knowledge and experience designated to supervise the use, storage, maintenance, statutory inspections & testing of Pressure Equipment.<br>Written Proof of Competence of above appointee available on Site<br>Risk Assessment carried out<br>Certificates of Manufacture available on Site<br>Register of Pressure Equipment on Site<br>Inspections & Testing by Approved Inspection Authority (AIA) |
| Construction. Regulation 23 | Construction Vehicles and Earth Moving Equipment | Operators/Drivers appointed to:<br>- Carry out a daily inspection prior to use<br>- Drive the vehicle/plant that he/she is competent to operate/drive<br>Written Proof of Competence of above appointee available on Site.<br>Record of Daily inspections kept |
| General Safety Regulation 13A | Inspection of Ladders | **Competent person** appointed in writing to inspect Ladders<br>Ladders inspected at arrival on site and weekly thereafter. Inspections register kept. Application of the types of ladders (wooden, aluminium etc.) regulated by training and inspections and noted in register |

### *14.2 Education & Training*

| Subject | Requirement |
|---|---|
| Company OH&S Policy Section 7(1) | Policy signed by CEO and published/Circulated to Employees<br>Policy displayed on Employee Notice Boards<br>Management and employees committed. |
| Company/Site SHE Rules (Section 13(a) | Rules published<br>Rules displayed on Employee Notice Boards<br>Rules issued and employees effectively informed or trained: written proof<br>Follow-up to ensure employees understand/adhere to the policy and rules. |
| Induction & Task Safety Training (Section 13(a) | All new employees receive SHE Induction Training.<br>Training includes Task Safety Instructions.<br>Employees acknowledge receipt of training.<br>Follow-up to ensure employees understand/adhere to instructions. |
| General SHE Training (Section 13(a) | All current employees receive specified SHE training: written proof<br>Operators of Plant and Equipment receive specified training<br>Follow-up to ensure employees understand/adhere to instructions. |

### *14.3 Public Safety, Security Measures & Emergency Preparedness*

| Subject | Requirement |
|---|---|
| Notices &Signs | Notices & Signs at entrances / along perimeters indicating **"No Unauthorised Entry".**<br>Notices & Signs at entrance instructing visitors and non - employees what to do, where to go and where to report on entering the site/yard with directional signs. e.g. **"Visitors to report to Office"**<br>Notices & Signs posted to warn of overhead work and other hazardous activities. e.g. **General Warning Signs** |

| *Subject* | **Requirement** |
|---|---|
| Site Safeguarding Security Measures | Nets, Canopies, Platforms, Fences etc. to protect members of the public passing / entering the site.<br>Access control measures/register in operation<br>Security patrols after hours during weekends and holidays<br>Sufficient lighting after dark<br>Guard has access to telephone/ mobile/other means of emergency communication |
| Emergency Preparedness | Emergency contact numbers displayed and made available to Security & Guard<br>Emergency Evacuation instructions posted up on all notice boards (including employees' notice boards)<br>Emergency contingency plan available on site/in yard<br>Doors open outwards/unobstructed<br>Emergency alarm audible all over (including in toilets) |
| Emergency Drill and Evacuation | Adequate No. of employees trained to use Fire Fighting Equipment.<br>Emergency Evacuation Plan available, displayed and practiced. |

### *14.4 Personal Protective Equipment*

| **Subject** | **Requirement** |
|---|---|
| PPE needs analysis | Need for PPE identified and prescribed in writing.<br>PPE remain property of Employer, not to be removed from premises GSR 2(4) |
| Head Protection  | All persons on site wearing Hardhats including<br>Sub-contractors and Visitors (where prescribed) |
| Foot Protection  | All employees on site wearing Safety Footwear including Gumboots for concrete / wet work and non-slip shoes for roof work.<br>Visitors to wear same upon request or where prescribed |
| Eye and Face Protection  | Eye and Face (also Hand and Body) Protection (Goggles, Face Shields, Welding Helmets etc.) used when operating the following:<br>• Jack/ Kango Hammers<br>• Angle / Bench Grinders<br>• Electric Drills (Overhead work into concrete / cement / bricks<br>• Explosive Powered tools<br>• Hammers & Chisels |
| Hearing Protection  | Hearing Protectors (Muffs, Plugs etc.) used when operating the following:<br>• Jack / Kango Hammers<br>• Explosive Powered Tools |
| Hand Protection  | Protective Gloves worn by employees handling / using:<br>• Cement / Bricks / Steel / Chemicals<br>• Welding Equipment<br>• Hammers & Chisels<br>• Jack / Kango Hammers etc. |
| Respiratory Protection  | Suitable/efficient prescribed Respirators worn correctly by employees handling / using:<br>• Dry cement<br>• Dusty areas<br>• Hazardous chemicals<br>• Angle Grinders |
| Fall Prevention Equipment  | Suitable Safety harnesses / Fall Arrest Equipment correctly used by persons working on / in unguarded, elevated positions e.g.:<br>• Scaffolding<br>Other methods of fall prevention applied e.g. catch nets |
| *Protective Clothing | All jobs requiring protective clothing (Overalls, Rain Wear, Welding Aprons etc.) Identified and clothing worn. |

| | |
|---|---|
|  | |
| *PPE Issue & Control | Identified Equipment issued free of charge.<br>All PPE maintained in good condition. (Regular checks).<br>Workers instructed in the proper use & maintenance of PPE.<br>Commitment obtained from wearer accepting conditions and to wear the PPE.<br>Record of PPE issued kept on H&S File.<br>PPE remain property of Employer, not to be removed from premises GSR 2(4) |

### *14.5 Housekeeping*

| Subject | Requirement |
|---|---|
| Scrap Removal System | All items of Scrap/Unusable Off-cuts/Rubble and redundant material removed from working areas on a regular basis. (Daily)<br>Scrap/Waste removal from heights by chute/hoist/crane.<br>Nothing thrown/swept over sides.<br>Scrap disposed of in designated containers/areas<br>Removal from site/yard on a regular basis. |
| Stacking & Storage<br>(See Section 1 for Designation & Register) | <u>Stacking:</u><br>* Stable, on firm level surface/base.<br>* Prevent leaning/collapsing<br>* Irregular shapes bonded<br>* Not exceeding 3x the base<br>* Stacks accessible<br>* Removal from top only.<br><u>Storage:</u><br>* Adequate storage areas provided.<br>* Functional – e.g. demarcated storage areas/racks/bins etc.<br>* Special areas identified and demarcated e.g. flammable gas, cement etc.<br>* Neat, safe, stable and square.<br>* Store/storage areas clear of superfluous material.<br>* Storage behind sheds etc. neat/under control.<br>* Storage areas free from weeds, litter etc. |
| Waste Control/Reclamation | Re-usable off-cuts and other re-usable material removed daily and kept to a minimum in the work areas.<br>All re-usable materials neatly stacked/stored in designated areas. (Nails removed/bent over in re-usable timber).<br>Issue of hardware/nails/screws/cartridges etc. controlled and return of unused items monitored. |
| Sub-contractors (Housekeeping) | Sub-contractors required to comply with Housekeeping requirements. |

### *14.6 Working at Heights (including roof work)*

| Subject | Requirement |
|---|---|
| Openings | Unprotected openings adequately guarded/fenced/barricaded/catch nets installed |
| Roof work | Roof work discontinued when bad/hazardous weather<br>Fall protection measures (including warning notices) when working close to edges or on fragile roofing material<br>Covers over openings in roof of robust construction/secured against displacement |

### *14.7 Scaffolding*

| Subject | Requirement |
|---|---|
| Free Standing Scaffolding | • Foundation firm / stable<br>• Sufficient bracing.<br>• Platform boards in good condition/sufficient/secured.<br>• Handrails and toe boards provided.<br>• Access ladders / stairs provided.<br>• Area/s under scaffolding tidy.<br>• Safe/unsafe for use signs<br>• Height to base ratio correct<br>• Outriggers used /tied to structure where necessary<br>• Complying with OH&S Act/SABS 085 |
| Edges & Openings | • Edges barricaded to acceptable standards.<br>• Manhole openings covered / barricaded.<br>• Openings in floor / other openings covered, barricaded/fenced. |

### *14.8 Ladders*

| Subject | Requirement |
|---|---|
| Physical Condition / Use & Storage | • Stepladders - hinges/stays/braces/stiles in order.<br>• No joined ladders used<br>• Wooden ladders are never painted except with varnish<br>• Aluminium ladders NOT to be used with electrical work<br>• All ladders stored on hooks / racks and not on ground.<br>• Ladders protrude 900 mm above landings / platforms / roof. |

### *14.9 Electricity (as part of, or additional to the manual "Safety & Switching Procedures for Electrical Installations"- available on request)*

| Subject | Requirement |
|---|---|
| Electrical Distribution Boards & Earth Leakage | • Colour coded / numbered / symbolic sign displayed.<br>• Area in front kept clear and unobstructed.<br>• Fitted with inside cover plate / openings blanked off / no exposed "live" conductors / terminals/Door kept close<br>• Switches / circuit breakers identified.<br>• Earth leakage protection unit fitted and operating.<br>• Tested with instrument: Test results within 15 – 30 milliamps<br>• Aperture/Opening/s provided for the plugging in and removal of extension leads without the need to open the door |

| Subject | Requirement |
|---|---|
| | • Apertures and openings used for extension leads to be protected against the elements and especially rain |
| Electrical Installations & Wiring | Temporary wiring / extension leads in good condition / no bare or exposed wires.<br>Earthing continuity / polarity correct:<br>**Looking at the open connectors to connect the wiring, the word "Brown" has the letter 'R' in it, so the b'R'own wire connects to the 'R'ight hand connector. "Blue" has the letter 'L' in it, so the b'L'ue wire connects to the 'L'eft hand connector.**<br>Cables protected from mechanical damage and moisture.<br>Correct loading observed e.g. no heating appliance used from lighting circuit etc.<br>Light fittings/lamps protected from mechanical damage/moisture.<br>Cable arrestors in place and used inside plugs |
| Physical condition of Electrical Appliances & Tools | Electrical Equipment and Tools: (includes all items plugging in to a 16 Amp supply socket)<br>• Insulation / casing in good condition.<br>• Earth wire connected/intact where not of double insulated design<br>• Double insulation mark indicates that no earth wire is to be connected.<br>• Cord in good condition/no bare wires/secured to machine & plug.<br>• Plug in good condition, connected correctly and correct polarity. |

### *14.10 Emergency and Fire Prevention and Protection*

| Subject | Requirement |
|---|---|
| Fire Extinguishing Equipment  | Fire Risks Identified and on record<br>The correct and adequate Fire Extinguishing Equipment available for:<br>• Offices<br>• General Stores<br>• Flammable Store<br>• Fuel Storage Tank/s and catchment well<br>• Where flammable substances are being used / applied.<br>• Equipment Easily Accessible |
| Maintenance | Fire equipment checked minimum monthly, serviced yearly |
| Location & Signs | Fire Extinguishing Equipment:<br>• Clearly visible<br>• Unobstructed<br>• Signs posted including "No Smoking" / "No Naked Lights" where required. (Flammable store, Gas store, Fuel tanks etc.) |
| Storage Issue & Control of Flammables (incl. Gas cylinders  | Storage Area provided for flammables with suitable doors, ventilation, bund etc.<br>• Flammable store neat / tidy and no Class A combustibles. Decanting of flammable substances carried out in ignition free and adequately ventilated area. Container bonding principles applied<br>• Only sufficient quantities issued for one task or one day's usage<br>• Separate, special gas cylinder store/storage area.<br>• Gas Cylinders stored / used / transported upright and secured in trolley/cradle/structure and ventilated.<br>• Types of Gas Cylinders clearly identified as well as the storage area and stored separately.<br>• Full cylinders stored separately from empty cylinders.<br>• All valves, gauges, connections, threads of all vessels to be checked regularly for leaks.<br>• Leaking acetylene vessels to be returned to the supplier **IMMEDIATELY**. |

| Subject | Requirement |
|---|---|
| Storage, Issue & Control of Hazardous Chemical Substances (HCS)  | • HCS storage principles applied: products segregated<br>• Only approved, non-expired HCS to be used<br>• Only the prescribed PPE shall be used as the minimum protection<br>• Provision made for leakage/spillage containment and ventilation<br>• Emergency showers/eye wash facilities provided<br>• HCS under lock & key controlled by designated person<br>• Decanted/issued in containers as prescribed with information/warning labels<br>• Disposal of unwanted HCS by accredited disposal agent<br>• No dumping or disposal of any HCS on or inside the storage area or anywhere else on the project site<br>• All vessels or containers to be regularly checked for leaks |

### *14.11 Excavations*

| Subject | Requirement |
|---|---|
| Excavations deeper than 1.5 m. | • Shored / Braced to prevent caving / falling in.<br>• Provided with an access ladder.<br>• Excavations guarded/barricaded/lighted after dark in public areas<br>• Soil dumped at least 1 m away from edge of excavation<br>• On sloping ground soil dumped on lower side of excavation<br>• All excavations are subject to daily inspections |

### *14.12 Tools*

| Subject | Requirement |
|---|---|
| Hand Tools | <u>Shovels / Spades / Picks:</u><br>• Handles free from cracks and splinters<br>• Handles fit securely<br>• Working end sharp and true<br><u>Hammers:</u><br>• Good quality handles, no pipe or reinforcing steel handles.<br>• Handles free from cracks and splinters<br>• Handles fit securely<br><u>Chisels:</u><br>• No mushroomed heads / heads chamfered<br>• Not hardened<br>• Cutting edge sharp and square |

### *14.13 Cranes*

| Subject | Requirement |
|---|---|
| Mobile Crane | • Only operated by trained authorised operator with valid certificate of training<br>• Rear view mirrors<br>• Windscreen visibility good<br>• Windscreen wipers operating effectively<br>• Indicators operational<br>• Hooter working<br>• Tyres safe/sufficient tread/pressure visibly sufficient<br>• No missing Wheel nuts<br>• Headlights, taillights operational<br>• Reverse alarm working and audible and known by all employees<br>• Grease nipples and grease on all joints<br>• No Oil leaks<br>• Hydraulic pipes visibly sound/no leaks<br>• No corrosion on Battery terminals<br>• Boom visibly in good condition/no apparent damage<br>• Cable/sheaves greased/no visible damage/split wires/corrosion and checked daily<br>• Brakes working properly<br>• Crane hook: Throat pop marked/safety latch fitted/functional<br>• SWL/MML displayed<br>• By-pass valves operational<br>• Deflection chart displayed/visible to operator/driver<br>• Outriggers functional used |

### *14.14 Transport & Materials Handling Equipment*

| Subject | Requirement |
|---|---|
| Site Vehicles | • All Site Vehicles, Dumpers, Bobcats, Loaders etc; checked daily before use by driver / operator.<br>• Inventory of vehicles used/operated on site<br>• Inspection by means of a checklist / results recorded.<br>• No persons riding on equipment not designed or designated for passengers.<br>• Site speed limit posted, enforced and not exceeded.<br>• Drivers / Operators trained / licensed and carrying proof.<br>• No unauthorised persons allowed to drive / operate equipment. |

### *14.15 Site Plant and Machinery*

| Subject | Requirement |
|---|---|
| Compressors | • Relief valves correctly set and locked / sealed.<br>• Maximum Safe Working Pressure (MSWP) indicated on face of pressure gauge: not on glass cover.<br>• All drives adequately guarded.<br>• Receiver/lines drained daily<br>• Hoses good condition/clamped, not wired<br>• Compressed air NEITHER used to dust off clothing/PPE/ and work areas NOR on bare skin |
| Concrete Mixer | • Dust abatement methods in use.<br>• Operators using correct PPE - eye / hands / respirators. |

| | |
|---|---|
| | • All moving drive parts guarded.<br>• Emergency stops identified / indicated and accessible.<br>• Area kept clean/dry/and free from tripping and slipping hazards. |

### *14.16 Plant & Storage Yards*

| Subject | Requirements |
|---|---|
| Pressure Equipment Regulation 13(1)(b): Supervision of the Use & Maintenance of Vessels under Pressure or Pressure Equipment | • Person/s with specific knowledge and experience designated in writing to Supervise the Use &Maintenance of Pressure Equipment<br>• Pressure Equipment identified/numbered/placed on register/Manufacturers plate intact<br>• Inspection/maintenance carried out according to schedule<br>• Results recorded/Test certificates available |
| Lock-out Procedure | Lock-out procedure in operation |
| Ergonomics | Ergonomics survey conducted – results on record. Survey results applied |
| Demarcation & Colour Coding | • Demarcation principles applied<br>• All services, pipes, electrical installation, stop-start controls, emergency controls etc. colour coded to own published or SABS standard<br>• Employees trained to identify colour coding |
| Portable & Bench Grinders | • Area around grinder clear/trip/slip free<br>• Bench grinders mounted securely/grinder generally in good condition/No excessive vibration<br>• On/Off switch/button clearly demarcated/accessible<br>• Adequate guards in place<br>• Tool rest – secure/square/max. 2 mm gap, perpendicular to drive shaft<br>• Stone/disk - correct type and size/mounted correctly/dressed<br>• Use of Eye protection enforced |
| Battery Storage & Charging | • Adequately ventilated, ignition free room/area/no smoking sign/s<br>• Batteries placed on rubber/wooden surface<br>• Emergency shower/eye wash provided<br>• No acid storage in area<br>• Prescribed methods in place and adhered to when charging batteries |
| Ancillary Lifting Equipment | • Chain Blocks/Tirfors/jacks/mobile gantries etc. identified/<br>• numbered on register<br>• Chains in good condition/links no excessive wear/checked daily<br>• Lifting hooks – throat pop marked/safety latch fitted<br>• SWL/MML marked/displayed |

### *14.17 Workplace Environment, Health and Hygiene*

| Subject | Requirement |
|---|---|
| Lighting | Adequate lighting in places where work is being executed e.g. stairwells and basements.<br>Light fittings placed / installed causing no irritating/blinding glare.<br>Stroboscopic effect eliminated (not only reduced) where moving objects or machinery is used |
| Ventilation | Adequate ventilation / extraction / exhausting in hazardous areas e.g. chemicals / adhesives / welding / petrol or diesel/ motors running and in confined spaces / basements. |
| Noise | Tasks identified where noise levels exceeds 85 dB at any one time.<br>All reasonable steps taken to reduce noise levels at the source.<br>Hearing protection used where noise levels could not be reduced to below 85 dB. |

| Subject | Requirement |
|---|---|
| Heat Stress | Measures in place to prevent heat exhaustion in heat stress problem areas e.g. steel decks, when the WBGT index reaches 30. (See Environmental Regulation 4)<br>Cold drinking water readily available at all times. |
| Ablutions | Sufficient hygiene facilities provided - 1 toilet per 30 employees (National Building Regulations prescribe chemical toilets for Construction sites)<br>• Toilet paper available.<br>• Sufficient showers provided.<br>• Facilities for washing hands provided<br>• Soap/cleaning agent available for washing hands<br>• Means of drying hands available<br>• Lock-up changing facilities / area provided.<br>• Ablution facilities kept hygienic and clean. |
| Eating / Cooking Facilities | Adequate storage facilities provided.<br>Weather protected eating area provided, separate from changing area<br>Refuse bins with lids provided.<br>Facilities kept clean and hygienic. |
| Pollution of Environment | Measures in place to minimize dust generation.<br>Accumulation or littering of empty cement pockets, plastic wrapping / bags, packing materials etc. prevented. Spillage / discarding of oil, chemicals and diesoline into storm water and other drains or into existing or newly dug holes/cavities on site expressly prohibited. |
| Hazardous Chemical Agents (HCA) | All HCA identified and list available e.g. acids, flammables, poisons etc.<br>Safety Data Sheets (SDS) indicating hazardous properties and emergency procedures in case of incident on file and readily available.<br>Substances stored safely.<br>Expiry dates meticulously checked where applicable |

## 15. THE PRINCIPAL CONTRACTOR'S GENERAL DUTIES

The Principal Contractor shall at all times ensure his status of an "employer" as referred to in the Act, and will abide by his/her responsibilities, duties and functions as per the requirements of the Act and Regulations with specific reference to Section 8 of the Act.

The Principal Contractor shall keep, and on demand make available, a copy of the Act on site at all times and in addition to that he/she will introduce and maintain a file titled "Health and Safety File", or other record in permanent form, which shall contain all relevant aspects and information as contemplated in the Construction Regulations. He/she will make this file available to the client or his representative whenever necessary or on request to an interested party.

## 16. THE PRINCIPAL CONTRACTOR'S SPECIFIC DUTIES

The Principal Contractor's specific duties in terms of these specifications are detailed in the Construction Regulations as published under government notice No. 84 dated 7 February 2014.

The Principal Contractor is specifically referred to the following elements of the Construction Regulations:

Regulation No. 1 - Definitions
Regulation No. 2 - Scope of application
Regulation No. 4 - Notification of construction work
Regulation No. 5 - Duties of client
Regulation No. 6 - Duties of designer
Regulation No. 7 - Principal Contractor and Contractor
Regulation No. 8 - Management and supervision of construction work
Regulation No. 9 - Risk Assessment for construction work
Regulation No. 10 - Fall protection
Regulation No. 11 - Structures
Regulation No. 12 - Temporary works

Regulation No. 13 - Excavation
Regulation No. 16 - Scaffolding
Regulation No. 22 - Cranes
Regulation No. 23 - Construction vehicles and mobile plant
Regulation No. 24 - Electrical installations and machinery on construction sites
Regulation No. 25 - Use and temporary storage of flammable liquids on construction sites
Regulation No. 27 - Housekeeping and general safeguarding on construction sites
Regulation No. 28 - Stacking & Storage on construction sites
Regulation No. 29 - Fire precautions on construction sites
Regulation No. 32 - Approved Inspection authorities
Regulation No. 33 - Offences and penalties

The Principal Contractor shall ensure compliance to the Act and its Regulations and specifically to the above regulations, and document each record in the Health and Safety File.

## 17. THE PRINCIPAL CONTRACTOR'S SPECIFIC RESPONSIBILITIES WITH REGARDS TO HAZARDOUS ACTIVITIES

The following activities are identifiable as hazardous in terms of the Construction Regulations.
The contractor shall execute the activities in accordance with the following Construction Regulations and other applicable regulations of the Act:

Regulation No. 10 - Fall protection
Regulation No. 11 - Structures
Regulation No. 13 - Excavation work
Regulation No. 16 - Scaffolding
Regulation No. 22 - Cranes
Regulation No. 23 - Construction vehicles and mobile plant.
Regulation No. 24 - Electrical installations and machinery on construction sites
Regulation No. 25 - Use and temporary storage of flammable liquids on construction sites
Regulation No. 27 - Housekeeping on construction sites
Regulation No. 29 - Fire precautions on construction sites.

All of the above requirements will be read in conjunction with the relevant regulations and health and safety standards as required by the Act. All documents and records required by the Construction Regulations will be kept in the Health and Safety File and will be made available at any time when required by the client or his representative, or on request to an interested party.

## 18. GENERAL NOTES TO THE PRINCIPAL CONTRACTOR

**Legal Framework and obligations**

The more important Acts and relevant subordinate/secondary legislation as well as other (inter alia Local Government) legislation that also apply to the State as well as to State owned buildings and premises: -

(i) The latest issue of SANS 10142-1: "Code of Practice for the Wiring of Premises"
(ii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority
(iii) The Fire Brigade Services Act 1987, Act 99 of 1987 as amended
(iv) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended and relevant proclaimed Regulations (SABS 0400)
(v) The Post Office Act 1958 (Act 44 of 1958) as amended
(vi) The Electricity Act 1984, Act 41 of 1984
(vii) Legislation pertaining to water usage and the environment
(ix) Common Law

**Legal Liabilities**

Common Law and Legislation

Based on two main criteria –

- Would the reasonable person have foreseen the hazard?
  **That is a reasonable person in that specific position, taking experience, qualifications, authority, position in the organization etc. into consideration**

- Would the reasonable person have taken precautionary measures (action) to prevent or limit the hazard?

Negligence can be proven on failure on **any** or **both** of the above criteria
(There may not necessarily be a relationship between criminal and civil liability!)

## 19. HOUSEKEEPING

Good housekeeping will be maintained at all times as per Construction Regulation No. 27. Poor housekeeping contributes to three major problems, namely, costly or increased accidents, fire or fire hazards and reduction in production. Good housekeeping will enhance production time.

Particular emphasis is to be placed on the following crucial elements of a construction site:

- Phase priorities and production/plant layout
- Enclosures
- Pits, openings and shoring
- Storage facilities
- Effective, sufficient and maintained lighting or illumination
- Principal sources of injuries e.g. stairways, runways, ramps, loose building material
- Oil, grease, water, waste, rubble, glass, storm water
- Colour coding
- Demarcations
- Pollution
- Waste disposal
- Ablution and hygiene facilities
- First aid

**This list must not be taken to be exclusive or exhaustive!**

In promotion of environmental control all waste, rubble, scrap etc, will be disposed of at a registered dump site and records will be maintained. Where it is found to be impractical to use a registered dump site or it is not available, the Principal Contractor will ensure that the matter is brought to record with the client or his representative, after which suitable, acceptable alternatives will be sought and applied.

Dross and refuse from metals, and waste matters or by-products whose nature is such that they are poisonous or capable of fermentation, putrefaction or constituting a nuisance shall be treated or disposed of by methods approved of by an inspector.

NOTE: No employer (Principal Contractor) shall require or permit any person to work at night or after hours unless there is adequate, suitable artificial lighting including support services in respect of Health and Safety.

## 20. LOCKOUT SYSTEMS - ELECTRICAL!

A system of control shall be established in order that no unauthorized person can energize a circuit, open a valve, or activate a machine on which people are working or doing maintenance, even if equipment, plant or machinery

is out of commission for any period, thus eliminating injuries and damage to people and equipment as far as is reasonably practicable.
Physical/mechanical lock-out systems shall be part of the safety system and included in training. Lockouts shall be tagged and the system tested before commencing with any work or repairs.

## 21. INCIDENT INVESTIGATION

Inspection and reporting is the best way in which a responsible contractor can control his area of responsibility. All incidents therefore, irrespective of whether it gave rise to loss, injury, damage or not, shall be investigated and the results recorded in the Health and Safety File.

## 22. GENERAL

The project under control of the Principal Contractor shall be subject to periodic health and safety audits that will be conducted by the client at intervals agreed upon between the Principal Contractor and the client, provided such intervals will not exceed periods of one month. The Principal Contractor is to ensure that he/she and all persons under his control on the construction site shall adhere to the above specifications, as non-conformance will lead to the client taking action as directed by Construction Regulation 5.1(q). The Principal Contractor should note that he/she shall be held liable for any anomalies including costs and resulting deficiencies due to delays caused by non-conformance and/or non-compliance to the above Health and Safety Specifications and the Health and Safety Plan based on these specifications.

## 23. IMPORTANT LISTS AND RECORDS TO BE KEPT

The following are lists of several records that are to be kept in terms of the Construction Regulations. The lists are:

1 List of appointments
2 List of record keeping responsibilities
3 Inspection checklist

These lists and documents are to be used as a point of reference to determine which components of the Act would be applicable to a particular site or task or project, as was intended under paragraph 1 (“Preamble”) above.

### *23.1* List of Appointments

See point 5.1 of appointment needed

### *23.2 List of Record Keeping Responsibilities*

| ITEM | CR | RECORD TO BE KEPT | RESPONSIBLE PERSON |
|---|---|---|---|
| 1. | 4(2) | Notification to Construction Work – Annexure 2 (Attached in Appendix F) | Contractor |
| 2. | 5(1)(m) | Copy of Principal Contractor’s Health & Safety Plan. Available on request | Contractor |
| 3. | 7(d) | Copy of Principal Contractor’s Health & Safety Plan<br>As well as each Contractor’s Health & Safety Plan<br>Available on request | Principal Contractor |
| 4. | 7(b) | Health and Safety File opened and kept on site (including all documentation required i.t.o. OHSA & Regulations<br>Available on request | Every Contractor |
| 5. | 7(e) | Consolidated Health and Safety File handed to Client on completion of Construction work. | Principal Contractor |

| ITEM | CR | RECORD TO BE KEPT | RESPONSIBLE PERSON |
|---|---|---|---|
| | | To include all documentation required i.t.o. OHSA & Regulations and records of all drawings, designs, materials used and similar information on the structure | |
| 6. | 7(f) | Comprehensive and Updated List of all Contractors on site, the agreements between the parties and the work being done Included in Health and Safety file and available on request | Principal Contractor |
| 7. | 8(6) | Keep record on the Health and Safety File of the input by Construction Safety Officer [CR 6 (7)] at design stage or on the Health and Safety Plan | Contractor |
| 8. | 9(1) | Risk Assessment - Available on site for inspection | Contractor |
| 9. | 7 (5) | Proof of Health and Safety Induction Training | Every Employee on site |
| 10. | 10(3) | Construction Manager [CR 8(1)] has latest updated version of Fall Protection Plan [CR 10(1)] | Contractor |
| 11. | 11(2)(b) | Record of inspections of the structure [First 2 years – once every 6 months, thereafter yearly] - Available on request | Owner of Structure |
| 12. | 11(2)(c) | Maintenance records - safety of structure - Available on request | Owner of Structure |
| 13. | 13(2)(h) | Record of excavation inspection - On site available on request | Contractor |
| 14. | 23(1)(k) | Findings of daily inspections (prior to use) of Construction Vehicles and Mobile Plant | Contractor |
| 15. | 24(d) | Record of temporary electrical installation inspections [once a week] and electrical machinery [daily before use] in a register and kept on site | Contractor |
| 16. | 29(*l*) | Fire Evacuation Plan | Contractor |

### *23.3* Inspection Checklist

| EMPLOYER DETAILS | |
|---|---|
| Employer: | |
| Registered Name of Enterprise: | |
| Trade Name of Enterprise: | |
| Company Registration No.: | |
| SARS Registration No.: | |
| UIF Registration No.: | |
| COIDA Registration No.: | |
| Relevant SETA for EEA purposes: | |
| Industry Sector: | |
| Bargaining Council: | |
| Contact Person: | |
| Address of Premises: | |
| Postal Address: | |
| Telephone Number: | |
| Fax Number: | |
| E-mail Address: | |
| Chief Executive Officer: | |
| Chief Executive Officer Address: | |
| Competent Person: | |
| Maximum power demand: in KW | |
| Health and Safety Representatives: | |
| Activities, products manufactured and/ | |

| | |
|---|---|
| services rendered: | |
| Raw materials, materials and chemical/ biological substances: | |
| Total Number of Employees: | Male:<br>Female: |

| CONTRACTOR INFORMATION | |
|---|---|
| Contractors: | |
| Site Address: | |
| Contracts Manager: | |
| Managing Director: | |
| Competent Persons: | |
| CR16: SCAFFOLDING: | |
| CR10(1)(a): FALL PROTECTION: | |
| CR13(1)(a): EXCAVATION WORK: | |
| CR28(a): STACKING | |

| INSPECTION SHEET | | | | |
|---|---|---|---|---|
| SECTION/REGS | ITEM CHECKED | N/A | YES | NO |
| **APPOINTMENTS** | | | | |
| CR8(1) | Construction Manager: | | | |
| CR8(2) | Assistant Construction Manager: | | | |
| S17(1) | Health & Safety Representative: (ratio) | | | |
| S19(1) | Health & Safety Committees | | | |
| **DOCUMENTS** | | | | |
| GAR 9(1) | Records of Incidents | | | |
| GAR 4 | Copy of the Act | | | |
| GAR 7 | Safety Reps Report | | | |
| GAR 8 | Safety Committee Minutes | | | |
| DMR 18(7) | Lifting Machinery Log (Crane) | | | |
| CR 4 | Notification of Construction Work | | | |
| CR 9(2) | Risk Assessment | | | |
| CR 9(9)(e) | Proof of the Health & Safety Induction Training | | | |
| CR 13(13)(h) | Inspection of Excavation (Records) | | | |
| CR 22(g) | Crane Operator Medical Certificate | | | |
| CR 23(11) | Mobile Plant Operator Medical Certificate | | | |
| CR24(d) | Temporary Electrical Installation Record | | | |
| CR 7(1)(b) | Health & Safety File | | | |
| CR 16 | Scaffolding Log Book | | | |
| CR 7(8) | Medical Certificate of Fitness | | | |
| CR 23(1)(l) | Construction Vehicle & Mobile Plant Register | | | |

| | | | | |
|---|---|---|---|---|
| CR 24(d) | Electrical Installation & Machinery Register | | | |
| **INCIDENTS** | | | | |
| GAR 8(1) S24 | Reported | | | |
| GAR 9(1) | Recorded, Investigated and action taken | | | |
| **PUBLIC SITE** | | | | |
| FR 2(1) | Sanitary Facilities | | | |
| CR 30(1) (c) | Changing Facilities for each sex | | | |
| NB Notice | Pedestrian warning | | | |
| **PERSONAL SAFETY EQUIPMENT** | | | | |
| GSR 2(3) | Items Issued: | | | |
| GSR 2(3) | Items Required: | | | |
| S23 | (What is the payment on each item?) | | | |
| **SAFETY PLANS** | | | | |
| FIRST AID | | | | |
| GSR 3(6) | Name(s) of First Aider(s): | | | |
| CR 5(1)(b) | Client's Health & Safety Specification | | | |
| CR7(1)(b) | Principal's contractor H&S Plan | | | |
| **FIRE HAZARD & PRECAUTIONS** | | | | |
| GSR 4 | Flammables used, waste, hot work, diesel, fuel, gas | | | |
| ER 9(1) | Portable Extinguishers | | | |
| **ELECTRICAL INSTALLATIONS & MACHINERY** | | | | |
| CR24 | Guarding & PPE to Electrical Installations | | | |
| **ILLUMINATION** | | | | |
| ER 3(6) | Dangerous Places and signage as well | | | |
| ER 3 | Housekeeping | | | |
| ER6(2)(b),(c),(d) | Clear space storage | | | |
| ER6(3) | Disposal of waste | | | |
| **EXCAVATIONS** | | | | |
| CR 13(3)(l) | Barricades (plus illumination!) | | | |
| CR 13(3)(c) | Safe Depth Shoring/Bracing | | | |
| CR 13(1)(a) | Monitored | | | |
| CR 13(3)(h) | Excavation Inspection Record | | | |
| **GUARDING** | | | | |
| ER 6(2)(f) | Floor Openings (plus illumination!) | | | |
| | Floor slab sides, Shafts (plus illumination!) | | | |
| **SITE EQUIPMENT** | | | | |
| GSR 13A(a) | Ladders condition, secured | | | |
| SANS 10085 | Scaffold condition, secured | | | |
| SANS 10085 | Platforms no. of boards condition Support 1.25. Toe Boards | | | |
| SANS 10085 | Hand Rails | | | |
| **SITE MACHINES** | | | | |
| DMR 3(2)(3) | Circulars, guards, riving knives | | | |
| DMR 2(a) | Mixers guarded | | | |
| **ELECTRIC POWER** | | | | |

| | | | | |
|---|---|---|---|---|
| EMR 6(1) | Supply Board, condition E.L Relay Test | | | |
| GMR 3(1) | Condition of Tools, Leads, Plugs, etc | | | |
| **LIFTING MACHINE/TACKLE** | | | | |
| DMR 18(8) | Lifting of persons | | | |
| DMR 18(8) | Condition, Securing of Load | | | |
| **ROOF WORK** | | | | |
| CR 10(1) | Safety equipment & precautions | | | |
| CR 10(2) | Fall protection plan | | | |
| CR 10(3) | Updated fall protection plan | | | |
| **CEMENT** | | | | |
| AR 10(a) | Suitable Tools | | | |

## 24. APPENDICES

**APPENDIX A** **ADDITIONAL PROJECT SPECIFICATIONS**

**APPENDIX B** **PRE-CONSTRUCTION ADMINISTRATIVE REQUIREMENTS**

**APPENDIX C** **PRE-CONSTRUCTION ADMINISTRATIVE REQUIREMENTS: APPOINTMENTS**

**APPENDIX D** **ON-GOING ADMINISTRATIVE COMPLIANCE RECORDS**

**APPENDIX E** **BASELINE RISK ASSESSMENT**

**APPENDIX F** **ANNEXURE 2 NOTIFICATION OF CONSTRUCTION WORK (REGULATION 4 OF THE CONSTRUCTION REGULATIONS, 2014)**

**APPENDIX G** **IMPORTANT CONTACT DETAILS TEMPLATE**

**APPENDIX H** **ACKNOWLEDGEMENT OF RECEIPT OF H&S SPECIFICATIONS**

**ADDITIONAL PROJECT SPECIFICATIONS**

**PROJECT TITLE: ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13.**

THE FOLLOWING SHOULD BE CONSIDERED SPECIFIC OF THE PROJECT SCOPE OF WORK NAMELY:

| ITEM | POSSIBLE HAZARDS |
|---|---|
| DELIVERY OF PRODUCT | Delivery vehicle colliding with structures<br>Driver not seeing pedestrians or workers<br>Falling material.<br>Employees standing under suspended loads<br>Heavy objects |
| STACKING AND STORAGE | Unsafe stacking<br>Collapsing stacks<br>Tripping over equipment product due to storage and housekeeping and practices |
| EXCAVATIONS | Collapse; Employees buried; Rain or flooding<br>Failure to shore or follow safety procedure<br>Utilities – electrical cables, gas, electrical water, other pipelines, underground storage tanks; vessels,<br>Geological profile. |
| MIXING OF MORTAR AND CEMENT | Exposure to dust.<br>Manual handling.<br>Unsafe Tools<br>Dust<br>Dermatitis<br>Stagnant water. |
| LIFTING LOADS | Employees, visitors standing under suspended loads<br>Equipment failure<br>Falling objects<br>Manual handling |
| ELECTRICAL INSTALLATIONS AND EQUIPMENT | Unsafe wiring<br>Electrocution<br>Equipment out of control<br>Fractured equipment<br>Electrical Arcs, flashes and fires |
| HOT WORK | Fire, Explosions, failure to implement fire controls.<br>Burns; Flash backs, Exposure to sparks; gases<br>Burrs on work piece; Failing to secure work piece. Flying objects; Fumes; Slag<br>Unsafe equipment; Ultraviolet and infrared radiation.<br>Working in confined spaces or near flammable materials<br>Poor stacking of combustibles; Failure to protect eyes causing blindness. |
| PAINTING | Solvents; Resins; Pigments; Additives; Dust; Foreign particles; Dermatitis |
| ELEVATED WORK | Falling from a height. Medically unfit; Scaffold collapse; Falling Objects etc. |

**PRE-CONSTRUCTION ADMINISTRATIVE REQUIREMENTS**

| Item No | Requirement | Legal Reference | Accepted by auditor |
|---|---|---|---|
| A1 | Notification of Intention to Commence Construction/Building Work | CR 4 (1) | |
| A2 | Assignment of Responsible Persons to Supervise Construction Work | CR 8 | |
| A3 | Competence of Responsible Persons | CR 8 | |
| A4 | Compensation for Occupational Injuries and Diseases – proof of registration | COIDA 80(1) | |
| A5 | Occupational Health and Safety Policy | OHSA 7 | |
| A6 | Health and Safety Organogram | Client Requirement | |
| A7 | Initial Hazard Identification and Risk Assessments | CR 9 | |
| A8 | Principal Contractor appointed in writing | CR 5(1)(k) | |
| A9 | Health and Safety Specification Annexure E signed by contractor | Client Requirement | |

## PRE-CONSTRUCTION ADMINISTRATIVE REQUIREMENTS: APPOINTMENTS

The Principal Contractor and Contractors shall make the following appointments: (Further appointments could become necessary as the project progresses).

| Item No | Requirement | Legal Reference | Requirement | Accepted by auditor |
|---|---|---|---|---|
| B1 | CEO Assignee | Section 16(2) | A competent person to assist with the on-site H&S overall responsibility – Contractor's Responsible Person. | |
| B2 | Construction Manager | CR 8(1) | A competent person responsible for managing all construction work and ensuring Health and Safety compliance on site. | |
| B3 | Construction Work Supervisor | CR 8(7) | A competent person to supervise and be responsible of Health and Safety related issues on site. The person is appointed to assist the CEO with his/her overall duties. | |
| B4 | Assistant Construction Work Supervisor | CR 8(8) | A competent person to assist with daily supervision of construction/building work. The person assists the Construction Work Supervisor. | |
| B5 | Health and Safety Representative(s) | Section 17 | A competent person(s) to inspect H&S in reference to plant, machinery and Health and Safety of persons in the workplace. | |
| B6 | Health and Safety Committee Member(s) | Section 19 | A competent person(s) representing the employer to assist with the on-site Health & Safety matters. | |
| B7 | Incident Investigator | GAR 9(2) | A competent person to investigate incidents / accidents on site and could be:<br>• The employer<br>• H&S Representative<br>• Designated person<br>• Member of the H&S Committee | |
| B8 | Risk Assessment Coordinator | CR 9(1) | A competent person to co-ordinate all risk assessments on behalf of the Principal Contractor. The same applies to Contractors. | |
| B9 | Fall Protection Plan Developer | CR10(1)(a) | A competent person responsible for the preparation of a fall protection plan. | |
| B9 | Emergency Plan Coordinator | | A Competent person to co-ordinate all emergency procedures and situations | |
| B10 | First Aiders | GSR 3 | A qualified person to address all on site first aid cases. | |
| B11 | Excavation inspector | CR 13(1)(a) | A competent person to inspect excavation work and ensure that approved safe working procedures | |

| Item No | Requirement | Legal Reference | Requirement | Accepted by auditor |
|---|---|---|---|---|
| | | | are followed at all times. | |
| B12 | Stacking Supervisor | CR 28(a) | A competent person to supervise all stacking and storage operations. | |
| B13 | Temporary electrical installations controller | CR 24(c) | A competent person to control all temporary electrical installations. | |
| B14 | Electrical Machinery Inspector | CR 24(e) | | |
| B15 | Fire-fighting equipment inspector | CR 29(h) | A competent person to inspect fire-fighting equipment. | |
| B16 | Construction Safety Officer | CR 8(5) | A competent person to fulfil the functions as set out in 2.3.24 of the HSS | |
| B 17 | Construction Vehicle and Mobile Plant Inspector | CR 23(1)(k) | A competent person to ensure that all inspections on the various plant and vehicles on site re conducted as required. | |
| B18 | Construction Vehicle and Mobile Plant Operator | CR 23(1)(d)(i) | A competent operator must be appointed for each specific Plant or Vehicle in use on site. | |
| B19 | Lifting machine and equipment inspector | DMR 18 | A competent person to inspect lifting machines and equipment. | |
| B20 | Lifting Tackle Inspector | DMR 18(6) | A competent person appointed to conduct the necessary inspections on lifting tackle. | |
| B21 | Crane Operator | DMR 18(11) | A competent person to operate the crane – certificate of training and fitness required. | |
| B22 | Crane Banksman | DMR 18(11) | A competent person to assist the crane operator during all lifting operations. At least one Banksman per crane must be appointed in writing. | |
| B23 | General Machinery Competent Person | GMR 2(1) | A competent person to supervise machinery. | |

## ON-GOING ADMINISTRATIVE COMPLIANCE RECORDS

The Principal Contractor and Contractors shall comply with but not be limited to the requirements tabled below: Report in writing on these requirements to the Client and Principal Contractor respectively at least monthly.

| Item No | What | When | Output | Accepted by Client and date |
|---|---|---|---|---|
| C1 | Construction phase Health and Safety Plan | Monthly review | Principal Contractor to report on status of Contractor's health and safety plans – monthly | |
| C2 | Health and Safety File | Open file when construction begins and maintain throughout | File on site at all times. Contractors to report on their file at monthly Health and Safety meetings with the Principal Contractor. | |
| C3 | OHS Act and relevant Regulations | Monthly review | To be kept in the health and safety file on site. | |
| C4 | Induction training | Every worker before he/she starts work | Attendance registers to be kept. | Date of last induction: |
| C5 | Awareness Training (Tool Box Talks) | At least weekly | Attendance registers to be kept. | Date of last toolbox talk: |
| C6 | Health and Safety Meetings | Monthly | Meeting minutes to be kept | Date of last meeting: |
| C7 | Health and Safety Reports | Monthly | Report covering:<br>• Incidents/accidents and investigations<br>• Non-conformances by employees and Contractors<br>• Health and Safety Audit Reports<br>• Health and Safety Representative Monthly Checklist<br>• Health and Safety Training<br>• HIRA updates | |
| C8 | Appointment of Subcontractors | As required | All subcontractors working directly under the Principal Contractor, whether selected, nominated or preferred must be appointed in writing. | |
| C9 | Audits on contractors | Monthly | Report covering compliance status in terms of :<br>• Health and Safety File/Plan<br>• FEM Status<br>• Appointment letters<br>• Section 37(2) agreements<br>• Risk assessment and method statements<br>• Inspection Registers | |
| C10 | List of Contractors | List to be updated weekly | Table list, number of workers and Company tel. numbers | |
| C11 | Workman's Compensation | Ongoing | A copy of the subcontractor's proof of registration with workman's compensation or FEM on file. | |
| C12 | Construction site | Ongoing | Proof of agreement documents to be | |

| Item No | What | When | Output | Accepted by Client and date |
|---|---|---|---|---|
| | rules and Section 37.2 Mandatory agreements | | kept in H&S file. | |
| C13 | Emergency Procedures | Monthly evaluation of procedure | • Table procedure in writing as well as tel. numbers<br>• Proof that the emergency procedures are being conveyed to the employees | |
| C14 | Health and Safety Notice Board | On-going | A notice board in the site office posted with the following:<br>• Signed Policy<br>• Emergency Procedure<br>• Emergency contact Nos.<br>• First Aid person's certificate<br>• Basic Site Rules<br>• Copy of FEM/WCA letter<br>• Toolbox Talk topic | |
| C15 | Risk assessments | Updated and signed off at least monthly | Documented risk assessments | |
| C16 | Method statements (Safe Work Procedures) | Drawn up and distributed before workers are exposed to the risks | Documented set of safe work procedures (method statements) reviewed and signed off. | |
| C17 | Method Statements | Communicated to affected employees | Confirmation of communication to employees in the form of a training awareness attendance registers. | |
| C18 | Medicals (fitness certificates) | Assessment of the Psychological and Physical conditions of employees | Certificates on filing relating to the psychological and medical fitness of;<br>• Plant operators<br>• Crane operator | |
| C19 | General Inspections | Daily and weekly | Report OHS Act compliance:<br>• Excavations<br>• Portable electrical equipment<br>• Temporary Electrical Installations<br>• Lifting tackle (visual)<br>• Crane daily check<br>• Hand Tools – daily issue register | |
| C20 | General Inspections | Monthly | • Fire fighting equipment<br>• First Aid Box contents | |
| C21 | General | 3 - Monthly | • Lifting tackle<br>• Oxy-acetylene cutting and welding sets<br>• Fall prevention equipment | |
| C22 | General Inspections | 6 - Monthly | • Lifting machines | |
| C23 | Load tests / performance tests | Annually / once erected, before use | • Lifting machines | |

**BASELINE RISK ASSESSMENT**

**Tables to rate the criticality of a Task in terms of Potential, Severity and Likelihood (Frequency of Exposure and Probability)**

| EVALUATION OF THE POTENTIAL SEVERITY OF THE LOSSES THAT MAY BE INCURRED DURING THE EXECUTION OF THE TASK | | | |
|---|---|---|---|
| **Severity Rating** | **Severity Rating Description** | | |
| | **Severity in terms of harm to people** | **AND/OR** | **Severity in terms of harm to assets, processes / production and/or the environment** |
| 1 | No injury or illness | and/or | Losses less than R1000 |
| 2 | Medical treatment required but without lost time | and/or | Non-disruptive asset damage, and/or other losses of more than R1000 but not exceeding R10 000 |
| 4 | Disabling injury or illness, but without permanent disabling | and/or | Disruptive asset damage, and/or other losses of more than R10 000 but not exceeding R100 000 |
| 6 | Permanent disabling injury or illness, and/or loss of life or body part | and/or | Extensive disruptive asset damage, and or other losses exceeding R100 000 |

| EVALUATION OF THE PROBABILITY THAT THE LOSS WILL BE INCURRED | | | | |
|---|---|---|---|---|
| **Probability Rating** | **Probability Rating Description** | | | |
| **Number of persons that perform the task** | **Frequency Rating Description** | | | |
| | **How often will the task be performed?** | | | |
| | **Once a month or less** | **Once a week** | **Once a day** | **More than once a day** |
| | **Frequency Rating** | | | |
| 1 – 3 | 1 | 1 | 2 | 3 |
| 4 - 6 | 1 | 2 | 3 | 3 |
| >6 | 2 | 2 | 3 | 3 |

| TASK RISK RATING | | |
|---|---|---|
| **Calculated Task Risk Rating** | **Description** | **Action to be Taken** |
| 10, 11, 12 | CRITICAL RATING | Control measures shall be developed to be implemented during task execution.<br>Highest level of priority. |
| 7, 8, 9 | HIGH RATING | Control measures must be developed to be implemented during task execution. |

| | | |
|---|---|---|
| | | High priority. |
| 4, 5, 6 | MODERATE RATING | Be aware of the task criticality rating and the possibility that the task may become more critical. Control measures may be developed. Moderate priority. |
| 1, 2, 3 | LOW RATING | Risk may be tolerated until the task criticality is again assessed. No need for control measures to be developed immediately. Lowest priority. |

**Task Risk Rating Calculation:**

**Task Risk Rating = Severity Rating + Likelihood Rating (Frequency of Exposure Rating + Probability Rating)**

- Task Risk Rating (max 12)
- Severity Rating (max 6)
- Likelihood Rating (max 6) = Frequency of Exposure Rating (max 3) + Probability Rating (max3)

**Legend:**
S = Severity
F = Frequency
P = Probability

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| Site Establishment | Site/Bush Clearing | Moving machinery accident | Critical | Induction training, reflective vests, restricted access |
| | | Injury due to hand tools | Moderate | Induction training, PPE (Safety gloves, Safety boots, safety goggles) |
| | | Snakes/Spider bites | Critical | First aid treatment available, Induction training |
| | | Dangerous animals in vicinity | Moderate | Induction training, First Aiders trained, first aid boxes available on-site |
| | | Electrical cables and other services in way of work area | Critical | Properly mark and demarcate services |
| | Removal of waste | Moving machinery accident | Moderate | Reflective vests, restricted access, induction training |
| | | Waste material falling from vehicle | High | Load to be secured, stay within maximum vehicle load capacity |
| | | Dust inhalation | Low | Induction training, PPE (dust masks) |
| General on-site activities | Access to site | Pedestrian and people/equipment interaction causing injury | Critical | Work area to be barricaded and secured. When using roads, traffic regulations to apply. |
| | | Dust inhalation | High | Dust masks |
| | | Slip, trip and fall | High | Induction training; PPE (hard hats, safety shoes) |
| General on-site activities | Loading and offloading of heavy machinery and equipment - hand | Items rolling/ slipping, falling causing injury | High | Induction training and PPE (Hardhats, Safety boots, gloves) |
| | | Incorrect lifting procedure resulting in injury | High | Induction training, SWP for manual lifting, PPE (Safety boots, gloves, hardhats) |
| | Loading and offloading of heavy machinery and equipment - machinery | Equipment falling - injury or damage | High | PPE (Hardhats, gloves, safety boots); Safe Work Area to be identified |
| | | Collision of vehicles – injury or damage | High | Flag men to be used |
| | Traffic | Equipment interaction | Critical | Traffic management plan |
| | | Pedestrian collision | Critical | Pedestrian walkways |
| | Lack of employee facilities | Worker dehydrates due to lack of | High | Provide adequate drinking water , induction training |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | | drinking water | | |
| | | Unhygienic condition due to lack of sanitary facilities | High | Provide chemical toilets, proper housekeeping |
| | Stacking and storage | Slip, trip and fall – injury | Moderate | Adequate storage areas provided and demarcated, induction training, access control |
| | | Obstruction of critical equipment and walkways | Moderate | Adequate storage areas provided and demarcated, induction training, access control |
| | | Flammable liquids catching fire | Moderate | Adequate storage areas provided and demarcated, induction training, adequate fire fighting equipment and fire fighters |
| | | Storage of HCS | Moderate | HCS are stored according to the requirements set out in the CR 25 and 28; induction training; access control |
| | | Improper stacking of material – injury/damage | Moderate | Supervision |
| | Handling of HCA | Exposure | High | Induction training, PPE (Gloves, overalls, Safety boots, Safety goggles ) |
| | | Inhalation | Moderate | Induction training, PPE (Dust masks) |
| | | Burn to skin | Moderate | Induction training, PPE (Gloves, overalls, safety boots) |
| General On-site Activities | Temporary Low Voltage Electrical Installation | Exposure to live wires - electrocution | Critical | Lockable DB box, regular inspections |
| | | Faulty earth leakage | Critical | Only competent person must install and inspect |
| | | Fire due to short circuit | High | Regular inspections, Adequate firefighting equipment and fire fighters |
| | Issue of PPE | Incorrect PPE issued | Moderate | PPE must be issued according to PPE register |
| | Use of PPE | Incorrect use of PPE | Moderate | Induction training, PPE register and supervision |
| | Use of PPE | Negligence to use PPE | Moderate | Induction training, PPE register and supervision |
| General On-site Activities | Adverse Storms | Struck by lightning | Moderate | Induction training |
| | Adverse heat | Dehydration, heat stroke and sunburn | High | Induction training, adequate drinking water and PPE (Hard hats, full overalls) |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | Excessive winds | Exposure to dust | High | PPE (Dust masks) |
| | Housekeeping | Injury due to objects lying around (Slip, trip and fall) | High | Induction training, regular cleaning of site |
| | | Pollution | Moderate | Adequate waste bins and regular waste removal |
| | | Unhygienic conditions | Moderate | Induction training |
| | Fire prevention | Open fires | Moderate | Induction training |
| | | Inadequate firefighting equipment | Moderate | Regular inspections |
| | | Run away fires | High | Emergency evacuation plan |
| | | Accidental fires | Moderate | Induction training, designated smoking areas |
| | Environmental pollution | Pollution of ground, air, workspace | Low | Induction training, adequate waste bins and regular waste removal, SWP for HCS spillage |
| | | Littering | High | Induction training, adequate waste bins and regular waste removal |
| | Working in close proximity to hazardous animals, including snakes, spiders , scorpions, dogs | Poisonous bites or attack by animals | High | Induction training, First aiders trained and adequate first aid boxes available |
| Mobile Equipment and Plant | Construction vehicles | Equipment failure | High | Vehicle inspection register and regular maintenance |
| | | Unroadworthy vehicles | Moderate | Vehicle inspection register and regular maintenance |
| | | Speeding / Unsafe operation | Critical | Training, Supervision |
| | | Potential accident/collision | High | Induction training, reflective vests, safe work area |
| | | Material/equipment fall from vehicle | High | Goods to be properly secured |
| | | Vehicle or plant not used for intended purpose | High | Supervision, training |
| | Licensing of operators | Unauthorized operation of equipment | Critical | Supervision, restricted access to machinery |
| | | Expired licenses | High | Keep licenses up to date |
| | Parking of vehicles | Runaway vehicle | Critical | Regular inspections of vehicles, stop blocks |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | | Parking in unsafe areas | High | Parking areas are properly demarcated |
| Transportation | Transportation of employees | Interaction with other vehicle - collision | High | Training, Supervision |
| | | Vehicle/Plant not roadworthy | Critical | Regular inspections of vehicles - register |
| | | Vehicle/Plant not licensed | Moderate | Supervision |
| | | Operator of vehicle transporting employees not licensed and authorized | High | Supervision and monitoring |
| | | Vehicle not equipped to transport employees | High | Inspection register - must meet standards required |
| Transportation | Transportation of employees | Not adhering to traffic legislation | High | Supervision, discipline |
| | Transportation – material/ equipment with people | Material/equipment fall from vehicle | High | Goods to be properly secured |
| | | Potential accident/collision | Moderate | Induction training, reflective vests |
| | Towing a Trailer | Vehicle accident | Moderate | Training |
| | | Towing coupler failure | Moderate | Regular inspections – register |
| Hand Tools | Injury due to | Incorrect tools | High | Supervision, On-the-job training |
| | | Defective tools | High | Supervision |
| | | Struck by flying debris | High | On-the-job training, PPE ( Full overalls, Hard hats, Safety goggles, safety boots) |
| | | Struck by hand tool | High | On-the-job training, PPE (Full overalls, hard hats, safety goggles, safety boots) |
| | Hand drills | Clothing being grabbed by rotating drill | Moderate | Supervision, SWP, On-the-job training, PPE (Safety gloves) |
| | | Unsecured rotating work piece | High | Supervision, SWP, On-the-job training, PPE (Safety gloves) |
| | | Shaving flying into eyes | Critical | Supervision, SWP, On-the-job training, PPE (Safety goggles) |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | | Accidental injury | Moderate | Supervision, SWP, On-the-job training, PPE (Safety gloves, Safety goggles) |
| | | Electrocution | Critical | Regular inspections – register, SWP |
| | | Exposure to noise | Critical | PPE (Earmuffs) |
| | Angle Grinder | Cutting disc cracked and breaks | Critical | Supervision, SWP, On-the-job training, PPE (Safety goggles and face shield, safety gloves) |
| | | Shaving flying into eyes | Critical | Supervision, SWP, On-the-job training, PPE (Safety goggles and face shield) |
| | | Exposure to noise | Critical | PPE, (Earmuffs) |
| | | Accidental injury | Moderate | Supervision, SWP, On-the-job training, PPE (Safety boots, safety goggles, safety gloves, face shield, ear muffs) |
| | | Electrocution | Critical | Regular inspections – register, SWP |
| Excavation, backfilling and explosives | Manual digging of holes and trenches | Defective tools - injury | Moderate | Induction training, inspection register – hand tools |
| | | Improper work method – injury | High | Induction training, supervision |
| | | Trip/fall into holes | High | Demarcated areas around holes, induction training, PPE ( Safety boots, Hard hats) |
| | Machine digging of holes/trenches | Collapse of trenches | High | Daily inspection by competent person – excavation |
| | | Collapse of adjacent structure | Critical | Safeguard adjacent structure |
| | | Malfunction of machinery | Critical | Regular inspections – machinery inspection register |
| | | Unauthorized operator | Critical | Trained operator, supervision, restricted access to machinery |
| | | Unnecessary damage to environment | High | Designated work area, induction training, PPE (Hard hats, safety boots, reflective vest, ear plugs) |
| | High Noise Levels | Hearing loss | Critical | Hearing protection to be used |
| | Tipping of material | Material falling on person | Critical | Safe work area, flag men, PPE (Hard hats, Safety boots) |
| | | Malfunction of equipment – injury/damage | Critical | Safe work are, flag men, PPE (Hard hats, safety boots) |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | Hitting of electrical cables/services | Electrocution | Critical | Site map indicating existing services, Induction training |
| | Opening trenches | Risk of collapse | Critical | Stabilize trench, induction training, work permit |
| | | Fall, slip into trench | Critical | Barricade trench, PPE (Hard hats, safety boots, reflective vest, ear plugs) |
| | Compaction | Personal injury | Moderate | Only trained operator (Hard hats, safety boots, safety goggles) |
| | | Collision of machinery | High | Induction training, reflective vests, safe work area |
| | | Dust inhalation | Moderate | Induction training, PPE (Dust masks) |
| | Handling of explosives | Spillage of Explosives | Critical | Appoint competent person to handle explosive material, PPE (Dust masks, safety gloves, safety goggles) |
| Installation of Electrical Cables | Installation of electrical cables in trench | Fall, slip into trench | High | Barricade trench, PPE (Safety boots, hard hats) |
| | | Handling and lifting cable - injury | High | Induction training, PPE |
| Concrete | Manual Mixing | Cement dust inhalation | Moderate | PPE (Dust masks) |
| | | Contact with dry cement mix | High | Induction training, PPE (Full overalls, safety gloves, safety boots) |
| | | Spillage/Pollution | High | Mixing sheet |
| | | Cement burns / Mixing - injury | High | Induction training, supervision, PPE (Full overalls, safety boots, safety gloves) |
| | HCS | Exposure | High | PPE (Safety boots, full overalls, safety goggles, safety gloves) |
| | | Burns to skin | Moderate | PPE ( safety boots, full overalls, safety goggles, safety gloves) |
| | | Inhalation | High | PPE (Dust masks) |
| Working on heights (Truck mounted crane) | Working in bucket of truck mounted crane | Fall from equipment | High | Fall arrest equipment to be used, Only trained employees to work on height |
| | | Equipment failure | Moderate | Regular inspections by competent person, Load tests to be done (proof) |

| Activity / Equipment / Machinery | Hazard | Risk | Rating | Preventative measure |
|---|---|---|---|---|
| | | Contact with electrical cables | Critical | Competent crane operator |
| Electrical Installations/ Reticulation | Medium Voltage Reticulation | Accidental switch on while work in progress | Critical | Lock-out before doing connections |
| | | Short circuit can blow up when switching | High | PPE (Hard hats, safety gloves, safety boots) |
| | | Electrocution | Critical | Competent person do installation and inspections |
| | | Dangerous/Unsafe cable joints | High | Supervision |
| | High Voltage Reticulation | Discharge of cable | High | Correct measuring equipment |
| | | Electrocution | Critical | Competent person do installation and inspections |
| | | Dangerous/unsafe cable joints | High | Supervision |
| | | Accidental switch on while work in progress | Critical | Lock-out before doing connections |
| Electrical Installations/ Reticulation | High Voltage Reticulation | Short circuit can blow up when switching | High | PPE (Hard hats, safety gloves, safety boots) |
| Steelwork | Welding and flame cutting | Unsafe flame cutting/welding equipment | High | Flashback arrestors, supervision, induction training |
| | | Employees not competent | High | Supervision, training |
| | | Unsafe storage | High | Adequate storage areas |
| | | Injury/Burns to employee | High | First aid boxes must have burn aids |
| | | Accidental fire | High | Firefighting equipment, Fire fighters |

# IMPORTANT CONTACT DETAILS

**(FOR HEALTH & SAFETY ASPECTS ONLY)**

**The contractor is to add all the important contact information about essentials services, support and assistance.**

| | SERVICE | NUMBER | CONTACT PERSON |
|---|---|---|---|
|  | Hospital | | |
| | | | |
|  | Ambulance | | |
| | | | |
|  | Water | | |
| | Electricity | | |
|  | Police | | |
| | | | |
|  | Fire Brigade | | |
| | | | |
|  | Engineer | | |
| | | | |

**ADD OTHER IMPORTANT HEALTH & SAFETY CONTACT DETAILS AS MAY BE FOUND NECESSARY.**

**ACKNOWLEDGEMENT OF RECEIPT:**

**CONTRACT NR. TN036/2023**

**DAWID KRUIPER MUNICIPALITY**

**ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

I, _____

representing _____

Principal Contractor / Contractor / Employer have received the Health and Safety Specification in good order and shall ensure that the Principal Contractor / Contractor / Employer and its personnel comply with all the obligations / requirements / specifications in respect thereof. This document is legally binding in terms of Regulation 4(1)(a) of the Construction Regulations (2014).

_____ _____

Signature of Principal Contractor / Contractor Date

_____ _____

Signature of Client / Client's Agent Date

# Annexure C – MBD Forms

**MBD 1**

# PART A
# INVITATION TO BID

| **YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE DAWID KRUIPER MUNICIPALITY** | | | |
|---|---|---|---|
| BID NUMBER: | **TN036/2023** | **CLOSING DATE: FRIDAY, 12 JANUARY 2024** | **CLOSING TIME: 14:00** |
| DESCRIPTION | **ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13** | | |
| **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).** | | | |

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT

| |
|---|
| **Dawid Kruiper Municipality** |
| **Civic Centre** |
| **Mutual Street** |
| **Upington** |
| **8800** |

| **SUPPLIER INFORMATION** | | | | | | |
|---|---|---|---|---|---|---|
| NAME OF BIDDER | | | | | | |
| POSTAL ADDRESS | | | | | | |
| STREET ADDRESS | | | | | | |
| TELEPHONE NUMBER | CODE | | NUMBER | | | |
| CELLPHONE NUMBER | | | | | | |
| FACSIMILE NUMBER | CODE | | NUMBER | | | |
| E-MAIL ADDRESS | | | | | | |
| VAT REGISTRATION NUMBER | | | | | | |
| TAX COMPLIANCE STATUS | TCS PIN: | | **OR** | CSD No: | | |
| B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX] | ☐ Yes ☐ No | | B-BBEE STATUS LEVEL SWORN AFFIDAVIT | ☐ Yes ☐ No | | |
| ***[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]*** | | | | | | |
| ARE YOU THE ACCREDITED REPRESENTATIVE **IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?** | ☐Yes ☐No [IF YES ENCLOSE PROOF] | | ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?** | ☐Yes ☐No [IF YES, ANSWER PART B:3] | | |

| | | | |
|---|---|---|---|
| **TOTAL NUMBER OF ITEMS OFFERED** | | **TOTAL BID PRICE: R…….** | |
| **SIGNATURE OF BIDDER** | …… | **DATE** | |
| **CAPACITY UNDER WHICH THIS BID IS SIGNED** | …… | | |
| **BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:** | | **TECHNICAL INFORMATION MAY BE DIRECTED TO:** | |
| DEPARTMENT | Supply Chain Management Unit | DEPARTMENT | Electro-Technical |
| CONTACT PERSON | Mary Marabi | CONTACT PERSON | Mr D Louw |
| TELEPHONE NUMBER | 054 338 7436 | TELEPHONE NUMBER | 054 338 7154 |
| FACSIMILE NUMBER | - | E-MAIL ADDRESS | |
| E-MAIL ADDRESS | mary.marabi@dkm.gov.za | daniel.louw@dkm.gov.za | |

# PART B
# TERMS AND CONDITIONS FOR BIDDING

| 1. BID SUBMISSION: |
|---|
| 1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION. |
| 1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED– (NOT TO BE RE-TYPED) OR ONLINE** |
| 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT. |
| **2. TAX COMPLIANCE REQUIREMENTS** |
| 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS. |
| 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS. |
| 2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA. |
| 2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3. |
| 2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID. |
| 2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER. |
| 2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED. |
| **3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS** |
| 3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO |
| 3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO |
| 3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO |
| 3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? ☐ YES ☐ NO |
| 3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? ☐ YES ☐ NO |
| **IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.** |

**NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID**.

**NB: NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.**

SIGNATURE OF BIDDER ……

CAPACITY UNDER WHICH THIS IS SIGNED ……

DATE ……

**MBD 4**

## DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state[1].

2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

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

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

3.2 Identity Number: ……...

3.3 Position occupied in the Company (director, trustee, shareholder[2]): …….. ……...

3.4 Company Registration Number: ……...

3.5 Tax Reference Number: ……..

3.6 VAT Registration Number: ……..

3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state? **YES / NO**

3.8.1 If yes, furnish particulars.

…..……

……

[1]MSCM Regulations: "in the service of the state" means to be –

(a) a member of –
  (i) any municipal council;
  (ii) any provincial legislature; or
  (iii) the national Assembly or the national Council of provinces;

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

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

3.9 Have you been in the service of the state for the past twelve months? **YES / NO**

3.9.1 If yes, furnish particulars.

……

……

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.10.1 If yes, furnish particulars.

……

……

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.11.1 If yes, furnish particulars

……

……

3.12 Are any of the company's directors, trustees, managers, principal shareholders or stakeholders in service of the state? **YES / NO**

3.12.1 If yes, furnish particulars.

……

……

3.13 Are any spouse, child or parent of the company's director's trustees, managers, principal shareholders or stakeholders in service of the state? **YES / NO**

3.13.1 If yes, furnish particulars.

……

……

3.14 Do you or any of the directors, trustees, managers, principal shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract? **YES / NO**

3.14.1 If yes, furnish particulars:

……

……

**MBD 4**

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

| Full Name | Identity Number | State Employee Number |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

…….. ……..
**Signature** **Date**

…….. ……..
**Capacity** **Name of Bidder**

**MBD 5**

## DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

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

1. Are you by law required to prepare annual financial statements for auditing? ***YES / NO**

   1.1. If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

   ……

   ……

2. Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? ***YES / NO**

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

   2.2. If yes, provide particulars.

   ……..

   ……

   ……

3. Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? ***YES / NO**

   3.1. If yes, furnish particulars

   ……

   ……

   ……

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? ***YES / NO**

   4.1. If yes, furnish particulars

   ……

   ……

   ……

* Delete if not applicable

**MBD 5**

## CERTIFICATION

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

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

| | |
|---|---|
| …….. | …….. |
| **Signature** | **Date** |
| …….. | …….. |
| **Position** | **Name of Bidder** |

**MBD 6.1**

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

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

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

## 1. GENERAL CONDITIONS

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

- the 80/20 system for requirements with a Rand value of up to R 50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R 50 000 000 (all applicable taxes included).

1.2

a) The value of this bid is estimated to **not exceed** R 50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable

1.3 Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

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

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

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

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

## 2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

**(e)** **"EME"** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

**1)** B-BBEE Status level certificate issued by an authorized body or person;

**2)** A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

**3)** Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

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

## 3. POINTS AWARDED FOR PRICE

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

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

**80/20 or 90/10**

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

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

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

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

| B-BBEE Status Level of Contributor | Number of points (90/10 system) | Number of points (80/20 system) |
|---|---|---|
| 1 | 10 | 20 |
| 2 | 9 | 18 |
| 3 | 6 | 14 |

| | | |
|---|---|---|
| 4 | 5 | 12 |
| 5 | 4 | 8 |
| 6 | 3 | 6 |
| 7 | 2 | 4 |
| 8 | 1 | 2 |
| Non-compliant contributor | 0 | 0 |

**5. BID DECLARATION**

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

**6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1**

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

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

**7. SUB-CONTRACTING**

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

(***Tick applicable box***)

| YES | | NO | |
|---|---|---|---|

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted ....……%

ii) The name of the sub-contractor ……..

iii) The B-BBEE status level of the sub-contractor. .....……..

iv) Whether the sub-contractor is an EME or QSE
***(Tick applicable box***)

| YES | | NO | |
|---|---|---|---|

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

| Designated Group: An EME or QSE which is at last 51% owned by: | EME √ | QSE √ |
|---|---|---|
| Black people | | |
| Black people who are youth | | |
| Black people who are women | | |
| Black people with disabilities | | |
| Black people living in rural or underdeveloped areas or townships | | |
| Cooperative owned by black people | | |
| Black people who are military veterans | | |
| **OR** | | |
| Any EME | | |
| Any QSE | | |

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm: …….

8.2 VAT registration number: ……

8.3 Company registration number: ……

8.4 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……
……

8.6 COMPANY CLASSIFICATION

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

[*TICK APPLICABLE BOX*]

**8.7 MUNICIPAL INFORMATION**

Municipality where business is situated: ……

Registered Account Number: ……

Stand Number: ……

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

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

i) The information furnished is true and correct;

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

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding process;

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

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

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

(e) forward the matter for criminal prosecution.

| | |
|---|---|
| WITNESSES<br>1. ……..<br>2. …… | ……<br>SIGNATURE(S) OF BIDDERS(S)<br>DATE: ……..<br>ADDRESS ……..<br>……..<br>…….. |

# DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

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

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2011 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

## 1. General Conditions

1.1. Preferential Procurement Regulations, 2011 (Regulation 9) makes provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Where necessary, for bids referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

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

1.5. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

LC = [1- x / y] *100

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

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

**The SABS approved technical specification number SATS 1286:2011 is accessible on http://www.thedti.gov.za/industrial development/ip.jsp at no cost.**

1.6. A bid may be disqualified if –

(a) this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation; and

(b) the bidder fails to declare that the Local Content Declaration Templates (Annex C, D and E) have been audited and certified as correct.

**2. Definitions**

2.1. **"bid"** includes written price quotations, advertised competitive bids or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"duly sign"** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour and intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

**3. The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:**

| Description of services, works or goods | Stipulated minimum threshold |
|---|---|
| a) Cables | 90% |
| b) Steel Value added products | 100% |
| c) Primary steel products | 100% |

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

| YES | | NO | |
|---|---|---|---|

4.1. If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date of advertisement of the bid.

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

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

| Currency | Rates of exchange |
|---|---|
| US Dollar | |
| Pound Sterling | |
| Euro | |
| Yen | |
| Other | |

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

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

| YES | | NO | |
|---|---|---|---|

5.1. If yes, provide the following particulars:
(a) Full name of auditor: ……
(b) Practice number: ……..
(c) Telephone and cell number: …….
(d) Email address: ……..

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

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

## LOCAL CONTENT DECLARATION
## (REFER TO ANNEX B OF SATS 1286:2011)

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

**IN RESPECT OF BID NO.** .....

**ISSUED BY**: (Procurement Authority / Name of Municipality / Municipal Entity):
.....

NB

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

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

contract.

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

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

(b) I have satisfied myself that

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

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

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

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

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

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

**SIGNATURE:** _____ **DATE:** _____

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

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

SATS 1286.2011

# Annex C

## Local Content Declaration - Summary Schedule

| | |
|---|---|
| *(C1)* | **Tender No.** |
| *(C2)* | **Tender description:** |
| *(C3)* | **Designated product(s)** |
| *(C4)* | **Tender Authority:** |
| *(C5)* | **Tendering Entity name:** |
| *(C6)* | **Tender Exchange Rate:** Pula EU GBP |
| *(C7)* | **Specified local content %** |

**Note:** VAT to be excluded from all calculations

| Calculation of local content | | | | | | | | Tender summary | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tender item no's | List of items | Tender price - each (excl VAT) | Exempted imported value | Tender value net of exempted imported content | Imported value | Local value | Local content % (per item) | Tender Qty | Total tender value | Total exempted imported content | Total Imported content |
| *(C8)* | *(C9)* | *(C10)* | *(C11)* | *(C12)* | *(C13)* | *(C14)* | *(C15)* | *(C16)* | *(C17)* | *(C18)* | *(C19)* |
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*(C20)* **Total tender value** R 0

*(C21)* **Total Exempt imported content** R 0

*(C22) Total* **Tender value net of exempt imported content** R 0

*(C23)* **Total Imported content** R 0

*(C24)* **Total local content** R 0

*(C25)* **Average local content % of tender**

**Signature of tenderer from Annex B**

Date:

SATS 1286.2011

# Annex D

## Imported Content Declaration - Supporting Schedule to Annex C

| | | |
|---|---|---|
| (D1) | Tender No. | |
| (D2) | Tender description: | |
| (D3) | Designated Products: | |
| (D4) | Tender Authority: | |
| (D5) | Tendering Entity name: | |
| (D6) | Tender Exchange Rate: | Pula |

Note: VAT to be excluded from all calculations

EU R 9.00 GBP R 12.00

### A. Exempted imported content

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

This total must correspond with Annex C - C 21

### B. Imported directly by the Tenderer

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

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

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

### D. Other foreign currency payments

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

Signature of tenderer from Annex B

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

This total must correspond with Annex C - C 23

Date:

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# Annex E

## Local Content Declaration - Supporting Schedule to Annex C

| | | |
|---|---|---|
| *(E1)* | **Tender No.** | |
| *(E2)* | **Tender description:** | |
| *(E3)* | **Designated products:** | |
| *(E4)* | **Tender Authority:** | |
| *(E5)* | **Tendering Entity name:** | |

**Note: VAT to be excluded from all calculations**

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

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|---|---|---|---|
| *(E10)* | **Manpower costs** | ( Tenderer's manpower cost) | R 0 |
| *(E11)* | **Factory overheads** | (Rental, depreciation & amortisation, utility costs, consumables etc.) | R 0 |
| *(E12)* | **Administration overheads and mark-up** | (Marketing, insurance, financing, interest etc.) | R 0 |
| | | ***(E13)* Total local content** | R 0 |

**This total must correspond with Annex C - C24**

**Signature of tenderer from Annex B**

Date: _____

**MBD 7.1**

## CONTRACT FORM - PURCHASE OF GOODS/WORKS

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

**PART 1 (TO BE FILLED IN BY THE BIDDER)**

1. I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to (name of institution) **Dawid Kruiper Municipality** in accordance with the requirements and specifications stipulated in bid number **TN036/2023** at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the purchaser during the validity period indicated and calculated from the closing time of bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:
   (i) Bidding documents, *viz*
   - Invitation to bid;
   - Tax clearance certificate;
   - Pricing schedule(s);
   - Technical Specification(s);
   - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
   - Declaration of interest;
   - Declaration of bidder's past SCM practices;
   - Certificate of Independent Bid Determination;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract; and
   (iii) Other (specify)

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

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

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

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

| | | | |
|---|---|---|---|
| NAME (PRINT) | …… | WITNESSES | |
| CAPACITY | …… | 1. | …… |
| SIGNATURE | …… | 2. | …… |
| NAME OF FIRM | …… | DATE: | …… |
| DATE | …… | | |

**MBD 7.1**

# CONTRACT FORM - PURCHASE OF GOODS/WORKS

**PART 2 (TO BE FILLED IN BY THE PURCHASER)**

1. I …… in my capacity as ……..….. accept your bid under reference number **TN036/2023** dated……for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.

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

| ITEM NO. | PRICE (ALL APPLICABLE TAXES INCLUDED) | DELIVERY PERIOD | B-BBEE STATUS LEVEL OF CONTRIBUTION | MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable) |
|---|---|---|---|---|
| | | | | |

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

SIGNED AT …… ON ……..……

NAME (PRINT) ……

SIGNATURE ……

WITNESSES

1. ……

2. ……

OFFICIAL STAMP

**MBD 8**

# DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

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

2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

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

a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

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

**MBD 8**

| Item | Question | Yes | No |
|---|---|---|---|
| 4.3 | Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years? | Yes ☐ | No ☐ |
| 4.3.1 | If so, furnish particulars: | | |
| 4.4 | Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months? | Yes ☐ | No ☐ |
| 4.4.1 | If so, furnish particulars: | | |
| 4.5 | Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract? | Yes ☐ | No ☐ |
| 4.7.1 | If so, furnish particulars: | | |

**CERTIFICATION**

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

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

…….. **Signature**

…….. **Date**

…….. **Position**

…….. **Name of Bidder**

**MBD 9**

# CERTIFICATE OF INDEPENDENT BID DETERMINATION

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

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;

b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

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[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

**MBD 9**

# CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

**ELECTRIFICATION OF 260 HOUSES IN KAMEELMOND, LOUISVALE ROAD, COUPLES VALLEY & PABALELLO WARD 13**

in response to the invitation for the bid made by:

**DAWID KRUIPER MUNICIPALITY**

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

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

1. I have read and I understand the contents of this Certificate;

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

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

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:

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

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

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

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices;
   (b) geographical area where product or service will be rendered (market allocation)
   (c) methods, factors or formulas used to calculate prices;
   (d) the intention or decision to submit or not to submit, a bid;
   (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
   (f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

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

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

| | |
|---|---|
| …….. | …….. |
| **Signature** | **Date** |
| …….. | …….. |
| **Position** | **Name of Bidder** |