



TENDER REFERENCE: EED 38-2022/23

TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD.

VOLUME 1

A Tender for Category 6EP or higher CIDB Registered Contractors

ISSUED BY:	PREPARED BY:
The Divisional Head <u>Supply Chain Management Unit</u>	The Group Head <u>Energy and Electricity Department</u>

Registered Name of Tenderer:	
Trading Name of Tenderer:	
Registration No. of Entity:	
Contact Person:	CoT Vendor No (Where Applicable):
Tel. No:	E-Mail Address:
Cell No:	Fax No:

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PORTION 1: TENDER

PART T1: TENDER PROCEDURES

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T1.1 TENDER NOTICE AND INVITATION TO TENDER

EED 38-2022/23
CITY OF TSHWANE

ENERGY AND ELECTRICITY DEPARTMENT



Tenderers should have a Construction Industry Development Board CIDB contractor grading designation of 6EP or higher

Tenders will be evaluated on the basis of awarding points for B-BBEE Status of Contributor for the Construction Charter Scorecard and quality of the tenderer. The 90/10 Preference Point System will be applied to the all tenders

TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD

A **COMPULSORY BRIEFING SESSION** with a representative of the Employer will take place in the **Princess park electricity depot, Cafeteria hall, 01 Nina Sita street, Pretoria on 28, November 2022 at 10H00**

The closing time for receipt of bids is **10H00 on, 15 December 2022.**

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data

The lowest or any bid will not necessarily be accepted, and the Municipality reserves the right to accept a bid as a whole or in part

Bids must remain valid for a period of 90 days after the closing date.

ENQUIRIES: Representative: Japhta Makgatha
Tel (Office): 012 358 4217
E-Mail: japhtama@Tshwane.gov.za

Johann Mettler
CITY MANAGER

NOTICE 08 OF 2022/23
11 November 2022

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in **Annexure C of Standard for Uniformity in Engineering and Construction Works Contracts (Board Notice 423 Government Gazette No 42622 of 8 August 2019)**,

The Standard Conditions of Tender makes several references to the Tender Data. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

CLAUSE NUMBER	TENDER DATA
C.1.1 Actions	The Employer is City Of Tshwane Metropolitan Municipality
C.1.2 Tender Documents	<p>Volume 1: <u>Tender Document</u></p> <p>THE TENDER</p> <p>Part T1: Tendering Procedures</p> <p>T1.1 Tender notice and invitation to tender</p> <p>T1.2 Tender data</p> <p>Part T2: Returnable documents</p> <p>T2.1 List of returnable documents</p> <p>T2.2 Returnable schedules</p> <p>THE CONTRACT</p> <p>Part C1: Agreements and contract data</p> <p>C1.1 Form of offer and acceptance</p> <p>C1.2 Contract data</p> <p>Part C 2 Pricing data</p> <p>Part C3: Scope of work</p> <p>C3 Scope of work</p> <p>ANNEXURES</p>
C.1.3 Interpretation	Add the following new clause:
C.1.3.4	<i>The tender documents have been drafted in English. The contract arising from the invitation to tender shall be interpreted and construed in English</i>
C.1.4 Communication and Employer's Agent	<p>Agent: Japhta Makgatha</p> <p>Tel (Office): 012 358 4217</p> <p>E-Mail: japhtama@tshwane.gov.za</p>
C.2.1 Eligibility	<p>Only those Tenderers who are registered with the CIDB or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a 6CE or higher of construction work, are eligible to submit.</p> <p>Joint ventures are eligible to submit tenders provided that:</p>

CLAUSE NUMBER	TENDER DATA
	<p>1. Every member of a joint venture is registered with the CIDB within 10 days from the closing date of tenders.</p> <p>2. The lead partner has a contractor grading designation in the 5EP Class of construction work; and</p> <p>3. The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor designation in accordance with the sum tendered for a 6EP class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations</p> <p>4. STAGES OF EVALUATION</p> <p>The bid will be evaluated as follows: Stage 1: Administrative Compliance Stage 2: Mandatory Requirements Stage 3: Functionality Criteria Stage 4: Preferential Point System</p> <p>Stage 1: Administrative Compliance</p> <p>All the proposals will be evaluated against the administrative responsiveness requirement as set out in the list of returnable documents</p> <p>Stage 2: Mandatory Requirements</p> <p>Bidders must submit the following documents with the tender document</p> <ul style="list-style-type: none"> i. Bidders must submit Compensation for Occupational Injuries and Diseases Act (COIDA) letter of good standing. Failure to submit COIDA letter of good standing shall disqualify the Bidder from further evaluation. ii. Bidders must submit proof of valid CIDB grading (6EP). Or higher <ul style="list-style-type: none"> ▪ The tenderer must have already obtained the minimum CIDB grade at the time of submitting the bid document. ▪ The tenderers CIDB registration must be valid at the time of submitting the bid document and also during the evaluation of the tender. ▪ Proof of CIDB registration and grading must be submitted as part of mandatory requirements. <p>Failure to submit proof of valid CIDB registration of 6EP or higher grading shall disqualify the Bidder from further evaluation.</p> <ul style="list-style-type: none"> iii. Bidders must submit a list of Safety, Health, Environment and Quality (SHEQ) legal appointments requirements. The SHEQ Plan must be in accordance with Occupational Health and Safety (OHS) regulations and must be in line with the safety specification and baseline risk assessment of this tender. Failure to submit the SHEQ Plan shall disqualify the bidder from further evaluation.

CLAUSE NUMBER	TENDER DATA
	<div data-bbox="603 376 1449 1249"> <ul style="list-style-type: none"> iv. Project Manager (National Diploma or higher: Electrical Engineering (with minimum 3 years). Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5 v. Test Technician (National N Diploma or higher: Electrical Engineering or Qualified Artisan with minimum 3 years experience) (NQF Level 6). Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5 vi. Installation and construction specialist (National N Diploma: Electrical with red seal certificate or higher qualifications with red seal certificate or Qualified artisan with minimum 5 years experience) with red seal certificate. Submit certified copies of qualification and CV. . Form R.D.D.4 and R.D.D.5 vii. Construction Health and Safety Officer (registered with South African Council for Projects and Construction Management Profession (SACPCMP). Submit certified copies of qualification, registration and CV. Form R.D.D.4 and R.D.D.5 viii. Environmental Officer (National Diploma /higher in Environmental management). Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5 ix. Service provider must have the following equipment: <ul style="list-style-type: none"> ▪ 1x Cherry picker ▪ 1x TLB ▪ 2X 8Ton or higher Crane Truck </div> <div data-bbox="491 1283 1449 1350"> <p>The service provider must complete RD.D.2 and attach Owner's Registration or Lease Agreements plus Lessor's Registration Documents for the above equipment.</p> </div> <div data-bbox="491 1384 810 1417"> <p>Stage 3: Functionality Criteria</p> </div> <div data-bbox="491 1451 1449 1518"> <p>Failure to comply with the mandatory requirements shall disqualify the tenderer from further evaluation.</p> </div> <div data-bbox="491 1597 762 1630"> <p>Functionality score card:</p> </div> <div data-bbox="491 1664 1449 1731"> <p>The following criteria and weights will be used and applied when bids are assessed for functionality:</p> </div>

CLAUSE NUMBER	TENDER DATA						
	Criteria No.	Criteria Description	Sub-Criteria	Scale	Weight	High Possible Score	
	1.	This criterion will assess the relevance of the bidder's experience and financial value (material and labor included) of previously completed projects over the last 5 years: Relevant experience of the company must be in the construction works of Medium Voltage (MV) and Low Voltage (LV) electrical network infrastructure and consumer connections. The bidder must provide evidence confirming successfully completed projects and the value thereof. Bidders must submit separate evidence for each of the previously completed projects. Where more than one project was completed, values of each project will be added. The following is required for the bidder to get points: <ul style="list-style-type: none">• A signed testimonials or reference letters or completion certificates from the contactable clients must be attached.• The submitted documentation must indicate the scope of work done, value in South African Rand Currency, duration of project and year completed. Failure to submit the required and acceptable supporting documents will result in zero score allocated.				Max 45 points. Points scored =	
		1.1.	Relevant projects with a total value not exceeding R10 000 000	Acceptable projects with value not exceeding R10 000 000 attached.	1		9
		1.2.	Relevant projects with a total value exceeding R10 000 000 but under R15 000 000	Acceptable projects with value exceeding R10 000 000 but under R15 000 000 attached	2		

CLAUSE NUMBER	TENDER DATA						
		1.3. Relevant projects with a total value exceeding R15 000 000 but under R20 000 000.	Acceptable projects with value exceeding R15 000 000 but under R20 000 000 attached	3			
		1.4. Relevant projects with a total value exceeding R 20 000 000	Acceptable projects with value exceeding R20 000 000 attached	5			
	2.	Experience of key staff working for the company: The staff must have relevant experience in electrical construction or new infrastructure installations. Certified copies of qualifications from the accredited institution for each category must be submitted. Key Staff as Indicated Below:					Max 40 Points scored =
			Years of Experience:				
		2.1. Project Manager (National Diploma or higher: Electrical Engineering (NQF Level 6, with minimum 3 years).	3 to 5 years	4	1	8	
			Above 5 years	8			
		2.2. Test Technician (National Diploma or higher: Electrical Engineering or Qualified Artisan with minimum 3 years + practical experience) (NQF Level 6).	3 to 5 years	4	1	8	
		Above 5 years	8				
	2.3. Installation and construction specialist (National Diploma: Electrical with red seal certificate or higher	5 to 7 years	4	1	8		
	Above 7 years	8					

CLAUSE NUMBER	TENDER DATA					
		qualifications with red seal certificate or Qualified artisan with minimum 5 years + practical experience) with red seal certificate.				
	2.4.	Construction Health and Safety Officer (registered with South African Council for Projects and Construction Management Profession (SACPCMP).	3 to 5 years	4	1	8
		Above 5 years	8			
	2.5.	Environmental Officer (National Diploma /higher in Environmental management).	3 to 5 years	4	1	8
			Above 5 years	8		
	3.	Local Economic Participation - Location of Business.				Max 15 Points scored =
		Municipal Rates & Taxes not older than three months or Valid Lease Agreement or Title Deed of the business must be submitted with the tender				
		4.1. Outside Gauteng	Acceptable evidence showing business address that is outside Gauteng province submitted.	1	3	15
		4.2. Within Gauteng	Acceptable evidence showing business address that is within Gauteng province submitted.	3		
4.3. Within City of Tshwane	Acceptable evidence showing business	5				

CLAUSE NUMBER		TENDER DATA					
			address that is within the City of Tshwane jurisdiction submitted.				
		HIGHEST POSSIBLE SCORE					100
	<p>(a) The CoT reserves the right to contact references submitted by the bidder.</p> <p>(b) Bids that do not achieve a minimum score of 75 points (out of 100) for functionality will not be evaluated further and will not be considered further.</p> <p>Stage 4: Preferential Points System</p> <p>Preferential points to be used will be the 90/20 points system in terms of the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000) Regulations 2017.</p> <ul style="list-style-type: none">90 points for price10 points for B-BBEE status (service provider to submit the certified copy of the B-BBEE level rating certificate). <p>• Please note should any of the nominated staff be replaced, the successfully appointed service provider will be required to ensure that such replacements must have equivalent criteria as above and this need to be approved by the City of Tshwane.</p>						
C.2.2	Cost of Tendering	The employer will not compensate the tenderer for any costs incurred in attending interviews or making any submissions in the office of the employer.					
C.2.7	Clarification meeting	<p>The arrangements for a <u>compulsory</u> clarification meeting are as stated in the tender notice and invitation to tender</p> <p>Confirmation of attendance will be recorded on site in the attendance register to be signed by all tenderers. Addenda will be issued to and tenders received from those tendering entities appearing on the attendance register.</p> <p>Tender documents will not be made available at the clarification meeting.</p>					
C.2.8	Seek clarification	<p><u>Replace</u> the clause with the following:</p> <p><i>Request clarification of the tender documents, if necessary, by notifying the employer at least 7 (seven) working days before the closing time stated in the tender data.</i></p>					
C.2.12	Alternative offers	<p><u>No</u> alternative tender offers will be considered.</p>					

CLAUSE NUMBER	TENDER DATA
C.2.13 Submitting a tender offer C.2.13.3	<p>Parts of each tender offer communicated on paper shall be submitted as an original tender Document and a scanned copy in USB</p> <p>Each tenderer is required to submit the <u>fully completed and signed</u> tender submission document, attached to the original tender submission documents, adequately identifiable as belonging to the tenderer.</p>
C.2.13.4	<p>Add the following to the clause</p> <p><i>Only authorised signatories may sign the original and all copies of the tender offer where required.</i></p> <p><i>In the case of a ONE-PERSON CONCERN submitting a tender, this shall be clearly stated.</i></p> <p><i>In the case of a COMPANY submitting a tender, include a copy of a <u>resolution by its board of directors</u> authorising a director or other official of the company to sign the documents on behalf of the company.</i></p> <p><i>In the case of a CLOSE CORPORATION submitting a tender, include a copy of a <u>resolution by its members</u> authorising a member or other official of the corporation to sign the documents on each member's behalf.</i></p> <p><i>In the case of a PARTNERSHIP submitting a tender, <u>all the partners</u> shall sign the documents, unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case <u>proof of such authorisation</u> shall be included in the Tender.</i></p> <p><i>In the case of a JOINT VENTURE/CONSORTIUM submitting a tender, include <u>a resolution of each company</u> of the joint venture together with a <u>resolution by its members</u> authorising a member of the joint venture to sign the documents on behalf of the joint venture.</i></p> <p><u>Accept that failure to submit proof of authorisation to sign the tender shall result in the tender offer being regarded as non-responsive.</u></p>
C.2.13.5	<p>The identification details are:</p> <p>Tender Reference: EED 38 2022/23</p> <p>Tender Description: TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD</p> <p>Closing Time: 10h00</p> <p>Closing Date: 15 December 2022</p>

CLAUSE NUMBER	TENDER DATA
	<p>Each tender shall be enclosed in a sealed envelope, bearing the correct identification details and shall be placed in the tender box located at:</p> <p>Tshwane House 320 Madiba Street Pretoria CBD 0001</p> <p>This address is 24 hours available for delivery of tender offers.</p>
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed offers will <u>not be</u> accepted.
C.2.15 Closing time	The closing time for submission of tender offers is stated in the tender notice and invitation to tender.
C.2.16 Tender offer validity	The tender offer validity period is 90 days .
C.2.16.5	<p><u>Add</u> the following new clause</p> <p><i>If the tender validity period expires on a Saturday, Sunday or public holiday, the tender offer shall remain valid and open for acceptance until closure of business on the following working day.</i></p>
C.2.18 Provide other material	The tenderer shall, when requested by the employer to do so, submit the names of all design, management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that such staff members satisfy the eligibility requirements.
C2.23 Certificates	Refer to part T2 of this procurement document for a list of the documents that are to be returned with the tender.
C2.24 Canvassing and obtaining of additional information by tenderers	<p><u>Add</u> the following new clause</p> <p><i>The Tenderer shall not make any attempt either directly or indirectly to canvass any of the Employer's officials or the Employer's agent in respect of his tender, after the opening of the tenders but prior to the Employer arriving at a decision thereon.</i></p> <p><i>The Tenderer shall not make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.</i></p>
C2.25 Prohibitions on awards to persons in service of the state	<p><u>Add</u> the following new clause</p> <p><i>The Employer is prohibited to award a tender to a person -</i></p> <ol style="list-style-type: none"> <i>who is in the service of the state; or</i> <i>if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or</i> <i>a person who is an advisor or consultant contracted with the municipality or municipal entity.</i> <p><i>In the service of the state means to be -</i></p> <ol style="list-style-type: none"> <i>a member of:-</i> <ul style="list-style-type: none"> <i>any municipal council;</i> <i>any provincial legislature; or</i> <i>the National Assembly or the National Council of Provinces;</i> <i>a member of the board of directors of any municipal entity;</i> <i>an official of any municipality or municipal entity;</i>

CLAUSE NUMBER	TENDER DATA
	<p>d) an employee of any national or provincial department;</p> <p>e) provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);</p> <p>f) a member of the accounting authority of any national or provincial public entity; or</p> <p>g) an employee of Parliament or a provincial legislature.</p> <p>In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.</p>
C2.26 Awards to close family members of persons in the service of the state	<p>Add the following new clause</p> <p>Accept that the notes to the Employer's annual financial statements must disclose particulars of any award of more than R2000 to a person who is a spouse, child or parent of a person in the service of the state (defined in clause F2.25), or has been in the service of the state in the previous twelve months, including -</p> <p>a) the name of that person;</p> <p>b) the capacity in which that person is in the service of the state; and</p> <p>c) the amount of the award.</p> <p>In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.</p>
C2.27 Vendor registration	<p>Add the following new clause</p> <p>The tenderer will be required registering as a supplier/ service provider on the City of Tshwane's vendor register before any payment can be done.</p> <p>If the tenderer is already registered as a vendor, it is required to record the vendor number in space provided on the cover page of this Tender document.</p> <p>Vendor registration documents are available from the Procurement Advice Centre or can be downloaded from:</p> <p>http://www.tshwane.gov.za/Business/Pages/Registration-of-Suppliers-(Vendors).aspx</p> <p>All parties of a joint venture or consortium submitting a tender shall comply with the requirements of this clause.</p>
C2.28 Tax	<p>Add the following new clause</p> <p>An original tax clearance certificate must be submitted with this tender document.</p> <p>In the case of a Joint Venture/Consortium the tax clearance certificate must be for the Joint Venture/Consortium and individual tax clearance certificates for the members of the Joint Venture/Consortium are not acceptable.</p>
C2.29 B-BBEE Status Level of Contributor	<p>Add the following new clause</p> <p>A valid B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) must be submitted with this tender document</p>

CLAUSE NUMBER	TENDER DATA
	<p><i>In the case of a Joint Venture/Consortium a valid B-BBEE Status Level of Contributor certificate must be submitted by each individual party to the Joint Venture/Consortium.</i></p> <p><i>Failure by the tenderer to comply with this clause will result in the tenderer scoring 0 points for preference.</i></p>
C.3.1 Respond to requests from the tenderer	
C.3.1.1	The employer will respond to requests for clarification up to 7 (seven) working days before the tender closing time.
C.3.4 Opening of tender submissions	<p>Tenders will be opened immediately after the closing time for tenders.</p> <p>Only the tenderer's name will be announced</p>
C3.11 Evaluation of tender offers	<i>All tenderers who submitted responsive tenders will be evaluated.</i>
C.3.13 Acceptance of Tender Offer	<p>Tender offers will only be accepted if:</p> <ul style="list-style-type: none"> a.) the tenderer complies with the eligibility criteria stated in clause F.2.1 b.) the tenderer is able to produce an original Tax Clearance Certificate issued by the South African Revenue Service; c.) the tenderer is not in arrears for more than 3 months with municipal rates and taxes and municipal service charges; d.) 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; e.) the tenderer has not: <ul style="list-style-type: none"> i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect. f.) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract; g.) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer;
C3.17 Copies of Contract	One signed copy of contract shall be provided by the Employer to the successful Tenderer. NOTE: BIDDERS ARE REQUIRED TO SUBMIT ELECTRONIC COPIES OF THE BID EITHER BY MEMORY STICK/USB FLASH DRIVE/CD/DVD TOGETHER WITH THE HARD COPY OF THE BID/PROPOSALS"

PART T2: RETURNABLE DOCUMENTS

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T2.1 LIST OF RETURNABLE DOCUMENTS

RD.A RETURNABLE DOCUMENTS FOR TENDER EVALUATION PURPOSES

Note: *Failure to submit the applicable documents will result in the tender offer being disqualified from further consideration*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Form of offer and acceptance	Section C1.1	
MBD 4: Declaration of interest in tender of persons in service of state	Form RD.A.1	
MBD 8: Declaration of tenderer's past supply chain management practices	Form RD.A.2	
MBD 2: Tax Clearance Certificate	Form RD.A.3	

RD.B RETURNABLE DOCUMENTS REQUIRED FOR PREFERENTIAL PROCUREMENT EVALUATION PURPOSES

Note: *Failure to submit the applicable documents will result in the tender offer being awarded 0 (zero) preference points*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Valid B-BBEE Status Level of Contributor Certificate		
MBD 6.1: Preference points claim form in terms of the Preferential Procurement Regulations, 2017	Form RD.B.1	

RD.C ADDITIONAL RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

Note: *Failure to submit the applicable document will result in the Tenderer having to submit same upon request within 7 days and if not complied with, will result to the tender offer being disqualified from further consideration [See also clause 2.18 of the Standard Conditions of Tender]*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
MBD 9: Certificate of independent tender determination	RD.C.1	

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Record of services provided to organs of state	RD.C.2	
Status of concern submitting tender	RD.C.3	
Classification of business	RD.C.4	
MBD 5: Declaration for procurement above R10 million (all applicable taxes included)	RD.C.5	
Certificate of authority of signatory	RD.C.6	
Certificate of authority of signatory for joint ventures and consortia	RD.C.7	
EPWP staff for labour intensive construction works	RD.C.9	
Proof of professional indemnity insurance	RD.C.10	

RD.D RETURNABLE DOCUMENTS REQUIRED FOR QUALITY EVALUATION PURPOSES

Note: *Failure to submit the applicable documents will result in the Tenderer receiving a 0 (zero) score for the applicable evaluation schedule.*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Evaluation Schedule: Tender's experience	RD.D.1	
Evaluation Schedule :Schedule of plant, equipment, machinery and personnel	RD.D.2	
Key Personnel	RD.D.4	
Curriculum vitae of key personnel	RD.D.5	

RD.E OTHER DOCUMENTS THAT WILL FORM PART OF THE CONTRACT

Note: *Failure to submit or fully complete the applicable documents will result in the tender offer being disqualified from further consideration*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Data provided by the contractor	Section C1.2	
Record of addenda to tender documents	RD.E.1	
Certificate confirming that bidder has CIDB grading 6EP or higher		
An organogram with all staff that will be assigned to the project		
Copies of Certified Qualifications of all staff to be assigned to the project		
Safety, health, Environmental management and Quality plan (SHEQ)		
3 years audited financial statements		

T2.2 RETURNABLE SCHEDULES

FORM RD.A.1 MBD 4: DECLARATION OF INTEREST IN TENDER OF PERSONS IN SERVICE OF STATE **MBD 4** **DECLARATION OF INTEREST**

1. No bid will be accepted from persons in the service of the state¹.
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, hareholder²)
 - 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, principle 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 directors trustees, managers, principle 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, principle 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:

.....

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

Full Name	Identity Number	State Employee Number

.....

Signature

.....

Date

.....

Capacity

.....

Name of Bidder

FORM RD.A.2 MBD 8: DECLARATION OF TENDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1. This Municipal Bidding Document (MBD) must form part of all tenders 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 tender of any tenderer may be rejected if that tenderer, or any of it's directors have:
 - a. abused the municipality's/municipal entity's supply 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, 2004 (Act 12 of 2004).
4. In order to give effect to the above, the following questionnaire must be completed and submitted with the tender:

Item	Question	Response	
4.1	Is the tenderer, any of it's directors listed on the National Treasurer's database as a company or persons prohibited from doing business with the public sector? (Companies for persons who are listed on this database were informed in writing of this restriction by the National Treasury after the audi alteram partem rule was applied)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
	If so, furnish particulars:		
4.2	Is the tenderer or any of it's directors listed on the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004)? (To access this register enter the National Treasury's website, www.treasury.gov.za , click on the icon "Register for Tender Defaulters" or submit your written request for a hard copy of the Register to facsimile number 012-326-5445)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
	If so, furnish particulars:		
4.3	Was the tenderer 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 <input type="checkbox"/>	NO <input type="checkbox"/>
	If so, furnish particulars:		

Item	Question	Response	
4.4	Does the tenderer 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 <input type="checkbox"/>	NO <input type="checkbox"/>
	If so, furnish particulars:		
4.5	Was any contract between the tenderer 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 <input type="checkbox"/>	NO <input type="checkbox"/>
	If so, furnish particulars:		

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

It is a condition of tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the tenderer's tax obligations.

1. In order to meet this requirement tenderers are required to complete in full the form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the tenderer with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
3. **The original Tax Clearance Certificate must be submitted together with the tender. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the tender. Certified copies of the Tax Clearance Certificate will not be acceptable.**
4. In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.
5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.
6. Applications for the Tax Clearance Certificates 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

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

This preference form must form part of all tenders 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, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017

1. GENERAL CONDITIONS

- 1.1 The following preference point systems are applicable to all tenders:
- The 80/20 system for requirements with a Rand value of up to R50 000 000.00 (**all applicable taxes included**); and
 - The 90/10 system for requirements with a Rand value above R50 000 000.00 (**all applicable taxes included**).

- 1.2 The value of this tender is estimated to *exceed* R50 000 000.00 and therefore the **90/10** system shall be applicable.

- 1.3 Preference points for this tender shall be awarded for:
- (a) Price; and
 - (b) B-BBEE Status Level of Contribution

- 1.3.1 The points for this tender are allocated as follows:

	POINTS
1.3.1.1 PRICE	90
1.3.1.2 B-BBEE STATUS LEVEL OF CONTRIBUTION	10
Total points for Price, B-BBEE must not exceed	100

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

- 1.5 Blank or incomplete particulars or insufficient documentary proof thereof, or failure to sign the declaration, will be construed to mean that the tenderer is not claiming preference points, in which case no points will be awarded for HDI.

2. DEFINITIONS

- 2.1 **all applicable taxes** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.
- 2.2 **B-BBEE** means broad-based black economic empowerment as defined in Section 1 of the Broad-Based Black Economic Empowerment Act.
- 2.3 **B-BBEE Status Level of Contributor** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of Section 9(1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).
- 2.4 **Broad-Based Black Economic Empowerment Act** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).

- 2.5 **comparative price** means the price after the factors of a non-firm price and all unconditional discounts that can be utilized have been taken into consideration.
- 2.6 **consortium or joint venture** means an association of persons for the purpose of combining their expertise, property, capital, efforts, skills and knowledge in an activity for the execution of a contract.
- 2.7 **contract** means the agreement that results from the acceptance of a tender by an organ of state.
- 2.8 **EME** means any enterprise with an annual total revenue of R5 million or less.
- 2.9 **firm price** means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs or excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract.
- 2.10 **functionality** means the measurement according to predetermined norms, as set out in the tender documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder.
- 2.11 **non-firm prices** means all prices other than **firm** prices.
- 2.12 **person** includes a juristic person.
- 2.13 **rand value** means that total estimated value of a contract in South African currency, calculated at the time of tender invitations and includes all applicable taxes and excise duties.
- 2.14 **sub-contract** means the primary contractor's assigning or leasing or 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.
- 2.15 **tender** 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, works or services works or goods, through price quotations, advertised competitive bidding processes or proposals.
- 2.16 **total revenue** bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act and promulgated in the Government Gazette on 9 February 2007.
- 2.17 **trust** means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person.
- 2.18 **trustee** means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM

- 3.1 The tenderer obtaining the highest number of total points will be awarded the contract.
- 3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.
- 3.3 Points scored will be rounded off to 2 (two) decimal places.
- 3.4 In the event that two or more tenders have scored equal total points, the successful tender must be the one scoring the highest number of preference points for B-BBEE.

3.5 However, when functionality is part of the evaluation process and two or more tenders have scored equal points including equal preference points for B-BBEE, the successful tender must be the one scoring the highest score for functionality.

3.6 Should two or more bids be equal in all respects, the award shall be decided by the drawing of lots.

4. POINTS AWARDED FOR PRICE

THE 80/20 OR 90/10 PREFERENCE POINT SYSTEM

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

80/20

90/20

$$P_S = 80 \left(1 - \frac{P_T - P_{MIN}}{P_{MIN}} \right)$$

$$P_S = 90 \left(1 - \frac{P_T - P_{MIN}}{P_{MIN}} \right)$$

Where

P_S = Points scored for price of tender under consideration

P_T = Rand value of tender under consideration

P_{MIN} = Rand value of lowest acceptable tender

5. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

5.1 In terms of Regulation 5 (2) and 6 (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	8	16
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5.2 Tenderers who qualify as EMEs in terms of the B-BBEE Act must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates.

- 5.3 Tenderers other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 5.4 A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.
- 5.5 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate tender.
- 5.6 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 5.7 A person will not be awarded points for B-BBEE status level if it is indicated in the tender documents that such a tenderer intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a tenderer qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 5.8 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

6. TENDER DECLARATION

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

7. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.3.1.2 AND 5.1

7.1 B-BBEE Status of Contribution: = (maximum of 10 or 20 points)

(Points claimed in respect of paragraph &.1 must be in accordance with the table reflected in paragraph 5.1 and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or an Accounting Officer as contemplated in the CCA.

8. SUB-CONTRACTING

8.1 Will any portion of the contract be sub-contracted?
(delete which is not applicable)

YES	NO
-----	----

8.1.1 If YES, indicate:

Name of subcontractor	% to be subcontracted	B-BBEE status level of sub-contractor	Is the sub-contractor an EME (delete which is not applicable)	
			YES	NO
			YES	NO
			YES	NO
			YES	NO

9. DECLARATION WITH REGARD TO COMPANY/FIRM

9.1 Name of FIRM: _____

9.2 VAT Registration number: _____

9.3 Company registration number: _____

9.4 Type of firm:

Partnership

One person business/sole trade

Close corporation

Company

(Pty) Limited

Small Medium Micro Enterprises

(Tick applicable box)

9.5 Describe principal business activities

9.6 Company classification

Manufacturer

Supplier

Professional service provider

Other service providers, e.g. transporter etc.

(Tick applicable box)

9.7 Municipal information

Municipality where business is situated: _____

Registered account number:

Stand number:

9.8 Total number of years the firm has been in business

9.9 I/we, the undersigned, who warrants that he/she is duly authorized to do so on behalf of the company/firm certify that points claimed, based on the B-BBEE status level of contribution, indicated in paragraph 7 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 claimed is 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 paragraph 7, 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 contribution has been claimed or obtained on a fraudulent basis or any 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 tender process;
 - b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct; and
 - 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) restrict the tenderer or contractor, its shareholders and directors, or only the shareholders and directors WHO acted on a fraudulent basis, 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 have been applied; and
 - e) forward the matter for criminal prosecution.

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at _____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1.

2.

FORM RD.C.1 MBD 9: CERTIFICATION OF INDEPENDENT TENDER DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all tenders¹ 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 tendering (or tender rigging)². Collusive tendering is a *per 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 tender of any tenderer if that tenderer 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 tendering process or the execution of the contract.
4. This MDB will serve as a certificate of declaration that would be used by institutions to ensure that, when tenders are considered, reasonable steps are taken to prevent any form of tender-rigging.
5. In order to give effect to the above, the attached Certificate of Tender Determination must be completed and submitted with the tender.

¹ Includes price quotations, advertised competitive tenders, limited tenders and proposals.

² Tender rigging (or collusive tendering) 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 tender process. Tender rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying tender:

EED 38-2022.23: TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD.

in response to the invitation for the tender made by

City of Tshwane Metropolitan Municipality

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

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

1. I have read and understand the contents of this certificate;
2. I understand that the accompanying tender will be disqualified if this certificate is found not to be true and complete in every aspect;
3. I am authorized by the tenderer to sign this certificate, and to submit the accompanying tender, on behalf of the tenderer;
4. Each person whose signature appears on the accompanying tender has been authorized by the tenderer to determine the terms of, and to sign, the tender, on behalf of the tenderer;
5. For the purposes of this Certificate and the accompanying tender, I understand that the word "competitor" shall include any individual or organization, other than the tenderer, whether or not affiliated with the tenderer who:
 - a. has been requested to submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - b. could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - c. provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer.
6. The tenderer has arrived at the accompanying tender independently form, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive tendering.
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 of services 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 tender;
 - e. The submission of a tender which does not meet the specifications and conditions of the tender; or
 - f. Tendering with the intention not to win the tender.

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.

8. In addition, there have been no consultations, communications, agreements or arrangement with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender invitation relates.
9. The terms of the accompanying tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or to 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 tenders and contracts, tenders 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.

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.2 RECORD OF SERVICES PROVIDED TO ORGANS OF STATE

Tenderers are required to complete this record in terms of the Supply Chain Management Regulations issued in terms of the Municipal Finance Management Act of 2003.

Include only those contracts where the tenderer identified in the signature block below was directly contracted by the employer. Tenderers must not include services provided in terms of a sub-contract agreement.

Where contracts were awarded in the name of a joint venture and the tenderer formed part of that joint venture, indicate in the column entitled "Title of contract for the service" that was in joint venture and provide the name of the joint venture that contracted with the employer. In the column for the value of the contract for the service, record the value of the portion of the contract performed (or to be performed) by the tender.

Complete the record or attach the required information in the prescribed tabulation

ALL SERVICES COMMENCED OR COMPLETED TO AN ORGAN OF STATE IN THE LAST FIVE YEARS				
	Organ of state, i.e. national or provincial department, public entity, municipality or municipal entity.	Title of contract for the service	Value of contract for service incl. VAT (Rand)	Date completed (State current if not yet completed)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				

(Attach additional pages if more space is required.)

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.3 STATUS OF CONCERN SUBMITTING TENDER

1. General

State whether the tenderer is a company, a closed corporation, a partnership, a sole practitioner, a joint venture/consortium or a co-operative

Public Company	<input type="checkbox"/>
Private Company	<input type="checkbox"/>
Closed Corporation	<input type="checkbox"/>
Partnership	<input type="checkbox"/>
Sole Proprietary	<input type="checkbox"/>
Joint Venture / Consortium	<input type="checkbox"/>
Co-operative	<input type="checkbox"/>

(Mark the appropriate option)

2. Information to be provided

If the Tendering Entity is a:		Documentation to be submitted with the tender
1	<u>Closed Corporation</u> , incorporated under the Close Corporation Act, 1984, Act 69 of 1984	CIPRO CK1 or CK2 (Certified copies of the founding statement) and list of members
2	<u>Private Company</u> incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 (Including Companies incorporated under Art 53 (b))	Certified copies of: a) CIPRO CM 1 - Certificate of Incorporation b) CIPRO CM 29 – Contents of Register of Directors, Auditors and Officers c) Shareholders Certificates of all Members of the Company, plus a signed statement of the Company's Auditor, certifying each Member's ownership/shareholding percentage relative to the total.
3	<u>Private Company</u> incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 in which any, or all, <u>shares are held by another</u> Closed Corporation or company with, or without, share capital.	Certified copies of documents referred to in 1 and/or 2 above in respect of all such Closed Corporations and/or Companies
4	<u>Public Company</u> incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 (Including Companies incorporated under Art 21)	A signed statement of the Company's Secretary confirming that the Company is a public Company.
5	<u>Sole Proprietary</u> or a <u>Partnership</u>	Certified copy of the Identity Document of: a) such Sole Proprietary, or b) Each of the Partners in the Partnership Certified copy of the Partnership agreement.
6	<u>Co-operative</u>	CIPRO CR2 - Certified copies of Company registration document.

If the Tendering Entity is a:		Documentation to be submitted with the tender
7	<u>Joint Venture / Consortium</u>	All the documents (as described above) as applicable to each partner in the joint venture / consortium as well as a certified copy of the joint venture / consortium agreement.

Note:

1. If the shares are held in trust provide a copy of the Deed of Trust (only the front page and pages listing the trustees and beneficiaries are required) as well as the Letter of Authority as issued by the Master of the Supreme Court wherein trustees have been duly appointed and authorised
2. Include a certified copy of the Certificate of Change of Name (CM9) if applicable.

3. Registered for VAT proposes in terms of the Value-Added Tax Act (89 of 1991)

Yes

☐

No

☐

(Make an X in the appropriate space)

REGISTRATION NO: _____

FORM RD.C.4 CLASSIFICATION OF BUSINESS

1. The Small Businesses are defined in the National Small Business Act, 1996 (Act 102 of 1996).

2. Information furnished with regard to the classification of Small businesses

(a.) Indicate whether the company/entity is defined as a small, medium or micro enterprise by the National Small Business Act.

YES	NO
-----	----

(Tick appropriate box)

(b.) If the response to 2.(a.) is **YES**, the following must be completed:

i. Sector/sub-sector in accordance with the Standard Industrial classification:

ii. Size or class:

iii. Total full-time equivalent of paid employees:

iv. Total annual turnover:

v. Total gross asset value (fixed property excluded):

(A schedule indicating the different sectors is attached to this form.)

(c.) The tenderer should substantiate the information provided by submitting the following documentation:

i. A letter from the tenderer's auditor or an affidavit from the South African Police Services confirming the correctness of the abovementioned information,

ii. Company profile indicating the tenderer's staff compliment, and

iii. 3 year financial statement or since their establishment if established during the past 3 years.

SCHEDULE OF SECTORS

SIZE OF CLASS	THE TOTAL FULL-TIME EQUIVALENT OF PAID EMPLOYEES	TOTAL TURNOVER	TOTAL GROSS ASSET VALUE (FIXED PROPERTY EXCLUDED)
AGRICULTURE			
Medium	100	R 5 mil	R 5 mil
Small	50	R 3 mil	R 3 mil
Very Small	10	R 500 000	R 500 000
Micro	5	R 200 000	R 100 000
MINING AND QUARRYING			
Medium	200	R 39 mil	R 23 mil
Small	50	R 10 mil	R 6 mil
Very Small	20	R 4 mil	R 2 mil
Micro	5	R 200 000	R 100 000
MANUFACTURING			
Medium	200	R 51 mil	R 19 mil
Small	50	R 13 mil	R 5 mil
Very Small	20	R 5 mil	R 2 mil
Micro	5	R 200 000	R 100 000
ELECTRICITY, GAS & WATER			
Medium	200	R 51 mil	R 19 mil
Small	50	R 13 mil	R 5 mil
Very Small	20	R 5.1 mil	R 1.9 mil
Micro	5	R 200 000	R 100 000
CONSTRUCTION			
Medium	200	R 26 mil	R 5 mil
Small	50	R 6 mil	R 1 mil
Very Small	20	R 3	R 500 000
Micro	5	R 200 000	R 100 000
RETAIL AND MOTOR TRADE & REPAIR SERVICES			
Medium	200	R 39 mil	R 6 mil
Small	50	R 19 mil	R 3 mil
Very Small	20	R 4 mil	R 600 000
Micro	5	R 200 000	R 100 000
WHOLESALE TRADE, COMMERCIAL AGENTS AND ALLIED SERVICES			
Medium	200	R 64 mil	R 10 mil
Small	50	R 32 mil	R 5 mil
Very Small	20	R 6 mil	R 600 000
Micro	5	R 200 000	R 100 000
CATERING, ACCOMMODATION AND OTHER TRADE			
Medium	200	R 13 mil	R 3 mil
Small	50	R 6 mil	R 1 mil
Very Small	20	R 5.1 mil	R 1.9 mil
Micro	5	R 200 000	R 100 000
TRANSPORT, STORAGE & COMMUNICATIONS			
Medium	200	R 26 mil	R 6 mil
Small	50	R 13 mil	R 3 mil
Very Small	20	R 3 mil	R 600 000
Micro	5	R 200 000	R 100 000
FINANCE & BUSINESS SERVICES			
Medium	200	R 26 mil	R 5 mil
Small	50	R 13 mil	R 3 mil
Very Small	20	R 3 mil	R 500 000
Micro	5	R 200 000	R 100 000
COMMUNITY, SOCIAL AND PERSONAL SERVICES			
Medium	200	R 13 mil	R 6 mil
Small	50	R 6 mil	R 3 mil
Very Small	20	R 1mil	R 600 000
Micro	5	R 200 000	R 100 000

1. The tenderer is required by law to prepare annual financial statements for auditing their audited annual financial statements:

- i) for the past three years; or
ii) Since the establishment if established during the past three years.

Indicate whether these have been included in the tender:

YES	NO
-----	----

2. Does the tenderer have any undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days?

YES	NO
-----	----

If so, state particulars

3. Has any contracts been awarded to the tenderer by an organ of state during the past five years?

YES	NO
-----	----

If so, state particulars

4. Has there been any material non-compliance or dispute concerning the execution of such contract?

YES	NO
-----	----

If so, state particulars

5. Is any portion of the goods or services expected to be sourced from outside the Republic?

YES	NO
-----	----

If, so state what portion and whether any portion of payment from the municipality is expected to be transferred outside of the Republic.

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

FORM RD.C.6 CERTIFICATE OF AUTHORITY OF SIGNATORY**RESOLUTION** of the 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 Tshwane Metro Municipality in respect of the following project:

Tender Number:	EED 38 -2022/23
Tender Description:	TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD.

2. *Mr/Ms:

in *his/her capacity as

and who will sign as follow:

Proof signature	Proof signature
-----------------	-----------------

be, and is hereby authorized to sign the tender, and any and all other documents and/or correspondence in connection with and relating to the tender for the enterprise mentioned above

NAME	CAPACITY	SIGNATURE

Note:	Enterprise stamp
1. *Delete which is not applicable. 2. IMPORTANT: This resolution <u>must</u> be signed by all 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.	

FORM RD.C.7 CERTIFICATE OF AUTHORITY OF SIGNATORY FOR JOINT VENTURES AND CONSORTIA

*Joint venture/consortium name: _____

We, the undersigned, are submitting this tender in a *joint venture/consortium and hereby authorize *Mr/Ms

_____ authorized signatory of the enterprise

_____ acting in the capacity of lead partner

to sign the tender, and any and all other documents and/or correspondence in connection with and relating to the tender for the *joint venture/consortium mentioned above.

Registered name of enterprise	Registration number	% of contract value	Address	Duly authorized signatory	Mark with (x) for lead partner

Note:

1. *Delete which is not applicable.
2. IMPORTANT: This resolution must be signed by all the parties of the joint venture/consortium and every duly authorized signatory for each party to the joint venture/consortium must complete a Form RD.C.15.
3. Should the number of directors/members/partners exceed the space available above, additional names and signatures must be supplied on a separate page.

FORM RD.C.9 STAFF FOR LABOUR INTENSIVE CONSTRUCTION WORKS

The tenderer shall, submit the names of all management, design and supervisory staff that will be employed to design and supervise the labour intensive portion of the works together with satisfactory documentary evidence that such staff members satisfy the eligibility requirements.

CATEGORY OF EMPLOYEE	NAME OF EMPLOYEE	NQF LEVEL	LABOUR INTENSIVE SKILLS PROGRAM UNIT STANDARD TITLES	DATE COMPLETED	YEARS EXPERIENCE
Designer					
<i>NQF 7 Unit Standard Required: Develop and Promote Labour Intensive Construction Strategies</i>					
Administrator/ Site supervisor					
<i>NQF 5 Unit Standard Required: Manage Labour Intensive Construction Projects</i>					

(Attach documentary proof to this page)

FORM RD.C.10 PROOF OF PROFESSIONAL INDEMNITY INSURANCE

The tenderer must provide proof of Professional Indemnity Insurance for at least R10-million per claim and the number of claims unlimited (refer to clause C1.2.2 Data Provided by the Employer).

1. Attach original or certified copy of Professional Indemnity Insurance to this page.
2. In the case of a joint venture / consortium parties must each attach original or certified copy of their Professional Indemnity Insurance.

TERMS OF REFERENCE FOR QUALITY EVALUATION

The quality evaluation for this tender will be based on the following project.

EED 38-2022.23 - TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD.

1. PROJECT SCOPE

The scope of works of the tender to appoint various contractors to provide construction works on low voltage (lv) and medium voltage (mv) electrical network infrastructure and consumer connections on as and when required basis, for a three year period. Specifications and bill of quantities

2. MANDATORY REQUIREMENTS

- Bidders must submit Certificate confirming that bidder has CIDB grading **6EP** or Higher
- An organogram with all staff that will be assigned to the project
- Bidders must submit the copies of Certified Qualifications of all staff to be assigned to the project
- Safety, health, Environmental management and Quality plan (SHEQ)
- 3 years audited financial statements
- Compensation for Occupational Injuries and Diseases Act (COIDA) letter of good standing
- RD.D.1 (Proof of relevant experience)
- RD.D.2 (Schedule of plant, equipment, machinery and personnel)

Failure to submit the above documents will lead to disqualification. The bidder will not be evaluated further

3. COMPULSORY BRIEFING SESSION

A compulsory briefing session will be required.

Failure to attend the session will lead to disqualification.

4. SCORING FORMULA FOR PRICING AND BBBEE

The preferential points to be used will be the 90/10 points system.

- 90 points for price
- 10 points for B-BBEE status (service provider to submit the certified copy of the B-BBEE level rating certificate).

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

RD.D.1: SCHEDULE OF TENDERER'S PREVIOUS SIMILAR EXPERIENCE**(The previous experience must be relevant to the technical specification.)**

EMPLOYER, CONTACT PERSON AND TELEPHONE NUMBER	DESCRIPTION OF CONTRACT	DATE STARTED	DATE COMPLETED	TOTAL CONTRACT AMOUNT
1 _____ (company or Client) _____ (contact person) _____ (telephone)				
2 _____ (company or Client) _____ (contact person) _____ (telephone)				
3 _____ (company or Client) _____ (contact person) _____ (telephone)				
4 _____ (company or Client)				

(contact person) _____ (telephone)				
5 _____ (company or Client) _____ (contact person) _____ (telephone)				
6 _____ (company or Client) _____ (contact person) _____ (telephone)				
7 _____ (company or Client) _____ (contact person) _____ (telephone)				

RD.D.2 SCHEDULE OF PLANT, EQUIPMENT, MACHINERY AND PERSONELL

The following are lists of major items of relevant resources that may be required from time to time during the execution of this contract. The tenderer must fill in the details in Schedule B. The tender further declares that all equipment/resources as furnished will be made available for this contract. The tenderer must demonstrate a tentative agreement/ quotation/similar which may be subject to this contract being awarded for items that will be hired. The CoT shall reserve a right to inspect the premises of the contractor to verify the furnished information.

Schedule A: CoT's specific minimum requirements

Schedule B: Tenderer's offer and guarantees. Must be filled in by tenderer/contractor

Failure to complete this form in full will result in the tenderer being disqualified.

Failure to meet the minimum requirements shall disqualify the tender.

Item	Description	Document proof to be submitted with the tender	Schedule A (CoT minimum requirements)	Schedule B (Tenderer's offer and guarantees)		
				Owned by Contractor	To be leased by the Contractor	Total
1	Cherry Pickers	Certified Copies of vehicle registration and or agreement to lease	Min 1			
2	TLB	Certified Copies of vehicle registration and or agreement to lease	Min 1			
3	8 Tonne or higher crane Truck	Certified Copies of vehicle registration and or agreement to lease	Min 2			

NB: Where the tenderer does not meet the minimum requirements RD.D.2, the tenderer will be disqualified

FORM RD.D.4 KEY PERSONNEL

The tenderer shall list in the table below the key personnel to be engaged for this project.

Note: Form RD.D.5 must be complete for each person listed below.

	PROPOSED POSITION	NAME	YEARS OF EXPERIENCE
1	Project Manager		
2	Test Technician		
3	Installation and construction specialist		
4	Occupational Health and Safety Officer		
5	Environmental Officer		

(Attach additional pages if more space is required)

FORM RD.D.5 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RD.D.4

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service:	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. <div style="display: flex; justify-content: space-between;"> <div>_____</div> <div>_____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(Signature of person named in schedule)</div> <div>Date:</div> </div>	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Part T2: Tender Procedures

Signature: _____
Date: _____

FORM RD.D.5 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RD.D.4

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service:	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. <div style="display: flex; justify-content: space-between;"> <div>_____</div> <div>_____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(Signature of person named in schedule)</div> <div>Date:</div> </div>	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.D.5 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RD.D.4

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service:	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. <div style="display: flex; justify-content: space-between;"> <div>_____</div> <div>_____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(Signature of person named in schedule)</div> <div>Date:</div> </div>	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.D.5 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RD.D.4

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service:	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. <div style="display: flex; justify-content: space-between;"> <div>_____</div> <div>_____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(Signature of person named in schedule)</div> <div>Date:</div> </div>	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.D.5 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RD.D.4

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service:	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. <div style="display: flex; justify-content: space-between;"> <div>_____</div> <div>_____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(Signature of person named in schedule)</div> <div>Date:</div> </div>	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.E.1 RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Employer before submission of this tender, amending or amplifying the tender documents, have been taken in account in this tender offer:

	DATE	REFERENCE	TITLE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

PORTION 2: CONTRACT

PART C1: AGREEMENTS AND CONTRACT DATA

TABLE OF CONTENTS

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C1.1 FORM OF OFFER AND ACCEPTANCE

STAMP

OFFER

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

EED 38-2022/23: TENDER TO APPOINT VARIOUS CONTRACTORS TO PROVIDE CONSTRUCTION WORK ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS ON AS AND WHEN REQUIRED BASIS, FOR A THREE YEAR PERIOD

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

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

Acceptance of this offer will not guarantee that the tenderer will be invited to submit a price for any task order or be allocated any task order during the duration of the appointment. Invitation and allocation of task orders will be done solely at the discretion of the employer.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX FOR THE 3 YEARS

R.....(in figures).....

.....

.....(in words)

FOR AND ON BEHALF OF THE TENDERER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at _____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1. _____
2. _____

ACCEPTANCE

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

The terms of the contract, are contained in:

Part C1 Agreements and Contract Data

Part C3 Scope of Work

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C3 above.

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

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

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

FOR AND ON BEHALF OF THE EMPLOYER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at

_____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1. _____

2. _____

SCHEDULE OF DEVIATIONS

Notes:

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

4.1	Subject:	
	Details:	
4.2	Subject:	
	Details:	
4.3	Subject:	
	Details:	
4.4	Subject:	
	Details:	
4.5	Subject:	
	Details:	

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from the amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

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

FOR AND ON BEHALF OF THE TENDERER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at

_____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1.

2.

FOR AND ON BEHALF OF THE EMPLOYER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at

_____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1.

2.

C1.2 CONTRACT DATA

C1.2.1 GENERAL CONDITIONS OF CONTRACT

The general conditions of contract applicable to this contract shall be **NEC3 Engineering and Construction Contract, 2013** as well as the Data provided by Employer.

Tenderers, contractors and subcontractors shall obtain their own copies of the document **NEC3 Engineering and Construction Contract, 2013** for tendering purposes and for use for the duration of the contract and shall bear all expenses in this regard.

Note: The copy of the NEC3 Engineering and Construction Contract, 2015 and all the conditions of this contract shall be regarded as the Service Level Agreement (SLA) between the appointed service provider and City of Tshwane.

Engineering Contracting Strategies (ECS)
Telephone: 011 803 3008
E-Mail: admin@ecs.co.za
Web: www.ecs.co.za

OR

Consulting Engineers South Africa (CESA)
Telephone: 011 463 2022
E-Mail: general@cesa.co.za
Web: www.cesa.co.za

OR

South African Institution of Civil Engineering (SAICE)
Telephone: 011 80505947 / 48 / 53
E-Mail: civilinfo@saice.org.za
Web: www.saice.org.za

C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for Main Option	B: Priced contract with schedule of rates
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X1: Price adjustment for inflation

Clause	Statement	Data
		X2: Changes in the law
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		Z: <i>Additional conditions of contract</i>
	of the NEC3 Engineering and Construction Contract (June 2005) ¹	
10.1	The <i>Employer</i> is (Name):	City of Tshwane P.O Box 423 Pretoria 0001 Represented by: Group Head Energy and Electricity Department
	Address	4th Floor Middestad building 252 Thabo Sehume street Tshwane
	Tel No.	012 358 4217
	Fax No.	012 358 0790
10.1	The <i>Project Manager</i> is:	Director / Deputy Director of Energy and Electricity Department

¹ Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009

Clause	Statement	Data
	Address	4th Floor Middestad building 252 Thabo Sehume street Tshwane
	Tel	012 358 4217
	Fax	012 358 4134
10.1	The <i>Supervisor</i> is: (Name)	A person to be appointed by the <i>Employer</i>. Municipal inspectors from the Tshwane Energy and Electricity Division will assist the <i>Supervisor</i> as may be necessary.
	Address	Of person appointed as supervisor for the specific project.
	Tel No.	N/A
	Fax No.	N/A
	e-mail	N/A
11.2(13)	The <i>works</i> are	The <i>works</i> are the construction of Low Voltage (LV) and Medium Voltage (MV) electrical network infrastructure and consumer connections in the CoT areas of jurisdiction as and when required.
11.2(14)	The following matters will be included in the Risk Register	As prescribed per specific project/work.
11.2(15)	The <i>boundaries of the site</i> are	Boundaries of the specific CoT depot Jurisdiction area.
11.2(19)	The Works Information is in	The Scope of Work in Part C3 of the Document
12.2	The <i>law of the contract</i> is the law of	The Republic of South Africa subject to the jurisdiction of the Courts of South Africa.
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period for reply</i> is	The period of reply, if not stated in the letter of appointment, shall be 14 days.

Clause	Statement	Data
2	The Contractor's main responsibilities	The <i>Contractor's</i> liability, for Defects due to his design that are not listed on the Defects Certificate, is unlimited.
3	Time	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> and sections.	The completion date for the whole of the works is 36 months subject to specific projects requirements, whichever is shorter. During this period the construction projects will be allocated to the contractor. The completion period for the specific project shall be specified by the deputy director.
30.1	The <i>access date</i> is	Date of appointment as per the letter of acceptance and / or official purchase order.
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	When required to do so per specific project and the deadline for submission is no longer than <i>period of reply</i>.
31.2	The <i>starting date</i> is.	Date of appointment as per the letter of acceptance and / or official purchase order
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	4 weeks.
35.1	The <i>Employer</i> is willing to take over each project allocated on completion.	
4	Testing and Defects	
42.2	The <i>defects date</i> is	Twelve (12) Months after the Completion date of the whole construction <i>works per specific purchase order</i>.
43.2	The <i>defect correction period</i> is	<u>Two (2) weeks</u>, unless stated otherwise in the appointment letter or official purchase order.

Clause	Statement	Data
5	Payment	
50.1	The <i>assessment interval</i> is	Minimum 2 weeks (for project schedule of a period of a month and more) or at the completion of each project.
51.1	The <i>currency of this contract</i> is the	South African Rand (R)
51.2	The period within which payment is made is	30 days from date of invoice, subject to the payment process and policy of the CoT Finance Department.
51.4	The <i>interest rate</i> is	Prime Bank Rate
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are:	the cumulative rainfall (mm)

Clause	Statement	Data
		the number of days with rainfall more than 10 mm & date
		the number of days with minimum air temperature less than 0 degrees Celsius
		the number of days with snow lying at 08:00 hours South African Time
		and these measurements:
	The place where weather is to be recorded (on the Site) is:	Site Office or point of supply for the specific site (mini-sub or transformer installation point)
	The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:	De Wildt
	and which are available from:	Weather SA
7	Title	No data is required for this section of the <i>conditions of contract</i>.
8	Risks and insurance	
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the <i>works</i> , Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract for any one event is	R10 million.
	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	As set out in COIDA (WCA) as well as a group life insurance for at least three times the employee's total annual earnings.

Clause	Statement	Data
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	
	1 Insurance against:	Loss of or damage to the <i>works</i> , Plant and Materials.
	Cover / indemnity:	R10 million.
	The deductibles are:	According to the Declaration Form from Insurance and Risk Management of CoT.
	2 Insurance against:	Liability for loss of or damage to property (except the <i>works</i> , Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract.
	Cover / indemnity	R10 million.
	The deductibles are	According to the Declaration Form from Insurance and Risk Management of CoT
9	Termination	There is no Contract Data required for this section of the <i>conditions of contract</i> .
10	Data for main Option clause	
A	Priced contract with bill of quantities	
60.6	<i>The method of measurement is</i>	As indicated in the schedule of rates/quantities.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is (Name)	In the event that a first dispute is referred to adjudication, the referring Party at the same time applies to the South African Institution of Electrical Engineering or any other relevant representative body to appoint an <i>Adjudicator</i> . All disputes are handled without transgressing stipulations from the MFMA and other relevant legislation for Local Government.
	Address	
	Tel No.	
	Fax No.	
	e-mail	

Clause	Statement	Data
W1.2(3)	The <i>Adjudicator nominating body</i> is:	
	If no <i>Adjudicator nominating body</i> is entered, it is	The South African Institution of Electrical Engineering or any other relevant representative body.
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules of the Association of Arbitrators
	The place where arbitration is to be held	Pretoria
	The person or organisation who will choose an arbitrator <ul style="list-style-type: none"> - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is 	Arbitrator to be mutually agreed by the Parties The Association of Arbitrators
12	Data for secondary Option clauses	
X1	Price adjustment for inflation	
X1.1(a)	Tenderers are required to register with SEIFSA (Steel and Engineering Industries Federation of South Africa) and obtain periodic SEIFSA rates for various categories applicable to this contract. Contractors and Subcontractors shall obtain their own copies (at their own cost) of the SEIFSA rates documents for contract management purposes and for use for the duration of the Contract. City of Tshwane or its representative may request such rates at any time during the contract and	
	Prices/Rates tendered shall remain fixed for the every 12 months of the contract. The first 12 months is the rates as they are tendered while the second and third 12 months are calculated using SEIFSA index stated below.	
	Thereafter the proportions used to calculate the Price Adjustment Factor are:	
X1.1(c)	For Material price calculation:	
	1.00 linked to the index in	Table C-3(a) of the SEIFSA Index
	0.00	Table O of the SEIFSA Index
	0.00	Table L-1 of the SEIFSA Index
X1.1(c)	For Unit Rates and hourly tariff calculation;	

Clause	Statement	Data
	0.70 linked to the index in	Table C-3(a) [field force] of the SEIFSA Index
	0.20 linked to the index in	Table P of the SEIFSA Index (Plant and Machinery before installation)
	0.10	Table L-1 (freight cost) of the SEIFSA Index
	The indices are those prepared by Steel and Engineering Industries Federation of South Africa (SEIFSA)	
X2	Changes in the law	No data is required for this Option
X7	Delay damages	
X7.1	Delay damages for Completion of the <i>works</i> are	<p>Projects with planned execution period shorter or equal to one month and not capital projects: R500.00 per day.</p> <p>Projects with planned execution period between one and three months and not capital projects: R1000.00 per day.</p> <p>Capital projects and any other projects with planned execution longer than three months: R2500.00 per day.</p> <p>The reimbursement to the employer is in a form of credit note against the invoice of the specific project.</p>
X13	Performance bond	
X13.1	The amount of the performance bond is	Retention (See also clause Z3)
X16	Retention	
X16.1	The <i>retention free amount</i> is	R0.00.
	The <i>retention percentage</i> is	<p>10%.</p> <p>Claimable at the expiry of defects certificate per specific project</p>
Z	<i>Additional conditions of contract</i>	

Clause	Statement	Data
	The <i>additional conditions of contract</i> are:	
Z1	Compensation Events	The provisions of 60.1(5) do not apply to this contract.
Z2	Insurance policies	Replace Clause 85.2 with the following: “Insurance policies arranged by the Contractor/Sub-contractor to include a waiver by the Insurers of their subrogation rights against the Employer except where there is fraud.”
Z3	X13 Performance Bond (Secondary option X13)	Add: <p>X13.2</p> <p>Should the contractor not comply with the terms and conditions of this contract and/or appointment under this contract, he shall be warned in writing by the employer or the representative of his failure to perform. As a result of three warning letters being provided under the same contract, the employer shall have the sole right to take one or more of the steps against the contractor:</p> <ol style="list-style-type: none"> Terminate the contract between the contractor and the employer for the remainder of the contract period. Suspend the contractor for the remaining period of the contract. The contractor shall qualify to bid for the same contract with the same scope of works but only after the contract for which he was suspended has expired. If the performance bond clause is applied, the retention amount for the specific project for which the clause is applied or the total retention amount already withheld by CoT for other projects, whichever is higher, shall be forfeited.

Clause	Statement	Data
		ALL decisions made shall be recommended and implemented by the Project Manager. The Group Head: Utility Services shall approve such recommendation prior to implementation. The recommendation(s) will be processed through Supply Chain Management (SCM) process.
Z4	91 Reasons for Termination	<p><i>Add the following to clause 91.2:</i></p> <ul style="list-style-type: none"> • The contractor may not refuse any work allocated to them other than for the following reasons: <ul style="list-style-type: none"> a. The works are not according to the works information and there is no rate tendered for in the Pricing Data or the new rate (provided by CoT) is not market related, b. The contractor does not have capacity to provide the works using the new scope which is not part of the contract. • If the contractor refuses work for any other reason, such refusal is noted and can be used as a reason for non-performance and ultimately termination of this contract.”
Add		

FOR AND ON BEHALF OF THE **CONTRACTOR**:

NAME(s): (BLOCK LETTERS)

CAPACITY of authorized agents:

SIGNATURE(s) of authorized agents:

SIGNED at on this day of

WITNESSES: (Full name – in block letters – and signature)
.....

1.

PART C2: PRICING DATA

CONTENTS

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C2.1 PRICING INSTRUCTIONS

a. Preamble

i. This preamble to the Schedule of Rates provides the tenderer with guidelines and requirements with regard to the completion of the Schedule of Rates. **The Schedule must be completed in black ink** and the tenderer is referred to the Tender Data regarding the correction of errors.

ii. The Schedule of Rates shall be read with all the documents which form part of this Contract.

iii. The following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work in terms of the Conditions of Contract and Special Conditions of Contract, the Specifications, and the Project Specifications.

Quantity: The number of units of work for each item.

Rate: The payment per unit of work at which the tenderer tenders to do the work.

Amount: The product of the quantity and the rate tendered for an item.

Schedule of Rates: Schedule of quantities

iv The quantities set out in the schedule of rates are approximate quantities. The quantities of work accepted and certified for payment, and not the quantities given in the schedule of quantities, will be used to determine payments to the contractor. The validity of the contract shall in no way be affected by differences between the quantities in the schedule of quantities and the quantities certified for payment. Work will be valued at the rates tendered, subject only to the provisions of the general conditions of contract and this preamble.

v The tendered rates shall include full compensation for overheads, profits, incidentals, duties, levies, taxes (except VAT), and for the completed items of work as specified. Full compensation for completing and maintaining (during maintenance period) the work shown on the drawings and specified in the standard specifications and project specifications, and for the risks, obligations and responsibilities specified in the general conditions of contract, special conditions of contract, standard specifications and project specifications, shall be deemed collectively provided for in the payment items in the schedule of rates, except that the quantities in the schedule of rates are approximate quantities only.

vi Reference shall be made to the Conditions of Contract and Special Conditions of Contract regarding Provisional and Prime Cost Sums.

- **Tenders are required to quote for ALL the items in the schedule of rates from section 1 to 13 for construction failure to follow this instruction will result in disqualification.**

b. Pay Items

iv. The abbreviated descriptions of the payment items given in the Schedule of Rates are only for the purposes of identifying the items and providing specific details. Reference shall be made, inter alia, to the Drawings, Specifications, Particular Specifications, Project Specifications, Conditions of Contract and Special Conditions of Contract for more detailed information regarding the extent of the work entailed under each item.

- ii. The amount of work or the quantities of materials stated in the schedule of rates shall not restrict or extend the amount of work to be done or the quantities of materials to be supplied by the contractor.

The quantities of materials or the amount of work listed in the schedule of rates shall not be regarded as authorization for the contractor to order materials or to execute work. The contractor shall obtain the employer's detailed instructions (purchase order) for all work before ordering any materials or executing work or making arrangements. [See *Material Rates for conditions of supply of materials*].

- iii. The item numbers appearing in the Schedule of Rates refer to the corresponding item numbers in the Particular Specifications and in the Project Specifications.
- iv. The units of measurement indicated in the Schedule of Rates are metric units and other as described in the schedule. The following abbreviations may be used in the pay items of the Schedule of Rates:

mm	=	millimetre
m ³	=	cubic metre
%	=	percent
V	=	volt
l	=	litre
W	=	watt
kl	=	kilolitre
kW	=	kilowatt
h	=	hour
u/mth	=	unit per month
P C sum	=	prime cost sum
prov sum	=	provisional sum
m	=	metre
kg	=	kilogram
km	=	kilometre
t	=	ton (1 000 kg)
No	=	number
m ²	=	square metre
MN	=	meganewton
Nm	=	meganewton-metre
ha	=	hectare
kPa	=	kilopascal

c. Rates (general)

v. The tenderer must fill in a rate for each item where provision is made for it, even where no quantities are given. Items against which a word or phrase such as "included" or "provided elsewhere" have been entered, will be accepted as a rate, percentage or rate of nil (R0,00) having been entered against such items.

Any work executed to which such a pay item applies, shall be measured under the appropriate item in the Schedule of Rates and valued at a rate or percentage of nil (R0,00). The rates of nil shall be valid irrespective of any change in the quantities during the execution of the Contract.

Item(s) against which no rate or phrase such as "included" or "provided elsewhere" is entered will be regarded as non-responsive and will lead to the whole tender being disqualified.

vi. The tenderer shall fill in a rate against all items where the words "rate only" appear in the amount column. The intention is that, although no work is foreseen under such item and no quantities are consequently given in the quantity column (if any), the tendered rate shall apply should work under this item be actually required.

The tendered rates shall be valid irrespective of any change in the quantities during execution of the contract.

Estimated quantities provided are for evaluation purposes only(indicative) and not the actual contract quantities.

This is a rate only tender.

vii. The tenderer shall not group together a number of items and tender one rate for such group of items.

viii. All rates and sums of money quoted in the Schedule of Rates shall be in South African Rands (ZAR).

ix. A tender may be rejected if the unit rates or percentage for some of the items in the schedule of rates are unreasonable or out of proportion in the opinion of the employer.

x. Subject to the conditions stated in *paragraph ix*, the rates filled in by the tenderer in the schedule of rates shall be final and binding. Should there be discrepancies between the tender sum and the correctly extended and totaled schedule of Rates, the correction method as stated in the tender data shall be applied. In such an event the contractor may be consulted where-after failing agreement to the adjusted rate(s) by the tenderer, the decision of the employer will be final and binding otherwise the tender as a whole shall be disqualified. In their own interests tenderers should make sure of the correctness of their tendered rates, the extensions and the tender sum.

d. Method of Measurement

i. The work shall be measured in accordance with the methods described in the documents which form part of this Contract. Attention is directed to the provisions of the Specifications, Particular Specification and Project Specifications regarding the measurement of quantities.

ii. Unless otherwise stated, items are measured in accordance with the Drawings, Specifications, Particular Specification, and Project Specifications and no allowance is made for waste or work in excess of that specified.

e. Rates

1. The tenderer must take into consideration that there are no guarantees that there will be work for them

Part C2.2: Pricing Data

-
- during the contract period as well as that all rates must be treated independently and at a quantity of **ONE (1)**, unless indicated otherwise in the schedule.
2. The site is the site indicated when the project is allocated (through the purchase order) and it shall be the site in the jurisdiction of City of Tshwane. That also includes Eskom licensed areas within such boundaries and which are serviced by CoT.
 - 2.1. The tenderer shall tender for *Normal Hours*. No overtime, Saturday, Sunday and Public Holidays rates shall be paid for construction work, e.g. Capital Projects.
 - 2.2. Shift allowance or compensation shall not apply to this contract except to the employees of the contractor for which the contractor shall be fully liable.
 3. Unit rates supplied in this tender shall include, unless stated otherwise in this document, all items listed below:
 - 3.1. all labour costs,
 - 3.2. all administrative expenses,
 - 3.3. Setting out of Works
 - 3.4. Transportation (fixed cost, running cost and driver cost) of employees, material and/or any other item required to be transported (within a specific depot area) to execute the contract to and from site where work is executed and supervision fees.
 - 3.5. tools, equipment and auxiliary equipment,
 - 3.6. safety equipment (*see OHS of the schedule of rates*),
 - 3.7. all notifications to consumers when a power failure is going to occur
 - 3.8. to the execution of tasks,
 - 3.9. Testing and Commissioning of complete installation
 - 3.10. all tariffs, levies, taxes payable by the bid,
 - 3.11. all expenses to restore the workplace/site to its original condition (where changing the site was not part of the works),
 - 3.12. all equipment needed to conform with the Regulations of the Occupational Health and Safety Act and the by-laws of the CoT.
 - 3.13. payments in terms of Royalties and Patent Rights (if the need arise).
 - 3.14. Compliance to OHS Act and Construction Regulations, 2003.
 4. The hourly rate shall include the following:
 - 4.1. all administrative expenses
 - 4.2. safety equipment
 - 4.3. all tariffs, taxes and levies payable by the bid,
 - 4.4. all equipment necessary to conform with the Occupational Health and Safety Act and the by-laws of CoT and
 - 4.5. all other cost required to provide the specific service, goods or equipment.
 5. In ALL items/activities for which the tenderer must provide a unit rate, the tenderer must also include in his/her unit rate, the restoration of the site to its original condition.
 - a. The *original condition* means that the state which the site was found prior to the commencement of the works.
 6. **When the tenderer completes the schedule of rates, he/she refers to this part of the tender document and the following additional parts:**
 - 6.1. **Pricing data or Pricing instructions**
 - 6.2. **C3 Scope of works**

Part C2.2: Pricing Data

6.3. C3.4.1 Particular specifications

6.3.1. **Herein the tenderer will notice that the schedule of rates table is divided into major sections, i.e. 1: Contract Administration, 2: Contractor's Site Establishment, 3: Miniature Substations, 4: Overhead Switchgear and Equipment, 5: Medium Voltage Cable Network, 6: Bare Conductor Overhead Network, 7: Low Voltage Cable Network, 8: Aerial Bundle Network, 9: Consumer Connections, 11: Cable Sleeve Pipes and Ducts, 12: Earthing, 13: Compliance to OHS Regulations.**

6.3.1.1. **Furthermore, the major sections have sub-sections to provide the necessary detail for the tenderer to make his/her pricing.**

6.4. C3.4.2 Standard specifications

6.5. C3.4.3 Health and Safety specification

7. The Community Liaison Officer (CLO):

7.1. The CLO shall be appointed by the contractor but will be provided to the contractor by The Office of the Speaker through public participation.

7.2. The CLO shall be appointed for a period not exceeding the complete period of project implementation and handing over to EED.

7.3. The CLO shall be remunerated for the period of employment within the period indicated in 7.2 above.

7.4. He/She will not be entitled to payment if the project has been halted by the employer,

7.5. He/she will not be entitled for payment beyond the handing over date of the project unless the agreement between the contractor and the CLO extends beyond the actual project's period. In such cases, CoT will not be liable for any payment arising from such agreement.

7.6. The remuneration of the CLO shall be equivalent to CoT administration officer's basic hourly salary (as indicated in the Part C3 of the contractor's employees.) and his/her salary shall be payable on an hourly rate.

f. Site establishment

- a. The project manager shall determine the suitable and most economical method of storing material, delivering it to site and other logistics required when implementing a project. From that decision, the project manager shall choose to either appoint the contractor to establish the site camp or provide a storage camp of CoT where the contractor shall only collect material.

CORRECTION OF ENTRIES MADE BY TENDERER

Any entry made by the Tenderer in the Schedule of Rates, forms, etc, which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.

Low Voltage (LV) & Medium Voltage (MV) Network

Construction Contract

C2.2 SCHEDULE OF RATES

**Note: PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000:
PREFERENTIAL PROCUREMENT REGULATIONS, 2017**

- The City of Tshwane reserve the right to accept proposed offered prices or to average proposed offered prices of the acceptable bidders who are successful on all four stages in accordance to the budget availability and national benchmarking.
- The City of Tshwane reserve the right to make a counter offer process and the City of Tshwane prices shall be final.

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SECTION 1: CONTRACT ADMINISTRATION

SECTION 2: CONTRACTOR'S SITE ESTABLISHMENT

SECTION 3: MINIATURE SUBSTATION

SECTION 4: OVERHEAD SWITCHGEAR AND EQUIPMENT

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SECTION 6: BARE CONDUCTOR OVERHEAD NETWORK

SECTION 7: LOW VOLTAGE CABLE NETWORK

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SECTION 9: CONSUMER CONNECTIONS

SECTION 11: CABLE SLEEVE PIPES, DUCTS and SITE REHABILITATION

SECTION 12: EARTHING

SECTION 13: COMPLIANCE TO OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

Part C2.2: Pricing Data

**Refer to Part C3.4.1 of this tender document for full description of each item.
This is a rate only tender.**

SCHEDULE OF RATES						
Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATE D QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 1: CONTRACT ADMINISTRATION						
1.22.1	1	Provide and maintain a quality system		20		
1.22.1	1.1	Land surveyor services				
1.22.1.2	1.1.2	Stand pegs	each	366		
1.22.2.1	1.2.1	Storage of equipment where storage space is provided by The contractor:	Per month	247		
1.22.7	1.5	Remove and return redundant material to CoT stores				
	1.5.1	Light Vehicle of mass of up to 3500 kg	per km	1643		
	1.5.2	Medium Vehicle of mass of 3501 to 9000 kg	per km	3091		
	1.5.3	Heavy Vehicle of mass of 9000 kg and over	per km	343		
1.22.9	1.6	Training of local labour 1	per person	43		
1.22.10	1.7	Liaison Officer	per month	25	CoT minimum T5-level Salary	
TOTAL FOR SECTION 1 CARRY FORWARD TO THE SUMMARY						

Part C2.2: Pricing Data

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 2 : CONTRACTOR'S SITE ESTABLISHMENT						
2.5.1	2.1	Contractor's establishment on site				
2.5.1.1	2.1.1	Fixed charges	per m ²	411		
2.5.1.2	2.1.2	Time related charges	per day	1233		
2.5.3	2.2	Supply and install sign board	each	6		
TOTAL FOR SECTION 2 CARRY FORWARD TO THE SUMMARY						

Part C2.2: Pricing Data

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 3 : MINIATURE SUBSTATIONS, RMUs and TAMPER PROOF METER BOXES						
3.13.1	3.1	Install the miniature substations, RMUs and tamper proof meter boxes				
	3.1.1	200 kVA	each	96		
	3.1.2	315 kVA	each	396		
	3.1.3	500 kVA	each	76		
	3.1.3	630 kVA	each	25		
	3.1.5	RMU unit(T3)	each	62		
	3.1.6	RMU unit(T4)	each	90		
		Tamper proof meter box 3 way	each	100		
		Tamper proof meter box 6 way	each	140		
		Tamper proof meter box 8 way	each	60		
		Tamper proof meter box 12 way	each	150		
13.13.2	Recover the miniature substations, RMUs and tamper proof meter boxes					
	3.1.7	200 kVA	each	20		
	3.1.8	315 kVA	each	60		
	3.1.9	500 kVA	each	10		
	3.1.10	630kVA	each	17		
	3.1.11	RMU unit(T3)	each	15		
	3.1.12	RMU unit(T4)	each	25		
		Tamper proof meter box 3 way	each	120		

Part C2.2: Pricing Data

		Tamper proof meter box 6 way	each	200		
		Tamper proof meter box 8 way	each	150		
		Tamper proof meter box 12 way	each	110		
3.13.4	3.2	Install casting of miniature substations, RMUs and tamper proof meter boxes plinth				
	3.2.1	200 kVA	each	96		
	3.2.2	315 kVA	each	396		
	3.2.3	500 kVA	each	76		
	3.2.4	630 kVA	each	25		
	3.2.5	RMU unit(T3)	each	62		
	3.2.6	RMU unit(T4)	each	90		
		Tamper proof meter box 3 way	each	100		
		Tamper proof meter box 6 way	each	140		
		Tamper proof meter box 8 way	each	60		
		Tamper proof meter box 12 way	each	150		
3.13.5	Recover casting of miniature substations, RMUs and tamper proof meter boxes plinth					
	3.2.6	200 kVA	each	20		
	3.2.7	315 kVA	each	60		
	3.2.8	500 kVA	each	10		
	3.2.9	630 kVA	each	17		
	3.2.10	RMU unit(T3)	each	15		
	3.2.11	RMU unit(T4)	each	25		
		Tamper proof meter box 3 way	each	120		
		Tamper proof meter box 6 way	each	200		

Part C2.2: Pricing Data

		Tamper proof meter box 8 way	each	150		
		Tamper proof meter box 12 way	Each	110		
3.13.6	3.3	Install LV Circuit Breakers				
	3.3.1	Single phase	Each	1564		
	3.3.2	Three phase	Each	136		
3.13.6	Recover LV Circuit Breakers					
	3.3.4	Single phase	Each	400		
	3.3.5	Three phase	Each	600		
TOTAL FOR SECTION 3 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 4 : OVERHEADSWITCHGEAR AND EQUIPMENT						
6.8.2	4.1	Install expulsion or dropout fuse units	set	1096		
6.8.6	4.2	Install insulating units and links	set	584		

Part C2.2: Pricing Data

6.8.8	4.3	Install Lighting surge arrestors	set	584		
6.8.10	4.4	Install surge arrestor earthing	each	440		
6.8.11	4.5	Constructio n of KFME structure				
6.8.11.1	4.5.1	Two pole	each	20		
6.8.11.2	4.5.2	Four pole	each	8		
6.8.12.1	4.6	Install overhead Transformer				
	4.6.1	25KVA or lower KVA	each	92		
	4.6.2	50KVA	each	128		
	4.6.3	100KVA	each	90		
	4.6.4	200KVA	each	210		
	4.6.5	315KVA	each	12		
6.8.12.1	Recover overhead Transformer					
	4.6.6	25KVA or lower KVA	each	54		
	4.6.7	50KVA	each	54		
	4.6.8	100KVA	each	54		
	4.6.9	200KVA	each	56		
	4.6.10	315KVA	each	248		
6.8.13	4.11	Install LV Pole mounted Distribution Box	each	2000		
	4.12	Install LV ground mounted Distribution Box				
	4.12.1	3 way box	each	576		
	4.12.2	12 way box	each	1002		
	4.12.3	None destructive box	each	1800		
		Recover LV Pole mounted	each	80		

Part C2.2: Pricing Data

		Distribution Box				
		Recover LV ground mounted Distribution Box	each	120		
6.8.15	4.12	Install galvanised steel cross arms	each	696		
TOTAL FOR SECTION 4 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER BIDDER PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 5 : MEDIUM VOLTAGE CABLE NETWORK						
7.10.1	5.1	Excavations				
7.10.1.1	5.1.1	Excavate in all materials for trenches, backfill, compact and dispose of surplus material by excavation equipment (LI/EPWP)	m ³	28119		
7.10.1.2	5.1.2	Extra over for excavating in hard material - hard rock	m ³	9298		
7.10.1.2	5.1.3	Extra over for excavating in hard material - soft rock (LI/EPWP	m ³	11822		

Part C2.2: Pricing Data

7.10.1.3	5.1.4	Extra over for excavating by hand (LI/EPWP	m ³	10434		
7.10.1.4	5.1.5	Compacted ground	m ³			
7.10.1.5	5.1.6	Extra over for using backfill material obtained from :				
		(i) borrow areas (LI/EPWP)	m ³	2160		
		(ii) sources provided by the contractor (LI/EPWP)	m ³	1343		
	5.1.7	Excavation of a jointing pit	m ³	1500		
7.10.20	5.2	Price for handling, loading, off-loading and transportation of MV-cable drums to site from CoT stores (+/- 60km)	Per Drum	15		
7.10.3	5.3	Lay MV cable				
	5.3.1	Up to 150mm ² x 3c pilcswa, pvc	m	6000		
	5.3.2	Above 150mm ² x 3c pilcswa, pvc	m	3971		
7.10.3	5.3	Recover MV cable				
	5.3.3	Up to 150mm ² x 3c pilcswa, pvc	m	1500		
	5.3.4	Above 150mm ² x 3c pilcswa, pvc	m	800		

Part C2.2: Pricing Data

7.10.5	5.4	Install MV cable joints and termination				
	5.4.1	MV Cable Joints				
	5.4.1.1	Joint PI 11/11kV 50 to 95mm ² 3C	each	120		
	5.4.1.2	Joint PI 11/11kV 120 to 185mm ² 3C	each	110		
	5.4.1.3	Joint PI 11/11kV 240 to 300mm ² 3C	each	60		
	5.4.2	MV Terminations (Outdoor)				
	5.4.2.1	Termination PI - 11kV 50 to 95mm ² 3C (outdoor)	each	120		
	5.4.2.2	Termination PI - 11kV 120- 185mm ² 3C (outdoor)	each	70		
	5.4.2.3	Termination PI -11kV 240- 300mm ² 3C (outdoor)	each	60		
	5.4.3	MV Terminations (Indoor)				
	5.4.3.1	Termination PI -11kV 50- 95mm ² 3C (Indoor)	each	554		
	5.4.3.2	Termination PI -11kV 120- 185mm ² 3C (Indoor)	each	1548		
	5.4.3.3	Termination PI -11kV 240- 300mm ² 3C (Indoor)	each	384		
7.10.6	5.5	Install MV cable on cable ladder	m	1		
7.10.8	5.6	Lay earth continuity conductor	m	10000		
7.10.9	5.7	Terminate and connect earth conductor	each	51000		

Part C2.2: Pricing Data

7.10.11	5.8	Install plastic warning tape	m	71280		
7.10.13	5.10	Removal of existing MV cable from existing switchgear	each	120		
7.10.15	5.11	Install cable markers	each	360		
7.10.17	5.12	Install Protective slabs	each	600		
7.10.18	5.13	Expose, cut and re-route existing cable	m	3600		
7.10.19	5.14	Name/Rename MV switchgear in substation	each	5024		
TOTAL FOR SECTION 5 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 6 :BARE CONDUCTOR OVERHEAD NETWORK						
8.10	6	Excavations				
8.10.1	6.1	Excavate in all materials for pole holes and stay, backfill, compact and dispose of surplus material.	each	24000		
8.10.1.1	6.1.1	Soft rock (LI/EPWP)	each	10200		

Part C2.2: Pricing Data

8.10.1.2	6.1.2	Hard Rock	each	15000		
8.10.3	6.2	Erect Wooden Poles				
	6.2.1	11m	each	3120		
	6.2.2	13m	each	460		
8.10.5	6.3	Install wooden cross arms	Each	340		
8.10.7	6.4	Install post insulators with pin-22kv complete assembly	Each	2540		
8.10.9	6.5	Install strain (longrod) 22kv assembly - complete set	Each	1640		
8.10.14	6.6	Install preform dead end terminations	Each	347		
8.10.16	6.7	Install bridge connectors between lines	Each	1180		
8.10.18	6.8	Install Aluminium conductor-hare	m	142880		
	6.8.1	Recover Aluminium conductor-hare	m	1		
8.10.20	6.9	Install parallel groove clamps	Each	195840		
8.10.22	6.10.1	Install 1.2m cross arms (steel)	each	540		
	6.10.2	Install 1.8m cross arms (steel)	each	140		
8.10.24	6.11	Install pin binders/ties (LI/EPWP)	each	700		
8.10.28	6.12	Install MV stay assembly (complete) etc.				
	6.12.1	7/3.5 stay+dead ends+insulator+2m plate	Each	260		
	6.12.2	Install 12m strut pole +bracket (complete)	Each	108		
	6.12.3	Install flying stay complete	Each	100		

Part C2.2: Pricing Data

8.10.32	6.13	Install identification and danger signs	Each	182		
8.10.34	6.14	Install anti-climb	Each	204		
8.10.35	6.15	Price for handling ,loading, off-loading and transporting of overhead conductor to site from CoT stores(+/-60km)	per drum	132		
8.10.36	6.16	Cutting of trees	per bay	252		
	6.17	Numbering of MV line (LI/EPWP)	Each	2040		
TOTAL FOR SECTION 6 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 7 : LOW VOLTAGE CABLE NETWORK						
2.9.9.1	7.1	Excavations: Refer to Section 5				
9.9.1.5	7.2	Price for handling, loading, off-loading and transportation of LV-cable to site from CoT stores (+/- 60km)	per drum	280		
9.9.3	7.3	Lay LV cable				
	7.3.1	35 x 4c Al,swa,pvc	m	1500		
	7.3.2	95 x 4c Cu,swa,pvc	m	3600		
	7.3.3	120 x 4c Al,swa,pvc	m	196760		

Part C2.2: Pricing Data

	7.3.4	150 x 4c Cu,swa,pvc	m	4000		
	7.3.5	150 x 4c Al,swa,pvc	m	3400		
	7.3.6	185 x 4c Cu,swa,pvc	m	2800		
	7.3.7	185 x 4c Al,swa,pvc	m	3000		
	7.3.8	240 x 4c Cu,swa,pvc	m	2480		
	7.3.9	240 x 4c Al,swa,pvc	m	1240		
9.9.3.1	Recover LV cables					
	7.3.10	35 x 4c Al,swa,pvc	m	1		
	7.3.11	95 x 4c Cu,swa,pvc	m	1		
	7.3.12	120 x 4c Al,swa,pvc	m	1		
	7.3.13	150 x 4c Cu,swa,pvc	m	1		
	7.3.14	150 x 4c Al,swa,pvc	m	1		
	7.3.15	185 x 4c Cu,swa,pvc	m	1		
	7.3.16	185 x 4c Al,swa,pvc	m	1		
	7.3.17	240 x 4c Cu,swa,pvc	m	1		
	7.3.18	240 x 4c Al,swa,pvc	m	1		
9.9.4	7.4	Termination of LV cables				
	7.4.1	95 x 4c Cu,swa,pvc	Each	340		
	7.4.2	120 x 4c Al,swa,pvc	Each	1461		
	7.4.3	150 x 4c Cu,swa,pvc	Each	480		
	7.4.4	185 x 4c Cu,swa,pvc	Each	340		
	7.4.5	240 x 4c Cu,swa,pvc	Each	260		
9.9.5	7.5	Jointing of LV cable				
	7.5.1	95 x 4c Cu,swa,pvc	Each	160		
	7.5.2	120 x 4c Al,swa,pvc	Each	892		
	7.5.3	150 x 4c Cu,swa,pvc	Each	212		
	7.5.4	185 x 4c Cu,swa,pvc	Each	212		
	7.5.5	240 x 4c Cu,swa,pvc	Each	174		
9.9.6	7.6	Lay earth continuity conductor				

Part C2.2: Pricing Data

	7.6.1	70mm ² Cu, pvc covered	m	1		
9.9.7	7.7	Terminate earth continuity conductor				
	7.7.1	70mm ² Cu, pvc covered	m	580		
9.9.9	7.8	Install cable markers	each	300		
9.9.11	7.9	Install protective slabs	each	288		
9.9.13	7.10	Install cable sleeves	each	5649		
TOTAL FOR SECTION 7 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 8 : AERIAL BUNDLE NETWORK						
Excavations						
10.9.1	8.1	Excavate in all materials for holes for poles, stays, backfill, compact and dispose of surplus material (LI/EPWP)	each	1		
10.9.2	8.2	Excavate in hard materials for holes for poles and stays, backfill, compact and dispose of surplus material: Refer to Section 6				
10.9.4	8.3	Erect wood pole structures				
	8.3.1	5m (LI/EPWP)	each	2400		
	8.3.2	7m	each	1200		
	8.3.3	9m	each	3600		
10.9.6	8.4	String bundle conductor (ABC)	m	81728		

Part C2.2: Pricing Data

		Recover bundle conductor (ABC)	m			
10.9.8	8.5	Install suspension assembly	each	1800		
10.9.10	8.6	Install tension assembly	Each	1800		
10.9.13	8.7	Install bridge connectors between circuits	Each	4800		
10.9.15	8.8	Install insulated piercing connectors (IPC) for jumper connections to the pole top box	each	3554		
10.9.17	8.9	Install LV cables termination for the structure:				
		95mm ² x 4 c pvc swa Al cable	Each	1		
		120mm ² x 4 c pvc swa Al cable	Each	39080		
10.9.19	8.1	Install stays, struts, stub stay, flying and fly stay				
	8.10.1	Pole stay	each	320		
	8.10.2	Struts	each	140		
	8.10.3	Strut pole	each	97		
	8.10.4	Stub stay	each	200		
	8.10.5	Stub pole	each	112		
	8.10.6	Flying stay	each	156		
	8.10.7	Fly stay	each	160		
10.9.21	8.11	Install structure earth				
	8.11.1	LV earth	m	1		
	8.11.2	Pole earth	each	1560		
10.9.23	8.12	Install signs	each	1892		
10.9.27	8.13	Install ABC structures				
	8.13.1	Suspension structure (0-30deg.)	each	4040		
	8.13.2	Strain structure (0-60deg.)	each	2160		
	8.13.3	Strain structure (60-90deg.)	each	1982		

Part C2.2: Pricing Data

	8.13.4	Terminal structure	each	519		
	8.13.5	Terminal structure (2way,schackle off)	each	440		
	8.13.6	Suspension structure (T-off)	each	380		
	8.13.7	Strain structure (T-off)	each	320		
	8.13.8	Suspension structure (4way cross)	each	284		
	8.13.9	Strain structure (4way cross)	each	310		
	8.13.10	Midway (4-way cross)	each	324		
TOTAL FOR SECTION 8 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 9:CONSUMER CONNECTION						
12.7.1	9	Excavations: Refer to Section 5				
12.7.3	9.2	Lay LV cable				
	9.2.1	10 x 3c Cu,swa,pvc+COMS	m	168000		
	9.2.2	10 X 3c Cu concentric cable (Airdac)+COMS	m	84404		
	9.2.3	10 x 4c Cu,swa,pvc	m	15600		
	9.2.4	16 x 3c Cu,swa,pvc	m	18800		
	9.2.5	16 x 4c Cu,swa,pvc	m	15600		
	9.2.6	25 x 3c Cu,swa,pvc	m	12000		
	9.2.7	25 x 4c Cu,swa,pvc	m	43600		
	9.2.8	35 x 4c Cu,swa,pvc	m	33804		
12.7.3	9.2	Recover LV cable				
	9.2.9	10 x 3c Cu,swa,pvc+COMS	m	1		

Part C2.2: Pricing Data

	9.2.10	10 X 3c Cu concentric cable (Airdac)+COMS	m	1		
	9.2.11	10 x 4c Cu,swa,pvc	m	1		
	9.2.12	16 x 3c Cu,swa,pvc	m	1		
	9.2.13	16mm BCEW	m	1		
	9.2.14	16 x 4c Cu,swa,pvc	m	1		
	9.2.15	25 x 4c Cu,swa,pvc	m	1		
	9.2.16	25 x 3c Cu,swa,pvc	m	1		
	9.2.17	35 x 4c Cu,swa,pvc	m	1		
	9.2.18	35mm BCEW	m	1		
12.7.4	9.3	Termination of LV cable at pole				
	9.3.1	10 x 3c Cu,swa,pvc+COMS	each	108200		
	9.3.2	10 X 3c Cu concentric cable (Airdac)+COMS	each	12800		
	9.3.3	10 x 4c Cu,swa,pvc	each	20000		
	9.3.4	16 x 3c Cu,swa,pvc	each	2400		
	9.3.5	16 x 4c Cu,swa,pvc	each	3080		
	9.3.6	25 x 3c Cu,swa,pvc	each	2080		
	9.3.7	25 x 4c Cu,swa,pvc	each	1080		
	9.3.8	35 x 4c Cu,swa,pvc	each	700		
12.7.5	9.4	Jointing of LV cable				
	9.4.1	10 x 4c Cu,swa,pvc	each	2600		
	9.4.2	16 x 3c Cu,swa,pvc	each	220		
	9.4.3	16 x 4c Cu,swa,pvc	each	2200		
	9.4.4	25 x 3c Cu,swa,pvc	each	180		
	9.4.5	25 x 4c Cu,swa,pvc	each	1800		
	9.4.6	35 x 4c Cu,swa,pvc	each	1800		
12.7.6	9.5	Lay earth continuity conductor				
	9.5.1	10mm BCEW	m	2400		
	9.5.2	16mm BCEW	m	3000		
	9.5.3	25mm BCEW	m	3400		
	9.5.4	70mm BCEW	m	4200		
12.7.7	9.6	Terminate and connect earth continuity conductor				
	9.6.1	10mm BCEW	Each	2800		
	9.6.2	16mm BCEW	Each	2880		
	9.6.3	25mm BCEW	Each	2840		
	9.6.4	70mm BCEW	Each	840		

Part C2.2: Pricing Data

12.7.13	9.7	Install pole mounted box				
	9.7.1	J-1 york box	each	20800		
	9.7.2	2 way	each	144		
	9.7.3	4 way	each	834		
	9.7.4	6 way	each	324		
	9.7.5	Street light Control Box and issue a CoC	each	300		
12.7.18	9. 8	Install Ready Board and update a ready board CoC	each	20800		
12.7.20	9.10	Install label				
	9.10.1	Pole mounted boxes	each	32000		
	9.10.2	Cable	each	26840		
	9.10.3	Miniature substation	each	4816		
	9.10.4	Pole numbering	each	1180		
	9.10.5	Meterbox	each	3880		
	9.10.6	Transformer	each	2856		
12.7.21		INSTALLATION OF THE FOLLOWING PVC, SWA COPPER/ALLUMINIUM CABLES (LV):				
	9.11	Installation of a PVC, SWA copper/alluminium 35mm2 and smaller / 4 core cable per meter	Per meter	235120		
	9.12	Installation of a PVC, SWA copper/alluminium 70mm2 - 95mm2 / 4 core cable per meter	Per meter	36480		
	9.13	Installation of a PVC, SWA copper/alluminium 120mm2 - 150mm2 / 4 core cable per meter	Per meter	1301280		
12.7.22		TERMINATION OF 415V-4 CORE CABLE (dry end: heat or cold shrink, k-clamps, seal joints)				
	9.14	Single termination of a 415V-4 core 35mm2 and smaller cable with heat or cold dry end using k-clamp and seal joints	Each	620		
	9.15	Single termination of a 415V-4 core 90mm2 - 50mm2 cable with heat or cold shrink dry end	Each	5768		

Part C2.2: Pricing Data

		using k-clamps and seal joints				
	9.16	Single termination of a 415V-4 core 185mm ² - 120mm ² cable with heat or cold shrink dry end using k-clamp and seal joints	Each	2040		
12.7.23		JOINTING 415V, 4 CORE CABLE WITH DRY JOINT (heat or cold shrink)				
	9.17	Single dry joint with heat or cold shrink for a 415V, 4 core 35mm ² and smaller cable	Each	14080		
	9.18	Single dry joint with heat or cold shrink for a 415V, 4 core 90mm ² - 50mm ² cable	Each	1445		
	9.20	Single dry joint with heat or cold shrink for a 415V, 4 core 185mm ² - 120mm ² cable	Each	76858		
		METER BOXES				
12.7.24	9.21	Installation of a single complete new meter box	Each	24756		
	9.22	Installation of meter box accessories including a meter.	Each	30000		
12.7.25	9.23	Making a single new connection in the existing meter box	Each	19776		
12.7.26	9.24	Replacement of the hasp and staple for the low voltage distribution box/kiosk	Each	2624		
	9.25	Recovery of the meter box to CoT Stores	Each	320		
		OVERHEADS				
		DRESSING:				
12.7.27	9.24	Dressing a single pole in an urban area for the cross arm	Each	11366		
	9.25	Dressing a single pole in an urban area for clamps	Each	12360		

Part C2.2: Pricing Data

	9.26	Dressing a single pole in an urban area for pole top box	Each	11032		
		AERIAL BUNDLE CONDUCTORS (70, 95 & 120 mm2)				
12.7.28	9.28	New construction using with 70mm ² , 95mm ² and 120mm ² aerial bundle conductor per bay in an urban area	Per bay	10800		
12.7.29	9.29	DELIVERY OF NOTES	Each	16920		
	POLES					
12.7.30	9.30	Planting of a single 4.5m steel pole (LI/EPWP)	Each	3294		
	9.31	Planting of a single 9.75m steel pole	Each	2080		
	9.32	Planting of a single 11m wooden pole	Each	14680		
12.7.31	9.33	Anchoring of a single pole with a stay	Each	260		
	9.34	Anchoring of a single pole with a strut pole	Each	188		
	9.35	Anchoring of a single pole with a pedestal	Each	190		
12.7.32	9.36	Removal of a single 11m wooden pole	Each	80		
	TRENCHING AND PAVING					
12.7.33	9.37	Trench digging in pickable ground per cubic meter (LI/EPWP)	Per m ³	8352		
	9.38	Trench digging in hard rock per cubic meter	Per m ³	1728		
	9.39	Digging single hole in pickable ground (LI/EPWP)	Each	2592		
	9.40	Digging single hole in very hard rock	Each	3800		
12.7.34	9.41	Horizontal drilling per meter for 1 x 110mm sleeve	Per meter	1.00		

Part C2.2: Pricing Data

12.7.35	9.42	Installation of single polythene and similar sleeve	Each	1380		
12.7.36	9.44	Repairing of surface coverings per square meter with paving tiles or stones (LI/EPWP	Per m ²	1.00		
	9.45	Repairing of surface coverings per square meter with 100mm thick concrete slab (LI/EPWP)	Per m ²	1.00		
	9.46	Repairing of surface coverings with tarred pavement (LI/EPWP)	Per m2	1.00		
12.7.37	9.47	Breaking of concrete paving per cubic meter (LI/EPWP)	Per m ³	1.00		
	9.48	Breaking of tar per cubic meter (LI/EPWP)	Per m ³	1.00		
12.7.38		Hiring of machinery				
	9.49	Hiring a compactor per hour	Per Hour	5000		
	9.50	Hiring a pole planter per hour	Per Hour	6000		
	9.51	Hiring a crane truck per hour	Per Hour	6530		
	9.52	Hiring a hydraulic per hour	Per Hour	5500		
	9.53	Hiring a step ladder truck per hour	Per Hour	5200		
TOTAL FOR SECTION 9 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 11 : CABLE SLEEVE PIPES AND DUCTS						
14.9.2	11.2	Install cable sleeves				
	11.2.1	110mm dia.FLEX pvc	m	11780		
	11.2.2	160mm dia.FLEX pvc	m	400		

Part C2.2: Pricing Data

	11.2.3	40mm HPDE duct for fibre optic	m	200		
14.9.3	11.3	Drilling of crossings				
	11.3.1	110mm dia - hard rock	m	580		
	11.3.2	110mm dia - soft rock	m	3084		
	11.3.3	110mm dia - soil	m	4752		
14.9.4	11.4	Cutting and repair tarmac	m ³	1430		
TOTAL FOR SECTION 11 CARRY FORWARD TO THE SUMMARY						

Refer to Part C3.4.1	ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION 12 : EARTHING						
5.12.1	12.1	Earthing surveys by specialist contractor	per test	20		
15.12.3	12.2	Install MV network earths				
	12.2.1	Minisub earths	each	1072		
	12.2.2	Outdoor cable termination earths	each	768		
	12.2.3	Lightning arrestors earth	each	480		
15.12.5	12.3	Install earths to Distribution or meter kiosk	each	4944		
15.12.7	12.4	Install LV earths for ABC (crow's foot)	Each	480		
15.12.9	12.5	Install transformer earths	each	3000		
15.12.11	12.6	Install pole earths - end poles	each	5760		
15.12.12	12.7	Supply and install conductive cement	m ³	240		
15.12.13	12.8	Drilling for earth rods (in all type of material)				

Part C2.2: Pricing Data

	12.8.1	50mm dia. 6m depth	each	200		
	12.8.2	75mm dia. 6m depth	each	200		
15.12.15	12.9	Install earth rods and equipment (for extra earths needed)	each	200		
	12.9.1	16mm dia. 1.2m Cu plated hand driven	each	200		
	12.9.2	16mm dia. 1.2m Cu plated power tool driven	each	200		
	12.9.3	16mm dia. 1.2m Cu plated in drilled hole	each	200		
15.12.16	12. 10	Install earth wire (70mm BCEW)	m	200		
TOTAL FOR SECTION 12 CARRY FORWARD TO THE SUMMARY						

ITEM [section in C3.4]	DESCRIPTION	Unit of Measure	ESTIMATED QUANTITY PER ANNUM	UNIT RATE (VAT EXCI)	TOTAL AMOUNT (VAT EXCI)
SECTION: 13 COMPLIANCE TO OCCUPATIONAL HEALTH AND SAFETY REGULATIONS					
13.1	Provision of OHS file	Each-Once off	50		
13.2	Occupational Health and Safety Officer (full time)	Per Month	130		
13.3	Occupational Health and Safety training				
13.3.1	First Aid Training (per person)	Each	126		
13.3.2	OHS representative Training(Per person)	Each	42		

Part C2.2: Pricing Data

	4	Provision of personal protective clothing and equipment (per set-per person)	Each	252		
SUB-TOTAL FOR SECTION 13 CARRY FORWARD TO THE SUMMARY						

Low Voltage (LV) & Medium Voltage (MV) Network Construction Contract SCHEDULE OF RATES SUMMARY

SECTIONS	TOTALS
SECTION 1 : CONTRACT ADMINISTRATION	
SECTION 2 : CONTRACTOR'S ESTABLISHMENT	
SECTION 3 : MINIATURE SUBSTATIONS	
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GRAND TOTAL (VAT EXCLUSIVE)	
VAT at 15%	
GRAND TOTAL (VAT INCLUSIVE)	

Note

- The City of Tshwane reserve the right to accept proposed offered prices or to average proposed offered prices of the acceptable bidders who are successful on all four stages in accordance to the budget availability and national benchmarking.
- The City of Tshwane reserve the right to make a counter offer process and the City of Tshwane prices shall be final.

C3.1. DESCRIPTION OF THE SERVICES

C3.1. PURPOSE

The Energy and Electricity Department (EED) of City of Tshwane (CoT) aims to appoint various contractors who will provide construction works on Low Voltage (LV) and Medium Voltage (MV) electrical network infrastructure and consumer connections on as and when required basis, for a three years period. The appointed contractors will only be required to provide labour. Materials for the works shall be provided by the CoT. It is the responsibility of the contractors to have, at their own costs; the tools, equipment, machinery and personnel that will enable them to perform the works.

C3.2. BACKGROUND

EED is responsible for the provision and development of the electricity network infrastructure as part of its mandate to provide electricity services to the community of the CoT.

The EED has a variety of skilled personnel which deals with the energy and electricity matters on a daily basis. Due to the ever growing demand for infrastructure improvement, the personnel of CoT alone might not be adequate to address all the growing needs, therefore the complement of internal capacity by electrical contractors is required in order to increase the capacity of the workforce where necessary.

The estimated amount of construction work in the seven (7) Regions of the City is not equal. The workload is dependent on the size of the Region, infrastructure age, how developed the Region is, number of new developments, and other factors. The workload in the seven (7) Regions is estimated to be in the order as indicated in the table below. The Regional workload order starts with the Region which has the highest to the Region with the lowest amount of construction work.

Allocation of bidders to Regions shall therefore follow Regional workload sequence. This tender aims to appoint 14 bidders. The City reserves the right to appoint more than one bidder per region and up to a maximum of 14 contractors for the tender. Allocation of contractors will be according to the 90/10 preferential point system.

Region 1	First and second highest scoring bidders
Region 6	Third and fourth highest scoring bidders
Region 7	Fifth and sixth highest scoring bidders
Region 3	Seventh and eighth highest scoring bidders
Region 5	Nineth and tenth highest scoring bidders
Region 4	Eleventh and twelve highest scoring bidders
Region 2	Thirteenth and fourteenth highest scoring bidders

C3.3. CIDB REGISTRATION REQUIREMENT

The minimum CIDB requirement for this tender is grade 6EP. Tenderers who are registered with the CIDB in a contractor grading designation equal to or higher than 6EP Class of electrical construction work, are eligible to submit tenders. Tenderers with CIDB registration of grade 6EP PE are also eligible to submit tenders. The following will be applied with respect to minimum grading and validity:

- The tenderer must have already obtained the minimum CIDB grade at the time of submitting the bid document.
- The tenderers CIDB registration must be valid at the time of submitting the bid document and also at the time of verification by the City.
- Proof of CIDB registration and grading must be submitted as part of mandatory requirements.

For the contractors to be considered for this tender they must meet the minimum CIDB requirements as stated above.

C3.4. SCOPE OF WORKS

DESCRIPTION OF TASKS

The following are brief descriptions of the tasks which must be performed under this contract. There are material and installation specifications that must be read together with this part of the contract for better understanding of the items described herein. The clauses in this section refer to the various items to be priced for in the schedule of rates.

The fact that the tender process will take place prior to the actual appointments and job executions shall not limit the contractor from obtaining the latest standards and specifications.

The attention of the tenderer is also drawn to the fact that CoT specifications are constantly revised to improve service delivery and the safety of both the infrastructure and the public. Where contradiction between this document and the Specifications has been identified, the Project Manager or the relevant authorised official will have the final decision. All decisions taken after contradictions must be reported to Group Head (GH) EED for recording.

Tasks or projects to be executed

The contractor shall as and when required by the employer, perform any one or more of the items as described in the particular specifications in C3.4.1. The contractor provides the works in accordance with the scope given to him/her by the employer. The contractor must take the following into account:

1. After the contract had been awarded and the need to use a contractor by the employer arises,
 - a. The employer will evaluate the work to be done, the time it will take to complete the work as well as the cost thereof.
 - i. The cost is calculated from the specific rates of each item referred to in the schedule of rates in C2.2.
 - b. In cases where the contractor is overloaded by current work already allocated to him/her, he/she must inform the employer of his/her reason not to accept the work allocated. The following is done:
 - i. The contractor and the employer decide on the best possible date and time for the said project to commence based on the urgency and the type of project.

- ii. Alternatively, the option to execute the work shall be given to another service provider, where available.
2. The allocated work is in the area for which the contract is awarded.
3. The work must be done according to specification and within the time prescribed in the Purchase Order (PO) or annexed documents. Payment is certified for work done according to specification(s).
4. The employer may charge the contractor penalty fee(s), should the contractor not provide the works by the completion date.
5. During the contract period which is also the period of work allocation to the contractor by the employer, the contractor complies with all the conditions of contract and applicable policies of the CoT.
6. The contractor may be expected, depending on the urgency of the work, to start the work immediately after the appointment letter has been issued or after the agreement has been signed. That is not exercised by derogation to conditions of contract.
7. The type of work that will be done under this contract is:
 - A. Construction of MV and LV network infrastructure.
 - i. Construction of new network infrastructure
 - ii. Upgrading and strengthening of the existing network
 - B. Consumer connections
 - i. Provision of a electricity supply to a consumer premise (new, alterations, downgrade and /or upgrade).
 - ii. Installation of a ready-board / distribution board.
 - iii. The installation of a new pre-payment metering unit.
8. Payment will be done on completion of the specific works and on conditions stated in the contract data. The currency of this contract is the South African Rand (ZAR).

C3.4.1. PARTICULAR SPECIFICATIONS

This section contains the particular specifications which gives full descriptions of all the items in the schedule of rates in C2.2. It is important that the tenderers make reference to this section when pricing.

1. Tenderers must note that the unit rates supplied in this tender for all the items in the schedule of rates in C2.2 shall include, unless stated otherwise in this document, all items listed below:
 - 1.1. All labour costs,
 - 1.2. All administrative expenses,
 - 1.3. Setting out of Works
 - 1.4. Transportation (fixed cost, running cost and driver cost) of employees, material and/or any other item required to be transported (within a specific depot area) to execute the contract to and from site where work is executed and supervision fees.
 - 1.5. Tools, equipment and auxiliary equipment,
 - 1.6. Safety equipment (see OHS of the schedule of rates),
 - 1.7. All notifications to consumers when a power failure is going to occur
 - 1.8. The execution of tasks,

- 1.9. Testing and Commissioning of complete installation
- 1.10. All tariffs, levies, taxes payable by the bid,
- 1.11. All expenses to restore the workplace/site to its original condition (where changing the site was not part of the works),
- 1.12. All equipment needed to conform to the Regulations of the Occupational Health and Safety Act and the by-laws of the CoT.
- 1.13. Payments in terms of Royalties and Patent Rights (if the need arise).
- 1.14. Compliance to OHS Act and Construction Regulations.
- 1.15. For all excavations, the unit rate shall include traffic accommodation tools and safety tools which are not limited to safety fence with reflective layers, safety signs, cones and flags

A. GENERAL

DEFINITIONS:

- Pickable ground is defined as follows: Ground which can be removed with spades and pickaxes and includes loose gravel, loose or soft shale, loose ferricrete and stones (<75 mm diameter). Provision was made in the bid to do the work mechanically or by hand tools. Mechanical excavations will however only be allowed with the consent of the Project Manager.
- Soft rock is defined as follows: Rocks or stones which can be loosened by hand tools and includes shale, compact ferricrete and rocks with a diameter of 75 mm or bigger. (0.03 m³ in volume).
- Compacted ground is defined as follows: Ground which had been compacted previously and can only be excavated by the use of a jack-hammer or any other mechanical means. The decision if the ground is compacted lies with the project manager.
- Hard rock is defined as follows: Granite, quartz sandstone, slate and any other rock with the same hardness or size, solid shale and rocks more than 0.03 m³ in volume and where the use of a jack-hammer/pneumatic tools or any other mechanical means is necessary.
- Hard rock is defined as follows: Can only be broken by means of explosives and / or non-explosive cracking powder.
- Pictures of the soil must be taken as proof of the type of the soil.

N.B: For all excavations the unit rate shall include traffic accommodation and safety tools which are not limited to safety fences and barricades with reflective layers, safety signs, cones and flags.

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STANDARD SPECIFICATION

SECTION 1

CONTRACT ADMINISTRATION AND REQUIREMENTS

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2.1.1 SCOPE

This standard specification covers the general, administrative, legal and organisational requirements as well as general technical requirements relating to quality of materials, installation, testing, commissioning and maintenance of the installation applicable to this contract.

2.1.2 RELEVANT ACT, REGULATIONS AND STANDARDS

The whole of the installation shall comply and the work shall be executed in accordance with the latest edition of the following:

- a) The Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act or the Factories Machinery and Building Works Act of 1941, whichever is applicable and their respective Regulations;
- b) The Code of Practice for the Wiring of Premises SABS 10142, with the latest amendments, issued by the South African Bureau of Standards;
- c) The regulations and by-laws of CoT;
- d) The local Fire Department Regulations;
- e) The applicable regulations of the relevant Telecommunication authority;
- f) The relevant SABS, BS, NRS and IEC supporting specifications referred to in the Standard Specifications.

2.1.3 RESPONSIBLE PERSON ON SITE

The contractor shall, before establishing on site, appoint and submit to the CoT in writing the name(s) of the person(s) who is/are the responsible person(s) in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act within 14 days from being appointed.

2.1.4 SAFETY

- a) From date of site handover to the contractor until the completed work is handed back to the CoT, the contractor shall be responsible for maintaining safe conditions on site. As the "owner" of the site, the contractor shall bear all responsibilities in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act or Factories, Machinery and Buildings Work Act, whichever is applicable.
- b) The contractor shall be responsible for supplying and installing the required safety signs as determined by the Occupational Health and Safety Act, 1993 (Act No85 of 1993) and the regulations promulgated in terms of the Act of Factories, Machinery and Building Works Act, whichever is applicable, both during the construction phase and for the completed works.
- c) All safety signs shall comply with the requirements of the latest edition of SABS 1186 as applicable.

2.1.5 QUALITY

a) Material and equipment

All material and equipment shall conform in respect of quality, manufacture, tests and performance, with the relevant requirements of the South African Bureau of Standards or where no such standards exist, with the relevant current specification of the British Standards Institution and/or relevant IEC publications.

All material and equipment shall be suitable for the conditions on site. These conditions shall include weather conditions as well as conditions under which materials are installed, stored and used. Should the materials not be suitable for use under temporary site conditions, then the contractor shall, at his own cost, provide suitable protection until these unfavourable site conditions cease to exist.

The contractor shall, were requested to do so, submit samples of equipment and material to the engineer for approval prior to installation. The engineer may retain these samples until the contract is completed after which they will be returned.

b) Proprietary materials

Where proprietary materials are specified, it is to indicate the quality or type of materials or articles required, and where the terms "or other approved" or "approved equivalent" are used in connection with proprietary materials or articles, it is to be understood that the approval shall be at the sole discretion of the engineer after the appropriate samples have been submitted to the engineer for his evaluation.

c) Voltage rating of appliances and equipment

The voltage rating of all appliances and equipment to be installed shall be in accordance with the nominal supply voltage of CoT except where otherwise laid down in the detail specification.

2.1.6 QUALITY ASSURANCE

The contractor shall implement a quality assurance system to ensure adequate control of the total construction process including those off-site activities that will have an impact on quality of the final constructed product. Before coming with any procurement or construction work, the contractor shall furnish the engineer with details of a quality management system which will be used by the contractor.

2.1.7 APPROVAL OF DRAWINGS, MATERIAL AND EQUIPMENT

a) Engineer's drawings and specifications

The drawings prepared by the engineer show the general layout of all equipment and systems, complete with schematic arrangements. These, together with the specification, give sufficient information to enable the contractor to estimate the cost and to determine how the system must be installed, tested, inspected, operated, serviced and maintained.

These drawings are not dimensioned installation drawings, and cannot be used as construction/shop drawings. Location dimensions shown are only indicative of the routes and zones in which the service shall be installed.

b) Contractor's drawings

(I) Preparation of drawings

Three paper print drawings of all equipment or plant to be manufactured shall be submitted to the engineer for approval. These drawings shall indicate all equipment, distribution systems, instrumentation positions and access requirements.

The contractor may, if he so desires, purchase copies of the engineer's drawings on 0,08 mm thick polyester film for modifications and updating if required. These drawings shall be retitled in accordance with the contractors system and shall thereafter be submitted as contractor drawings. No portion of the contractor's work shall be commenced until the drawings have been approved by the engineer.

The contractor shall at all times keep an updated as built drawing in the site office. This completely marked up drawing shall be handed to COT when area's are handed over.

(ii) Submission of workshop drawings

Submission for approval will consist of the following activities executed by the contractor and other parties involved: -

Three copies of the drawings shall be submitted to the engineer for approval.

The contractor shall review, stamp, date and sign to signify his approval and submit in the manner required by the engineer and with reasonable promptness and in orderly sequence so as to cause no delay in the work, all contractor drawings and samples required by the contract documents or subsequently by the engineer. Contractor drawings shall be properly identified and numbered to the CoT standard.

At the time of submission the contractor shall inform the engineer in writing of any deviation in the contractor drawings or samples from the requirements of the contract documents.

By submitting drawings and samples, the contractor signifies that he has determined and verified all site measurements, site instruction criteria, materials, catalogue numbers and similar data, or will do so, and that he has checked and coordinated each contract's drawing and sample with the requirements of the works and of the contract documents.

The engineer will review and approve construction drawings and samples with reasonable promptness (but within 21 days) so as to cause no delay, but only for conformance with the design concept of the works and with the information given in the contract documents. The engineer's approval of a separate item shall not indicate approval of an assembly in which the item functions.

The contractor shall make any corrections required by the engineer and shall re-submit the required number of corrected copies of contractor drawings or new samples until approved. When re-submitting drawings, the contractor shall specifically direct the engineer's attention (in writing) on revisions other than corrections required by the engineer on previous submissions.

No portion of the contract works requiring a contractor drawing or sample submission shall be commenced until the submission has been approved by COT.

c) Samples of material and equipment

The contractor shall, prior to placing orders, submit samples of all material and equipment to the engineer for written approval prior to commencing with the tender installation.

For large equipment such as high voltage switchgear, transformers, standby generators, pumps, compressors and lifts, catalogues and brochures shall be submitted for approval with the tender document.

d) Compliance with national and international standards

For all material and equipment that are required to conform to any national or international specification or publication, the contractor shall submit a certificate to the engineer, issued by a accredited testing laboratory clearly stating that the material and/or equipment complies with the required specification or publication whenever requested by the engineer and it shall be for the contractors cost.

2.1.8 CONSTRUCTION PROGRAMME

The contractor shall submit his programme of work to the engineer not later than 14 days after the contractor has been notified of the acceptance of his tender. If necessary, the engineer may instruct the contractor to adjust his programme to suit other activities.

The programme shall not be in the form of a bar chart only but shall be based on a network technique and shall clearly show the anticipated quantities of work to be performed each week, together with the manner in which the listed plant is to be used, as well as the cash flow for the various sections of work.

If, during the progress of the work, the quantities of work performed per week fall below those shown on the programme, or if the sequence of operations is altered, or if the programme is deviated from in any other way, the contractor shall, within two days after being notified by the engineer, submit a revised programme.

If the programme has to be revised by reason of the contractor falling behind his programme, he shall produce a revised programme showing how he intends to regain lost time in order to ensure completion of the works within the time for completion as defined in the General Conditions of Contract or any granted extension of time. Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the engineer to take steps as provided for in the General Conditions of Contract.

The approval by the engineer of any programme shall have no contractual significance other than that the engineer will be satisfied if the work is carried out according to such programme and that the contractor undertakes to carry out the work in accordance with the programme. It shall not limit the right of the engineer to instruct the contractor to vary the programme should circumstances make this necessary.

Progress will be monitored weekly. If the contractor is behind schedule, CoT will notify the contractor. The contractor must bring the program back to schedule within one week at his own cost.

2.1.9 SETTING OUT OF WORKS

The contractor shall arrange for the setting out of the works by a competent person.

2.1.10 CONTRACTOR'S SITE REPRESENTATIVE

In terms of the General Conditions of Contract, the contractor shall advise the engineer in writing of the name of the person the contractor intends using to supervise the carrying out of the works on site. The contractor shall furthermore submit the qualifications and details of the experience of the person the contractor intends using on site. The engineer reserves the right to accept or reject the employment of the proposed representative of the contractor on site. Such representative shall have full powers to act on behalf of the contractor.

The approved representative on site shall be on site at all times while the contractor is established on site and shall not be removed from the site and replaced by any other person without the prior approval of the engineer. The engineer reserves the right to stop all work on site in the event of the site representative not being on site at all times or if the approved site representative is removed from site without the engineer's approval, until this condition is complied with.

Both the contractor and the contractor's representative on site shall sign a declaration that they are conversant with the requirements of the contract document and that they are aware of the details of the contract. No excuses will be accepted for material or work which does not comply with the standards and specifications in the contract document.

2.1.11 SITE MEETINGS

The contractor and his authorized representative shall attend all meetings held on the site with representatives of the main contractor and professional team at dates and times to be determined by the engineer. Such meetings will be held to evaluate the progress of the contract and to discuss matters pertaining to the contract which any of the parties represented may wish to raise. It is not the intention of such meetings to discuss matters concerning the normal day-to-day running of the contract.

2.1.12 SUBCONTRACTORS

The appointment of subcontractors shall be subject to the approval of the Engineer.

Proposed subcontractors shall first be introduced to the engineer before he (the subcontractor) commences work. The subcontractor shall have a thorough knowledge of the work to be carried out under his portion of the contract. The engineer will make payments in favour of the main contractor alone. The contractor shall mutually arrange payments between himself and the subcontractor.

The responsibility for communication, standard and quality of workmanship or material remains the responsibility of the main contractor.

2.1.13 HANDLING AND STORAGE OF EQUIPMENT

Payment items have been provided for the storage of equipment either on site or at a location determined by the engineer. These items shall only be applicable if the engineer has confirmed in writing that the equipment is ready to be installed, but that the other work on site has not advanced sufficiently to enable the equipment to be installed.

Facilities for extended storage at site for plant may not always be available and the contractor shall therefore make his own arrangements and at his own cost for any off-site storage which may be required for plant which became available before installation thereof can commence. The contractor must plan his work program so that the site work and factory items correspond to prevent any unnecessary storage.

A layout plan of the site camp must be handed in by the contractor within one week after the start of the project. Equipment shall be stacked in neat rows ie one row for 25x3c and another row for 10x3c Cu Cable. The contractor shall keep the site camp clean and ordered.

The equipment stored on site shall be adequately protected and insured against damage resulting from weather, vandalism, theft, etc. This also applies to tools and equipment required for installation.

The Engineer reserves the sole authority to determine when equipment is damaged and what remedial actions, if any, are required. If the damage is extensive, the equipment shall be rejected and removed from site. Previous payments can then be revoked until the contractor has replaced all such damaged equipment or material.

The contractor shall be responsible for the necessary maintenance of the equipment during the period of storage eg the maintenance of breathers, rotation of gearboxes, etc. All equipment shall, where necessary, be protected against the elements and corrosion.

Should the contractor claim payment of a portion of the value of some or all of the plant and equipment held in off-site stores, the items concerned must be clearly marked: "The property of COT and a certificate from the supplier of the plant or equipment to this effect shall accompany his claim detailing the items and serial numbers included in his claim as well as the street address of the store where the plant material or equipment is held. In addition, a certificate must also be furnished by the company with whom the plant or equipment has been insured in terms of the requirements of the general conditions of contract, in which it is certified that the plant and equipment for which the contractor is claiming payment is fully covered by the

insurance policy concerned while the plant and equipment is stored away from the site (street address of store to be stated).

Payment under this item will be done in terms of the General Conditions of Contract.

The tendered rate shall include for double handling of the equipment, all packing material, insurance, maintenance, repair work where such repair work is not claimed from the insurance, storage costs, corrosion protection, administrative costs, additional transport, etc.

2.1.14 FACTORY TESTING AND INSPECTION

- a) The engineer reserves the right to visit and enter the manufacturer's works during the design and manufacturing stages for the purposes of interim and final inspections and for progress information acquisition. Where the contractor makes use of third parties for the manufacturing and/or procurement of equipment, the contractor shall ensure that this requirement is agreed with the third party.
- b) The engineer reserves the right to be present to witness at all or any of the tests (or, at the engineer's discretion repeats of such tests) conducted on the equipment or plant.
- c) One calendar week's notice of pending tests shall be given to the engineer in writing.
- d) Three copies of all test records are to be submitted to the engineer for approval before the equipment or plant are delivered to site.

2.1.15 INSPECTIONS

The contractor shall give the engineer at least 24 hours notice in writing to inspect, measure, test or commission any section of the works. In the event of the contractor requesting the engineer to inspect, measure, test or commission any sections of the works where the contractor has not completed such sections of the works and is not ready for the engineer to inspect, measure, test or commission the sections of the works or where the testing of the works fails due to the neglect of the contractor to test such sections of the works prior to notifying the engineer to witness the tests, the contractor shall pay the engineer an amount of R200,00 per hour for his travelling time and time spent on site and R1,00 per kilometre for the distance travelled to and from site by the engineer.

The contractor shall furthermore be liable for the engineer's costs as specified above for all inspections, measurements, tests and commissioning that the engineer has to undertake after the expiry of the completion period allowed for in this contract and where no extension of time has been granted.

Previous payments can then be resolved to cover the cost of such inspection.

2.1.16 SECTION COMPLETION

It is a specific requirement of this contract that the contractor shall, after acceptance of his tender, submit a program in accordance to clause 2.1.8 which shall provide completion dates for the section as stated below. These dates shall be the official completion dates for these sections. Each section, when completed, shall be fully functional with all parts of the installation completed, useable and requiring no further work or material.

- a) MV network for the complete area.
- b) The low voltage network must be divided in zones consisting of three minisub areas. State completion dates for these zones.

Completion shall be calculated from the date on which the contractor is advised that his tender is accepted.

2.1.17 SITE TESTING AND COMMISSIONING

- a) The contractor shall be responsible for commissioning all sections of the works and shall perform all of the tasks set out below and as detailed in the relevant standard and detail specifications.

- (i) Prior to any tests and commissioning, all sections of the works shall be carefully inspected by a qualified electrician representing the contractor to ensure that all construction and installation work has been properly completed.
- (ii) Prior notice of and proper arrangements for the commissioning shall be made with the engineer and all contractors and suppliers of equipment which will be affected by the commissioning operation.
- (iii) If plant and equipment, which has been supplied by others, have to be commissioned, the supplier's specific permission thereto, together with any specific requirements relating to commissioning shall be obtained prior to commissioning and the contractor shall arrange that the commissioning shall be attended by a representative of the equipment supplier.
- b) Commissioning and testing on site shall be carried out by experienced qualified personnel under the manufacturer's supervision, and shall be contractor's responsibility.
- c) All equipment necessary for the purpose of the tests must be provided by the contractor and remains the property of the contractor.
- d) All tests and checks to be carried out shall be approved by the engineer prior to the commencement thereof.
- e) All tests and checks are to be recorded in writing. All test certificates and records to be handed to the engineer prior to the "handing over" of the work.
- f) Commissioning
 - (i) Carry out all necessary adjustments to ensure correct operation of the equipment, mechanisms and interlocks.
 - (ii) Adjust all the protective devices to the setting required.
 - (iii) Operate all circuits and check that all interlocks and controls operate correctly. Check that all meters are reading correctly.
 - (iv) Instruct the CoT staff in the operation and servicing of the equipment.
 - (v) Hand over all loose items together with lists of such items and obtain a receipt from the engineer.
 - (vi) Clean all equipment and thoroughly clean plant rooms, substations etc. and leave in neat and tidy condition.
 - (vii) All low voltage networks shall be checked and tested as set out in clause 2.9.6 by an experienced qualified person provided by the contractor prior to commissioning.
 - (viii) Medium voltage cable networks shall prior to commissioning be tested and phased between mini subs by an experienced qualified person provided by the contractor as set out in clause 2.7.7.

When phasing into the existing network is required, the contractor will arrange with the CoT test department to test the installation. The contractor will pay all test fees as requested by the CoT. Any faults found by the CoT electrical test department will be the responsibility of the contractor to repair. A fee for the retest will be payable by the contractor.

2.1.18 HANDING OVER

The handing over of completed sections of the works to the CoT and the energizing/- putting into operation of the completed sections of the works will only take place once the following documents and drawings have been submitted to the engineer:

- A certificate of compliance in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act of Factories, Machinery and Building Works Act, whichever is applicable.
- A certificate issued by the contractor that the installation complies with the contract and specifications.
- A certificate of acceptance which shall be specified and signed by the engineer after the inspection, acceptance and approval of the completed sections of the works has taken place.
- "As-built" drawings, signed by the contractor, of the completed installation.
- Written application to energize the completed sections of the works.

- The payment of all outstanding service fees as required by the COT.
- The payment or setting of all outstanding claims for service damage by the contractor from any third party.

The contractor shall be responsible for timeously arranging all tests and inspections with the engineer, submitting the necessary documents and drawings to the engineer and applying for the energizing of the completed sections of the works.

2.1.20 OPERATING AND MAINTENANCE MANUALS

2.1.20.1 Submission of Manuals

- a) A complete set of Provisional Operation and Maintenance manuals shall be handed over to the engineer at least one month before any commissioning tests commence. The manuals will be checked by the engineer and returned to the contractor with comments. The contractor shall make the necessary changes and amendments to the manuals to incorporate the engineer's comments in the manuals.
- b) Portions of the information required in terms of this section may only be omitted with approval of the engineer.
- c) After the Operation and Maintenance manuals have been approved by the engineer, four sets of the manuals shall be provided by the contractor for distribution by the engineer.
- 4) On completion of the contract, all drawings required for the manuals shall be prepared and included in the manuals as specified.

2.1.20.2 Format of the Manuals

- a) Physical appearance
 - (i) Manuals shall be bound in hard cover lever-arch files with plastic coatings. The files shall be clearly labelled on the outer front cover and on the edge with the following information:
 - The contractor's name (logo optional)
 - The project title
 - The title "Operation and Maintenance Manuals"
 - The month and year during which the manuals are finally handed over to the engineer.
 - (ii) Pamphlets and bound leaflets/booklets from suppliers shall be placed in plastic sachets, especially if they are of non-standard size.
 - (iii) Large format drawings shall be folded and placed in plastic sachets such that they can be easily removed.
 - (iv) Systems and/or functional units on the site shall be treated as units in the manuals, even if different types of the equipment occur on such units. Cross-referencing may be used.
- b) Contents

The manual shall contain the following:

- (I) Title page
- (ii) Contents list
- (iii) List of drawings and appendices
- (iv) The main body of manual divided into sections with each section covering a system and/or functional unit. Each of these sections shall contain the following:
 - (1) Title page
 - (2) Contents list
 - (3) Technical description and specification of the system / functional unit.

- (4) Operating instructions for the system / functional unit. These operating instructions shall include clear instruction for the procedures to be followed during starting and stopping of the system and shall include all operating requirements as well as all safety procedures.
- (5) Technical description and specification of the components /equipment making up the system / functional units. This description and specification shall include the following:

Plant tag numbers, technical description, drawings, design details, operation curves, range of operation limits, materials of construction, installation procedures, limits of misalignment, power output, supply requirements and noise and vibration specification.
- (6) System maintenance requirements, which shall be presented in a single maintenance schedule which shall clearly identify all daily, weekly, monthly and running hour based maintenance requirements. A similar schedule is required for each major piece of equipment. The maintenance schedule shall be supplemented by full maintenance instructions.
- (7) Schedule of spare parts and consumable. This schedule shall contain the following minimum information:

Specification and illustration where necessary, correct identification of components for ordering replacements, alternative manufacturer details, supplier details and an alternative supplier detail.
- (8) Erection, installation and commissioning instruction.
- (9) As-built circuit and layout paper print drawings.

2.1.21 MATERIALS / SPARES

At project planning and quotation stage, the contractor shall submit a detailed list of items for activities to be performed in delivering the project before the implementation. The Project Manager and contractor shall compile a list of materials required to execute the project.

2.1.22 MEASUREMENT AND PAYMENT

1.22.1 Services of a land surveyor

<u>Item</u>	<u>Unit</u>
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1.22.1.2 Stand pegs	Each
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The unit of measurement shall be a number of stand pegs. The land surveyor will be used when stand pegs cannot be found and it is necessary to install services only when approved by the Engineer.

<u>Item</u>	<u>Unit</u>
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1.22.2 Storage of equipment where storage space is provided by:

1.22.2.1 The contractor	month
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The unit of measurement shall be per month.

The tendered rate shall include full compensation for all double handling of the equipment, all packing material, insurance, maintenance, repair work where such repair work is not claimed from the insurance, storage costs, corrosion protection, administrative costs, additional transport, etc of the equipment as specified.

<u>Item</u>	<u>Unit</u>
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1.22.7 Remove and return redundant material to COT stores	per km
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In upgrading projects this item must include for all the old material that was removed, like overhead lines, streetlights, etc. This item must also include for labour and all material which COT paid for after the installation is completed. The item must include for loading, transport, off-loading at stores, etc. The vehicles classification are as follows; Light vehicle of mass of up to 3500 kg, Medium Vehicle of mass of 3501 kg to 9000 kg and Heavy Vehicles of mass of 9001 kg and over.

<u>Item</u>	<u>Unit</u>
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1.22.9 Training of local labour (10% work force)	per person
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The unit of measurement shall be per person

The payment unit tendered shall include full compensation for a competent person to give training to local labourers (line workers) which must include the proof from the company indicating that the person has been trained.

<u>Item</u>	<u>Unit</u>
1.22.10 Community Liaison Officer (CLO)	per month

The unit of measurement shall be a monthly salary of the Community Liaison Officer paid at first notch of CoT T7-1 salary scale.

The payment unit shall include full compensation for a Community Liaison Officer's monthly salary. Community Liaison Officer's hourly rate must be per hour and monthly hours must not exceed 176 hours per month. The contractor must approve a daily timesheet for the Community Liaison Officer which means that the contractor will only claim for the hours that the Community Liaison Officer was on duty.

STANDARD SPECIFICATIONS

SECTION 2

CONTRACTOR'S ESTABLISHMENT ON SITE

CONTENTS

2.2.1 SCOPE

2.2.2 SITE REQUIREMENTS

2.2.3 NOTICES, SIGNS AND ADVERTISEMENTS

2.2.4 CLAIMS FOR EXTENSION OF TIME OR FINANCIAL CLAIMS

2.2.5 MEASUREMENT AND PAYMENT

2.2.1 SCOPE

This specification covers all work and costs involved in the establishment of the contractor's organisation, camp and plant on the site and the removal thereof after completion of the contract. Payment for the contractor's general obligations, liabilities and risks which are not covered elsewhere, is also provided for in this section.

2.2.2 SITE REQUIREMENTS

MINIMUM REQUIREMENTS FOR CONTRACTOR'S SITE ESTABLISHMENT

To ensure professionalism and to advance service delivery every service provider is required to adhere to the following minimum requirements, where a site establishment is required for the project. Not all projects require site establishment. The Project Manager shall determine if there is a need to have a site established for the project.

Structures:

- Site camp location to be approved by ward councillor.
- Site camp minimum of 400m². Must be fenced off with sound material & 6m opening gate.
- 1 x Office container & 1x Material container
- Boardroom container and Air-condition
- Adequate lighting
- Ablution facility

Occupational Health and Safety:

- No 85 of 1993: Occupational health and Safety Act will apply
- Construction Regulations 2014
- Sections 7(1)(b); 11; 24; 25; 27; 28; 29; 30
- Site establishment to be included in risk assessments.

Security:

- Service provider to be liable for guarding and protection of site camp and material.

General:

- Office container should be fully furnished as meetings will be on site on a regular basis.
- Designs drawings should be fixed and visible at all times in the office container.
- A project sign board should be fixed at the main entrance gate.
- Ablution facility

The service provider must ensure that all of the above are covered in his/her pricing

a) Camps, personnel and plant

The contractor shall establish his construction camp, including all accommodation, maintenance and testing facilities necessary for his personnel, plant, stores, process control etc. on the site.

Accommodation must comply in all respects with the requirements of CoT who shall have free access at all times for inspection purposes.

The contractor shall also move all necessary personnel and plant to the site preparatory to starting work, and from the site after completion of the work, leaving the camp clean, tidy and free from obstructions. All buildings as well as the whole camp area and fencing shall be maintained during the contract.

The contractor shall provide and maintain suitable facilities within his office complex for the holding of site meetings. This will include a table and ± 8 chairs.

The positioning and layout (including information such as site office position and storage areas for different materials) of the camp on the site shall be shown on a drawing subject to the approval of the engineer. This must be handed in two weeks after letter of acceptance.

The contractor shall install a rain meter in the site camp with a logbook to record information such as quantity of rain (mm), date and time etc.

b) Tidiness of camp

If the camp is not tidy or not laid out according to the drawing, a site instruction will be given to rectify this within one week.

Off loading of cable drums shall be in such a way as to arrange cables of the same size together ie 10mm² x 3 core shall be in one row and 25mm² x 3 core in another row etc.

Drums provided by CoT remain the property of CoT and the contractor must include in his tender amount for delivery of these drums to CoT stores after completion of the contract (or during the contract period).

The contractor shall also make suitable arrangements to protect the property of CoT ie MV cable off cuts must be capped.

c) Legal relations and responsibility to the public

The contractor shall take steps necessary to comply with the terms of the General Conditions of Contract, particularly in respect of the insurance, guarantees and indemnities required, and shall comply with all the regulations of the CoT.

d) Delivery Notes

The contractor shall keep a file of all the delivery notes. If the contractor arranges material from his stores, suitable delivery notes must be supplied. The file must be maintained throughout the contract period and must be arranged in sections for the different materials.

e) Facilities

Temporary removable and chemical latrines (long drops are not allowed) shall be provided by the contractor. One latrine shall be provided for every 15 people.

2.2.3 NOTICES, SIGNS AND ADVERTISEMENTS

The contractor shall not erect any notices, signs or advertisements on or near the site without the written approval of the engineer.

As part of his general obligations, the contractor shall erect the official name board(s), the details of which are shown on the drawings. The name board(s) shall be erected in the position(s) indicated by the engineer.

All signboards, notices, the official name boards(s) and advertisements shall be removed by the contractor on completion of the works or by the end of the maintenance period, as may be directed by the engineer.

2.2.4 CLAIMS FOR EXTENSION OF TIME OR FINANCIAL CLAIMS

Payment for this item falls under 2.5.1.2.

The contractor must hand in a written claim (financial or time extension) within 14 days after the event that caused the claim. The contractor must make due allowance for this in his contract under item 2.5.1.2 and must include for salary of liaison officer(s), all labourers and any cost that may be incurred as a result of extension of time.

2.2.5

MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
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2.5.1 Contractor's establishment on site

2.5.1. 1. Fixed charges	per m ²
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The tendered rate shall include full compensation for the establishment of contractor's Site and the unit rate shall be in square meter of the area of the site.

2.5.1.2 Time-related charges	per day
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Payment of the amount tendered under sub items 2.5.1.1 and 2.5.1.2 shall, for the two items together, be full compensation for all the contractor's charges in respect of the following items, collectively termed the "contractor's establishment on site":

- (i) Setting up and maintaining his organisation, camp, accommodation, all types of equipment and plant on site, the supply of water and power, the supply and erection of temporary latrines, all other services and camp site fencing and for the removal thereof on completion of the contract.
- (ii) Effecting the insurance and providing the guarantees and indemnities required.
- (iii) All site and head office overheads, profit, finance costs, risks, legal and contractual responsibilities and other costs and obligations of a preliminary and general nature which are not specifically measured for payment under any other items of payment.

<u>Item</u>	<u>Unit</u>
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2.5.3 Sign Board	Each
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The contractor must allow for delivery, off-loading, erection and all material for the sign board.

STANDARD SPECIFICATIONS

SECTION 3

MINIATURE SUBSTATIONS

CONTENTS

2.3.1 SCOPE

2.3.12 TESTING AND COMMISSIONING

2.3.13 MEASUREMENT AND PAYMENT

2.3.1 SCOPE

This section covers the installation of miniature substations.

2.3.12 TESTING AND COMMISSIONING

a) General

The contractor shall be responsible for the complete testing of the installation as defined herein. All test equipment shall be provided by the contractor and shall remain his property.

b) Site Testing and Commission after Installation

An individual record sheet will be supplied by the CoT at Commissioning and shall be completed for each mini-sub. The items on the record sheet shall be carried out in the presence of the engineer or CoT and a responsible person representing the contractor.

The following tests shall be required on site:

i) 11kV Switchgear

- All ring main switches, transformers, earth switches, pad lockable shutters, interlocks and cable test facilities are to be operated to check for current functioning.
- The transformer fuses are to be checked and their correct rating verified and recorded.
- The tank is to be filled with oil to SANS 555 and the oil level checked. The breakdown voltage of the oil is to be tested and recorded in accordance with IEC156 before filling. A minimum value of 40kV is to be achieved.
- Ascertain that the labelling on the ring main switches agree with the physical interconnections and drawings.
- With the transformer isolated and RMU connected, the cables shall be tested through RMU using a DC test voltage, as specified in SANS 1339, for 15 minutes between phases and earth, on a "Two up, one down" basis.
- The phasing of the HT cables at switchgear terminations to insure correct phases and colours.
- All switching operation shall be done only by COT according to standard specifications.

ii) Transformer

- Check oil level
- Operate switch to check for correct functioning. The tap switch is to be adjusted to achieve 400V line voltage after energizing.
- Insulation resistance between phase and earth of all windings. A one minute test using a DC insulation tester shall be carried out at the following voltages:

LV windings	:	1000V DC
HV windings	:	5000V DC

- After energizing, the transformer terminals shall be tested to check phase rotation which shall be as specified in the project specification.

iii) Low Voltage Compartment and Low Voltage Equipment

- Check all circuit breakers for correct operation. Set any adjustable overloads and record setting.
- Check all connections for tightness before energizing.
- Check voltmeter selector switch for correct functioning.
- Check ammeters, CT ratios and phase colour markings. CT ratios and name plates shall be clearly visible without having to remove any panels in the LV compartment.
- The LV busbar system and connections shall be tested at 1000V DC to earth on "two up, one down" basis. Any voltage sensitive equipment likely to be damaged during such tests must be disconnected.
- The co-ordination between the labelling and external cabling is to be verified by individual energizing and testing of the live remote end.
- All outgoing feeder cable to be meggered (1000V) before any switching commence.

2.3.13 MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
3.13.1 Install the miniature substations, T3 or T4 (Ring main units)	Each

The unit of measurement shall be the number of miniature substation installed.

The tendered rate shall include for the transporting, handling, installing, testing, and commissioning to site of the mini substation, T3 or T4 unit. The rate shall furthermore include for the excavation, backfilling compacting, cleaning around the minisub numbering of minisub, all feeder labelling and all material needed to complete the installation to the specification. Separate items shall be scheduled for the different type and size of mini substation, T3 or T4 units.

<u>Item</u>	<u>Unit</u>
3.13.2 Recover the miniature substations, T3 or T4 (Ring main units)	Each
The unit of measurement shall be the number of miniature substation recovered	

The tendered rate shall include for the removing, decommissioning, handling, transporting, from site of the mini substation, T3 or T4 unit to CoT storage areas. The rate shall furthermore include for the excavation, backfilling compacting, cleaning around the minibus/RMU and all

material needed to complete the recovering. Separate items shall be scheduled for the different type and size of mini substation, T3 or T4 units.

<u>Item</u>	<u>Unit</u>
3.13.4 Install the miniature substations, T3 or T4 (Ring main units) plinth	Each

The unit of measurement shall be the number of miniature substations plinths supplied.

The tendered rate shall include full compensation for the handling, off-loading, installing, and/or casting of the complete plinth including top and under-base, PVC sleeves, sealing of the plinth, and the cleaning of the site.

The rate shall furthermore include for all excavations, backfill and earthworks to complete the installation.

<u>Item</u>	<u>Unit</u>
3.13.5 Recover the miniature substations, T3 or T4 (Ring main units)	Each

The unit of measurement shall be the number of miniature substation recovered

The tendered rate shall include for the removing, handling, from site of the complete plinth including top and under-base, PVC sleeves and transporting to CoT storage areas. The rate shall furthermore include for the excavation, backfilling compacting, cleaning around the complete plinth including top and under-base, PVC sleeves and all material needed to complete the recovering.

<u>Item</u>	<u>Unit</u>
3.13.6 Install LV Circuit Breakers	Each

The unit of measurement shall be the number of LV Circuit Breakers installed.

The tendered rate shall include full compensation for the delivery to site, handling and installation of the circuit breakers and accessories.

<u>Item</u>	<u>Unit</u>
3.13.7 Recover LV Circuit Breakers	Each

The unit of measurement shall be the number of LV Circuit Breakers recovered.

The tendered rate shall include for the removing, handling, from site of the circuit breakers and accessories and transporting to storage areas.

STANDARD SPECIFICATIONS

SECTION 4

OVERHEAD SWITCHGEAR AND EQUIPMENT

CONTENT

- 2.6.1 SCOPE
- 2.6.2 RELEVANT STANDARDS AND REGULATIONS
- 2.6.3 EXPULSION FUSES
- 2.6.4 INSULATING LINKS
- 2.6.5 LIGHTING SURGE ARRESTORS
- 2.6.6 FAULT PATH FINDERS
- 2.6.7 AUTO RECLOSERS AND SECTIONALIZERS
- 2.6.8 MEASUREMENT AND PAYMENT

2.6.1 SCOPE

This specification covers the installation of the overhead switchgear and equipment.

2.6.2 RELEVANT STANDARDS AND REGULATIONS

- a) Occupational Health and Safety Act No 85 of 1993 and regulations of the Republic of South Africa.
- b) Electricity Act, No 41 of 1987 of the Republic of South Africa
- c) The code of Practice for Overhead Power Lines for Conditions Prevailing in South Africa

d)	SANS		
	833	:	High and low voltage bushings
	166/167	:	Insulators for lines
	178	:	Insulators and conductor fittings
	763	:	Hot dip galvanised
e)	BS		
	162	:	Electric power switchgear and associated apparatus
	223	:	Isolator Bushings
	3288	:	Insulator and Conductor fittings
f)	NRS		
	031	:	Alternating current disconnectors and earthing Switches
	036	:	Auto recloser and SECTIONALIZERS (pole mounted)

2.6.3 EXPULSION FUSES

The expulsion fuse units or drop out fuse units shall be of the outdoor, single phase, single break type suitable for vertical mounting on channel iron or galvanized steel cross arm.

The expulsion fuse units shall be operated by standard operation telescopic stick (Linkstick) to switch, open, remove, replace and reclose the fuses or units. Each unit shall consist of the following:

- * Hot dipped galvanized mounting bracket with galvanized fixing bolts washers and nuts
- * Insulator assembly manufactured from high quality glazed porcelain
- * Spring loaded contact assembly. Positive spring action shall cause the ejection of the fuse holder from the contact points under fault conditions.
- * Fuse holder consisting of an insulated cartridge and the specified fuse element (rating specified in project specification)
- * The unit shall be suitable for the connection to ACSR bare conductors
- * The high interrupting rating fault clearance of up to 20kA.

The expulsion fuse units shall be equal or similar approved to Cullinan type: AH1069 or AH1072

The fuses element shall be specified in the project specification.

2.6.4 ISOLATING LINKS

The links shall be of the outdoor, single phase, single break type suitable for vertical mounting on a channel iron or galvanized steel cross arm.

The links shall be operated with link stick, each unit shall consist of the following:

- * Hot dip galvanized mounting base complete with galvanized fixing bolts, washers and nuts.
- * Insulator assembly manufacture from high quality glazed porcelain

- * Hot dip galvanized retaining latch
- * Large galvanized operating ring
- * Non-ferrous parts shall be plated to protect against corrosion
- * The links current rating of 400 amps and a short circuit capacity of up to 350MVA for 3 seconds
- * The links shall be suitable for the connection of ACSR bare conductors. Allow enough space for easy installation and smooth operation.

2.6.5 LIGHTING SURGE ARRESTORS

The surge arrestors shall be the outdoor, single phase type and shall withstand a service cycle test of 10kVA and an internal fault current of 16kA in accordance with IEC 99. The arrestors shall be designed to be mounted on poles, cross arms and transformers by a galvanized steel bracket, bolts, washers and nuts.

The arrestors shall be connected to the overhead conductors by the same size and type of overhead conductor in use and terminated to the overhead conductor with the suitable parallel groove clamps.

Surge Arrestors shall be placed on all the phase conductors at the following points in addition to those specified in the project specification.

- * on the transformer tank or/and as near as possible to the transformer terminals
- * at every cable termination on the overhead line
- * at every line sectionaliser or recloser (supply and load)
- * At every HT-meter point (ct/vt unit)
- * the arrestors shall be mounted below the overhead conductor to reduce the length of the discharge

The surge arrestors earthing shall comprise out of a 7,35mm galvanized steel down wire with lugs, clamps and staples. The down wire shall be stapled 500mm apart to the pole 300mm below ground level and be connected to an earth rod (1,5m) with clamps. The earth resistance of the lighting surge arrestors earth shall be below 50 ohms. The contractor shall test the installation and handover test certificates to the engineer.

2.6.6 FAULT PATH FINDERS

The pathfinder unit shall be of the outdoor, pole mounted type and comply with the following requirements:

- * Overhead line earth fault passage indicator that will respond to phase to phase faults
- * Identifies the fault passage and alarms with high intensity gas flashing light (for day and night)
- * Resets automatically when the line is re-energized
- * Separate red disc indicator to give visual indication if line remains dead for longer than the reset period.
- * Replaceable long life batteries (up to 10 years, maintenance free)
- * Adjust sensitivity automatically according to the load value and balance.
- * Must have rechargeable batteries and remote indication

The pathfinder must be suitable for permanent installation at 2 metres below the overhead conductor one pole away from every T-off point as specified in the project specification.

The pathfinder shall be mounted with UV-resistant cable ties according to NRS 020.

2.6.7 AUTO RECLOSERS AND SECTIONALIZERS

The Auto reclosers and SECTIONALIZERS shall be pole mounted according to NRS 036-1.

Auto reclosers to be equal or similar approved to VR-3S Recloser with the following technical specification.

Ratings:

- Nominal system voltage : 11kV
- Rated maximum votage : 15,5kV
- Rated continuous current : 560 amperes
- Rated short circuit breaking current : 12kA
- Rated making current : 32kA peak
- Rated frequency : 50Hz
- Rated impulse withstand voltage : 110kV
- Power frequency withstand, dry : 50k Vrms
- Power frequency withstand, wet : 45k Vrms
- Bushing creepage distance : 450 mm
- Bushing strike distance : 267 mm
- Phases : 3 phase
- Materials : Vacuum interrupter encased in polyurethane
Steel housing
No gas or oil
- Sensors : Encapsulated in polyurethane and sized not to saturate
at the rated fault currents
- Operating temperature : 40°C to 70°C.
- Ability to record the last 32 faults.
- Ability to record the last 128 operations.
- Choice of curve standards: ANSI, IEC, Recloser and User programmable custom

- curves
- Setting group options : User programmable, with local or remote switching
- Protective functions:
 - Phase time overcurrent protections (51P)
 - Phase instantaneous overcurrent protection (50P-1, 50-2, 50P-3)
 - Ground overcurrent protection (51N)
 - Ground instantaneous overcurrent protection (50N-1, 50N-2, 50N-3)
 - Negative sequence overcurrent protection (46)
 - Phase and ground directional overcurrent protection (67P, 67N)
 - Two independent steps for loadshed, restoration and over frequency (815, 81R, 810)
 - Under voltage and over voltage control and alarm (27/59)
 - Multishot reclosing
 - Adaptive reclosing shots: each step in reclose sequence allows independent programming of protective functions
 - Sensitive earth fault protection with directional features.
- Preprogrammed adaptive protection
 - Zone sequence coordination
 - Cold load pick-up
 - Automatic reclose blocking.

2.6.8 MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
6.8.2 Install expulsion or dropout fuse units	set

The unit of measurement shall be the complete set of (3) three fuse units installed.

The tendered rate shall include full compensation for the delivery to site, handling and installation of the fuse units and holders.

<u>Item</u>	<u>Unit</u>
6.8.6 Install insulating units and links	set

The unit of measurement shall be the number of the complete set of (3) three insulating units and links installed.

The tendered rate shall include full compensation for the handling and installation of the insulating units and links complete, including all equipment and material to complete the installation.

<u>Item</u>	<u>Unit</u>
6.8.8 Install Lighting surge arrestors	Set

The unit of measurement shall be the number of complete sets of (3) three lighting surge arrestors installed.

The tendered rate shall include full compensation for the handling and installation of the complete set of lightning surge arrestors, including all equipment and material needed to complete the installation.

<u>Item</u>	<u>Unit</u>
6.8.10 Install surge arrestor earthing	Each

The unit of measurement shall be the number of complete surge arrestor earthing installed.

The tendered rate shall include full compensation for the handling and installation of the surge arrestor earthing including all equipment and material needed to test and complete the installation.

<u>Item</u>	<u>Unit</u>
6.8.11 Install/Construction of KFME structure	Each

The unit of measurement shall be the number of KFME installed.

The tendered rate shall include for the transporting, handling, installing, testing, and commissioning of KFME on site. The rate shall furthermore include for construction of either a 2 pole or 4 pole structure, cleaning around the KFME structure, numbering of KFME and all material needed to complete the installation to the specification.

<u>Item</u>	<u>Unit</u>
6.8.12.1 Install overhead Transformer	Each

The unit of measurement shall be the number of Transformers installed.

The tendered rate shall include for the transporting, handling, installing, testing, and commissioning of transformers on site. The rate shall furthermore include for construction of transformer structure, cleaning around the transformer structure, numbering of the transformer and all material needed to complete the installation to the specification.

<u>Item</u>	<u>Unit</u>
6.8.12.2 Recover overhead Transformer	Each

The unit of measurement shall be the number of Transformers recovered.

The tendered rate shall include for the removing, handling, from site of the overhead transformer and transporting to CoT storage areas. The rate shall furthermore include for all material needed to complete the recovering.

<u>Item</u>	<u>Unit</u>
6.8.13 Install LV pole mounted Distribution Box	Each

The unit of measurement shall be the number of LV pole mounted Distribution Box installed.

The tendered rate shall include for the transporting, handling, installing, all necessary connections, and inspections in the LV pole mounted distribution box. The rate shall furthermore include for construction of LV pole mounted distribution box structure, numbering of the LV pole mounted distribution box and all material needed to complete the installation to the specification.

Item

Unit

6.8.15 Install galvanized steel-cross arms

Each

The unit of measurement shall be the number of steel cross arms installed.

The tendered rate shall include full compensation for the transporting, handling and installation of the galvanised steel cross arms complete including all equipment and material needed to complete the installation.

STANDARD SPECIFICATIONS

SECTION 5

MEDIUM VOLTAGE CABLE NETWORK

CONTENTS

2.7.1 SCOPE

2.7.4 EXCAVATIONS

2.7.5 INSTALLATION OF CABLES

2.7.6 JOINTING AND TERMINATION OF MV CABLES

2.7.7 TESTS BEFORE ACCEPTANCE

2.7.8 INFORMATION REGARDING THE COMPLETED NETWORK

2.7.9 CLEARING OF SITE

2.7.10 MEASUREMENT AND PAYMENT

2.7.1 SCOPE

This section covers installation of medium voltage cables.

2.7.4 EXCAVATIONS

For all excavations, the unit rate shall include traffic accommodation tools and safety tools which are not limited to safety fence with reflective layers, safety signs, cones and flags.

a) General

The contractor shall preserve the site as far as possible. Only the minimum of trees, shrubs, rocks and sand shall be removed and cleared for the cable route. Where surplus material has to be disposed of the contractor shall dump the material in the area provided for him.

The contractor shall at his own cost load and transport to the abovementioned site all surplus or unsuitable material for backfilling etc.

b) Trench routes

The cable trench shall be excavated along the routes indicated on the relevant drawings.

The trench shall be absolutely straight and shall comply with all requirements. The engineer shall determine the length of the trench to be excavated, which shall not exceed 700 m at one time, before the cable is installed and the trench backfilled.

If any obstacle or interference should be encountered which may require alterations to the trench or routes, such alterations shall receive prior written approval from the engineer before alterations commence.

c) Cable trench

The trench shall be excavated to a depth below final ground level of 1100mm and 600mm wide for all MV cables.

The contractor shall excavate by hand where he cannot excavate by means of machines due to limited access and in the proximity of other services.

The bottom of the trench shall be level and shall follow the contours of the final ground level. Where the excavation is in excess of the required depth, the excavation shall be backfilled and compacted with suitable material to the required depth.

The contractor shall trim the trenches and clean up the bottom of the trenches after he has completed the required excavation.

Bedding and cables shall not be laid until the trench has been approved by the engineer. Where bedding has already been laid the engineer may instruct the contractor to demonstrate that the minimum thickness of bedding has been provided for before authorizing cable laying to proceed.

The contractor shall remove all sharp projections which could damage the cable where the trench is excavated through rocky formations, and shall remove all loose rocks, material, etc from the bottom of the trench.

d) Excavation of joining chambers

Joining pits shall be excavated to a depth of 1,2 m and shall be rectangular in shape and large enough for the cable jointers to work comfortably and in an efficient manner. Where more than one joint is to be made in the same position the joint pit shall be larger and long enough to allow staggered joints to be made. The minimum size of a joint pit shall be as follows:

-one joint	: 3 m long x 2 m wide x 1,2 m deep
-two joints	: 6 m long x 2 m wide x 1,2 m deep

e) Excavated material

No excavated material shall be left closer than 300 mm from the side of the excavation. The excavated material which is considered by the engineer to be suitable for bedding material for the cable shall be placed separately on one side of the trench so that it is available when required. The excavated material shall take up as small an area as possible with the safety of the public, workmen and Works taken into consideration.

f) Inspection and measurement of excavations

Once the excavations for cable trenches and joint pits have been completed, the contractor shall give the engineer 24 hours notice to inspect the trench and to be present when the measurements are made. No inspections shall be undertaken on Saturdays, Sundays and public holidays and after 14:00.

Full detail of the cable trench dimensions and classification of the type of excavation shall be recorded and signed by the contractor's representative and the engineers as the final quantities for payment of excavations.

Inspections and recordings shall be completed before the installation of any bedding or backfilling and the contractor shall be responsible to keep all records as proof of progress. These records shall be checked by the engineer who will issue a site instruction to the contractor and will be used as a basis for claims for payments

g) Maintenance of excavation

The contractor shall maintain the excavation in a good condition, free of water, mud, loose ground, rocks, stones, gravel and other strange material until the cables are installed and the excavation is backfilled and compacted.

2.7.5 INSTALLATION OF CABLES

a) Sand bed for cables

A sand bed layer of soft soil shall be installed and levelled at the bottom of each trench after the trench has been approved by the engineer, and prior to cable laying.

The minimum thickness of the sand bed layer is 100 mm.

If the material that has been excavated is not suitable to sift for the sand bed layer then suitable soil shall be imported for this purpose. The cost thereof shall be included in the unit price for the excavation unless otherwise specified. An adequate quantity of soil similar to the sand bed material shall be available next to the excavation for the sand cover before an inspection of the cables is called for. The sand cover for MV cables shall be a minimum of 300 mm thick and shall be placed directly after the cable(s) has been inspected and approved by the engineer. If the soil for the sand bed and sand cover has to be sifted, a sieve with holes not larger than 10 mm shall be used. Contractor to provide enough sieves to cover the cable length in one day.

b) Cables shall be laid without delay

The cable shall be laid at 1m below final ground level, after the completion of the trench, be laid with the minimum of delay so that the trench can be backfilled the same day. The contractor shall, however, not backfill the trench until each length of cable has been inspected and approved by the engineer. Prior segments of the inspection shall be done by the contractor not to delay backfilling.

The service position shall be as specified in the project specification or as detailed on the standard services drawing.

c) Laying of cables

The method to be used for laying cables shall be approved by the engineer prior to the commencing of the laying of the cables.

Cable rollers shall be used when cables are drawn into trenches. The cable rollers shall be placed so that the cable does not touch the bottom or the sides of the trench. The rollers shall be of an approved construction without any sharp metal parts which could damage the cables.

If the contractor intends using a winch to draw the cable into the trench, a approved cable stocking shall be used or the draw wires shall be soldered to the cable so that the tension is exerted on all the cores, lead sheath and/or steel wire armouring at the same time. No vehicle/tractor or truck may be used to draw the cable into the trench.

The maximum tension on a cable during laying operations shall not exceed the value specified by the manufacturer, these tension scales and tables shall be approved by the engineer prior to the installation of the cable.

Should the engineer not be satisfied with the manner or method employed to lay the cable he shall have the authority to instruct the contractor to lay the cable by hand or in accordance with approved standards.

The medium-voltage cables shall be laid in such a manner that the beginning of a drum shall be laid from the end of the previous drum to ensure that the lay of the cores remain the same. Medium-voltage cables shall overlap by at least 1 m, but not more than 1,5 m at each joint. In cases where the MV cable should be jointed, provision must be made for slack in the joining chamber (snake).

Sufficient lengths of cable shall be left at the beginning and end of the cable routes to allow for the termination of the cables. Where necessary the engineer shall decide on what length of cable is to be left. The contractor shall take the necessary precautions to protect the cable ends until they are terminated. The cable ends shall be sealed by means of lead and heat shrink sealing caps to ensure that the cable is waterproof. Where the end seal is damaged with the installations, the contractor shall redo the sealing of the lead end cap the same day.

Where cables are drawn through sleeves, care shall be taken that they are not kinked or excessively bent. No bend in a cable shall have a radius less than the minimum bending radius specified by the cable manufacturer.

The contractor shall keep accurate records of each length of cable laid. The following information shall be recorded:

- Cable drum number
- Size of cable
- Laid from where to where (stand numbers)
- Length of cable
- Date laid

The contractor shall be liable for the repair of the cable due to the faulty manufacture of the cable, should this information not be recorded directly after the cable has been laid.

Every cable shall be marked by means of a lead label on which the size of cable and its source or destination number is punched. This applies to cables that are not alive and radial ends. Off cuts to be sealed.

d) Verification of cables

The contractor shall be solely responsible for inspecting all cables before backfilling to ensure that the correct type, size and number of cables have been installed.

The engineers shall inspect all cable trenches before backfilling to ensure that the laying of cables complies with the specification.

During this inspection the contractor's and engineer shall record the lengths for all cables and all such records shall be signed by both representatives as the final quantities. The contractor shall be responsible to keep the records as proof of progress and as basis for claims for payment.

e) Road crossings

The contractor shall approve all crossings with the engineer prior to the crossing. The cable sleeves shall be installed 1,5 m below ground level to avoid damage when the roads are constructed. Tar roads shall only be drilled, prior to approval by the engineer. Unless otherwise specified, two additional sleeves shall be installed for future use at each crossing and shall extend 500mm past both sides of the road or future road.

Sleeves used for crossings shall be straight and undamaged. Bends shall not be allowed in road crossings.

After the installation of the sleeves, the sleeves shall be meticulously backfilled so that no air pockets are left. The trench shall thereafter be backfilled in layers of 300 mm and compacted with mechanical vibrators to the original density.

The contractor shall lay and join the cable sleeves and compact the trench to the satisfaction of the engineer. After installation, the sleeves shall be cleaned and a 2 mm galvanized steel draw wire installed in the sleeves. The type and sizes of the sleeves to be used shall be specified in the project specification.

f) Crossing of other services

Where a cable crosses over other services, the cable shall not be installed at a depth less than 800 mm below ground level and if this is not possible the cable shall be installed underneath the other services, it shall be protected in the prescribed manner by means of concrete slabs. The depth of the cable crossing shall be maintained for one metre on either side of the crossing. No services shall be cut to install cable.

If it is not possible to cross over or underneath a service in the prescribed manner, the matter shall be referred to the engineer for a decision.

The following minimum clearances shall be maintained between electrical cables and other services:(side to side)

	<u>Vertical</u>	<u>Horizontal</u>
GPO Cables	0,5 m	0,5 m
Water pipes	0,3 m	0,3 m
Sewer pipes	0,3 m	0,8 m
Storm water pipes	0,3 m	0,6 m
Other electrical cables	0,15 m	0,15 m

g) Backfilling of trenches

When the cable has been laid, inspected and approved and the sand bed cover as specified in the clause on "Sand bed for cables" has been installed, the trench shall be backfilled with soil containing not more than 40% rock or shale which shall be able to pass through a 10 mm sieve which is approved by the engineer.

Where more than 40%, but less than 70% rock occurs, the contractor shall replace the rock with imported soil. However, should more than 70% rock occur then all the backfilling material shall be imported.

- The contractor may import further stone-free material to the site or sieve the excavated material for sand bedding and cover but payment shall only be compensated for the actual quantity imported material required as determined by the engineer. The quantity of imported material required shall be calculated from the standard trench width specified.
- The excavated material shall be backfilled in layers of 300 mm and shall be compacted to the satisfaction of the engineer. Where necessary the engineer may require a mechanical vibrator to be used for compacting the trench, and tests to be done by specialist contractors.
- The contractor shall maintain the completed sections of the cable trench in a proper safe condition for the duration of the contract. The contractor shall refill and compact the trench where subsidence occurs at his own cost.
- After completion of the work the route of the cable shall be neatly finished off and cleared. All stones bigger than 25 mm as well as all loose organic material and rubble shall be removed.

h) Installation of concrete slabs

Where cables cross other services such as water pipes, sewerage pipes and other cables or where the chance exists that the cable may be damaged as a result of excavation by others, the cable shall be protected by means of reinforced concrete slabs or fibre protection covers. The slabs or covers shall protect the cable for a distance of 500 mm on either side of the crossing.

5) Cable markers

Cable route markers shall be installed where specified to indicate the cable route and positions of cable joints and cable sleeves. The markers shall be buried in the ground on the stand boundary, with the rounded side to the cable, indicating the distance from the boundary to the cable, joint, sleeve, or where the cable crosses a known service, with the top protruding 100 mm above the final ground level. The route marker shall be marked with signal red paint at the top 100mm. Route markers shall be placed at every change in direction and at 300 m intervals on straight runs and where the cable turns or leaves a substation yard.

2.7.6 JOINTING AND TERMINATION OF MEDIUM-VOLTAGE CABLES

i) Jointers approval

The contractor shall provide the engineer with documentary proof that he has qualified, experienced and competent cable jointers in his employ to execute the work to the satisfaction of the engineer.

The contractor's jointer(s) shall thereafter demonstrate to the engineer that he/they are completely conversant with the standard jointing methods by doing a test joint for each type of cable to be installed on the contract.

The test joint may at the discretion of the engineer be a joint which is to be made in the execution of the contract. The jointer(s) shall be permitted to proceed with the jointing should the engineer be satisfied with the test joint and the test joint withstands a

medium-voltage test. Notwithstanding the aforementioned, the engineer may at his discretion require that any one of the joints completed be opened and inspect to determine whether the joints comply with the requirements before the contractor shall be allowed to proceed with the jointing.

The requirements in these clauses shall also apply to all new cable jointers employed during the duration of the contract to do cable jointing on the contract.

No jointer shall commence with a joint or terminations before 7am or after 3pm.

The engineer shall be informed in advance of when jointing is to take place to enable him to inspect or witness the joint.

ii) Jointer equipment and conditions

The jointer shall, before he commences with the jointing, ensure that:

- he has sufficient and suitable material to properly and efficiently complete the joint, including cable bridge pieces
- the joint chamber is the correct size, dry and clean
- all stones, loose ground, sticks, leaves etc is removed from the joint chamber
- the walls and sides of the joint chamber is firm and free of loose ground, stones, gravel etc which could fall into the chamber
- the necessary barriers are made to keep water out of the joint chamber
- the necessary cover is provided over the joint chamber to keep unexpected rain out of the chamber and that enough light and ventilation is provided under the cover
- he has the necessary material to seal off the joint or termination when he has to discontinue jointing or terminating the cable due to unexpected storms or flooding of the chamber which makes it impossible to continue jointing or terminating the cable, irrespective of how far the work has progressed
- he has the necessary ground sheets to line the floor of the joint chamber
- the cable and other materials are dry, undamaged and in all respects suitable for jointing or terminating
- his equipment and tools are at all times dry, clean and absolutely free of ground or moist
- he has all test equipment such as oil, gas etc. to test the cable for moist before jointing commences.
- The engineer reserves the right to stop the jointer from doing any joint or termination due to the neglect of above items.

No jointing or terminating shall commence in rainy weather without the prior approval of the engineer. When the jointer commences with a joint he shall complete the joint before he leaves the site.

The standard phase arrangement shall be observed when connecting up cables in the end boxes. The contractor shall ensure that the prescribed phase arrangement is at all times maintained on the connection terminals of the end boxes. Phasing between mini substations shall be the contractors own responsibility.

The contractor is responsible to ensure that the requirements are carried out by his jointer.

iii) Moisture test (crackle test)

This test shall be carried out before any joint or termination is made.

a) Apparatus and test medium

A clean metal container of adequate capacity and filled with cable impregnating compound or paraffin wax or G38 Insulation oil (the test medium).

b) Test specimen

A 300 mm length cut from the finished cable and having any external coverings, armouring, and metal sheath removed, but with the dielectric left intact and untouched by hand.

c) Procedure

Bring the test medium to a temperature of $130 \pm 5^{\circ}\text{C}$ and maintain it at this temperature throughout the test. Unwind the paper tapes one at a time, holding them at a point close to the cut end of the cable so as not to contaminate the tapes with moisture from the hands, and dip each tape in turn in the hot test medium. Frothing on the surface of the test medium indicates the presence of moisture in the impregnated dielectric and the extent of the frothing is indicative of the quantity of moisture present.

The engineer to be contacted if moist is detected. The cut back method only be used on approval of the Engineer and CoT.

2.7.7 TESTS BEFORE ACCEPTANCE

After the completion of the electrical installation, the contract shall arrange with the test department of the CoT to test the installation in accordance with the requirements of the specification.

The engineer shall have the right to call for or to carry out any additional tests which may be necessary to prove that the requirements of the specification have been met. The contractor shall assist with the conducting of these tests without delay.

All tests shall be conducted in the presence of the engineer and the costs or fees thereof shall be payable by the contractor to CoT prior to testing the works.

a) General

The tests hereinafter described comprises only the site tests and tests before acceptance or handing over of the installation. Where cables and other material are supplied by the contractor the factory or manufacturing tests shall be as specified in the specification.

After the installing and completing of the installation, before the service is taken over, the following tests shall be undertaken. These tests shall form an integral part of the erection, construction or installation of the various items and the costs thereof shall be included in the unit rates for the erection, construction or installation of the various items.

b) Tests on medium-voltage cables

The contractor shall arrange to undertake the following tests in the presence of the engineer before the engineer shall agree to accept any part of the installation. The contractor shall, furthermore undertake any other test the engineer may prescribe to satisfy himself that the work is of an acceptable standard. If these test are done by CoT test department the fees thereof will be payable by the contractor.

(i) Voltage tests

Each section of the cable installation between miniature substations shall be subjected to preliminary voltage or insulation resistance test to prove the insulation resistance.

(ii) Continuity test

The resistance between each core and the lead sheath of the cable shall be measure for each section (between mini subs) while the core and sheath is short circuited at the far end to ascertain if all connections have been correctly made.

All test instruments used by the contractor shall be of a high quality and shall, if required, be calibrated by the SABS or such body approved by the engineer at the cost of the contractor.

(iii) DC medium-voltage tests for PILCSWA cables

Each cable circuit, including joints and terminations, shall be tested by means of a direct current voltage of 17,5 kV between the different cores and 14,5 kV between the cores and the lead sheath or copper tape screen for a period of 15 minutes. The voltage shall be gradually raised to the test voltage and kept there for 15 minutes.

The contractor shall undertake all repairs and replacements at his own costs in the event of the installation failing the abovementioned tests. Re-testing the installation will be at the contractors cost. Note: The testing process of the CoT must be followed by the contractor.

(iv) 10kV DC Sheathing Test

The contractor shall cover the cable with sand bedding (300 mm) and complete 10kV DC Sheathing test to prove correct installation.

(v) Phase Colors

The contractor to test and correct phase colors with a tester in the presence of CoT before commissioning.

2.7.8 INFORMATION REGARDING THE COMPLETED NETWORK

The contractor shall submit the "as built" drawings on which complete information of the installation, cable route, joints, as installed, is indicated after the completion of the installation and before the installation is handed over to CoT.

2.7.9 CLEARING OF SITE

The contractor shall remove everything that he brought onto the site or handled on the site in the execution of the contract as well as all excess excavated material and rubble so as to leave the site in a neat and clean condition to the satisfaction of the engineer after the completion of the contract and after the engineer's approval has been obtained. Any cleaning up work to be done by the contractor, will be allowed for in the excavation rate as tendered.

2.7.10 MEASUREMENT AND PAYMENT

7.10.1 Excavation

<u>Item</u>	<u>Unit</u>
7.10.1.1 Excavate in all materials for trenches, backfill, compact and dispose of surplus material by excavation equipment.	m ³

This rate shall apply to all the excavations.

The unit of measurement shall be the cubic meter of material excavated in trenches, classified according to the depth and width specified listed. The width classification shall be in accordance with the authorized dimensions and the depth of excavation shall be measured to the underside of the bedding.

The tendered rate shall include full compensation for clearing and grubbing the trench areas and the temporary removal of improvements from the line of the trench, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill, keeping the excavations safe, dealing with any surface or subsurface water, measuring, classification and keeping of all records and for separating topsoil and selected backfill material where necessary.

The rate shall furthermore cover the costs of installing the sand bed and sand cover, backfilling, warning tape, compacting and disposing of the surplus material.

<u>Item</u>	<u>Unit</u>
7.10.1.2. Extra over for excavating in hard material	m ³

The unit of measurement shall be the cubic metre of material excavated and classified as hard accordance with the classification set out hereunder

7.10.1.2.	The tendered rate shall be paid over and above the rate tendered for excavation in respect of item in full compensation for the additional cost of excavating in hard material instead of soft material.
	m ³

The tendered rate shall include full compensation for any over break as well as the additional backfilling required, reinstating the trench bottom, and for any other incidentals resulting from over break.

The materials excavated shall be classified as follows for payment purposes:

- a) Hard rock
Material classified as hard rock shall mean such as granite, quartzite, sand stone, solid shale, slate and rock of similar or greater hardness and boulders exceeding 0,75 cubic metre in volume, but more than 70 % of the excavation encountered per cubic metre must comply to size (bigger than 0,75 cubic metre), excavated with the use of pneumatic tools, or blasting.
- b) Soft rock
Material classified as soft rock shall mean rock that can be loosened by hand pick, crowbar wedging or splitting, material such as hard shale, compact "ou klip", stone or material of similar hardness and boulders exceeding 200 mm in diameter but not exceeding 0,75 cubic metre, but more than 70 % must comply to size (smaller than 0,75 cubic metre).

The decision of the engineer as to the classification of the material shall be final and binding and objection as to the classification shall be made before the excavation has been backfilled.

<u>Item</u>	<u>Unit</u>
7.10.1.3 Extra over for excavating by hand	m ³

The unit of measurement shall be the cubic metre of trench material excavated by means of hand for as instructed or authorized in writing by the engineer where the use of conventional excavating equipment is either impractical or likely to cause damage to services, trees or property or where the contractor has to excavate by hand where he cannot excavate by machine.

The tendered rate shall be paid extra over the rates tendered for item 7.10.1 in full compensation for the additional expense of excavating by means of hand labour instead of conventional trenching or excavation equipment.

<u>Item</u>	<u>Unit</u>
2.7.10.1.5	
Extra over for using backfill material obtained from:	
(a) borrow areas	m ³
(b) sources provided by the contractor	m ³

The tendered rate for item 7.10.1.4(a) paid extra over item 7.10.1.1 and shall be in full compensation for the additional cost of excavating and selecting of suitable material and the moving of the material to the backfilling site.

The tendered rate for item 7.10.1.4(b) paid extra over item 7.10.1.1 shall cover the cost of the acquisition of the material and of the disposal of the surplus material resulting from the importation together with all the costs of transporting the material to the site regardless of distance.

The unit of measurement shall be linear length in metre of MV cable installed.

The tendered rate shall include full compensation for the handling, inspection, laying, cutting and testing the cable into the trenches and through sleeve pipes. Cables will be measured linearly over all lengths laid.

The tendered rate shall include full compensation for the handling and removal.

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<u>Item</u>	<u>Unit</u>
7.10.5 Install MV cable joints and terminations	Each

The unit of measurement shall be the number of MV cable joints and terminations installed.

The tendered rate shall include full compensation for the handling, the cost of cutting the cable testing for moisture, fitting the kits and the cost of testing the joints and terminations separate items shall be scheduled for the different cable type and sizes.

<u>Item</u>	<u>Unit</u>
7.10.6 Install MV cable on cable ladder	m

The unit of measurement shall be the length per metre of MV cable installed on cable ladder.

The tendered rate shall include full compensation for the handling, inspection, laying, cutting and testing the cable. Cables shall be measured linearly over all lengths laid. Separate items shall be scheduled each size and type of cable ladder and cable laid.

<u>Item</u>	<u>Unit</u>
7.10.7 Supply earth continuity conductor	m
The unit of measurement shall be the length in metre of earth continuity conductor supplied.	

The tendered rate shall include full compensation for supply, delivery to site the specified earth continuity conductor.

<u>Item</u>	<u>Unit</u>
7.10.8 Lay earth continuity conductor	m

The unit of measurement shall be the length in metre of earth continuity conductor installed.

The tendered rate shall include full compensation for handling and laying the specified earth continuity conductor.

<u>Item</u>	<u>Unit</u>
7.10.9 Terminate and connect earth conductor	Each

The unit of measurement shall be the number of earth continuity conductors terminated and connected.

The tendered rate shall include full compensation for supplying all the material required to terminate and connect the earth continuity conductors and the connecting thereof to the earth bars. Separate items shall be scheduled each size of cable Termination.

<u>Item</u>	<u>Unit</u>
7.10.11 Lay plastic warning tape	m

The unit of measurement shall be the length in metre of plastic warning tape installed.

The tendered rate shall include full compensation for the supply, handling and laying the plastic warning tape.

<u>Item</u>	<u>Unit</u>
7.10.13 Removal of existing medium voltage cable from existing switchgear	Each

The unit of measurement shall be the number of existing MV cable removed from existing switchgear.

The tendered rate shall include full compensation for the disconnection and removal of existing medium voltage cables from existing switchgear and the transport, handling and delivery to COT stores.

<u>Item</u>	<u>Unit</u>
7.10.15 Install cable markers	Each

The unit of measurement shall be the number of cable markers installed.

The tendered rate shall include full compensation for the handling and installing of the cable markers.

<u>Item</u>	<u>Unit</u>
7.10.17 Install Protective slabs	Each

The unit of measurement shall be the number of cable slabs installed.

The tendered rate shall include full compensation for the handling and installing of the concrete protective slabs or fibre covers.

<u>Item</u>	<u>Unit</u>
7.10.18 Expose, cut and re-routing existing cable	m

The unit of measurement shall be the sum to expose, cut and relocate existing cable.

The tendered sum shall include full compensation to expose the length of cable as specified in the project specification by hand, taking all the necessary precautions not to damage the cable, cutting the cable and re-routing the MV cable into the specified miniature substation or switchgear, excavation shall be measured separately.

<u>Item</u>	<u>Unit</u>
7.10.19 Name/Rename MV switchgear in substation	Each

The tendered sum shall include full compensation to remove old name plates (if any); supply and install new name plates; repair/covering of damaged surfaces on switchgear as well as the removal of redundant material.

<u>Item</u>	<u>Unit</u>
7.10.20 Price for handling, loading, and off-loading and transportation of MV cable	per drum

The tendered rate shall include full compensation to load, off-load, handling and transportation of MV cable on 300m drums from CoT store to site (+/- 40 km

STANDARD SPECIFICATIONS

SECTION 6

BARE CONDUCTOR OVERHEAD NETWORKS

CONTENTS

- 2.8.1 SCOPE
- 2.8.2 RELEVANT ACTS, REGULATIONS
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- 2.8.6 MAXIMUM AND MINIMUM WORKING CONDITIONS
- 2.8.7 CROSSING OF SERVICES
- 2.8.8 MATERIALS
- 2.8.9 INSTALLATION
- 2.8.10 MEASUREMENT AND PAYMENT

2.8.1 SCOPE

This specification provides requirements for the erection of high voltage and low voltage power lines.

2.8.2 RELEVANT ACTS, REGULATIONS

All work and materials shall comply with the terms and directions of the latest amendment or addition of the following:

- a) Occupational Health and Safety Act, and Regulations of the Republic of South Africa.
- b) Post Office Act No 44 of 1958 and the requirements of the Department of Posts and Telecommunications.
- c) Electricity Act, No 41 of 1987 of the Republic of South Africa.
- d) The Code of Practice for Overhead Power Lines for Conditions Prevailing in South Africa.

2.8.3 RELEVANT STANDARDS

a) SABS

135	:	Isometric black hexagon bolts, screws, nuts
763	:	Hot dip galvanizing
833	:	High and low voltage bushing
1186	:	Industrial safety signs
1091	:	Colours
166/167	:	Insulators for lines
178	:	Insulator and conductor fittings
182	:	aluminium conductors, steel reinforced, for Overhead power and transmission lines
177	:	Ceramic and glass insulators for overhead lines of nominal voltage greater than 1000V
161	:	Low voltage porcelain insulators
171	:	Low voltage lightning arrestors
753	:	Pine poles and cross-arms for power transmission, low voltage and telephone systems
754	:	Eucalyptus poles and cross-arms for power transmission, low voltage and telephone system

b) BS

2569	:	Zinc metal spraying
4360	:	Weldable structural sheets
5135	:	Metal arc welding of carbon steels
137	:	Insulators for lines
3288	:	Insulators and conductor fittings

c) NRS

016:1992	:	Combined neutral and earth (CNE) on low-voltage distribution systems.
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2.8.4 FACTORS OF SAFETY

Each structure used on this project shall have the following factors of safety:

a) Wooden structures not continually loaded	3,5
b) Wooden structures continually loaded	3,5
c) Line conductors, based on ultimate strength	3,0
d) Insulator units including caps and pins based on minimum working load	3,0

The structures shall furthermore have a factor of safety of 1,5 under a broken conductor condition. No failure or permanent distortion shall occur to any structure when subjected to a load equivalent to 1,5 the maximum unbalanced load due to a broken conductor condition. A broken conductor condition shall be assumed when any one conductor breaks without restriction as to the span in which the condition occurs.

2.8.5 CLEARANCES

The minimum clearances of the conductors of the power lines shall be the following:

MAXIMUM VOLTAGE, KV RMS CLEARANCE PHASE TO PHASE	0 - 1 kV	11kV
Minimum safety clearance	0,15m	0,20m
Above ground outside townships	4,9m	5,1m
Above ground in townships	5,5m	5,5m
Above roads in townships, proclaimed roads outside townships and railways	6,1m	6,3m
To communication lines, other power lines or between power lines and cradles	0,6m	0,8m
To buildings, poles and any structures not forming part of the power line	3,0m	3,0m

2.8.6 MAXIMUM AND MINIMUM WORKING CONDITIONS

The following maximum and minimum working conditions shall be used:

Minimum temperature of line and earth conductor	5°C
Maximum temperature of line and earth conductor	75°C
Wind pressure per square metre on whole projected area of line conductors	430N/m ²
Wind pressure per square metre on 1½ times projected area of one face of structures	720N/m ²

2.8.7 CROSSING OF SERVICES

The following conditions shall apply when crossing a proclaimed road, communication lines and a railway line:

- a) Structures supporting crossing spans shall be so located that they will not touch the service crossed should the structure overturn.

- b) One structure supporting a crossing shall be placed as close as possible to the service crossed taking the above condition into consideration.
- c) The deviation from a right angle when crossing a communication line or any other service and railways shall not be greater than 30°.
- d) A clearance of 4,5m shall be maintained in the span crossing a proclaimed road when a broken conductor condition occurs in any other span than the crossing span.
- e) No joints shall be made in a span crossing any other service.

2.8.8 MATERIALS

a) Wooden poles

All wooden poles and cross-arms shall be siligna class A to SABS 753 and eucalyptus to SABS 754. The poles shall be of the 55 MPA quality.

All poles shall be subject to inspection in accordance with SABS 753-1982 or SABS 754-1982 to ensure compliance with the specification. Each pole and cross-arm shall bear a marked tag indicating such compliance and be securely bound at both ends. All wooden poles and cross-arms shall be impregnated with a creosote mixture conforming to the requirements of SABS 1290.

Impregnation shall be carried out by means of either of the following methods:

- i) Hot/cold open tank process
- ii) Full cell pressure process
- iii) Empty cell pressure process

Where poles are drilled on site the wood shall be impregnated with high temperature creosote immediately after drilling. Where holes are drilled into the wood a maximum clearance of 2mm shall be allowed to avoid the exposure of thinly treated wood. No hole shall be drilled within 150mm from the end of a pole. At all points where hardware is to be installed 150mm to 200mm bands are to be painted around the pole using conducting paint comprising of 10kg plumbago to 18 litre raw linseed oil.

b) Conductors

The line conductors shall consist of Aluminium Conductor Steel Reinforced (ACSR) conductors.

The following standard British size ACSR conductors shall be used having characteristics as indicated in the table below:

CODE NAME	STRANDING AND WIRE DIAMETER (mm)	OVERALL DIAMETER (mm)	NOMINAL ALUMINIUM AREA (mm ²)	BREAKING LOAD (kg)	DC RESISTANCE AT 20°C (ohm/km)	CURRENT RATING (A)
Gopher	6/1/2,36	7,08	26,25	990	1,0933	150
Rabbit	6/1/3,35	10,05	52,88	1 890	0,5426	240
Hare	6/1/4,72	14,16	104,98	3 670	0,2733	360

The steel-core wires shall be preformed so that they remain inert and do not move relative each other when cut. The aluminium used for the conductors shall be of the highest purity

available. The stranding of each layer of the conductor shall be as close as possible with a right-handed outer layer.

No joints shall be allowed in individual wires of a standard drum length.

The conductors shall be supplied wound onto drums constructed of approved material in accordance with BS 1559. The standard drum lengths for Gopher, Rabbit and Hare conductors shall be 3 000m, 1 500m respectively. The exact length of the conductor with an arrow indicating the correct direction of rolling must be marked on all conductor drums.

c) Insulators

Insulators together with their fittings shall comply with SABS 177, as specified and where specified shall offer a high resistance to damage, caused by malicious vandalism. Insulator material shall be high grade porcelain. As an alternative approved cycloaliphatic resin insulators shall be used where specified.

Pin type, Class B insulators shall be used on all cross arms for the MV-suspension structures. Pin type insulators shall be made in one piece and shall be manufactured from the finest grade wet process porcelain, by the hot-press method. Pure cement, steam cured in saturated atmosphere ovens shall be utilized to cement the porcelain and metal to porcelain components.

Line post, Class A insulators shall be used as an alternative insulator to the pin insulator where specified. Line post insulators shall be of the capless, solid-core type. Line post insulators shall be puncture proof, radio interference free and shall display superior performance in polluted environments. They shall have a basic insulation level of 150kV.

Long rod, Class A insulators shall be used in all cross arms for the high voltage strain, terminal and pole mounted transformer structures. The porcelain long rod insulator shall be absolutely puncture proof and of the type as specified in the Project Specification.

Porcelain insulators shall have the following electrical and mechanical characteristics or more:

INSULATOR CHARACTERISTICS	UNIT	PIN	LINE POST (150 kV Bill)	LONG ROD
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Nominal System Voltage	kV	15	22	22
Dry flash over voltage	kV	90	100	115
Wet flash over voltage (vertical)	kV	40	75	60
Wet flash over voltage (horizontal)	kV	-	-	90
Dry withstand voltage	kV	85	95	105
Wet withstand voltage	kV	36	65	50
Wet withstand voltage (horizontal)	kV	-	-	80
Impulse withstand voltage	kV	120	150	190
Minimum tensile failing load	kV	10	4	40
50% Impulse flash over voltage (+)	kV	140	160	195
50% Impulse flash over voltage (-)	kV	150	350	210
Total leakage distance	mm	300		
Protected leakage distance	mm	165		
Nett mass per insulator	kg	3		4,2

Cycloaliphatic resin insulators shall have the following electrical and mechanical characteristics:

INSULATOR CHARACTERISTICS	UNIT	PIN	LINE POST	LONG ROD
Nominal System Voltage	kV	11	11	22
Dry flash over voltage	kV	75	87	107
Wet flash over voltage	kV	56	82	77
Dry withstand voltage	kV	73	76	101
Wet withstand voltage	kV	48	70	61
Impulse withstand voltage (+)	kV	110	146	170
Impulse withstand voltage (-)	kV	218	168	174
Dry arc distance	mm	160	190	215
Creepage	mm	350	320	460
Minimum tensile failing load	kN	-	-	46
Cantilever	kN	4	-	-
Mass per insulator	kg	1,6	1,3	4,1

Shackle insulators shall comply with SABS 161 as applicable and shall be used on all low voltage overhead conductors. The shackle insulators suitable for mounting to the pole with a D-bracket shall be of the type "Bobbin".

Low voltage shackle insulators shall have the following characteristics:

Dry withstand voltage	:	26kV
Wet withstand voltage	:	14kV
Puncture voltage	:	39kV
Mechanical strength	:	17,8kN
Mass per insulator	:	1,2kg

(d) Joints

The Contractor shall, where possible, order the conductor lengths so that there are no joints on any of the spans and that the jointing of conductors only takes place at termination structures.

Where joints are to be used the joints shall be of the compression type which shall have a mechanical strength of not less than 99% of the ultimate strength of the conductor when tested in accordance with BS 3288 Part 1 of 1973.

The electrical conductivity and current carrying capability of the joint shall not be less than that of the conductor.

During assembly of a joint, there must be no possibility of relative movement between individual layers of the conductor.

(e) Hardware and fittings

All cast iron and steel fittings and hardware shall be manufactured in compliance with SABS 178 and shall be hot-dipped galvanized to SABS 763. No drilling, screw tapping or cutting of hardware and fittings shall be permitted after galvanizing.

Eye bolts used for the strain and terminal structures shall be manufactured from mild steel and shall have a minimum failing load of 70 kN. The bolt size shall be of diameter indicated on the drawings with length to suit and the diameter of the eye and the eye material shall suit the dimensions of the shackle to be used.

The shackles shall be manufactured from forged steel and shall have a minimum failing load of 70 kN. The dimensions thereof shall suit the clevis of the insulators to be used.

The strain clamps shall be manufactured from malleable cast iron to BS 310 and shall have a minimum failing load of 70 kN. The dimensions of the clevis of the clamp shall be suitable for the tongue of the insulators to be used.

Intermediate pole conductor binding shall be affected by means of preformed wire ties. The ties shall be secured against unravelling by an approved stainless steel security band.

Tension fittings shall be the preformed wire type together with suitable fittings for securing the tension insulators.

Tension insulator sets and fittings shall, unless otherwise approved, be ranged to give a minimum clearance of 150 mm between the jumper conductor and the rim of the live end insulator units. Tension sets shall be fitted with attachment plates to enable the load on the tension set to be relieved for maintenance purposes. Fittings made of steel or malleable iron shall be galvanised as specified. All bolts and nuts shall be as specified and unless otherwise approved shall be locked by means of locknuts.

Split pins used on all insulator fittings shall be of stainless steel and shall be backed by washers. Hump backed split pins shall not be used.

Two bolts parallel groove clamps of approved quality shall be used at jumper connections. The clamps should not allow any slip or deterioration of the jumper connection at a load of less than 50% of the ultimate strength of the conductor, and shall be designed so that loosening of the jumper connection is not possible in service.

(f) Steel cross arm

The steel cross arm for the mounting of the expulsion fuses shall be manufactured from 1,6 metre 75 mm channel iron.

The steel cross arms for the mounting of the transformer shall be manufactured from 100 mm steel channel iron as indicated on the detail thereof on the drawings.

(g) Pole stays

MV-Pole stays shall comprise of the following:

- i) preformed pole make-off (guy grip).
- ii) galvanised multi-strand steel wire, 7/3,35 mm.
- iii) galvanised steel stay rod, M20 x 2,4 m assembly including thimble.
- iv) galvanised steel stay plate, 600 mm x 600 mm x 6 mm.
- v) porcelain stay insulator, 136 mm x 85 mm, type S22.

The central part of the "make-off" shall be double-wrapped onto the pole top, after which the two legs shall be wrapped over the unformed wire to form a seven strand stay of similar strength and diameter to that of the normal stay wire.

LV Pole stays shall comprise of the following:

- i) Pre-formed make-off (guy grip)
- ii) galvanized multi-strand steel wire, 3/3,35 mm
- iii) galvanized steel stay rod, M20 x 1,5 + thimble
- iv) galvanized steel stay 300mm x 300mm x 6mm
- v) Porcelain stay insulator ± 78 mm x 65 mm.

Stay rods, swivels and wire etc. shall comply with the relevant requirements of BS 16, BS464 and BS1831.

Galvanizing shall comply with the requirements of SABS 764.

The stays shall be erected so as to an angle of 45° to the pole and must be set for sufficient tension.

Base-plates shall be provided with locking facilities to prevent turning of the stay rods.

Approved means for setting and re-adjusting the stay for stretch and settlement shall be provided.

Porcelain stay insulators shall be used on all stays. They shall have a dry flashover of 35 kV equal and similar to Cullinan 21-0522 for medium voltage stays and 21kV equal and similar to Cullinan 21-1354 for Low Voltage stays.

h) Structure earth

Galvanized steel wire, 3/3,35 stay wire shall be used for the earthing of the wooden pole structures where specified.

The steel earth wire shall be stapled to the bottom end of the pole in a spiral form, using two metre of steel earth wire and must then be stapled along the length of the pole to the top of the pole in 500mm intervals.

The following overall resistance to earth shall be maintained:

Where cross arms are used the bracket securing the middle conductor to the upright shall have steel earth wire connected between it and the bolt securing the cross arm to the uprights. The earth wire shall also be strapped across the whole length of the cross arm.

Transformer Earths and MV Earths -	30 ohm
Low Voltage earths -	10 ohm
Lightning Arrestors -	50 ohm

l) Identification and danger plates

Conspicuous danger plates shall be fixed on all transformer structures. The inscription and background of danger plates shall be vitreous enamel and the plate must be completely covered to prevent corrosion. Pressed aluminium for LV poles and reflected, PVC material for MV-poles plates shall be used for pole numbering.

j) Anti climbing device

The strut pole stay and transformer structure shall be fitted with washing line type anti climb device at a height of not less than 3 m horizontal above ground level to prevent unauthorized persons coming into contact with live conductors by climbing such structures. Galvanized wood screws are to be used for securing these anti-climb devices.

2.8.9 INSTALLATIONS

a) General

Before the contractor intends, erecting conductors across public roads, telephone lines or other power line servitudes, he shall be responsible for giving adequate notice to the appropriate authorities of the date and time at which he proposes to perform the work.

b) Clearing of site

The contractor shall remove everything that he brought onto the site or handled on the site in the execution of the contract as well as all excess excavated material and rubble so as to leave the site in a neat and clean condition to the satisfaction of the engineer after the completion of the contract and after the engineer's approval has been obtained.

The contractor shall also return all redundant material to the COT store.

c) Excavations

The holes for 11m MV poles shall be excavated or drilled to a depth of 1,8m.

The holes for stays MV shall be excavated or drilled to a 1,8m and shall have dimensions of 1,0m by 0,5m when excavated.

Once the structure has been erected aligned and the stays installed then the excavations shall be backfilled and compacted in layers of 300mm to 96% MOD AASHO.

All holes that are going to be left open during the evening must be barricaded using approved danger warning tape and signs.

d) Erection of structures

The contractor shall ensure that the structures are not strained or damaged in any way during the erection thereof.

The structures shall be vertical to a tolerance of 1,5 at the top of the structure after erection.

Poles shall not exhibit either twisting or bowing greater than the approved tolerances which will not exceed 2% of the mast length.

All ladders are to be removed when erection work is not in progress. No ladder shall be placed against a "live" 11kV structure at any time for any reason whatsoever.

e) Installation of stays

The stays shall be attached to all wood pole strain and terminal structures in the positions indicated on the drawings. The stay shall be installed to form an angle of 45° with the vertical. The stay plate shall be installed at a depth of 1,8m.

f) Stringing of conductors

The method of stringing and the equipment to be used for stringing shall be approved by the engineer prior to the contractor commencing with the stringing of the conductors. The engineer may, if in his opinion, the stringing work is being carried out in an unsatisfactory way, order the contractor to supply additional labour, plant and equipment to execute the work in a proper manner at no additional cost. The contractor shall furthermore make provision in his rates for providing additional labour and equipment required during the crossing of other services and for temporarily staying structures during the stringing operation.

The standard span lengths to be used are 80m in areas outside townships and 50 m in township areas. The term "span length" shall be taken as the horizontal distance between the centre lines of adjacent structures.

Adequate length of conductors shall be left at the strain structures for the bridging jumpers and these lengths of conductors shall be overlapped and joined at two points using two approved aluminium parallel groove clamps.

An approved red-lead compound shall be used to seal the conductor ends.

Adequate length of conductors shall be left at the strain structures for the bridging jumpers and these lengths of conductors shall be overlapped and joined at two points using two approved aluminium parallel groove clamps.

The contractor shall provide suitable dynamometers, or other approved apparatus necessary for checking of the work. Dynamometers shall be tested and if necessary re-calibrated if so required by the Engineer.

The contractor shall submit for approval curves tables showing the correct initial and final sag tension of the line conductors at the various temperatures and spans. The conductors shall be not over-tensioned to the above curves to allow for any permanent settlement after the erection of the conductors.

2.8.10 MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
8.10.1.1 Excavate in all materials for holes for poles and stays, backfill, compact and dispose of surplus material.	Each

The unit of measurement shall be the number of holes excavated or drilled.

The tendered rate shall include full compensation for excavating the holes for poles and stays in accordance with the dimensions as specified, backfilling the hole with suitable material, compacting the backfill material in layers of 300mm to 90% MOD AASHO and disposing of any material.

<u>Item</u>	<u>Unit</u>
8.10.1.2 Excavate in hard material for holes for poles and stays, backfill, compact and dispose of surplus material.	Each

The unit of measurement shall be the number of hole excavated and classified as hard, in accordance with the classification set out as following:

The tendered rate shall include full compensation for any over break as well as the additional backfilling required, reinstating the trench bottom, and for any other incidentals resulting from over break and shall include for the supply of any additional backfill material required due to the disposing of suitable material excavated from the hole.

The materials excavated shall be classified as follows for payment purposes:

Hard materials

Material which cannot be excavated efficiently except with the use of pneumatic tools or drill blasting or wedging and splitting, and shall include boulders exceeding 0,15m³ in volume.

Soft materials

Notwithstanding the above classification, all material excavated from previously constructed fills, embankments, pavement layers and from above existing services shall be classified as soft material.

The decision of the Engineer as to the classification of the material shall be final and binding and any objection as to the classification shall be made before the excavation has been backfilled.

<u>Item</u>	<u>Unit</u>
8.10.3 Erect wood pole structures	Each

The unit of measurement shall be the number of wooden poles erected.

The tendered rate shall include full compensation for transporting the poles to site, hot impregnating the newly drilled holes with high temperature creosote, assembling the structure and erecting to structure and to keep the structure erect while the hole is backfilled and compacted. The rate shall furthermore include for the installing of all material not specified in the other rates to complete the structure and shall include for the supply and installing of all bolts, nuts and washers required. Separate items will be specified in the schedules for the various structures.

<u>Item</u>	<u>Unit</u>
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8.10.5	Install wooden cross arms	EACH
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The unit of measurement shall be the number of wooden cross arms installed.

The tendered rate shall include full compensation for transporting the cross arms to site, handling and the drilling of the pole, the treatment of the holes after drilling as specified and the installing of any material or equipment not specified in the other rates to complete the structure.

<u>Item</u>		<u>Unit</u>
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8.10.7	Install suspension insulators	Each
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The unit of measurement shall be the number of insulators for structures installed.

The tendered rate shall include full compensation for installing the insulators including hardware and equipment needed to erect the structure.

<u>Item</u>		<u>Unit</u>
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8.10.9	Install strain and terminal insulators	Each
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The unit of measurement shall be the number of insulators for strain and terminal structures install.

The tendered rate shall include full compensation for installing the insulators including the hardware and equipment needed to fix on to the structure.

<u>Item</u>		<u>Unit</u>
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8.10.14	Install pre-form dead end terminations	Each
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The unit of measurement shall be the number of the pre-form dead end terminations installed.

The tendered rate shall include full compensation for the installing of the pre-form dead end terminations including all equipment needed to terminate or shackle the conductor.

<u>Item</u>		<u>Unit</u>
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8.10.16	Install bridge connectors between lines	Each
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The unit of measurement shall be the number of bridge connectors between lines installed.

The tendered rate shall include full compensation for installing of the conductor as well as the parallel groove clamps at either end of the bridge connector when specified.

<u>Item</u>		<u>Unit</u>
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8.10.18	String ACSR conductor	m
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The unit of measurement shall be the length in metres of ACSR conductor stringed.

The tendered rate shall include full compensation for stringing the conductor and shall include for temporarily staying any of the structures during the stringing operation, terminating the

conductors on the structures and fastening the conductors on the suspension structures. The rate shall furthermore include for all the equipment or material required to string and fastening the conductors as specified.

<u>Item</u>	<u>Unit</u>
8.10.18.1 Recover ACSR conductor	m

The unit of measurement shall be the length in metres of ACSR conductor recovered.

The tendered rate shall include for the removing, handling, transporting, from site of the conductor to CoT storage areas. The rate shall furthermore include for all the equipment or material required to recover the conductors.

<u>Item</u>	<u>Unit</u>
8.10.20 Install parallel groove clamps for jumper connections	No

The unit of measurement shall be the number of parallel groove clamps for jumper connections installed.

The tendered rate shall include full compensation for the installing of the parallel groove clamps as specified.

<u>Item</u>	<u>Unit</u>
8.10.22 Install steel cross arms	Each

The unit of measurement shall be the number of steel cross arms installed.

The tendered rate shall include full compensation for installing the cross arms complete with the necessary bolts, nuts and curved washers were specified.

<u>Item</u>	<u>Unit</u>
8.10.24 Install pin binders/ties	Each

The unit of measurement shall be the number of pin binders/ties installed.

The tendered rate shall include full compensation to install the pin binders/ties, including all the necessary bolts, nuts and curved washers.

<u>Item</u>	<u>Unit</u>
8.10.28 Install pole stay assembly	Each

The unit of measurement shall be the number of pole stays installed.

The tendered rate shall include full compensation for the installation of the complete stay assembly and all material required to make off the complete stay.

<u>Item</u>	<u>Unit</u>
8.10.30 Install structure earth	Each

The unit of measurement shall be the number of structure earths installed.

The tendered rate shall include full compensation for installing the complete structure earth.

<u>Item</u>	<u>Unit</u>
8.10.32 Install identification and danger signs	Each

The unit of measurement shall be the number of identification and danger signs installed.
The tendered rate shall include full compensation for the installing of the identification and danger signs.

<u>Item</u>	<u>Unit</u>
8.10.34 Install anti climb device	Each

The unit of measurement shall be the number of anti-climb devices installed.

The tendered rate shall include full compensation for the installing of the anti-climb device as specified.

<u>Item</u>	<u>Unit</u>
8.10.35 Price for handling, loading, and off-loading and transportation of Hare Conductor	per drum

The tendered rate shall include full compensation to load, off-load, handling and transportation of MV cable drums from CoT store to site (+/- 60 km).

<u>Item</u>	<u>Unit</u>
8.10.36 cutting of trees	per bay

The tendered rate shall include full compensation to cut trees which are on the way of the construction and will also include the removal and dumping to the nearest approved dumping site.

STANDARD SPECIFICATIONS

SECTION 7

LOW VOLTAGE CABLE NETWORK

CONTENTS

- 2.9.1 SCOPE
- 2.9.2 MATERIALS
- 2.9.3 EXCAVATIONS
- 2.9.4 INSTALLATION OF CABLES
- 2.9.5 JOINTING AND TERMINATION OF LOW VOLTAGE CABLES
- 2.9.6 TEST BEFORE ACCEPTANCE
- 2.9.7 INFORMATION REGARDING THE COMPLETED NETWORK
- 2.9.8 CLEARING OF SITE
- 2.9.9 MEASUREMENT AND PAYMENT

2.9.1 SCOPE

This section covers the installations of the low voltage cables.

2.9.2 MATERIALS

- (a) Low voltage cable

Low voltage cables shall be in accordance with latest SANS standards: Part I to Part VI and shall be PVC insulated, with either stranded or solid copper or aluminium conductors as specified in the Project Specification, PVC bedded, steel wire armoured and PVC sheathed.

The armouring shall consist of one layer of round galvanized steel wire.

(b) Cable drums

The cable drums shall be capable of taking a round spindle and be lagged with strong, closely fitted battens, at the inner and outer circumference so as to prevent damage to the cables. The spindle bearing plates shall be steel. The dimensions of the drum shall not exceed 1 100 mm width, 2 000 mm diameter and the spindle bearing plate shall not be less than 9 mm thick. Each drum shall be clearly marked on both sides with the following particulars:

- (a) Voltage
- (b) Actual cable length
- (c) Conductor size (cross-sectional area and stranding)
- (d) Number of cores
- (e) Finish.
- (f) Drum number
- (g) Gross mass
- (h) Nett mass
- (i) Direction of rotation
- (j) Manufacturers project or job number

The ends of the PVC sheathed cable shall be sealed to avoid penetration of moisture.

The end protruding from the drum shall be protected against mechanical damage.

(c) Low voltage cable joints and terminations

Low voltage joints shall be of the epoxy-resin type.

Cable glands shall be of the adjustable type, equal or similar to the Pratley type gland and shall be suitable for use with PVC SWA PVC cable complying with SABS 150 of 1970. All glands shall be installed with non-deteriorating neoprene shrouds.

Bi-metallic aluminium-copper lugs, equal or similar to SIMEL type ACX, shall be used according to the manufacturer's specifications, where solid aluminium conductors are terminated onto copper bus bars or circuit breakers.

(d) Earth continuity conductors

Earth continuity conductors shall comprise of stranded copper conductors of cross-section indicated in the Project Specification.

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. All earth conductors shall be terminated using crimped cable lugs. Only cadmium plated bolts, nuts and spring washers shall be used for fixing earth conductors to earth bars.

Joining of earth conductors shall be done using the Cad weld process.

(e) Cable route markers

Cable route markers shall be constructed of reinforced concrete and shall be of dimensions indicated on the tender drawings.

(f) Concrete protective slabs

Concrete protective slabs shall have the following dimensions:

Length	1 000 mm
Width	350 mm
Thickness	50 mm

The slabs shall be constructed of 20 MPa concrete and each slab shall be reinforced with one longitudinal and three transverse mild steel rod of minimum diameter 8 mm. The slabs shall be manufactured in such a way that the slabs interlock with each other thus avoiding shifting of the slabs after installation.

(g) Cable sleeves

Cable sleeves shall be manufactured from PVC the standard size to be used is 110 mm diameter. Refer to cable sleeve specification.

2.9.3 EXCAVATIONS

(a) General

The contractor shall preserve the site as far as possible. Only the minimum of trees, shrubs, rocks, etc. shall be removed and cleared for the cable routes.

Where surplus material has to be disposed of the Contractor shall dump the material in the area provided by CoT to stockpile his material, in 25 km radius from the site.

The contractor shall at his own cost load and transport to the abovementioned site all surplus material, unsuitable material for backfilling, etc.

(b) Trench routes

The cable trench shall be excavated along the routes indicated on the plan.

The trench shall be absolutely straight and shall comply with all requirements. The Engineer shall determine the length of the trench to be excavated, which shall not exceed 400 m, before the cable is installed and the trench backfilled. If any obstacle or interference should be encountered which may require alterations to the trench or routes, such alterations shall receive prior written approval of the Engineer.

Contractor to make provision for cross over at car entrances etc.

(c) Cable trench

The trench shall be excavated to a depth below final ground level as specified:

-Feeder cables + sleeves	1500 mm
-House connections - bus routes	1000 mm
-House connections – road crossings	1000mm
-House connections - non bus routes (including pavements)	800 mm

The excavation of all trenches for the low voltage cables in the road reserves shall be undertaken by the Contractor.

The bottom of the trench shall be level and shall follow the contours of the final road level. Where the excavation is in excess of the required depth, the excavation shall be backfilled and compacted with suitable material to the required depth.

The contractor shall trim the trenches and clean up the bottom of the trenches after he has completed the required excavation. Bedding and cables shall not be laid until the trench has been approved by the Engineer. Where bedding has already been laid the Engineer may instruct the contractor to demonstrate that the minimum thickness of bedding has been provided for before authorizing cable laying to proceed.

The contractor shall remove all sharp projections which could damage the cable where the trench is excavated through rocky formations, and shall remove all loose rocks, material, etc. from the bottom of the trench.

(d) Excavated material

No excavated material shall be left closer than 300 mm from the side of the excavation. The excavated material which is considered by the Engineer to be suitable for bedding material for the cable shall be placed separately on one side of the trench so that it is available when required. The excavated material shall take up as small an area as possible with the safety of the workmen and Works taken into consideration.

(e) Inspection and measurement of excavations

Once the excavations for cable trenches and jointing pits have been completed, the Contractor shall give the Engineer 24 hours notice to inspect the trench and to be present when the measurements are made. No inspections shall be undertaken on Saturdays, Sundays and public holidays and after 14:00 in the afternoon.

(f) Maintenance of excavations

The contractor shall maintain the excavation in a good condition, free of water, mud, loose ground, rocks, stones, gravel and other strange material until the cables are installed and the excavation is backfilled and compacted.

2.9.4 INSTALLATION OF CABLES

(a) Sand bed for cables

A sand bed layer of soft soil shall be installed and levelled at the bottom of each trench after the trench has been approved by the Engineer, and prior to cable laying. A minimum thickness of the sand bed layer is 50 mm.

If the material that has been excavated is not suitable for the sand bed layer then suitable soil shall be imported for this purpose. The cost thereof shall be included in the unit price for the excavation unless otherwise specified.

An adequate quantity of soil similar to the sand bed material shall be available next to the excavation for the sand bed cover before an inspection of the cables is called for. The sand bed cover shall be a minimum of 100 mm thick and shall be placed directly after the cable has been inspected.

If the soil for the sand bed and sand cover has to be sifted, a sieve with holes not larger than 10 mm shall be used.

(b) Cables shall be laid without delay

The cable shall, after the completion of the trench, be laid with the minimum of delay so that the trench can be backfilled. The contractor shall, however, not backfill the trench until each length of cable has been inspected and approved by the Engineer.

Only one cable shall be laid at a time and the contractor shall take precautions that the cables which are already installed are not damaged.

(c) Laying of cables

The method to be used for laying cables shall be approved by the Engineer prior to the commencement of the laying of the cables.

If the contractor intends using a winch to draw the cable into the trench, a cable stocking shall be used or the draw wires shall be soldered to the cable so that the tension is exerted on all the cores and steel wire armouring at the same time.

The maximum tension on a cable during laying operations shall not exceed the value specified by the manufacturer. The tension force shall not be more than the force needed to pull 50m of the applicable cable, but if this value is more than that is specified by the manufacturer, the manufacturer's value will apply.

Should the Engineer not be satisfied with the manner or method employed to lay the cable he shall have the authority to instruct the contractor to lay the cable by hand or in accordance with approved standards.

1,5 Metre extra lengths of cable shall be left at the beginning and end of the cable routes to allow for the termination of the cables. Where necessary the Engineer shall decide on what length of cable is to be left. The contractor shall take the necessary precautions to protect the cable ends until they are terminated. The cable ends shall be sealed by means of lead sealing caps to ensure that the cable is waterproof. No PVC sealing caps to be used.

Where cables are drawn through sleeves, care shall be taken that they are not kinked or excessively bend. No bend in a cable shall have a radius less than the minimum bending radius specified by the cable manufacturer.

The contractor shall keep accurate records of each length of cable laid. The following information shall be recorded:

- Cable drum number
- Size of cable
- Laid from where to where
- Length of cable
- Date laid

The contractor shall be liable for the repair of the cable due to the faulty manufacture of the cable, should this information not be recorded directly after the cable has been laid.

Every cable shall be marked by means of a lead label on which the size of cable and its source or destination is punched. The label shall be installed around the inner PVC sheath immediately above the cable gland.

(d) Road crossings

The cable sleeves shall be installed 1,5 m below ground level to avoid damage when the roads are constructed.
Unless otherwise specified, two additional sleeves shall be installed for future use at each road crossing.

Sleeves used for crossings shall be straight and undamaged. Bends shall not be allowed in road crossings.

The sleeves shall be meticulously backfilled so that no air pockets are left. The trench shall thereafter be backfilled in layers of 150 mm and compacted with mechanical vibrators to 95% modified AASHTO density.

The contractor shall lay and join the cable sleeves and compact the trench to the satisfaction of the Engineer. The sleeves shall be meticulously backfilled so that no air pockets are left. The trench shall thereafter be backfilled in layers of 150 mm and compacted with mechanical vibrators to 95% modified AASHTO density. After installation, the sleeves shall be cleaned and a galvanized steel draw wire installed in the sleeve prior to the sleeve ends being sealed by means of plastic plugs.

Where specified cable route markers shall be installed to indicate the cable sleeves. The markers shall be buried in the ground directly over the sleeve with the top protruding 50 mm above the finished ground level.

(e) Crossing of other services

Where a cable crosses over other services, the cable shall not be installed at a depth less than 500 mm below ground level and if this is not possible the cable shall be installed underneath the other service and shall be protected by means of concrete slabs. The depth of the cable shall be maintained for one metre on either side of the crossing.

If it is not possible to cross over or underneath a service in the prescribed manner, the matter shall be referred to the Engineer for a decision.

The following minimum clearances shall be maintained between electrical cables and other services:

	<u>Horizontal</u>	<u>Vertical</u>
GPO Cables	0,3 m	0,3 m
Water pipes	0,3 m	0,3 m
Sewer pipes	0,3 m	0,8 m
Storm water pipes	0,3 m	0,6 m
Other electrical cables	0,15 m	0,15 m

(f) Backfilling of trenches

When the cable has been laid, inspected and approved and the sand bed cover has been installed, the trench shall be backfilled with soil containing not more than 40% rock or shale which shall be able to pass through a 75 mm sieve and which is approved by the Engineer.

Where more than 40%, but less than 70% rock occurs, the Contractor shall replace the rock with imported soil. However, should more than 70% rock occur then all the backfilling material shall be imported.

- The contractor may import further stone-free material to the site or sieve the excavated material for sand bedding and cover but payment shall only be compensated for the actual quantity of imported material required as determined by the Engineer.

The quantity of imported material required shall be calculated from the nominal trench width.

- The excavated material shall be backfilled in layers of 300 mm and shall be well compacted and consolidated. Where necessary the Engineer may require that a mechanical vibrator be used for compacting the trench.
- The contractor shall maintain the completed sections of the cable trench in a proper safe condition for the duration of the contract. The contractor shall refill and compact the trench where subsidence occurs.
- After completion of the work the route of the cable shall be neatly finished off and cleared. All stones bigger than 25 mm as well as all loose organic material and rubble shall be removed.

(g) Cable Warning Tape

Danger tape shall be installed 300mm above the installed cable on all main LV feeder cables from the ABC network or distribution kiosks.

The plastic cable warning tape shall consist of a strip of poly-ethylene of thickness 0,04mm and a normal width 230mm, completely impregnated, colour yellow, according to SABS 1091 having printed at 1 metre intervals a black triangle, an electric flash symbol and the words "DANGER, GEVAAR, INGOZI".

2.9.5 JOINTING AND TERMINATION OF LOW-VOLTAGE CABLES

No joints shall be allowed in the new low-voltage cables without the prior approval of the Engineer.

The main low-voltage cables shall be terminated on the same side of the distribution kiosk from where the cable feeds from or supplies to.

The termination of low-voltage cables to overhead line or bundle conductor systems will be done by bi-metal (AL/CU) groove or IPC clamps and cable ties, and for main low-voltage feeder cables double clamps shall be used to insure good termination.

2.9.6 TESTS BEFORE ACCEPTANCE

After the completion of the electrical installation, the contractor shall test the installation in accordance with the SABS 1507.

The Engineer shall have the right to call for or to carry out any additional tests which may be necessary to prove that the requirements of the specification have been met. The contractor shall assist with the conducting of these tests without delay. All tests shall be conducted in the presence of the Engineer.

(a) General

The test hereinafter described comprises only the site tests and tests before acceptance or handing over of the installation. Where cables and other material are

supplied by the contractor the factory and manufacturing tests shall be as specified in the specification.

After the installing and completion of the installation, before the service is taken over, the following tests shall be undertaken. These tests shall form an integral part of the erection, construction or installation of the various items and the costs thereof shall be included in the unit rates for the erection, construction or installation of the various items.

(b) Tests on low-voltage cables

(i) Phase and continuity tests

The phasing and continuity of each circuit shall be determined by meggering between each phase and earth while the phase is short circuited to earth at the far end of the cable route.

(ii) Voltage insulation tests

The insulation resistance shall be determined by imposing a 1 000 volt DC test voltage between each individual phase and earth at the miniature substations. The insulation resistance shall not be less than 50 mega ohm.

2.9.7 INFORMATION REGARDING THE COMPLETED NETWORK

The contractor shall submit the "as built" drawings on which complete information of the installation, as installed, is indicated after the completion of the installation and before the installation is handed over to the Engineer.

2.9.8 CLEARING OF SITE

The contractor shall remove everything that he brought onto the site or handled on the site in the execution of the contract as well as all excess excavated material and rubble so as to leave the site in a neat and clean condition to the satisfaction of the Engineer after the completion of the contract and after the Engineer's approval has been obtained.

2.9.9 MEASUREMENT AND PAYMENT

2.9.9.1 Excavation

<u>Item</u>	<u>Unit</u>
9.9.1.1 Excavate in all materials for trenches, backfill, compact and dispose of surplus material	m ³

The unit of measurement shall be the cubic metre of material excavated in trenches, classified according to the depth and width specified listed. The width classification shall be in accordance with the authorized dimensions and the depth classification in accordance with the total depth of the trench and not with the depth range in which the material is situated before excavation. The depth of excavation shall be measured to the underside of the bedding.

The tendered rate shall include full compensation for clearing and grubbing the trench areas and the temporary removal of improvements from the line of the trench, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill, keeping the excavations safe, dealing with any surface or subsurface water, and for separating topsoil and selected backfill material where necessary.

The rate shall furthermore cover the costs of installing the sand bed and sand cover, backfilling, compacting and disposing of the surplus material.

<u>Item</u>	<u>Unit</u>
9.9.1.2 Extra over for excavating in hard material	m ³

The unit of measurement shall be the cubic metre of material excavated and classified as hard, in accordance with the classification set out hereunder.

The tendered rate shall be paid over and above the rate tendered for excavation in respect of items 9.9.1.1 in full compensation for the additional cost of excavating in hard material instead of soft.

The tendered rate shall include full compensation for any over-break as well as the additional backfilling required, reinstating the trench bottom, and for any other incidentals resulting from over-break.

The materials excavated shall be classified as follows for payment purposes:

a) Hard rock:

Material classified as hard rock shall mean such as granite, quartzite, sand stone, solid shale, slate and rock of similar or greater hardness and boulders exceeding 0,15 cubic metre in volume, but more than 70% of the excavation encountered per cubic metre must comply to size (smaller than 0,15 cubic metre), excavated with the use of pneumatic tools, or blasting.

b) Soft rock:

Material classified as soft rock shall mean rock can be loosened by hand pick, crowbar wedging or splitting, material such as hard-shale, compact "ou klip", stone or material of similar hardness and boulders exceeding 75mm in diameter but not exceeding 0,15 cubic metre, but more than 70 % of the excavations encountered per cubic metre must comply to size (bigger than 0,15 cubic metre).

The decision of the Engineer as to the classification of the material shall be final and binding and any objection as to the classification shall be made before the excavation has been backfilled.

<u>Item</u>	<u>Unit</u>
9.9.1.3 Excavate by hand in all materials	m ³

The unit of measurement shall be the cubic metre of trench material excavated by means of hand tools as instructed or authorized in writing by the Engineer where the use of conventional excavating equipment is either impractical or likely to cause damage to services, trees or property or where the Contractor has to excavate by hand where he cannot excavate by machine.

The volumes of the trench excavation will be computed from the length and the depth to the bottom of the specified bedding layer and the minimum base widths specified in the Detail Specifications. The rate shall cover the cost of complying with the safety and protection requirements specified except where particular items are scheduled to cover particular costs for the excavation.

The tendered rate shall be paid extra over the rates tendered for item 9.9.1 in full compensation for the additional expense of excavating by means of hand labour instead of

conventional trenching equipment. This rate shall only apply if a site instruction was issued by COT prior to commencement of the work.

<u>Item</u>	<u>Unit</u>
9.9.1.4 Extra over item 9.9.1.1 for using backfill material obtained from	m ³
(a) borrow areas	
(b) sources provided by the Contractor	m ³

The unit of measurement shall be the cubic metre of imported backfill material.

The tendered rate for item 9.9.1.4(a) paid extra over item 9.9.1.1 shall be in full compensation for the additional cost of excavating and selecting of suitable material and the moving of the material to the backfilling site.

Items 9.9.1.4(a) and (b) above will not be measured for payment unless importation has been ordered in writing. The volume will be computed from the trench width and the depth from ground level to the top of the sand bed cover as shown on the tender drawings. The rate for material from designated borrow pits shall cover the cost of excavation and selection of suitable material, the moving of the material to the backfilling site, and the disposal of the material that becomes surplus as a result of the importation, all within 25 km.

The tendered rate for item 9.9.1.4(b) paid extra over item 9.9.1.1 shall cover the cost of the acquisition of the material and of the disposal of the surplus material resulting from the importation together with all the costs of transporting the material to the site regardless of distance.

<u>Item</u>	<u>Unit</u>
9.9.1.5 Price for handling, loading, and off-loading and transportation of LV cable	per drum

The tendered rate shall include full compensation to load, off-load, handling and transportation of LV cable drums from CoT store to site

<u>Item</u>	<u>Unit</u>
9.9.3 Lay LV cable	m
The tendered rate shall include full compensation for the handling, inspecting, laying, cutting and testing the cable. Cables shall be measured linearly over all lengths laid. Separate items shall be scheduled for each size and each type of cable laid.	

<u>Item</u>	<u>Unit</u>
9.9.3.1 Recover LV cable	m
The tendered rate shall include full compensation for the handling and removal.	

The tendered rate shall include full compensation for the disconnection and removal of existing cables from existing switchgear and the transport, handling and delivery to COT stores.

<u>Item</u>	<u>Unit</u>
9.9.4 Termination of LV cables	Each

The tendered rate shall include full compensation for providing the cable glands and shrouds, the costs of handling, fitting and cutting the cable. Separate items shall be scheduled for each size and type of cable.

<u>Item</u>	<u>Unit</u>
9.9.5 Jointing of LV cable	Each

The tendered rate shall include full compensation for the cost of providing the kits, the cost of cutting the cable, handling and fitting the kits and the costs of testing the joints. Separate items shall be scheduled for each size and type of cable.

<u>Item</u>	<u>Unit</u>
9.9.6 Lay earth continuity conductor	m

The tendered rate shall include full compensation for laying the specified earth continuity conductor. Separate items shall be scheduled for each size of cable laid

<u>Item</u>	<u>Unit</u>
9.9.7 Terminate and connect earth continuity conductor	Each

The tendered rate shall include full compensation for supplying all the material required such as brass clamps, lugs, etc, to terminate and connect the earth continuity conductors and the connecting thereof to the earth bars in the miniature substations, distribution kiosks, meter board or earth spike.

<u>Item</u>	<u>Unit</u>
9.9.9 Erect cable markers	Each

The tendered rate shall include full compensation for the handling and erection of cable markers as specified.

<u>Item</u>	<u>Unit</u>
9.9.11 Install protective slabs or covers	Each

The tendered rate shall include full compensation for the handling and installing of the concrete slabs or Fibre tiles.

<u>Item</u>	<u>Unit</u>
9.9.13 Install cable sleeves	m

The tendered rate shall include full compensation for the handling and installing of the complete cable sleeve and draw wires. Separate items shall be scheduled for each type or size.

STANDARD SPECIFICATIONS

SECTION 8

AERIAL BUNDLE NETWORK

CONTENTS

- 2.10.1 SCOPE
- 2.10.2 STANDARDS AND REGULATIONS
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- 2.10.6 ERECTION OF AERIAL BUNDLE CONDUCTOR
- 2.10.7 SETTING OUT THE WORKS
- 2.10.8 TESTING AND COMMISSIONING THE SYSTEM
- 2.10.9 MEASUREMENT AND PAYMENT

2.10.1 SCOPE

This specification provides the erection of low voltage aerial bundle network.

2.10.2 STANDARDS AND REGULATIONS

All work and materials shall comply with the terms and directions of the latest amendment or addition of the following:

- (a) Occupational Health and Safety Act, Act No 85 of 1993 and Regulations of the Republic of South Africa.
- (b) The requirements of the Department of Telecommunications.
- (c) Electricity Act, No 41 of 1987 of the Republic of South Africa.
- (d) The Code of Practice for Overhead Power lines for Conditions Prevailing in South Africa.
- (e) SABS and BS supporting specifications.

2.10.3 MATERIAL SAFETY FACTORS

Each structure used on this project shall have the following factors of safety:

<u>Description</u>	<u>Factor</u>
(a) Wooden structures not continually loaded	3,5
(b) Wooden structures continually loaded	5,5
(c) Line conductors, based on ultimate strength	3,0
(d) Suspension clamps	12 kN
(e) Tension clamps (horizontal)	25 kN

No failure or permanent distortion shall occur to any structure when subjected to a load equivalent to 1,5 the maximum unbalanced load due to a broken conductor or clamp condition. A broken conductor or clamp condition shall be assumed when any one conductor or clamp breaks without restriction as to the span in which the condition occurs.

2.10.4 CLEARANCES AND CROSSING OF SERVICES

I) Clearances

The minimum clearances of the aerial bundle conductor of other services shall be the following:

<u>Description</u>	<u>Clearances</u>
--------------------	-------------------

* Above ground in townships	4 m
* Above streets in townships	4,8 m
* Above proclaimed roads outside township	6,1 m
* To buildings, poles and structures not forming part of the ABC line	1,0 m
* Above Telecommunication lines (MIDSPAN)	0,25 m

ii) Crossing of services

The following conditions shall apply when crossing other services, like, communication lines proclaimed roads, etc.

- * Structures supporting crossing spans shall be as close as possible and be so located that they will not touch the service crossed, should they over turn.
- * The deviation from a right angle when crossing a communication line shall not be greater than 30°.
- * No joints shall be made in a span crossing a service.
- * Care shall be taken not to damage any other service while installing the ABC conductor.

2.10.5 AERIAL BUNDLE INSTALLATION MATERIALS

I) Wooden poles

All wooden poles shall be Silgna class A to SABS 753 and eucalyptus to SABS754 and the pole shall be of the 55MPA quality.

The standard pole length shall be 7.2 metres (mounting height) with a top diameter of 120 to 140 mm.

All poles shall be subject to inspection in accordance with SABS 753-1982 or SABS 754 -1982 to ensure compliance with the specification. Each pole shall bear a SABS marked tag indicating such compliance.

All poles shall be securely bound or secured with punched plates at both ends or double wound steel wire.

All wooden poles shall be impregnated with a creosote mixture conforming to the requirements of SABS 1290 or BS 144.

Unless otherwise approved, the average moisture content of poles at the time of treatment shall not exceed 150 g/kg.

Impregnation shall be carried out by means of either of the following methods:

- (I) Hot/cold open tank process
- (ii) Full cell pressure process
- (iii) Empty cell pressure process.

Where poles are drilled or cut on site the wood shall be impregnated with high temperature creosote immediately after drilling or cutting. Where holes are drilled into the wood a maximum clearance of 2 mm of the drill hole and bolt size shall be allowed to avoid the exposure of thinly treated wood. No hole shall be drilled within 150 mm from the end of a pole.

Where specified the pole shall be fitted with a washing line type anti-climb device, fixed at a vertical height above ground level of not less than 2,5 metres.

Skew poles are not acceptable.

ii) LV stay assembly

a) Pole stays

Pole stays shall comprise of the following:

- preformed pole make-off
- galvanised multi-strand steel wire, 3 x 3,35mm (SABS 182)
- galvanised steel stay rod, M16 x 1,5 m, assembly including thimble (SABS 464) and Guy grip dead end. (SABS 462)
- galvanised steel base plate 450 mm x 450 mm x 6 mm
- porcelain stay insulator
- stay bracket
- in sandy conditions use a 600mm x 600mm galvanised base plate.

The central part of the "make-off" shall be double-wrapped onto the pole top, after which the two legs shall be wrapped over the unformed wire to form a seven strand stay of similar strength and diameter to that of the normal stay wire.

Pole stay to be installed as indicated on the drawing and on every run longer than 9 poles.

b) Flying stay

Flying stays shall be installed where shown on drawings and shall comprise of the following:

- * Stay attachment (SABS 0162) including, eye nut, thimble and dead end (BS 462)
- * Galvanized multi-strand steel wire 3 x 3,35mm (SABS 182)
- * Stay insulator with guy grip/dead ends
- * Stay bracket, rod M20 x 450 mm with 4 nuts and eye nut M20
- * 7m pole and completed pole stay as listed above.

The clearance above road crossing shall be 5,1m above main roads and streets in town area.

c) Strut pole

Strut pole stays shall be installed where shown on drawings and shall comprise of the following:

- * 10 m wooden pole with top diameter of 120 to 140 mm
- * Soil anchor mounted on structure pole (1,5m in-hole, kicking plate)
- * Rod threaded M20 x 450 with nuts (galvanized)
- * Steel base plate (400 mm x 400 mm x 5 mm)
- * Anti climb - blade wire – 6 turns rapped around the pole, saddled to the pole.
- * The strain point on the tension structure must not be 150 mm lower than the strut pole connection point.
- * All stays and strut poles shall be taken down at an angle to the pole of approximately 45 degrees consistent with adequate stay tension.
- * Galvanized steel brackets as per drawing.

d) Fly Stay

Fly stays shall be installed where shown on drawings and shall comprise of the following:

- * Stay attachment (SABS 0162) including, eye nut, thimble and dead end (BS 462)
- * Galvanized multi-strand steel wire 3 x 3,35mm (SABS 182)
- * Stay insulator with guy grip/dead ends
- * Stay bracket, rod M20 x 450 mm with 4 nuts and eye nut M20

The clearance above road crossing shall be 5,1m above main roads and streets in town area.

e) Stub stay

Stub stay stays shall be installed where shown on drawings and shall comprise of the following:

- * Stay attachment (SABS 0162) including, eye nut, thimble and dead end (BS 462)
- * Galvanized multi-strand steel wire 3 x 3,35mm (SABS 182)
- * Stay insulator with guy grip/dead ends
- * Stay bracket, rod M20 x 450 mm with 4 nuts and eye nut M20
- * 3m steel pole and cement

iii) Bolts and nuts

All metal parts shall be secured by means of bolts and nuts with minimum diameter of 16 mm. All bolts, nuts and screw threads shall comply with SABS 135. Bolts and nuts shall be of galvanized steel with hexagen heads. The nuts of all bolts for attaching to the stays brackets or tension and suspension clamps droppers to earth clamps shall be locked by approved means.

Unless otherwise approved, all bolts and screwed rods shall be galvanized including the threaded portions; all nuts shall be galvanized with the exception of the threads, which shall be greased. Galvanizing shall be according to SABS 763.

When in position all bolts or screwed rods shall project through corresponding nuts, but such projection shall not exceed 20mm.

Where different grades of steel are used, bolts or rods of any given diameter and length shall be the same grade of steel.

iv) Erection of poles

Before the contractor intends erecting the structures, conductors or stays across public roads, telephone lines or other power line servitudes, he shall be responsible for giving adequate notice (seven (7) days) to CoT authorities of the date and time at which he proposes to perform the work.

The contractor shall ensure that the structures are not strained or damaged in any way during the erection thereof.

All structures shall be vertical within a tolerance at the structure top of 0,3% of the overall structure height, before erection of the conductors.

Poles shall not exhibit either twisting or bowing greater than the approved tolerance which will not exceed 2% of the mast length. After erection of the conductors the vertical tolerance of the structures shall not exceed 0,5% of the height.

Proper precautions shall be taken to ensure that poles are not strained or damaged in any way during handling, off-loading or erection.

Suitable ladders shall be used whenever necessary during erection of the structures. All ladders shall be removed when erection work is not in progress.

Once the structure has been erected aligned and the stays installed, excavations shall be backfilled and compacted in layers of 150 mm to 95% MOD AASHO.

v) Excavations of poles

The holes for ABC poles shall be excavated or drilled to a depth of 600mm + 10% of the total length of the pole.

vi) LV aerial bundle conductor (ABC)

The supply and installation of Low Voltage aerial bundle conductors shall comply with the SABS Code of Practice 1418, Parts 1 and 2 and the relevant NSI Standards.

The bundle shall have a bare neutral supporting core with a cross sectional area of not less than 54 mm² for a phase cross-sectional area of up to 95 mm², and 70 mm² for a phase cross-sectional area of 120 mm². The street lighting core shall have a cross-sectional area of 25 mm², where specified.

Samples of equipment and material intended for use in the installation shall be requested by the Engineer before work commences. Copies of the relevant SABS Test Reports shall also be submitted on request.

All apparatus shall be of a similar make and type for each item throughout the installation.

vii) Structure earths

All structure earths' position shall be according to the layout drawings.

a) LV earth

The LV earth shall be one pole away from the transformer or minisub. The LV earth resistance value shall be less than 10 ohm. The LV earth shall consist of a steel down wire connected to a 1,5m copper earth consist spike and be connected to the ABC neutral conductor. To bring down the earth resistance value by installing a 3m/6m/6m/6m crow foot with, 4 (four) 1,5m earth spikes.

Approved alternative methods may be used to bring down the earth resistance even more such as a trench earth of 50 metres, conductive cement or drilling for 6 m earth rods. CoT shall be present to witness all earth tests done.

b) Pole Earths

The pole earths shall be installed where specified and on the end of every ABC feeder circuit and at every T-off point. The pole earths shall consist of steel down wire connected to the ABC neutral conductor with PG clamps and shall rap around the ground end of the pole four (4) times, stapled to the pole.

viii) Cable protection

The LV feeder cable from the minisub to the ABC shall be protected with a 3 m steel galvanized kick pipe or a steel galvanized V-plate strapped to the pole with stainless

steel straps 500mm apart. The kick pipe or V-plate shall extend 300mm under the ground.

ix) Aerial bundle conductor accessories

All connectors and accessories used on low voltage aerial bundle conductor systems shall be 6000V insulated.

a) Insulation Piercing Connectors

The insulation piercing connectors allow the connection of covered conductor and bare neutral conductor ranging from 10 to 120 mm², either for tapping or splicing. The connectors shall be of insulation piercing type on main and tap conductors. When used for splicing, connectors shall be used without mechanical load or tension.

The insulation piercing connector shall not have looseable parts. The housing shall be made entirely of mechanical and weather resistant plastic insulating material. No metallic part outside the housing except the tightening bolt is acceptable. The tightening bolt must include an over-torque shear head which allows a clamping torque in conformity with the manufacturers' recommendations without the use of any special tool. After the head is sheared off, it must remain possible to remove the connector. No energised parts shall be exposed or accessible by the operators during connector installations.

Insulation piercing connectors shall be di-electrically waterproof in the same manner as cables.

These connectors shall be rated to 6kV and similar and equal to the range of SICAME or SIMEL type connectors.

b) Junctions Sleeves

For jointing of aerial bundle conductors special 6kV pre-insulated junction sleeves shall be used. No mid-span ABC joints shall be allowed all ABC joints shall be at a pole. These lugs shall be pre-insulated aluminium or aluminium alloy covered inside with contact grease for phase and neutral conductors respectively. The method and type of joint shall be approved prior to jointing by COT. Junction sleeves shall be similar and equal to SICAME type.

c) Phase labelling

All conductors must be individually identified by raised markings on the outer sheath, spaced at not more than 50 mm apart. Letters shall be 5 mm high for conductors up to and including 35 mm² and 6 mm high on all other sizes. The phase shall be identifiable by means of continuous single ridges next to each other, one for line one, two for line two three for line three and neutral to be bare. The ridges shall be not less than 1 mm high as measured between the surface of the insulation and the apex of the ridge.

d) Tension and suspension clamps

The tension clamp shall be of wedge type where no bolts for clamping the conductor, and where no looseable parts are allowed. No tools shall be required for its installation. The tension clamps must be made entirely of mechanical and weather resistant plastic insulating material. The tension

clamp must be for bare conductor and include a flexible attachment onto the bracket. Flexible attachment shall be made of stainless steel and fitted with a wear resistant buckle, the flexible attachment shall hook onto the pigtail or bracket.

The suspension clamp and its articulated link is a device where no bolts for tightening the conductor and no looseable parts are allowed. Clamping of conductor shall be made without need of any tool and shall be of controlled slippage. This device must have the capacity for the suspension and the tightening of bare conductors from 25 to 70 mm². This device must be made entirely and exclusively of mechanical and weather resistant plastic insulating material.

The suspension clamp shall have a vertical strength of 12 000 N without failure. When specified the tension clamps and suspension assemblies shall be similar and equal to SICAME or SIMEL manufacture. The clamps attachment hole must be able to take a M16 bolt.

e) Bridge connectors

All bridging from on circuit to another shall be done with the correct type and size of parallel groove and piercing connectors. The bridging leads shall be the same size as the circuit it bridge from and the connectors and clamps shall be double installed (two (2) per phase).

f) Other installation material

- * The tension and suspension clamps shall be hooked to a galvanized "pigtail bolt", M16 with two flat washers (60 mm x 60 mm). spring washers and two nuts.
- * PVC sleeves to protect ABC cable when tied with "bandit" strap at end termination poles
- * "End caps" pre-manufactured caps to protect the end points of the ABC conductors from 25 to 120mm² at termination points. The end leads to be bent up, to prevent moisture to enter the caps
- * Plastic cable tie straps (NRS020: 1991) to be used at all connection, termination, tension or suspension and jointing points, as indicated on drawings.
- * Identification sign or numbers shall be of the approved UV resistance type with white reflector lettering of 50mm on a green background mounted with two galvanized nails, or stainless-steel straps where specified, at the LV termination points for all the ABC feeders. (See drawing no. E/T/STD/44)
- * Warning signs shall comply with the Occupational Health and Safety Act 85 (1993). The sign will be a black flash, in a red triangle, on a yellow background with red lettering on white background. All writing shall be in English, Afrikaans and Zulu.

2.10.6 ERECTION OF AERIAL BUNDLED CONDUCTOR

Aerial bundle cable shall be erected in accordance with the Manufacturers Standards and recommendations and also with SABS 0198.

Bending radius, tension and sag charts shall be in accordance with the sag and stress tables provided by the manufacturer of the particular systems selected. The contractor shall provide the engineer with the manufacturer's sag and stress tables before commencing with the erection of the ABC.

The contractor shall employ staff who have completed a recognised training course for the erection of Aerial Bundle Conductors, failing which he shall employ a competent erector to equip his crew with the necessary skills.

Running out Roller blocks of adequate diameter shall be used to ensure that the minimum bending radius is not exceeded. Blocks must have the correct groove width to accommodate the cable size being used.

Manufacturers recommended construction procedure shall be followed, together with recommended tools and equipment.

No mid span joint shall be made on any ABC run. The joints may be made on a strain structure with a loop and the insulated ferrules on the non-tension part. These joints shall only be used with written approval from COT and not more than one per minisub area.

The minimum required tool kit shall consist of the following and prior to commencing with the erection of ABC will be inspected by the engineer.

	<u>Quantity</u>
Running-out wide groove Roller Block (Pulleys)	1 per pole
Pulling sock (Inner and Outer)	1each
Come Along - suitable for use with Insulated Cable	2
Pilot Rope	300 m
Crimping Tool	1
Nylon Slings	5
Pulling swivel to prevent twist	1
Phase Separators	2

2.10.7 SETTING OUT OF WORKS

The contractor shall arrange for the setting out of the works by a competent person.

The developer shall hand in surveyor certificates prior to the work commencing.

The contractor shall hand in surveyor certificates at the hand over stage.

2.10.8 TESTING AND COMMISSIONING THE SYSTEM

The entire bundle system, including all the accessories shall withstand all the tests as specified in SABS 1418.

The following test shall be done by a qualified electrician employed by the contractor prior to the handing-over of the system to CoT.

- a) Insulation test with a 1000V Megger between the phases and Neutral/earth for 2 minutes the entire LV bundle system shall be tested on every feeder line at the transformer. The Contractors to insure that all circuit breakers in the pole top boxes are switched off to prevent damage to any electrical equipment. In the event of damage to any equipment due to the wrong testing methods or connections, to the sole discretion of the engineer, then the contractor shall cover the cost of the claims for the damage equipment immediately and then only recover cost from his insurance.
- b) Phase rotation tests shall be done on all LV bundle ends, to test the correct phasing of termination points;
- c) Voltage test shall be done on every pole top box to test for voltage drop and a three(3) phase error and;
- d) An inspection shall be done on all the equipment by the contractor of every termination, connection, joint and Pole top box (Neutral Link to earth) prior to handing over the installation;

Test certificates and inspection forms shall be handed to the engineer prior to handing-over and the installation and the COT shall witness all the tests. The contractors shall inform COT in writing two (2) days before the date of the test.

The contractor shall do or redo all other tests requested by the engineer. The cost of testing equipment, testing staff or any other tests costs shall be that of the contractor and must be allowed for in the tendered amount.

2.10.9 MEASUREMENT AND PAYMENT

Item

Unit
Each

10.9.1 Excavate in all material for holes for poles, stays and backfill, compact and dispose of surplus material.

The unit of measurement shall be the number of holes excavated or drilled.

The tendered rate shall include full compensation for excavating the holes for poles in accordance with the dimensions as specified, backfilling the hole with suitable material, compacting the backfill material in layers of 150 mm to 95% MOD AASHO and disposing of any surplus material.

Item

Unit

10.9.2 Excavate in hard material for holes for poles and stays, backfill, compact and dispose of surplus material Each

The unit of measurement shall be the number of holes excavated and classified as hard, in accordance with the classification set out hereunder.

The tendered rate shall include full compensation for any over break as well as the additional backfilling required, reinstating the trench bottom, and for any other incidentals resulting from over break and shall include for the supply of any additional backfill material required due to the disposing of suitable material excavated from the hole.

The materials excavated shall be classified as follows for payment purposes:

a) Hard Rock

Material classified as hard rock shall mean such as granite, quartzite, sand stone, solid shale, slate and rock of similar or greater hardness and boulders exceeding 0,15 cubic metre in volume, but more than 70% of the excavation encountered per cubic metre must comply to size (smaller than 0,15 cubic metre, excavated with the use of pneumatic tools, or blasting).

b) Soft Rock

Material classified as soft rock shall mean rock can be loosened by hand pick, crowbar wedging or splitting, material such as hardshale, compact "ou klip", stone or material of similar hardness and boulders exceeding 75mm in diameter but not exceeding 0,15 cubic metre, but more than 70% of the excavations encountered per cubic metre must comply to size (bigger than 0,15 cubic metre).

The decision of the Engineer as to the classification of the material shall be final and binding and any objection as to the classification shall be made before the excavation has been backfilled.

<u>Item</u>	<u>Unit</u>
10.9.4 Erect wood pole structures	Each
The unit of measurement shall be the number of wooden poles erected.	

The tendered rate shall include full compensation for transporting the poles to site, drilling all holes in poles as required on site, hot impregnating the newly drilled holes with high temperature creosote, assembling the structure and erecting the structure in the holes and shall include for all the labour, material and equipment required to erect the structure and to keep the structure erect while the hole is backfilled and compacted. The rate shall furthermore include for the installing of all material not specified in the other rates to complete the structure and shall include for the supply and installing of all bolts, nuts and washers required. Separate items will be allowed for the various structures.

<u>Item</u>	<u>Unit</u>
10.9.6 String ABC Conductor	m

The unit of measurement shall be the circuit length of ABC conductor stringed.

The tendered rate shall include full compensation for the delivery to site, the ABC and the stringing of the ABC conductor and shall include for temporary staying any of the structures during the stringing operations, terminating and fastening the ABC conductor as specified. Each ABC conductor size shall be specified separately and the contractor shall be responsible to determine the correct lengths before cutting the ABC.

<u>Item</u>	<u>Unit</u>
10.9.6 Recover ABC Conductor	m

The unit of measurement shall be the circuit length of ABC conductor recovered.

The tendered rate shall include full compensation for the collection from sit to CoT stores, the ABC and the collection of the ABC conductor and shall include for unfastening of the conductor from the overhead structure. Each ABC conductor size shall be specified separately and the contractor shall be responsible to determine the correct lengths before cutting the ABC.

<u>Item</u>	<u>Unit</u>
10.9.8 Install suspension assembly	Each

The unit of measurement shall be the number of suspension assemblies installed.

The tendered rate shall include full compensation for drilling the pole and fixing the pigtail and complete suspension assembly with the pigtail, washers, nuts, suspension clamp, cable ties and all installation equipment needed to complete the installation as specified.

<u>Item</u>	<u>Unit</u>
10.9.10 Install tension assembly	Each

The unit of measurement shall be the number of tension assemblies installed.

The tendered rate shall include full compensation for the drilling of pole and fixing the pigtail and complete tension cable ties and all installation equipment needed to complete the installation as specified.

<u>Item</u>	<u>Unit</u>
10.9.13 Install bridge connectors between circuits	Each

The unit of measurement shall be the number of bridge connectors between lines installed.

The tendered rate shall include full compensation for installing the conductor as well as the parallel groove clamps and piercing connectors at either end of the bridge connector.

<u>Item</u>	<u>Unit</u>
10.9.15 Install insulated piercing connectors (I.P.C.) for jumper connections to the pole top box	Each

The unit of measurement shall be the number of insulated piercing connectors for jumper connections installed.

The tendered rate shall include full compensation for the installation of the insulated piercing connectors specified. Separate items will be allowed for the various type and sizes.

<u>Item</u>	<u>Unit</u>
10.9.17 Install LV cables terminating on to the circuit structure	Each

The unit of measurement shall be the number of LV cables terminations installed on to the circuit structure.

The tendered rate shall include full compensation for the installation of the specified cable and shall include for the termination and connection the cable and the fixing of the cable onto the structure. Each cable shall be specified separately and the contractor shall be responsible to determine the lengths of cable on site.

<u>Item</u>	<u>Unit</u>
10.9.19 Install stays, struts, stub stay, flying and fly stay	Each

The unit of measurement shall be the number of stays installed.

The tendered rate shall include full compensation for the installation of the pole, stay plate, stay rod, stay wire, guy grips, stay strain insulator and whatever other material is required to make off the stay. Separate items shall be scheduled for each type of stay.

<u>Item</u>	<u>Unit</u>
10.9.21 Install earth structure	Each

The unit of measurement shall be the number of earth structure installed.

The tendered rate shall include full compensation for the installation of the material to complete earth structure.

<u>Item</u>	<u>Unit</u>
10.9.23 Install signs	Each

The unit of measurement shall be the number of identification and danger signs installed.

The tendered rate shall include full compensation for the installation of the identification and danger signs.

<u>Item</u>	<u>Unit</u>
10.9.27 Install ABC structures	Each

The number of structures will be given for the various structures i.e. Suspension or strain structure. Must include for supply, delivery and off-loading of all material.

Material needed:

Suspension structure	:	1 x pigtail, washers, nuts, 1 x shook, 1 x eyenut, 1 x suspension clamp, 3 x cable ties and all installation equipment needed to complete the installation. Pole priced separately.
Strain structure 0 - 60 deg	:	1 x pigtail, washers, nuts, 1 x eyenut, 2 x ABC tension wedge clamps, 6 x cable ties and all equipment needed to complete the installation. Pole priced separately.
Terminal structure	:	1 x pigtail, washers, nuts, 1 x eyenut, 1 x ABC tension wedge clamp, cable ties, end termination complete with end caps (4-off where no streetlight conductor exist but 5-off where streetlight conductor is used), PVC sleeve 35mm dia, steel straps (2-off) to fix termination, pg clamp (earthing) and all equipment needed to complete the installation. Pole priced separately.
Strain structure 60-90 deg	:	2 x pigtails, 2 x eyenuts, 2 x ABC tension wedge clamps, washers, nuts, 6 x cable ties and all equipment needed to complete the installation. Pole priced separately.
Terminal structure (2-way, shackle off)	:	2 x pigtails, 2 x eyenuts, 2 x ABC tension wedge clamp, 2 x PG clamps, nuts, washers, cable ties, 2 x end terminations complete with end caps (2 x 4-off where no streetlight conductor exist but 2 x 5-off where streetlight conductor is used), steel straps (2-off) to fix termination and all equipment needed to complete the installation. Pole priced separately.
Suspension structure (T-off)	:	1 x pigtails, 1 x eyenut, 1 x suspension clamps, nuts, washers, 7 x cable ties, 1 x ABC tension wedge clamp, 1 x 5-hook, 3 x IPC connectors, 1 x IPC streetlight connector (if necessary), 1 x PG clamp, 1 x

		PG clamp (for earth wire if required) and all equipment needed to complete the installation. Pole priced separately.
Strain structure (T-off)	:	2 x pigtails, 2 x eyenuts, 7 x cable ties, 3 x ABC tension wedge clamps, 1 x PG clamps, 3 x IPC, 1 x PG clamp (for earth wire if required), and all other equipment needed to complete the installation. Pole priced separately.
Suspension (4-way cross)	:	2 x pigtails, 2 x eyenuts, 9 x cable ties, 2 x suspension clamps, 2 x S-hooks, 2 x PG clamps, 6 x IPC connectors and all equipment needed to complete the installation. Pole priced separately.
Strain (4-way cross)	:	1 x suspension clamp, 1 x S-hook, 9 x cable ties, 2 x ABC tension wedge clamps, 2 x PG clamps, 6 x IPC connectors, 1 x eye nut, 1 x pigtail and all other equipment needed to complete the installation. Pole priced separately.
Midway (4-way cross)	:	Conductor and all necessary double (2-off) parallel groove clamps, and double (2-off) piercing connectors at both ends for all the phases and streetlight conductor and all other equipment needed to complete the installation. Pole priced separately.

STANDARD SPECIFICATIONS

SECTION 9

CONSUMER CONNECTIONS

CONTENTS

2.12.1 SCOPE

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2.12.6 CLEARING OF SITE

2.12.7 MEASUREMENT AND PAYMENT

2.12.1 SCOPE

This specification covers the installation, testing and commissioning of all material and equipment required for the consumer connection.

2.12.2 MATERIAL

i Underground cable connection

Consumer connection cables shall be in accordance with the latest SANS standards and shall comprise of PVC insulated stranded copper conductors, PVC sheathed. All cables shall bare the SABS mark and comply with the standard specification "Low voltage network" of this document.

Consumer connection cables shall be terminated either by means of mechanical glands with shrouds equal or similar to the Pratley, glanded on the bottom of the meter box.

ii Road crossings

All road crossings of house connection cables shall be 1 metre from the road surface running from stand to stand.

iii Split concentric cable

Split concentric cable shall be in accordance with NRS 017 and shall comprise of XLPE insulated circular stranded hard-drawn copper conductor, with identified neutral and bare earth conductors arranged concentrically around the phase conductor and UV stable polyethylene sheathed.

iv Pole mounted box

Where specified the contractor is to provide a pole mounted box equal and similar approved to York 6 way UV resistant glass fibre/resin impregnated box with sliding cover and cliptray [with provision for six (6) circuit breakers], neutral bar, phase bars, earth bar and No 1 PVC glands. The pole mounted box must be provided with mounting brackets suitable for stainless steel strapping (to mount box to pole).

Single pole 60 Amp curve I (slow curve) circuit breakers is specified separately.

Jumper tails of 2 m shall be provide for each phase, neutral and earth connection. The tails to be insulated 25mm² copper UV stable sheath and the phase are to be marked clearly red, blue, white and green impregnated colour line.

v Single pole Distribution box

Where specified, the contractor shall provide a single pole distribution box equal and similar to CBI type SXDB, complete compact and robust polycarbonate, UV resistant, linkstick operated and pad lockable in the "off" position. The distribution box shall be equipped with single pole 60 Amp curve 1 (slow curve) circuit breaker. The SXDB must be provided with mounting brackets suitable for mounting the SXDB on a dinrail.

vi Other material

The pigtail shall have a 12 mm diameter and shall be a hot dipped galvanized steel rod complete with galvanized flat washer, spring washer and nuts.

The wedge strain clamps for the concentric cable shall be manufactured with glass reinforced nylon and shall take a conductor size range from 10mm² to 16mm² [airdac] complete with galvanized wire loop and hold strap.

The contractor is to use UV resistant cable ties according to NRS 020 to hold and neaten the installation.

2.12.3 INSTALLATION

i) Consumer Connections on Opposite side of the Road to the ABC poles

Consumer connections shall consist of 10mm², 16mm² or 25mm² three core PVC, SWA cable running from the pole mounted supply circuit breaker to a position 1 m inside the consumers premises, generally 1 meter from the boundary fence and at a depth of 500mm below final ground level.

The supply cable shall be supported down the pole at 500mm intervals by means of stainless steel strapping.

The cable end inside the stand must be capped with a water proof glued-on PVC end cap.

The cable must be connected in pole top box as follows:

- a) live phase long enough to reach the bottom of the supply circuit breaker.
- b) neutral phase to neutral bar in box.
- c) earth phase to earth bar.
- d) cable armouring to neutral bar (at least 50% of strands).
- e) link piece between neutral and earth bar.
- f) the cable to be glanded to bottom of the pole top box.

The cable must be connected to the single pole distribution box as follows:

- a) live phase to top of the supply circuit breaker, marked "load".
- b) neutral phase direct to the neutral phase conductor, connected with the correct clamps.
- c) earth phase to the neutral phase conductor connected with the correct groove clamps.
- d) armouring of the cable to neutral phase conductor connected with the correct groove clamps (at least 50% of the strands).
- e) single pole distribution box shall be mounted on a dinrail screwed directly onto the pole with two approved wood screws.

We refer to the relevant standard meter box drawing for bottom entry in the document.

ii) Consumer connection on same side of the Road as to the ABC poles

The concentric connection cable shall be cut to length, coiled and securely fixed to a M12 pigtail bolt mounted on the house and pigtail on the pole.

The cable shall be fixed with wedge service strain clamps for the concentric cable, hooked to the pigtail bolts on the pole and house. The tension on the cable shall be as specified by the manufacturer and supplier. The contractor shall provide sag and tension tables before the work commences. The pigtail shall be mounted on the house side closes to the road to provide enough ground clearance, and a direct span to the house without touching any structures. The concentric cable shall be provided with a drip loop to prevent the water to enter the wall or connection conduit.

We refer to the relevant stranded meter box layout drawing for top entry bound into the document.

4m poles shall be used in cases where shacks are encountered. Where long distances is applicable, 7m poles shall be used in conjunction with a 4m pole. In such cases, an

extra pigtail and eyenut is necessary. COT shall approve the position of the 7m pole. 4m poles shall be planted at a distance of 1 metre from the shack.

iii) The pole mounted box

The contractor shall mount the pole mounted box with the opening lid facing the road sideways to ensure that it is not necessary to use ladders in the road but safely on the side of the road. All boxes to face to the same direction.

The pole mounted box shall be strapped to the pole with two stainless steel straps through the brackets provided. The mounting height will be 400mm below the ABC.

The connection tails from the pole mounted box to the bundle conductor shall be grouped together with cable ties and neatly looped to the bundle conductor. The IPC clamps shall be installed neatly 100mm apart, on the correct phase with end cap on the tail ends.

The concentric or PVC cable shall be glanded to the pole mounted box with the termination done correctly.

Labels shall be provided to identify the stand nr of the house being served by the circuit breaker in the pole mounted box.

The contractor shall make one demonstration installation for the engineer to approve before commencing with the rest of the installation.

iv) Single Pole distribution box

The contractor shall mount the single pole distribution box (SXDB) with the operating slide facing the road sideways. The single pole distribution box shall be mounted next to each other on a dinrail, two on each side of the pole, the ON/OFF mode must be visible from the ground, at street front.

The concentric or PVC armoured cable shall be connected to the bundle conductor with the relevant clamps and to the single pole distribution box, the cable must be sealed with, PVC cable hood caps and the neatly strapped to the pole.

Labels shall be provided to identify the stand nr of the house being served by the circuit breaker in the pole mounted box.

The contractor shall make one demonstration installation for the engineer to approve before commencing with the rest of the installation.

v) Shack pole

The contractor is to provide a 4m shack pole installed 1 m from the building, if the ground clearances are not according to the specifications or the building material cannot withstand the tension of the concentric cable.

2.12.4 TEST BEFORE ACCEPTANCE

After the completion of the electrical installation, the Contractor shall test the installation in accordance with the SABS 1507.

The Engineer shall have the right to call for or to carry out any additional tests which may be necessary to prove that the requirements of the specification have been met. The Contractor shall assist with the conducting of these test without delay. All tests shall be conducted in the presence of the Engineer.

a) General

The test hereinafter described comprises only the site tests and tests before acceptance or handing over of the installation. Where cables and other material are supplied by the Contractor the factory and manufacturing tests shall be as specified in the relevant specifications.

After the installing and completing of the installation, before the service is taken over, the following tests shall be undertaken. These tests shall form an integral part of the erection, construction or installation of the various items and the cost thereof shall be included in the unit rates for the erection, construction or installation of the various items.

b) Tests on low-voltage cables

i) Phase and earth continuity tests

The phasing and earth continuity of each circuit shall be determined by meggering between each phase and earth while the phase is short circuited to earth at the end of the cable route.

ii) Voltage insulation tests

The insulation resistance shall be determined by imposing a 1 000 volt DC test voltage between each individual phase and earth at the miniature substations or transformer for every outgoing feeder. The insulation resistance shall not be less than 50 megohm

iii) Voltage tests

After energising the installation each consumer connection cable shall be tested by reading the voltage between the phase, neutral and earth, the volt drop shall not be more or less than +6%, -10% of 230 volt supply at the consumers meter box.

iv) Test and inspection reports

The contractor is to complete all the test and inspection reports as provide by the Engineer. These reports shall be handed to Engineer before acceptance or handing over of the installation or completed sections of the works.

2.12.5 INFORMATION REGARDING THE COMPLETED NETWORK INSTALLATION

The Contractor shall submit the "as built" drawings on which complete information of the installation, as installed, and connected is indicated after the completion of the installation and before the installation is handed over to the Engineer.

2.12.6 CLEARING OF SITE

The Contractor shall remove everything that he brought onto the site or handled on the site in the execution of the Contract as well as all excess excavated material and rubble so as to leave the site in a neat and clean condition to the satisfaction of the Engineer after the completion of the Contract and after the Engineer's approval has been obtained.

2.12.7 MEASUREMENT AND PAYMENT

12.7.1 Excavation

<u>Item</u>	<u>Unit</u>
12.7.1.1 Excavate in all materials for trenches, backfill, compact and dispose of surplus material	m ³

The unit of measurement shall be the cubic metre of material excavated in trenches, classified according to the depth and width specified. The width classification shall be in accordance with the authorized dimensions and the depth classification in accordance with the total depth of the trench and not with the depth range in which the material is situated before excavation. The depth of excavation shall be measured to the underside of the bedding.

The tendered rate shall include full compensation for clearing and grubbing the trench areas and the temporary removal of improvements from the line of the trench, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill, keeping the excavations safe, dealing with any surface or subsurface water, and for separating topsoil and selected backfill material where necessary.

The rate shall furthermore cover the costs of installing the sand bed and sand cover, backfilling, compacting and disposing of the surplus material.

Typical trench dimensions: 0,5m x 0,3m.

The same dimension shall apply to a ditch witch or excavator.

<u>Item</u>	<u>Unit</u>
12.7.1.2 Extra over for excavating in hard material	m ³

The unit of measurement shall be the cubic metre of material excavated and classified as hard, in accordance with the classification set out hereunder.

The tendered rate shall be paid over and above the rate tendered for excavation in respect of items 12.7.1 in full compensation for the additional cost of excavating in hard material instead of soft.

The tendered rate shall include full compensation for any over break as well as the additional backfilling required, reinstating the trench bottom, and for any other incidentals resulting from over break.

The materials excavated shall be classified as follows for payment purposes and site instructions must be issued before commencement:

Hard rock:

Material classified as hard rock shall mean such as granite, quartzite, sand stone, solid shale, slate and rock of similar or greater hardness and boulders exceeding 0,15 cubic metre in volume, but more than 70% of the excavation encountered per cubic metre must comply to size (smaller than 0,15 cubic metre), excavated with the use of pneumatic tools, or blasting.

Soft rock:

Material classified as soft rock shall mean rock that can be loosened by hand pick, crowbar wedging or splitting, material such as hard shale, compact "ou klip", stone or material of similar hardness and boulders exceeding 75mm in diameter but not exceeding 0,15 cubic metre, but more than 70% of the excavations encountered per cubic metre must comply to size (bigger than 0,15 cubic metre).

The decision of the Engineer as to the classification of the material shall be final and binding and any objection as to the classification shall be made before the excavation has been backfilled.

<u>Item</u>	<u>Unit</u>
12.7.1.3 Excavate by hand in all materials	m ³

The Unit of measurement shall be the cubic metre of trench material excavated by means of hand tools as instructed or authorized in writing by the Engineer where the use of conventional excavating equipment is either impractical or likely to cause damage to services, trees or property or where the Contractor has to excavate by hand where he cannot excavate by machine.

The volumes of the trench excavation will be computed from the length and the depth to the bottom of the specified bedding layer and the minimum base widths specified in the Detail Specifications. The rate shall cover the cost of complying with the safety and protection requirements specified except where particular items are scheduled to cover particular costs for the excavation.

The tendered rate shall be paid extra over the rates tendered for item 12.7.1 in full compensation for the additional expense of excavating by means of hand labour instead of conventional trenching equipment.

<u>Item</u>	<u>Unit</u>
12.7.1.4 Extra over item 12.7.1 for using backfill material obtained from	
12.7.1.4.1 i) borrow areas	m ³
12.7.1.4.2 ii) sources provided by the Contractor	m ³

The unit of measurement shall be the cubic metre of imported backfill material.

The tendered rate for item 12.7.1.4 (I) paid extra over item 12.7.1.1 shall be in full compensation for the additional cost of excavating and selecting of suitable material and the moving of the material to the backfilling site.

Items 12.7.1.4 (I) and (ii) above will not be measured for payment unless importation has been order in writing. The volume will be computed from the trench width and the depth from ground level to the top of the sand bed cover as shown on the tender drawings. The rate for material from designated borrow pits shall cover the cost of excavation and selection of suitable material, the moving of the material to the backfilling site, and the disposal of the material that becomes surplus as a result of the importation, all within 5 km.

The tendered rate for item 12.7.1.4 (I) paid extra over item 12.7.1.1 shall cover the cost of the acquisition of the material and of the disposal of the surplus material resulting from the importation together with all the costs of transporting the material to the site regardless of distance.

<u>Item</u>	<u>Unit</u>
12.7.3 Install LV cable	m

The tendered rate shall include full compensation for the handling, inspecting, laying, stringing, cutting and testing the cable. Cables shall be measured linearly over all lengths installed. Separate items shall be scheduled for each size and each type of cable installed.

<u>Item</u>	<u>Unit</u>
-------------	-------------

12.7.3 Recover LV cable m
The tendered rate shall include full compensation for the handling and removal.

The tendered rate shall include full compensation for the disconnection and removal of existing cables from existing switchgear and the transport, handling and delivery to CoT stores.

<u>Item</u>	<u>Unit</u>
12.7.4 Termination of LV cables	Each

The tendered rate shall include full compensation for providing the cable glands and shrouds, IPC and groove clamps, cable ties, cover caps, end caps and the costs of handling, fitting and cutting the cable. Separate items shall be scheduled for each size and type of cable.

<u>Item</u>	<u>Unit</u>
12.7.5 Jointing of LV cable	Each

The tendered rate shall include full compensation for the cost of providing the kits, the cost of cutting the cable, handling and fitting the kits and the costs of testing the joints. Separate items shall be scheduled for each size and type of cable.

<u>Item</u>	<u>Unit</u>
12.7.6 Lay earth continuity conductor	m

The tendered rate shall include full compensation for laying the specified earth continuity conductor. Separate items shall be scheduled for each size of cable laid.

<u>Item</u>	<u>Unit</u>
12.7.7 Terminate and connect earth continuity conductor	Each

The tendered rate shall include full compensation for supplying all the material required such as brass clamps, lugs, etc to terminate and connect the earth continuity conductors and the connecting thereof to the earth bars in the miniature substations, distribution kiosks, meter board or earth spike.

<u>Item</u>	<u>Unit</u>
12.7.13 Install pole mounted box	Each

The unit of measurement shall be the number of pole mounted boxes installed.

The tendered rate shall include full compensation for the loading, transport to site, inspecting, installing, cutting of tails, connecting and testing the pole mounted boxes, including all installation and connecting equipment such as, stainless steel straps, IPC and groove clamps, cable ties and internal wiring to complete the installation, connecting and testing of the pole mounted box.

<u>Item</u>	<u>Unit</u>
12.7.18 Install Ready Board and Keypad	Each

The tendered rate shall include full compensation for the transportation, handling and installation of the Ready Board and Keypad including bolts, nuts, washers, pop rivets, ferrules, lugs and all equipment and material need to complete the installation.

<u>Item</u>	<u>Unit</u>
12.7.20 Labelling of stand number in the pole mounted box	Each

The tendered rate shall include full compensation for the collecting, handling and installation of labels in the pole mounted box which include all material needed to complete the installation (e.g. small cable ties).

<u>Item</u>	<u>Unit</u>
12.7.21 INSTALLATION OF CABLES	per meter

The unit rate includes the collection, installation of the cable and the earth wire, the handling thereof in the excavations, pipes, sleeves or channels as well as the straightening of the cables.

The cost to draw up the route plans for the cables must be included in the unit rates for the installation of cables

<u>Item</u>	<u>Unit</u>
12.7.22 TERMINATION OF CABLES	Each

Terminations must be performed by a competent person as described in section C3.6. - CERTIFICATIONS.

1. The unit rate for the termination of high and low voltage cable includes the termination of the cables, marking of the cables, the drawing up of the necessary cable route plans and any work which may be necessary to finish the termination points according to standards.

2. The Contractor will be expected to make a test termination at his own cost before he will be allowed to perform cable terminations.

2.1. Material for the test terminations must be supplied by the Contractor

<u>Item</u>	<u>Unit</u>
12.7.23 TERMINATION OF CABLES	Each

Cable joints must be performed by a competent person as described in section C3.6 - CERTIFICATIONS.

1. The unit rate for the jointing of high and low voltage cables includes:
the marking of the joint,
the marking of the cable,

the drawing up of the cable route plans,

the performing of the necessary work and that may be necessary to finish the joints properly.

The unit rates for the material must be listed separately in the "Material Cost" column and such material must comply with the material specifications of COT.

2. The unit rate for the jointing of a LV, 35 mm² and smaller, cable must include the cost of the jointing pit.
3. The Contractor will be expected to make a test joint at his own cost before he will be allowed to perform cable joints.

Material for the **test** joints must be supplied by the Contractor

<u>Item</u>	<u>Unit</u>
12.7.24 Installing new meter box	Each
1. Placing of new meter boxes	
2. The unit rate for the placing of new meter boxes includes the cost of:	
2.1. the excavations, the piecing together of the boxes, the mounting and wiring of the circuit breakers, the marking of the cables, the backfilling, compacting and levelling of the ground and the removal of all vegetation in a 2 m radius around the box.	
2.2. The rate must also include delivery, supply and labour to make a 50mm floor for the unit.	
2.3. The wiring and mounting of circuit breakers must be done by a qualified person.	

<u>Item</u>	<u>Unit</u>
Installation of meter box accessories including a meter.	Each

The unit rate for installing meter box accessories includes the cost of:

The mounting and wiring of the meter and other accessories.

The rate must also include delivery, supply and labour.

The wiring and mounting of meters must be done by a qualified person.

<u>Item</u>	<u>Unit</u>
Recover the meter box	Each

The unit of measurement shall be the number of meter boxes recovered

The tendered rate shall include for the removing, handling, from site of the meter box including transporting to CoT storage areas. The rate shall furthermore include for the excavation, backfilling compacting, cleaning around the area of recovery and all material needed to complete the recovering.

<u>Item</u>	<u>Unit</u>
-------------	-------------

12.7.25 Single new connection in the existing meter box

Each

The unit rate for the making of connections in existing meter boxes includes the cost to mount and wire the meters and the connection of a service cables.

The cost of joining the low voltage cables and the excavations for the joint pit must be included.

Payment will be made for each meter placed.

<u>Item</u>	<u>Unit</u>
12.7.26 Replacement of hasp and staple	Each

<u>Item</u>	<u>Unit</u>
12.7.27 Dressing Single pole	Each

Definitions:

1. Cross-arm is pole/structure (shorter than a pole suspending the conductor) mounted at the level of the suspending pole where its use includes the mounting of insulators, clamps or other items horizontal at a required height above natural ground level.
2. Clamp is an apparatus used to provide straining, suspension and dead-end configuration on the network infrastructure.

Items

3. Dressing

3.1. The unit rates for each section must include the cost of the drilling of any holes which may be necessary to install equipment and the mounting of the items on the poles.

3.2. A separate price must be given for each item.

<u>Item</u>	<u>Unit</u>
12.7.28 AERIAL BUNDLE CONDUCTORS Urban area,	Per Bay

1. The unit rate for the replacement of bare conductors with bundle conductors includes the moving of the streetlights, the stripping of the poles and the removal of the existing conductors. It includes the cost to mount the necessary clamps and the installation of the bundle conductors. The cost of any connections that are made to conductor must be included. Stringing pulleys and phase separators must be supplied by the Contractor. A cable car must be supplied by the Contractor and must be used when stringing the bundle conductors.
2. The unit rate for new construction with bundle conductors includes the cost to mount any clamps to the poles and the stringing of the bundle conductors. The cost of any connections that are made to conductor must be included. Stringing pulleys and phase separators must be supplied by the Contractor. A cable car must be supplied by the Contractor and must be used when stringing the bundle conductors.

<u>Item</u>	<u>Unit</u>
Page 98 of 129	

12.7.29 Delivery of Note

Each

1. It includes the cost to deliver warning notes or accounts at a certain address.

Item

Unit

12.7.30 planting of poles

Each

1. Planting of poles:

1.1. The unit rate includes the installation of the poles, aligning of the poles and the filling of the holes with appropriate soil and the compacting thereof.

1.2. In the case of steel poles, the unit rate shall include one or all of the following (depending on type of pole):

1.2.1. the mounting of the base plate,

1.2.2. the installation of the stubby and the fastening of the pole to the stubby.

1.2.3. The unit rate for the planting of robot poles includes the following:

1.2.3.1. the installation of the base and the bolting down of the poles,

1.2.3.2. the filling of the holes:

1.2.3.2.1. In the case of short robot poles the hole must be filled with cement. The measurements of the holes are: depth 600 mm and width 250 mm.

1.2.3.2.2. In the case of overhead robot poles the hole must be filled with concrete with strength 20 MPA to a depth of 900 mm. The dimension of the hole is: 1m x 1m x 1m (L x W x D). The prices must include the supply and delivery of cement and concrete and casting.

The price of the cement and concrete must be provided in "Material Cost" column

Item

Unit

12.7.31 Anchoring of poles

Each

1. Anchoring of poles (Section 8.2):

1.1. The anchors are divided into 3 groups: Stays, struts and pedestals.

1.1.1. The Stay: the unit rate includes the mounting of the base plate and the installation thereof in the ground.

1.1.2. The Strut pole: the unit rate includes the installation of the strut pole in the ground and the fastening thereof to the pole being supported.

1.1.3. The Pedestal: the unit rate includes the excavation of the hole. The hole must be filled with concrete and the price of the supply, delivery and casting of the concrete must be included with the rate.

1.1.3.1. The price of the concrete must be provided in “Material Cost” column.

The fastening of the stay, to the pedestal and the pole; and/or the fastening of the stay to the pole being supported must be included in all unit rates above.

<u>Item</u>	<u>Unit</u>
12.7.32 Removal of poles	Each

The unit rate of the removal of poles includes the opening of the holes, removal of the redundant poles and the delivery of the redundant poles to the store. The backfilling of the holes and the clearing of the site must be included in the price

<u>Item</u>	<u>Unit</u>
12.7.33 Trenches and Holes	m ³ /each

Any use of mechanical means for the purpose of excavations shall be allowed through the written consent of the Project Manager.

2.1 Trenches shall be dug to the following dimensions:

Length x 0.6m x Depth (L x W x D)

Note: L x D shall be indicated in writing by Project Manager on the specific design of the specific project.

2.2 Pole holes must be according to the following measurements:

1.2m x 0.6m x depth. (L x W x D)

- Dimension for the pole shall be: 10% of pole's total length plus 700mm.
- Dimension for the MV stay shall be: 1.2m x 0.6m x 1.8m (L x W x D)
- Dimension for the LV stay shall be: 1.2m x 0.6m x 1.5m (L x W x D)

<u>Item</u>	<u>Unit</u>
12.7.34 Horizontal drilling	Per Meter

In all horizontal drilling crossings, the contractor must supply HDPE pipe and this pipe will be a standard pipe usable on all projects of CoT.

4. Horizontal drilling includes the drilling of the holes, the supply and installation of sleeves and 4mm steel wire and the placing of the end seal. Water for the drilling process must be supplied by the Contractor.

1.1. At tarred road intersections a minimum of 4 spare sleeves must be installed.

- 1.2. An accurate hole is defined as a hole which is drilled in a way that the sleeves installed are at the same height at both ends. Inaccurate holes are unacceptable and no payment will be made for such holes. Payment will only be made for sleeves that were successful installed.

Note: All sleeves and/or drilling must be at 1m depth from ground level at all times.

<u>Item</u>	<u>Unit</u>
12.7.35 Installation of sleeves	Each

This section excludes sleeves installed by means of horizontal drilling.

1. The unit rate for installation of sleeves includes:
 - 1.1. the installation of sleeves
 - 1.2. the placing of the necessary end seals on the sleeves that are not used
 - 1.3. as well as the installation of the steel wire.
 - 1.4. If the sleeves must be installed in concrete, the unit rate must include the supply of the concrete and the casting work.
2. Payment will only be made for sleeves successfully installed. Successful installation is defined as sleeve installed at the same depth from the road or natural ground level at both ends.

Item

12.7.36 REPAIR OF SURFACE COVERINGS

1. Channel covering tiles, paving- stones/ tiles and bricks. (Section 6.1, 6.2 and 6.3):
 - 1.1. The unit rates for the repair of tiles or bricks include the compacting of the ground and the restoration thereof to the original condition. Any bricks or tiles that break, will be for the account of the Contractor.
2. The Concrete (per m²)

NOTE: The concrete must be restored to the original thickness.

- 2.1. The unit rate for the repair of concrete includes the supply, delivery and casting of the concrete to the satisfaction of the Project Manager.
3. Tarred pavement (per m²)
 - 3.1. The unit rate for the repair of tar pavements includes the supply, delivery and placing of the tar and the finishing thereof to the standards set by the Project Manager.
4. In-print concrete paving (per m²)
 - 4.1. The unit rate for the repair of in-print concrete paving includes the supply, delivery and placing of the concrete paving and the finishing thereof to the satisfaction of the Project Manager.

Item

Unit

12.7.37

Per m³

1. Breaking

- 1.1. The unit rate for the breaking of tar, concrete or in-print paving includes the breaking of the tar, concrete or in-print paving by means of a jack-hammer as well as the removal of all unwanted material to a suitable dumping site.
- 1.2. The unit rate for the lifting of paving includes the cost to lift any form of paving (bricks, tiles, blocks etc.). Any material that is damaged will be on the account of the Contractor.

Item

Unit

12.7.38 Hiring of machinery

Per hour

1. The unit rate includes the hiring of the relevant equipment or machinery per hour.
2. The cost to hire shall be the same for after-hours, Saturdays, Sunday and public holidays.
3. The cost of the operator of the machinery/equipment supplied by the Contractor must also be provided separately in the space provided.

STANDARD SPECIFICATIONS

SECTION 11

CABLE SLEEVE PIPES AND DUCTS

CONTENTS

2.14.1 GENERAL

2.14.2 BORE AND JOINTING

2.14.3 STANDARD TESTS

2.14.4 PIPE POSITION

2.14.5 PIPE LENGTHS

2.14.6 DEPTHS

2.14.7 INSTALLATION

2.14.8 INSPECTION

2.14.9 MEASUREMENT AND PAYMENT

2.14.1 GENERAL

The pipes shall be PVC, polyethylene, class "c" or approved alternative pipes complying with this specification. The Engineer shall approve all samples of proposed cable sleeves prior to the ordering thereof.

2.14.2 BORE AND JOINTING

The nominal outside diameter of the pipes shall be between 110 and 160 mm with a wall thickness of 5mm. The bore shall be accurate, smooth and without ridges or surface cracks and the inside edges shall be edged or rounded.

The edging or rounding shall be such that no ridge is formed when two pipes are joined and with the edges of the jointed pipes.

Joints shall be carried out with suitable couplings to prevent movement between pipe ends.

A suitable slip collar or other simple device shall be provided to maintain a minimum of 5mm spacing after the jointing of the sleeves. The joints shall be flexible enough and have enough play to allow for 5° adjustment in adjacent pipe lengths during installation or in the case of subsequent subsidence of the ground. The joints need not be watertight but shall stop sand, stones and other materials entering the sleeves. Flexible black sleeves or similar approved by CoT to be used.

2.14.3 STANDARD TESTS

All pipes shall withstand a shock test conforming to the requirements of BS3505.

All pipes shall furthermore pass the break resistance test specified below and the contractor shall submit a test certificate of a test carried out. CoT reserves the right to request that the tests be repeated in the presence of their representative.

Compression test shall withstand a load of 2,25kN/m with maximum compression of 15mm/min and 5% deflection.

2.14.4 PIPE POSITIONS

The positions and number of sleeves shall be indicated on the drawings. The sleeves must be installed strictly in accordance with the stand pegs and drawings. The position of every crossing shall be marked with "E" cut in the kerb and painted "RED" or cable marker to indicating crossing.

The distance between pipes shall be not less than 50mm where more than one pipe is installed.

Pipes shall be installed in two staggered layers with a minimum distance of not less than 50mm between pipes where more than four pipes are specified for a road crossing.

2.14.5 PIPE LENGTHS

The pipes shall be extended 1m on either side of the tarmac, road surface or service to be crossed.

2.14.6 DEPTHS

The pipes shall be installed at a depth of not less than 1,5 m below the top of the road surface or other depth specified by CoT. Where other services are to be crossed within one metre from the pipe end and the specified clearance between services cannot be maintained, the pipes shall be installed at a depth to allow crossing underneath the other service maintaining the minimum specified clearance and without the bending of the cables.

The minimum clearance between electric cables and other services shall be as follows:

Post Office cables	:0,3 m
Water pipes	:1 m
Other pipes	:0,3 m
Sewerage pipes	:0,3 m
Storm water pipes	:0,3 m
Other electric cables	:0,15m
Gas pipes	:1 m

2.14.7 INSTALLATION

The pipe shall be bedded onto a 50 mm layer of sifted sand. A 100mm sand cover shall be backfilled over the pipes and thoroughly compacted.

The pipes shall be laid straight without kinks and cross the road or other service vertical and horizontally.

After the installation of the sleeve, it shall be cleared out of all foreign material such as sand, etc. with a hand drill or cap.

A 2,5mm diameter galvanized steel wire extending 1 m on either side of the pipe crossing shall be installed in every sleeve.

The sleeve pipes shall be sealed with PVC plugs to prevent the entry of sand prior to backfilling the trench. The necessary precautions during further construction activities shall be made to prevent damage to the sleeve pipes.

Drilling or cutting of tarmac for road crossings shall be done only with the prior written approval by the Engineer.

2.14.8 INSPECTION

The contractor shall arrange with the Engineer and/or COT to inspect the cable sleeves after the sleeves have been installed and before the trench is backfilled and compacted.

2.14.9 MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
14.9.2. Install cable sleeves	m

The unit of measurement shall be the length in metre of the cable sleeves installed.

The tendered rate shall include full compensation for the handling and installation of the cable sleeves including all the couplings, steel draw wire and plugs.

<u>Item</u>	<u>Unit</u>
14.9.3. Drilling of sleeves under roads	m

The unit of measurement shall be the length in metre of sleeve holes drilled.

The tendered rate shall include full compensation for the drilling of 110mm dia sleeve holes. The rate furthermore shall include for all cost the drilling team may have, supervision, site establishment, water and diesel to be used. Separate items shall be schedule for hard rock, soft rock and soil. The rate also includes the supply, installation of these 110mm dia sleeves, including all the couplings, steel draw wire and plugs.

<u>Item</u>	<u>Unit</u>
14.9.4 Cutting and repair tarmac	m

The unit of measurement shall be the cubic metre of tarmac cut and repaired.

The tendered rate shall include full compensation for the cut, removal, excavating under road, backfill, compacting to specification and repair of tarmac. This item only to be used with written approval of the Engineer if drilling is not successful.

STANDARD SPECIFICATIONS

SECTION 12

EARTHING

CONTENT

2.15.1	SCOPE
2.15.2	STANDARDS
2.15.3	EARTHING SURVEYS
2.15.4	MATERIAL
2.15.5	SUBSTATION EARTHS
2.15.6	MV NETWORK EARTHS
2.15.7	MINIATURE SUBSTATION EARTHS
2.15.8	TRANSFORMER EARTHS
2.15.9	LV EARTHS
2.15.10	AERIAL BUNDLE NETWORK EARTHS
2.15.11	EARTH TEST
2.15.12	MEASUREMENT AND PAYMENT

2.15.1 SCOPE

This specification covers the requirements and standards required for earthing systems.

2.15.2 STANDARDS

SABS

1063: Earthing Rods

0199: Earthing Rods

Other standards

- Substation earth's resistance shall be less than 1 ohm
- MV Earths resistance shall be less than 30 ohm at the mini substation or transformer
- LV Earths resistance shall be less than 10 ohm LV supply point
- Lightning protection earth resistant shall be less than 50 ohm at, each earth point.

2.15.3 EARTHING SURVEYS

The Contractor shall obtain the services of an approved earthing specialist to perform soil resistivity surveys at the points of earthing required.

The tests shall be over the depth range 0-6 metres and the result shall be submitted for evaluation to the engineer. CoT shall be present to witness the method and type of tests done.

Where the Contractor is equipped and capable of performing such tests, the equipment and method to be approved by the CoT, before he may perform this work in house.

The engineer shall then issue specific instruction and design requirements regarding the type of earthing to be installed for each application and condition.

2.15.4 MATERIAL

i) Earth Conductor

The earth conductor to be used shall be 70mm² bare copper earth wire connected to the earth bus bars or earth studs with lugs and to the earth rods with brass earth clamps. Approved welding or solder methods may be used if approved to CoT.

ii) Conductive cement

The conductive cement shall be use with earths rods and only for conditions on specific instructions of the engineer.

iii) Earthing Rods

The earthing rods shall be of stainless steel or of the copper coated high tensile steel type 16mm diameter and approximately 1,2m long. The copper coat shall be "molten welded" onto the steel so that an inter-locking crystalline union exists between the two metals. The coatings shall be even over entire rod and shall not be of a thickness less than 0,4mm. The rod, when broken by successive bending shall show no seams, pit slivers or separation of the copper from the steel.

Earth rods shall be hand or power driven with a proper driver. The use of hammers for driving without the use of driving caps is not acceptable.

Where the soil resistivity survey indicates a good earth at depth and hard subsoil or rock is encountered, holes must be drilled. After placing the rods the holes must be filled with conductive cement.

Threads on the rods shall be protected during driving by the use of the necessary couplings, driving tips, head and studs.

Jointing of the rods shall be done with the aid of proper couplings tightly screwed onto the rods.

Earth conductors shall be solidly clamped onto the earth rod with special bronze clamps.

iv) Trench Earths

Where the survey indicates that the resistivity does not decrease with depth, and that deep earths will therefore not be economical, a trench earth will be used, as indicated by the Engineer.

Trench earths shall consists of 70mm² bare copper conductors laid 1 000mm below ground level, to the length as specified by the engineer.

2.15.5 SUBSTATION EARTHS

The substation earths shall be below 10hm and specifically design for the equipment and conditions of the substation area on receipt of the earthing resistance data from the specialist contractor.

COT shall approve the substations earthing system prior to the installation thereof.

The fence and all steel equipment shall be hard earthed continuously to the main earth system.

A provisional amount shall be allowed for the testing and installation of the substation earths.

2.15.6 MV NETWORK EARTHS

All MV cable sleeves and armouring shall be terminated to the earth bars provided in the substations and switchgear mini substations.

All outdoor terminations to the overhead system, shall have a termination earth connected to a separate earth steel down wire to the earth rod of 3/2,5mm stapled to the pole connected.

The Lightning arresters earths shall be connected to a steel down wire of 3/2,5mm, stapled to the pole, 300mm intervals to the bottom foot of the pole.

2.15.7 MINIATURE SUBSTATION EARTHS

Each miniature substation is provided with two separate earthing bus bar and earthing bus bar in the MV compartment connected to the minisub frame, and an insulated earth bar in the LV compartment. The LV earth bar shall be connected to both the MV earth bar as well as the LV neutral bar by means of removable 70mm² stranded bare copper conductor, BCEW.

The exact method of earthing of the minisub shall be prescribed by the Engineer on receipt of the earthing resistance data from the Specialist Contractor.

In general however, earthing shall comprise of the following:

1. Install 70mm² BCEW earthing wire in the trench on MV side of minisub for 50 metre and connect to the MV earth bar, plus a 16mm dia earth rod connected to the MV earth bar via 70 BCEW 1 metre from the minisub.
2. Connect all MV cable armouring and lead sleeves to the MV terminal earth bar.
3. Connect all LV cables neutrals to neutral bar.
4. Connect all LV cables earths to earth bar.
5. Install a 70mm² BCEW running for 50m in the trench in the opposite direction to the MV earth from the LV earth bar. Interconnect LV earth and neutral bars, with a 70mm² BCEW.
6. All LV earth conductors must be insulated over the first 6m before entering the mini substation.
7. The Engineer will issue detailed instructions regarding the installation of additional earth rods as well as removal of the link between the LV neutral and earth bars. If the earth resistance level is above 1 ohm, then shall the MV and LV earth be separated.

2.15.8 TRANSFORMER EARTHS

Each transformer pole structure shall be provided with two earths. One for the surge arresters and one for the transformer earth, each of these earths shall be provide with separate steel 3/2,5mm² down conductor interconnected in the ground. The down conductors shall be connected to one (1) 1,2 earth rod installed 400mm below final ground level.

The MV earth resistance shall be less than 30 ohm.

2.15.9 LV EARTHS

1. Underground network

Each distribution kiosk, pillar or metre box shall be provided with two 70mm² bare copper conductor, laid 10m in the trench in apposite directions connected to the earth bus bar.

2. ABC Network

The LV earth for the ABC network shall be installed at the pole nearest to the transformer or mini substation (one pole away).

The standard arrangement shall be as follows:

The LV earth shall consist of a steel stay wire 7/2,5mm² as down conductor saddled to the pole at 300mm intervals and be connected to a crow foot earthing type arrangement with three 1,2m earth rods, 6m apart, interconnected with a 70mm² BCEW, installed 600mm depth below final ground level.

2.15.10 AERIAL BUNDLE NETWORK EARTH

The following earth conductors shall be used:

1. From Minisub to the Bare earth or Neutral conductor of the ABC

Interconnect the minisub LV earth bar with the ABC neutral conductor by means of 70mm² ABC insulated Aluminium cable or larger. Note that the conductor must be insulated from the minisub earth bar. The ABC neutral conductor shall be connected to the neutral conductor with double clamps.

2. Pole earthing

A system of multiple neutral earthing will be used. The neutral conductor therefore will also act as an earth conductor. At all end poles, earth the neutral conductor by means of steel wire 3/2,5mm used for pole stays, fixed to the pole with staples at 300mm intervals.

The earth wire shall be stapled to the bottom of the pole. Where connections are made to equipment, suitable tinned copper cable lugs shall be fitted and properly soldered onto the end of wires.

2.15.11 EARTH TESTS

Earth tests shall be done on all MV and LV earth points with the correct test equipment. COT shall witness all tests and the contractor shall provide test certificates of the results.

2.5.12 MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
15.12.1 Earthing surveys by specialist contractor	per test

The unit of measurement shall be the sum amount as tendered.

The tendered rate shall provide full compensation for the appointing a specialist contractor to do all earth resistance tenders and provide the results to the engineer.

The contractor shall provide the specialist contractor with the relevant drawings to complete the tests.

The rate shall furthermore include all fees, costs and rents of the specialist contractor to provide the specified results to the engineer.

<u>Item</u>	<u>Unit</u>
15.12.3 Install MV Network earths	Each

The unit of measurement for payment shall be the number of the MV Network earths installed.

The tendered rate shall provide full compensation for the excavating, installation and connecting of the MV Network earth to the earth points complete, including the testing of the newly installed earth resistance and providing test certificates.

<u>Item</u>	<u>Unit</u>
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15.12.5 Install earths for distribution or metre kiosk	Each
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The unit of measurement for payment shall be the number of complete earths for the installation handling and testing of the earths for distribution or metre kiosk complete including the excavations and all equipment or material needed to complete the installation.

<u>Item</u>	<u>Unit</u>
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15.12.7 Install LV earths for ABC Network	Each
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The unit of measurement for payment shall be the number of complete LV earths installed.

The tendered rate shall provide full compensation for the handling, excavation, installation and testing of the complete LV earths for ABC named "crow foot" including all equipment and material needed to complete the installation.

<u>Item</u>	<u>Unit</u>
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15.12.9 Install Transformer earths	Each
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The unit of measurement for payment shall be the number of complete transformer earths installed.

The tendered rate shall provide full compensation for the excavation, installation, handling and testing of the complete transformer earths included all equipment and material needed to complete the installation.

<u>Item</u>	<u>Unit</u>
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15.12.11 Install pole earths	Each
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The unit of measurement for payment shall be the number of complete pole earths installed.

The tendered rate shall provide full compensation for the installation of the complete pole earths, at the end of every LV circuit.

<u>Item</u>	<u>Unit</u>
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15.12.12 Supply and install conductive cement	m ³
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The unit of measurement shall be the volume in m³ of conductive cement supplied.

The tendered rate shall provide full compensation for the supply, delivery, off-loading and installation of conductive cement in bags, in good and dry conditions.

<u>Item</u>	<u>Unit</u>
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15.12.13 Drilling for earth rods	Each
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The unit of measurement shall be for payment shall be the number of holes drilled.

The tendered rate shall include full compensation for the transport, diesel, drilling and labour needed to drill the holes in CoT supply area, in all type of material, separate item shall be schedule for different depth and size of holes.

<u>Item</u>	<u>Unit</u>
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15.12.15 Install earth rods and equipment	Each
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The unit of measurement shall be the number of earth rods installed.

The tendered rate shall provide full compensation for the handling and installation of the earth rods and equipment needed to complete the installation.

Separate items shall be scheduled for the type of installations.

<u>Item</u>	<u>Unit</u>
15.12.16 Install earth wire	m

The unit of measurement for payment shall be the length of earth wire installed.

The tendered rate shall provide full compensation for the installation of the earth wire including the terminations of the earth wire to the bus bars.

This item shall only be paid for addition earth wire required by the engineer.

STANDARD SPECIFICATIONS

SECTION 13

Notwithstanding any laws stated in any part of this tender document and the contract, the contractor is required to comply with the Occupational Health and Safety (OHS) Act and regulations as amended from time to time.

1. Provision of Health and Safety file [Once off]

The unit of measurement shall be number of health and safety files provided.

The cost component shall include full compensation for the provision and maintenance of a health and safety plan, risk assessment, permit applications, notifications and a health and safety file on site containing all the documentation required in terms of the act and applicable regulations. The safety plan must always be specific to the project for which it is going to be applied.

2. Provision of Safety Officer [Per month]

The unit of measurement shall be number of days worked per 30 days calendar month. Where the safety officer has worked for less than 30 day calendar month, a pro rata rate shall be calculated and used. (Normal hour rate shall apply)

The cost component shall include full compensation for the provision of one or more competent and experienced safety officer as may be necessary for the duration of the contract.

3. Occupational Health and Safety training [Each]

The unit of measurement shall be per each person trained.

The cost component shall include full compensation for the provision of training programs for the contractor's employees and also, where applicable, for sub-contractors. Training shall include first aid training and/or OHS representative training as per the requirements of OHS regulations.

4. Provision of personal protective clothing and equipment [Per Set]

The unit of measurement shall be per set of PPE for each person.

The cost component shall include full compensation for the provision, maintenance, repair and/or replacement of damaged or unsuitable protective clothing and equipment for use by the contractor's employees. Provision of PPE must be in accordance to HIRA or PPE study.

The set of PPE shall include the following items: Safety hard hat, protective work suits, safety boots, safety gloves and accessories

HANDOVER, TESTING AND COMMISSIONING

CONTENTS

2.16.1	SCOPE
2.16.2	TESTING SEQUENCE
2.16.3	SITE TESTING OF EQUIPMENT PRIOR TO COMMISSIONING
2.16.4	COMMISSIONING
2.16.5	MEASUREMENT AND PAYMENT

2.16.1 SCOPE

This section covers the factory and on site testing and commissioning requirements for all equipment supplied and installed under this contract. The procedures described are the minimum required and additional tests/requirements are specified in the relevant standard and detail specifications.

2.16.2 TESTING SEQUENCE

The testing to be performed on site is divided into two sections as follows:

- (a) Before official commissioning commences the contractor shall test his equipment as described below to ensure that the plant or equipment have been installed correctly.
- (b) After the contractor has been satisfied that his equipment is in good and running order, the commissioning of the plant or equipment will commence as described below.

2.16.3 SITE TESTING OF EQUIPMENT PRIOR TO COMMISSIONING

- (a) The contractor shall timeously inform the engineer when he intends to perform his first tests and start-up of equipment in order to allow the engineer to witness the tests.
- (b) Before starting up and section of the mechanical plant or filling tanks and sumps with liquid, the contractor shall clean out the tanks, pipes, fittings, equipment or structures, and, if necessary, make arrangements with other contractors to remove their building rubble from the structures, check that all safety devices and alarms have been set and activated, all nuts have been tightened correctly, that all the equipment is complete and ready for start-up, that the plant has been installed correctly, and that three copies of the operating manuals have been handed over to the engineer.
- (c) Each section of the equipment shall be started up by the contractor, who shall ensure that all oil fillings, lubrication, vibration monitoring, etc, have been correctly completed. In addition, he shall be responsible for the first re-filling

of all the lubricating oils as well as for adjusting the plant to operate according to specification. Before any equipment is started or energized, the contractor shall ensure that it is safe for personnel and equipment on site to do so. Allowance for these costs shall be made in his tendered rates and sums.

- (d) The contractor shall conduct his own tests on the equipment and, only when he is satisfied that these tests meet the requirements of the specifications, shall he notify the engineer that he is ready to conduct the official tests on completion. The contractor shall not conduct an official test without the engineer being present. All equipment tested shall conform to the requirements specified.
- (e) The contractor must provide his own test equipment and electrical supply. Cost thereof to be included in tender amount.
- (f) Test equipment to be approved by CoT before testing commences.
- (g) Procedures of CoT must be strictly followed when testing ie when testing MV cable the cable must be alive on the same day when the pressure test is completed.

2.16.4

COMMISSIONING

- (a) The contractor shall be responsible for commissioning all sections of the works and shall perform all of the tasks set out below:
 - (i) Prior notice of and proper arrangements for the commissioning shall be made with the employer, engineer, supply authority, and all electrical contractors and suppliers of equipment which will be affected by the commissioning operation.
 - (ii) If plant and equipment which has been supplied by others has to be installed and commissioned, the supplier's specific permission thereto, naming the contractor to commissioning.
 - (iii) All sections of the works shall be carefully inspected by the contractor to ensure that all construction and installation work has been properly completed.
 - (b) Commissioning and testing on site shall be carried out by experienced personnel under the contractor's supervision.
 - (c) All re-commissioning tests and checks shall be agreed with the engineer prior to the commencement therewith.
 - (d) When all the tests required before commissioning, or tests before tests on completion, have been completed and accepted by the engineer, the commissioning may proceed. During this period the contractor shall instruct the operating and maintenance staff in the correct procedures of operating the plant under all circumstances of operation, including emergency conditions, the correct servicing of every part, the type of oil or grease to be used, and similar instructions. This shall be done by demonstration and confirmation, in writing, and operating manuals shall be referred to for this purpose.

- (e) At least one week before commissioning commences the engineer will be requested to provide the contractor with commissioning sheets for all the equipment installed by the contractor. These forms shall be completed by the contractor during the commissioning period and all items listed shall be entered. Final handover certificates will not be issued for equipment with incomplete commissioning reports. Information that is not available or applicable, or reasons for not performing certain tests shall be agreed with the engineer.
- (f) Commissioning of the plant shall include operating under conditions which shall adequately prove that all the specifications are met. All safety devices, stand-by plant, automatic controls and protection devices shall be adequately tested for reliability and correct functioning. The contractor may be called upon to repeat testing during the maintenance period if the performance of any equipment supplied under this contract is suspected to be substandard by the engineer. Such tests shall be for the contractor's account and shall comply with the requirements specified. Copies of updated commissioning reports shall be provided to the engineer within two days after a test has been performed.
- (g) After the contractor has provided training to the employer and provided all other contractual requirements have been met, the latter will sign the commissioning report.
- (h) Once a commissioning report is complete, the engineer and the contractor will sign and date the report, the maintenance for that particular piece of equipment from then on is the responsibility of CoT in compliance with the general conditions of contract.
- (i) Programs for the tests, and instruction/training sessions with the CoT shall be prepared by the contractor and provided to the engineer no less than two weeks before the commissioning period commences. Weekly updates to these schedules shall be provided by the contractor for the duration of the commissioning period.
- (j) Note that if any equipment should fail during the commissioning period, the equipment shall be repaired or replaced by the contractor, and testing and commissioning will commence from scratch.
- (k) During the commissioning period, the contractor shall be responsible for providing all labour and materials (including testing equipment) and shall carry out all the servicing and any adjustment of the plant required for ensuring that it operates as specified. Valid calibration certificates shall be available for all testing equipment on site during the commissioning period.
- (l) The contractor shall conduct all the tests required to satisfy the engineer that the plant is capable of performing in accordance with the specification, and shall make allowance therefore in his tendered rates and prices. Any defects detected during the commissioning period shall be made good by and at the expense of the contractor, including all additional costs incurred by the COT and the engineer. These tests shall be conducted to certify that the plant, as installed, is operating in accordance with the specified requirements. Note that all equipment will be tested as part of a system, where appropriate, and will not be passed if all protection devices, interlocking with other equipment, etc, are not fully functional.

C3.4.2. STANDARD SPECIFICATIONS

The following are tables listing CoT specifications which may be made available on a disc upon request.

Table 1

CITY OF TSHWANE REWORKING OF INSTALLATION SPECIFICATIONS	
SPECIFICATION REGISTER	
Document no.	Description
CTMME-IS-01	General Rev 1
CTMME-IS-02	Positioning of services Rev 1
CTMME-IS-10	Miniature substations Rev 1
CTMME-IS-20	Low voltage distribution boxes Rev 1
CTMME-IS-30	Underground cable reticulation Rev 1
CTMME-IS-40	Earthing Rev 1
CTMME-IS-50	Overhead lines Rev 1
CTMME-IS-60	Streetlights Rev 1
CTMME-IS-70	Substations Rev 1
CTMME-IS-80	Inspection Forms Rev 1

Table 2

CITY OF TSHWANE REWORKING OF INSTALLATION SPECIFICATIONS		
DRAWING REGISTER		
Old Dwg. no.	New Dwg. no.	Description
A-1718	A-1800	11kV overhead line three phase t-off – Staggered Vertical Construction (Front view)
A-1720	A-1801	11kV overhead line Two phase t-off to the left & three phase T-off to the right – Staggered Vertical Construction
A-1722	A-1802	11kV overhead line Three phase t-off to the left vertical in-line strain construction (side view)
A-1724	A-1803	11kV overhead line three phase t-off to the Right – Staggered Vertical Construction
A-1727	A-1804	11kV overhead line strain assembly 30° - 90° (vertical) (type B)
A-1728	A-1805	11kV overhead line in-line strain assembly 0° - 10° (vertical)
A-1729	A-1806	11kV overhead line terminal assembly
A-1730	A-1807	11kV overhead line strain assembly 30° - 90° (vertical) (typeA)
A-1731	A-1808	11kV overhead line strain assembly vertical (30° deviation)
A-1732	A-1809	11kV overhead line intermediate assembly (small deviation)
A-1733	A-1810	11kV overhead line intermediate assembly 0° (staggered vertical)
A-1734	A-1811	11kV overhead line stay rod installation for wooden poles
A-1735	A-1812	11kV overhead line wooden pole stay assembly
A-1736	A-1813	Pole mounted 3-phase 11kV/400/230V transformer and earthing installation details
A-1740	A-1814	Earth mat Manufacturing details
A-1743	A-1815	Pole mounted single phase 11kV/230V transformer and earthing installation details
A-1744	A-1816	11kV overhead line two stay needed
A-1745	A-1817	11kV overhead line road crossing
A-1748	A-1818	11kV overhead line change from vertical to horizontal
A-1749	A-1819	11kV overhead line with section switches
A-1752	A-1820	11kV overhead line with slack span connection
A-0356	A-1821	LV Neutral surge arrester installation
A-1000	A-1822	Open wire assemblies – earthing bracket
A-1002	A-1823	CT/VT installation (Front & side view)

CITY OF TSHWANE REWORKING OF INSTALLATION SPECIFICATIONS DRAWING REGISTER		
Old Dwg. no.	New Dwg. no.	Description
A-1004	A-1824	4 pole auto-recloser structure (Front view)
A-1005	A-1825	11kV overhead line automatic recloser or sectionalizer installation (4-pole) with LV control
A-1006	A-1826	LV-pole mounted meter box
A-1007	A-1827	Service connection from open wire system
A-1008	A-1828	LV intermediate assembly – open wire system
A-1100	A-1829	LV ABC three phase bare neutral suspension assembly (0 - 30°) wood pole
A-1120	A-1830	LV ABC three phase terminal assembly (wood pole)
A-1121	A-1831	LV ABC three phase strain assembly (0 - 60°) wood pole
A-1122	A-1832	LV ABC three phase strain assembly (60 - 90°) wood pole
A-1140	A-1833	LV ABC three phase T-off assembly from intermediate (wood pole)
A-1141	A-1834	LV ABC three phase cross assembly from intermediate (wood pole)
A-1142	A-1835	LV ABC three phase T-off assembly from strain (wood pole)
A-1143	A-1836	LV ABC three phase cross intermediate – strain assembly from intermediate (wood pole)
A-1168	A-1837	Overhead (flying) stay arrangement for wood pole
A-1850	A-1838	Section/equipment links cut/out 1300 steel crossarm/single pole
A-3000	A-1839	8m wood pole with stay
A-3001	A-1840	8m wood pole with strut pole
A-3002	A-1841	Transformer pole

C3.6. CERTIFICATIONS

There are specific services or activities which would require only certified persons to perform them and such certification shall be issued by the CoT with the written consent of the project manager. The procedure to obtain certification is given below:

- a. An application must be made, in writing, to the relevant section/depot. In the application it must be stipulated if the Contractor/Sub-contractor want to:
- b. Be tested or
- c. Do the training which includes testing.
 - i. The application must be send by the section to Consulting Engineer: Technical Training Operations or appointed person with the same authority.
 - ii. If the Contractor/Sub-contractor need only be tested, a test date must be organized with the relevant representatives.
 - iii. Both the theoretical and practical test must be passed before the certificate will be issued. The Contractor/Sub-contractor must provide his own equipment, material and tools for the practical test.
 - iv. If the Contractor/Sub-contractor requests to do the course, the course date and the invoice will be provided to the Contractor/ Sub-contractor by the Technical Training Operations. Both the theoretical and practical tests must be passed before the certificate will be issued.
 - v. The certificate will be issued by the Technical Training Operations and a copy will be send to the section involved after the invoice has been paid. The certificate must always be available when requested.
 - vi. and the invoice will be provided to the Contractor/ Sub-contractor by the Technical Training Operations. Both the theoretical and practical tests must be passed before the certificate will be issued.
 - vii. The certificate will be issued by the Technical Training Operations and a copy will be send to the section involved after the invoice has been paid. The certificate must always be available when requested.

C3.7. ADMINISTRATIVE ARRANGEMENTS

3.7.1 The administrative tasks and conditions as set out in the audit trail policy of the EED must be carried out by each contractor. If the Contractor does not abide by these conditions, his/her contract may be suspended. The following submissions shall form part of the contractor's report:

- a. The contractor will be requested to report on progress on site as required by the project manager.
- b. The contractor must submit a signed "Approved Appointment Form with Approved Unit Rates" together with the invoice where applicable.
- c. The contractor shall be required to produce a Certificate of Compliance for the work completed and requiring such certification by law.

3.7.2 A project appointment letter or purchase order is a document/form stating that the contractor has been appointed for a specific stated project. The document shall further state:

- a. The duration of the project, i.e. starting and completion dates,
- b. Total cost of the part of the project for which the contractor has been appointed,
- c. The reply period,
- d. Project supervisor and other matters that may be relevant for the project at the time of the appointment.

3.7.3 The employer may at any time require any and all information about the contractor's employees. If any irregularity is found, the employer may order the removal of such employee from the project and such person shall have no involvement with the contractor (for the specific project) under the awarded contract from the next day after the notification has been served.

The employee may be re-appointed provided that the employer agrees and that whatever information that was not available, is available and acceptable.

3.7.4 The contractor must comply with all the applicable CoT's procurement policies.

C3.8. APPOINTMENT OF COMMUNITY LIAISON OFFICER (CLO)

C3.8.1 Appointment process

C3.8.1.1 Project Steering Committee (PSC)

Section 6.1.3.1 of the Expanded Public Works Programme (EPWP) Recruitment Framework requires the Office of the Speaker, in consultation with the Ward Councillor, to hold a public meeting, and elect a project steering Committee (PSC).

Project Steering Committees will be limited to a minimum of four (4) members and a maximum of six (6) members, to avoid a situation of too many potential interest groups preventing the PSC from functioning.

C3.8.1.2 Community Liaison Officer (CLO)

After the election of the PSC, at the same meeting, residents and stakeholders in attendance are to vote for a pool of three (3) potential CLOs, coming from the community concerned.

In the event that a PSC is not constituted by public meeting, or cannot proceed with its work, as contemplated by section 6.1.3.5 of the Framework, the appointed Project Steering Committee should nominate potential CLOs.

It is from this pool that the contractor, after interviewing the three (3) nominees and consultation with the Project Steering Committee, appoints the CLO.

This renders the CLO selection process less arbitrary and gives the community a voice in the selection process.

C3.8.1.3 Role of Councillors

Councillors are not permitted to interfere in the EPWP or CLO recruitment process.

Ward Councillors, in conjunction with the Office of the Speaker, convene the first meeting to establish PSC and to establish a pool of potential CLOs.

Ward councillors may be invited to the selection of beneficiaries for projects in their wards, provided that they do not risk the integrity of the selection process.

C3.8.1.4 Role of City of Tshwane (CoT) officials

Only designated CoT officials may assist in organising public meetings and coordinating Expanded Public Works Programme (EPWP) lotteries.

City of Tshwane officials may not approach Ward Councillors to appoint CLOs, or perform other tasks inconsistent with the Framework.

City of Tshwane officials must provide the Office of the Speaker and Ward Councillors' sufficient notice of at least ten (10) working days to arrange for public meetings to elect PSC members, and a further

fourteen (14) days' notice for the appointment of a Community Liaison Officer (CLO).

C3.8.1.45 Administrative processes for appointment of Community Liaison Officers

Minutes and an attendance register must be kept as evidence of the proceedings of the election meeting.

The Office of the Speaker must submit the results (minutes) and attendance register of the Community Liaison Officer (CLO) election meeting to the chairperson of the PSC, the contractor and the Expanded Public Works Programme (EPWP) Division.

The elected Community Liaison Officer (CLO) will be appointed by the contractor for the duration of the project and also be remunerated by the contractor. Where the Community Liaison Officer (CLO) is no longer available and another is appointed, the exiting Community Liaison Officer (CLO) shall cease to receive remuneration.

An employment agreement containing the general terms and conditions of the contract, will be issued to the Community Liaison Officer (CLO) and must be signed by the Community Liaison Officer (CLO) before his/her commencement of duties.

Sometimes works is undertaken in more than one ward at a time. A Community Liaison Officer (CLO) may be appointed for each ward. However, the number of wards affected does not increase the work performed by each Community Liaison Officer (CLO). Therefore it is proposed that the remuneration amount be divided among the number of CLO's if more than one is appointed in the same project.

The Community Liaison Officer (CLO) will be remunerated according to the entry-level basic salary of an Administrative Officer position of the City of Tshwane (CoT). No fringe benefits will be applicable.

C3.8.2 SUB-CONTRACTING

Any other work beside the activities deemed to be core functions and responsibility of the main contractor shall be allocated to subcontractors.

Before work can commence with the successful Bidder, City of Tshwane will insist on being provided with copies of formal signed subcontracting agreements that make up the legislated 30% of the contract value. All agreements to state that City of Tshwane will not be held responsible or liable should the successful Bidder breach contract with the subcontracted entities or enterprises.

The work to be sub contracted shall include among others but not limited to.

- Excavations
- Construction of the guard house
- Paving
- Security Services
- Transportation of material
- Installation of electrical equipment (if not done by main contractor)
- etc

C3.9. INSURANCE

The Contractor shall ensure that all the works performed under this contract are insured. The insurance shall be against public liability.

The Contractor must provide proof of such insurance to the Project Manager within 14 (fourteen) days after the notification of acceptance of the tender. Should the renewal of an

existing policy fall within the period prior to the Defects Certificate being issued, a letter of confirmation from the insurance company that such a policy will be renewed and that all premiums have been paid must be attached and the copy of the renewed policy be submitted within 2 (two) months of renewal to the Project Manager.

The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the Contractor) caused by activity in connection with this contract for any one event is ten million Rands (R 10 000 000.00)

The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the Contractor arising out of and in the course of their employment in connection with this contract for any one event is as set out in Compensation for Occupational Injuries and Diseases Act (COIDA) as well as a group life insurance for at least three times the employee's total annual earnings.

The cover shall provide these insurances from the table	
Insurance against:	Loss of or damage to the works, Plant and Materials.
Cover / indemnity:	R10 million.
The deductibles are:	According to the Declaration Form from Insurance and Risk Management of CoT.
Insurance against:	Liability for loss of or damage to property (except the works, Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the Contractor) caused by activity in connection with this contract.
Cover / indemnity	R10 million.
The deductibles are	According to the Declaration Form from Insurance and Risk Management of CoT

C3.10. PERFORMANCE BOND, GUARANTEES AND RETENTIONS

C3.10.1. PERFORMANCE BOND AND GUARANTEES

Should the contractor not comply with the terms and conditions of this contract and/or appointment under this contract, he shall be warned in writing by the employer or the representative of his failure to perform. As a result of three warning letters being provided under the same contract, the employer shall have the sole right to take one or more of the steps against the contractor:

- a. terminate the contract between the contractor and the employer for the remainder of the contract period.
- b. suspend the contractor for the remaining period of the contract. The contractor shall qualify to bid for the same contract with the same scope of works but only after the contract for which he was suspended has expired.
- c. If the performance bond clause is applied, the retention amount for the specific project for which the clause is applied or the total retention amount already withheld by CoT for other projects, whichever is higher, shall be forfeited.

ALL decisions made shall be recommended and implemented by the Project Manager. The Group Head: Energy and Electricity Department shall approve such recommendation prior to

implementation. The recommendation(s) will be processed through supply chain management process.

The contractor may not refuse any work allocated to them other than for the following reasons:

- A). The works are not according to the works information and there is no rate tendered for in the contract data or the new rate (provided by CoT) is not market related,
- B). the contractor does not have capacity to provide the works using the new scope which is not part of the contract.

If the contractor refuses work for any other reason, such refusal is noted and can be used as a reason for termination of this contract.”

C3.10.2. RETENTION

The CoT reserves the right to retain a certain percentage of the invoiced amount until the defect period has lapsed.

The retention percentage is 10% of the total invoice amount (VAT Exlc), claimable at the expiry of defects certificate per specific project.

The defect period is 12 months after the Completion date of the whole construction works per specific purchase order.

The defect correction period is 2 weeks for construction work, unless stated otherwise in the appointment letter.

C3.11. PRICE ADJUSTMENTS FOR INFLATION

Tenderers are required to register with SEIFSA (Steel and Engineering Industries Federation of South Africa) and obtain periodic SEIFSA rates for various categories applicable to this contract. Contractors and Subcontractors shall obtain their own copies (at their own cost) of the SEIFSA rates documents for contract management purposes and for use for the duration of the Contract. City of Tshwane or its representative may request such rates at any time during the contract and contractors should provide them within the response time stipulated in this document. The base date for indices is the month prior to the month in which the tender was awarded.

Prices/Rates tendered shall remain fixed for the every 12 months of the contract. The first 12 months is the rates as they are tendered while the second and third 12 months are calculated using SEIFSA index stated below.

The proportions used to calculate the Price Adjustment Factor are:

For Material price calculation:		
1.00	linked to the index in	Table C-3(a) of the SEIFSA Index

0.00		Table O of the SEIFSA Index
0.00		Table L-1 of the SEIFSA Index
For Unit Rates and hourly tariff calculation;		
0.70	linked to the index in	Table C-3(a) [field force] of the SEIFSA Index
0.20	linked to the index in	Table P of the SEIFSA Index (Plant and Machinery before installation)
0.10		Table L-1 (freight cost) of the SEIFSA Index
The indices are those prepared by Steel and Engineering Association of South Africa.		

C3.12. CONTRACT DOCUMENTS:

The document “NEC3 Engineering and Construction Contract”, April 2013.

Tenderers, Contractors and Subcontractors shall obtain their own copies (at their own cost) of this document for tendering purposes and for use for the duration of the Contract from the Secretary of the South African Institution of Civil Engineering, Private Bag X200, Halfway House, Midrand, 1685 and shall bear all expenses in this regard. This document shall form part of the contract.

C3.13. INSTALLATION SPECIFICATIONS

These documents are obtainable from CoT upon request.

C3.14 EVALUATION CRITERIA

The tender shall be evaluated in four phases. Failure to comply with the requirement of a phase, will results in the bidder being disqualified and not allowed to proceed further to the next phase. The phases are as follows:

- Phase 1 : Administrative Evaluation.
- Phase 2 : Mandatory Requirements
- Phase 3 : Functionality
- Phase 4 : Preference Point System

C3.14.1. PHASE 1: Administrative evaluation.

Failure to comply with the administrative requirements shall disqualify the tenderer from further evaluation. The following requirements, submissions and returnable documents shall be assessed.

- CIDB grading.
- Attendance of a site briefing meeting.
- Singing of all Forms

C3.14.2. PHASE 2: Mandatory requirements (This process is preceded by administrative evaluation):

Bidders must submit the following documents with the tender document

- i. Bidders must submit Compensation for Occupational Injuries and Diseases Act (COIDA) letter of good standing. Failure to submit COIDA letter of good standing shall disqualify the Bidder from further evaluation.
- ii. Bidders must submit proof of valid CIDB grading (6EP).
 - The tenderer must have already obtained the minimum CIDB grade at the time of submitting the bid document.
 - The tenderers CIDB registration must be valid at the time of submitting the bid document and also during the evaluation of the tender.
 - Proof of CIDB registration and grading must be submitted as part of mandatory requirements.

Failure to submit proof of valid CIDB registration, minimum 6EP or higher grading shall disqualify the Bidder from further evaluation.
- iii. Bidders must submit a list of Safety, Health, Environment and Quality (SHEQ) legal appointments requirements. The SHEQ Plan must be in accordance with Occupational Health and Safety (OHS) regulations and must be in line with the safety specification and baseline risk assessment of this tender. Failure to submit the SHEQ Plan shall disqualify the bidder from further evaluation.
- iv. Project Manager (National Diploma or higher: Electrical Engineering (with minimum 3 years). Submit certified copies of qualification and CV. . Form R.D.D.1
- v. Test Technician (National N Diploma or higher: Electrical Engineering or Qualified Artisan with minimum 3 years experience) (NQF Level 6). Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5
- vi. Installation and construction specialist (National N Diploma: Electrical with red seal certificate or higher qualifications with red seal certificate or Qualified artisan with minimum 5 years experience) with red seal certificate. Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5
- vii. Construction Health and Safety Officer (registered with South African Council for Projects and Construction Management Profession (SACPCMP). Submit certified copies of qualification, registration and CV. . Form R.D.D.4 and R.D.D.5
- viii. Environmental Officer (National Diploma /higher in Environmental management). Submit certified copies of qualification and CV. Form R.D.D.4 and R.D.D.5
- ix. Service provider must have the following equipment:
 - 1x Cherry picker
 - 1x TLB
 - 2X 8Ton or higher Crane Truck

The service provider must complete RD.D.2 and attach Owner's Registration or Lease Agreements plus Lessor's Registration Documents for the above equipment.

Failure to comply with the mandatory requirements shall disqualify the tenderer from further evaluation.

C3.14.3. Phase 3: Functionality

The following criteria and weights will be used and applied when bids are assessed for functionality:

Criteria No.	Criteria Description	Sub-Criteria	Scale	Weight	High Possible Score
1.	<p>This criterion will assess the relevance of the bidder's experience and financial value (material and labor included) of previously completed projects over the last 5 years:</p> <p>Relevant experience of the company must be in the construction works of Medium Voltage (MV) and Low Voltage (LV) electrical network infrastructure and consumer connections.</p> <p>The bidder must provide evidence confirming successfully completed projects and the value thereof. Bidders must submit separate evidence for each of the previously completed projects. Where more than one project was completed, values of each project will be added.</p> <p>The following is required for the bidder to get points:</p> <ul style="list-style-type: none"> • A signed testimonials or reference letters or completion certificates from the contactable clients must be attached. • The submitted documentation must indicate the scope of work done, value in South African Rand Currency, duration of project and year completed. <p>Failure to submit the required and acceptable supporting documents will result in zero score allocated.</p>				<p>Max 45 points.</p> <p>Points scored =</p>
	1.1. Relevant projects with a total value not exceeding R10 000 000	Acceptable projects with value not exceeding R10 000 000 attached.	1	9	
	1.2. Relevant projects with a total value exceeding R10 000 000 but under R15 000 000	Acceptable projects with value exceeding R10 000 000 but under R15 000 000 attached	2		

Criteria No.	Criteria Description	Sub-Criteria	Scale	Weight	High Possible Score
	1.3. Relevant projects with a total value exceeding R15 000 000 but under R20 000 000.	Acceptable projects with value exceeding R15 000 000 but under R20 000 000 attached	3		
	1.4. Relevant projects with a total value exceeding R 20 000 000	Acceptable projects with value exceeding R20 000 000 attached	5		
2.	Experience of key staff working for the company:				Max 40 Points scored =
	The staff must have relevant experience in electrical construction or new infrastructure installations. Certified copies of qualifications from the accredited institution for each category must be submitted.				
	Key Staff as Indicated Below:				
		Years of Experience:			
	2.1. Project Manager (National Diploma or higher: Electrical Engineering (NQF Level 6, with minimum 3 years).	3 to 5 years	4	1	8
		Above 5 years	8		
	2.2. Test Technician (National Diploma or higher: Electrical Engineering or Qualified Artisan with minimum 3 years + practical experience) (NQF Level 6).	3 to 5 years	4	1	8
		Above 5 years	8		
	2.3. Installation and construction specialist (National Diploma: Electrical with red seal certificate or higher qualifications with red seal certificate or Qualified artisan with minimum 5 years + practical experience) with red seal certificate.	5 to 7 years	4	1	8
		Above 7 years	8		
	2.4. Construction Health and Safety Officer (registered with South African Council for Projects and Construction Management Profession (SACPCMP).	3 to 5 years	4	1	8
		Above 5 years	8		
	2.5. Environmental Officer (National Diploma /higher in Environmental management).	3 to 5 years	4	1	8
		Above 5 years	8		

Criteria No.	Criteria Description	Sub-Criteria	Scale	Weight	High Possible Score
3.	Local Economic Participation - Location of Business.				Max 15
	Municipal Rates & Taxes not older than three months or Valid Lease Agreement or Title Deed of the business must be submitted with the tender				Points scored =
	Outside Gauteng	Acceptable evidence showing business address that is outside Gauteng province submitted.	1	3	15
	Within Gauteng	Acceptable evidence showing business address that is within Gauteng province submitted.	3		
Within City of Tshwane	Acceptable evidence showing business address that is within the City of Tshwane jurisdiction submitted.	5			
	HIGHEST POSSIBLE SCORE				100


- (a) The CoT reserves the right to contact references submitted by the bidder.
- (b) Bids that do not achieve a **minimum score of 75 points** (out of 100) for functionality **will not be evaluated further and will not be considered further.**
- Please note should any of the nominated staff be replaced, the successfully appointed service provider will be required to ensure that such replacements must have equivalent criteria as above and this need to be approved by the City of Tshwane.

C3.14.3. Phase 4: Preference point system

Evaluation in terms of the 90/10 preference point system

Note: As per PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000: PREFERENTIAL PROCUREMENT REGULATIONS, 2017

- The City of Tshwane reserve the right to accept proposed offered prices or to average proposed offered prices of the acceptable bidders who are successful on all four stages in accordance to the budget availability and benchmarking with other municipalities.
- The City of Tshwane reserve the right to make a counteroffer process and the City of Tshwane prices shall be final.


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General Notification

This document forms an integral part of the tender document and, in particular, shall constitute the Client's (City of Tshwane.) Occupational Health & Safety Specification, as required by the Construction Regulations, 2014, as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993).

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'. Notwithstanding this, cognizance should be taken of the fact that no single Act or its set of Regulations can 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 and safety 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.


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 when drafting the Health and Safety Plan based on these Health and Safety Specifications. 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

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Statement’ (see definitions under Construction Regulations) detailing the key activities to be performed in order to reduce as far as practicable, the hazards identified in the Risk Assessment.

1. Definition of Terms

- I. Client-Means any person for whom construction work is performed and or undertaken (City of Tshwane for the purposes of this project)
- II. Construction site means a workplace where a construction work is being performed
- III. Construction supervisor means a competent person responsible for supervising construction activities on a construction site.
- IV. Competent person means a person who –
 - a) Has in respect of the work or task to be performed the required knowledge, training and experience and where applicable, qualifications, specific to that work or task:
Provided that where appropriate qualifications and training are registered in terms of the provision of the National Qualification Framework Act 2000 (Act 67 of 2000), those qualifications and that training must be regarded as the required qualification and training and
 - b) Is familiar with the Act.
- V. Principal Contractor-Means an employer, as defined by Section 1 of the OHSACT who performs construction work and is appointed by the client to be in overall control and management of the construction site and works
- VI. Agent-Means a competent person who acts as a representative for a client in this case MIH Projects.
- VII. Occupational Health and Safety Specification- Means a documented specification of all Health and Safety requirements pertaining to the associated works on a construction site so

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as to ensure the health and safety of persons working ,visiting, passing, staying and working close to the construction site and or other applicable areas such as the site camp

VIII. Risk-means the probability that injury or damage may occur

IX. Hazard-means a source of or exposure to danger


2. Introduction

In terms of the Construction Regulation 5 (1) of the OHS ACT, the client is required to compile an Occupational Health and Safety Specification for an intended project. This specification has an objective to ensure that the principal contractor entering into a contract with the client achieves and maintain an acceptable level of Occupational Health and Safety performance and compliance.

This document forms an integral part of the contract between the client and the principal contractor.

The Principal Contractor and its Contractors shall furthermore implement any reasonable practicable means to ensure compliance to this Occupational Health and Safety Specification and any other applicable legislation on their organization and/or activities performed by or for them Compliance with this document does not absolve the principal contractor from complying with any other minimum legal requirement and the principal contractor remains responsible for the health and safety of his employees, those of his mandatories as well as any person coming on site or on adjacent properties as far as it relates to the construction activities.


Bidders must submit Compensation for Occupational Injuries and Diseases Act (COIDA) letter of good standing with the tender document. Failure to submit COIDA letter of good standing with the tender document shall disqualify the Bidder from further evaluation.

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3. The Client `s commitment to Occupational Health and Safety Management

City of Tshwane is committed to responsible occupational health, safety management. This commitment is essential to protect the environment, employees, mandatories, visitors and provide a work environment conducive to health and safety. Principal Contractors and their Contractors shall demonstrate their commitment and concern by:

- Ensuring that decisions and practices affecting occupational health and safety performance are consistent with the issued specification;
- Ensuring adequate resources are made available for the effective implementation of occupational health and safety control and mitigation measures;
- Participating in hazard identification and risk assessments and design safety reviews;
- Communicating occupational health and safety management processes, strategies and control measures with all levels of employees, contractor and/or visitors;
- Ensuring visible leadership at all sites;
- Promoting and enforcing the use of correct types of Personal Protective Equipment (PPE);
- Reporting and investigation of incidents and accidents and ensuring actions are identified and implemented to prevent similar types of incidents reoccurring;
- Participating in Client audits and meetings and ensuring required actions are implemented within reasonable time frames on the site/project;
- Recognizing and commending safe work practices and coaching employees who require guidance;
- Applying and enforcing consequence management from deviations and transgressions of/from compliance to this OHS Specification noted and/or observed, where applicable;
- Carrying out safety observations, implement corrective and preventative actions and giving immediate feedback;

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- Encouraging employee participation in the formulation of work instructions and safety rules.

4. Scope

To develop a project specific Occupational Health and Safety Specification that addresses the reasonable and foreseeable, risks, exposures and aspects of Occupational Health and Safety as affected by CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS:


The specification will provide the requirements that the principal contractor and other contractors will have to comply with in order to reduce the risk associated with the above mentioned contract work and that may lead to incidents causing injury and/or ill health to a level as low as reasonable practicable and possible.

5. Omissions from OHS Specification

Where any omission from the OHS Specification is identified, applicable legal requirements will constitute the minimum standard for compliance to the relevant omission. The responsibility will be on the Principal Contractor to provide assurance to the client (City of Tshwane) on compliance to the applicable legal requirements related to the activity / task / process.

6. Change or Review of Specifications

Whenever the client (City of Tshwane) identifies the need to change or review the OHS Specification, approved changes and revisions will be communicated to the Principal Contractor. A cost analysis on the implementation of the proposed changes / revisions will be calculated through a collaborative processes between the Client and the Principal Contractor – where the

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approved changes and/or revisions has no cost implication for the Principal Contractor the Principal Contractor will be required to accept the approved changes / revisions and ensure implementation within the OHS Plan .


7. Safety Files

7.1. Preparation and Submission of safety file


The Principal Contractor shall prepare a safety file containing the processes / procedures and templates to be applied during the project period for the scope of work. The Principal Contractor will be evaluated during the contract period against the submitted safety file.

At a minimum the safety file shall contain the following documentation and in accordance with the specification:

1. Notification of construction work to the relevant Department of Labour (stamped on each page / no faxed copies);
2. Scope of work to be performed;
3. Public Liability
4. Personnel list (Principal Contractor employees);
5. OH&S Policy and other procedures;
6. Updated copy of the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations.
7. Updated copy of the Compensation for Occupational Injuries and Diseases Act (Act no. 130 of 1993) and its Regulations;
8. Proof of valid registration and good standing with the Compensation Commissioner or another licensed Insurer;
9. OHS Plan approved by the Client.
10. Agreement with Mandatory in terms of Section 37(1) &2 of the OHS Act.

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11. Approved risk assessments, review and monitoring plans and safe work procedures (method statements);
12. A list of contractors (sub-contractors) including copies of the agreements between the parties and the type of work being done by each contractor;
13. Designs and/or drawings;
14. All written designations and appointments for project scope of work (CV and competency copies);
15. Management structure (inclusive of OH&S responsibility & meeting structure);
16. Induction training and site OHS rules;
17. Occupational health and safety training matrix / plan;
18. Arrangements with contractors and/or mandatories;
19. The following registers (as applicable to contract scope of work):
 - Accident and/or incident notifications, investigation & control register;
 - Occupational health and safety representatives inspection register;
 - Construction vehicles and mobile plan inspections;
 - Daily inspections templates of vehicles, plant and other equipment by the operator, driver and/or user;
 - Daily inspections templates of excavations by competent person;
 - Template for entry into confined space;
 - Toolbox talks pro-forma;
 - Designer's inspections and structures record template;
 - Inspection and maintenance template of explosive powered tools;
 - Inspection template of electrical installations (including inspection of portable electrical tools, electrical equipment and other electrical appliances);
 - Fall protection inspections template;
 - First-aid box content template;

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- Record of first-aid treatment template;
- Fire equipment inspection and maintenance template;
- Record of hazardous chemical substances template kept and used on site;
- Ladder inspection template;
- Machine safety inspections template (including machine guards, lock-outs etcetera);
- Inspection templates for lifting machines and –tackle (including daily inspections by drivers/operators);
- Inspection templates of scaffolding;
- Inspection templates of stacking and storage;
- Inspections templates of structures;
- Inspections templates of vessels under pressure;
- Inspection templates of welding equipment; and
- Templates of issuing of Personal Protective Equipment;
- Monthly reporting and recording of statistics templates;
- Keeping of any other record in terms of applicable legislation falling within the scope of OHS Legislation applicable to the project and the Principal Contractor / Contractor’s activities and organization.
- Emergency preparedness and response programmes;

7.2. Evaluation and approval of Safety file

The client (City of Tshwane) will conduct an initial inspection and evaluation of the Principal Contractor’s OHS file for approval purposes to commence work. The Principal Contractor is required to submit the OHS file within 5 days after receiving the induction training from the Client. The Client will evaluate the file and give feedback to the Project manager and the

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Principal contractor. If the file has not been approved, the Principal contractor shall ensure that the outstanding documents are submitted for re-evaluation within 3 working days.

NOTE: The construction work cannot commence until the safety file is approved. The approval letter from the Client must be kept in the OHS file and any letter issued concerning the evaluation of the file. Principal Contractors are required to achieve at least 80% (Eighty Per cent) compliance on the entire safety file documentation to obtain approval by the Client.

7.3.Principal Contractor engagement phase

The Principal Contractor shall commence with the construction work after approval of the safety file. The following processes will be applied to the Principal Contractors on a monthly basis for the duration of the contractual period:

- Monthly Compliance Assessments;
- Site Inspections;
- Progress meetings;
- Contractor`s forum OHS meetings held at City of Tshwane


An initial site establishment inspection will be conducted by the Client after approval of the safety file / plan.

7.4.Project close-out and submission of consolidated Health & Safety File.

On completion of a construction work/ project the Principal Contractor shall submit all documentation required for the consolidated safety file to City of Tshwane as part of the project hand over documentation.

At a minimum, the safety file will contain the following records:


1. Approval letter by City of Tshwane on contents of Health and Safety file including plan;

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2. A construction work permit issued by the Department of Labour as contemplated in Construction Regulation 3 of the Construction Regulations 2014 (when applicable).
3. Scope of work performed;
4. OHS Policy and other procedures;
5. Proof of registration and good standing with the Compensation Commissioner or another licensed Insurer;
6. OHS plan approved by the Client including the underpinning risk assessment(s) and method statements;
7. A list of contractors (sub-contractors) including copies of the agreements between the parties and the type of work done by each contractor;
8. Notifications of new projects /extension of scope received;
9. Designs and/or drawings;
10. Occupational health and safety committee meeting agenda and minutes;
11. Copies of written designations and appointments (CV and competency copies);
12. Management structure (inclusive of OHS responsibility & meeting structure);
13. Induction training conducted and site OHS rules;
14. Occupational health and safety training provided;
15. Arrangements with contractors and/or mandatories;
16. Description of security measures;
17. All applicable registers;

8. OHS Specification Requirements

8.1.General Requirements of Health and Safety Plan

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Construction Regulation 7 (1) stipulates that the principal contractor must provide and demonstrate to the client a suitable sufficiently documented and coherent site specific health and Safety Plan, based on the client's documented Health and Safety Specification contemplated in Regulation 5(1) (b), which plan must be applied from the date of commencement of and for the duration of the construction and which must be reviewed and updated by the principal contractor as work progresses.

It is expected from the Contractor to include in his safety plan method statements on how to accomplish the requirements relating to the Construction Regulations, 2014 and related incorporated standards and regulations.

Principal Contractors should describe how their safety management systems will work and what control procedures they plan on using to ensure safety on the construction site

The following generic aspects should be covered in the Safety plan:

- What administrative procedures the Principal Contractor envisages to use in the implementation and maintenance of the safety plan with reference to the construction site
- How continuous assessment of the safety plan will be assessed and implemented with respect to construction site
- What control systems the Principal Contractor envisages to implement on site to support his safety program
- How the Principal Contractor will ensure that he adheres to the construction regulations in respect of competent persons for appointments
- What external resources the Principal Contractor envisages on using to ensure successful implementation and sustainability of the safety plan
- What training to employees the Principal Contractor envisages and how he would go about to execute it


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- The Principal Contractor should indicate which competent persons he plans on employing based on the scope of work.

8.2. Outline of Health and Safety Plan

The Principal Contractor's Health and Safety Plan prepared in accordance with this specification shall consist of at least the following sections and sub-sections:

1. Aim and Scope of Plan,
2. Risk Assessment,
 - a. Alternative Forms of Risk Assessment,
 - b. Methodology of Risk Assessment,
 - c. Elements of Risk Assessment,
 - i. Scope of assessment,
 - ii. Risks Identified,
 - iii. Risk Analysis,
 - iv. Risk Evaluation,
 - v. Risk Treatment(safe working procedures)
 - vi. Monitoring and reviewing,
3. Resources,
 - a. Health and Safety Staffing Organogram,
 - b. Supervisors, Inspectors and Issuers,
 - c. Employees,
 - d. Subcontractors inclusive of their scope of work and their core resources,
 - e. Training,
 - f. Plant,
 - g. Vehicles,
 - h. Equipment

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4. Materials,
 - a. Temporary Materials
 - b. Permanent Materials
5. Categories of Work
6. Implementation of Health and Safety Plan,
 - a. Administrative systems,
 - b. Training,
 - c. Reporting,
 - d. Monitoring,
 - e. Inspections,
7. Auditing,
 - a. Internal audits,
 - b. Follow-up audits,
8. Financial Aspects,
9. Emergency procedures and response


8.3. Risk Assessment

8.3.1 General

This section of the specification provides guidelines for the Contractor in preparation of risk assessments in order to ensure compliance with Regulation 9 of the Construction Regulations, 2014. According to SANS 31000:2009, Risk is the overall process of risk identification, risk analysis, and risk evaluation. This section highlights the principles related to the preparation of suitable and sufficient risk assessments. Contractor Staff intending to prepare risk assessments should be trained and suitably experienced in the application envisaged.

A suitable and sufficient risk assessment is an assessment which:

- Accounts for risks that are likely to arise during the construction of the Works,

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- Enables the development and implementation of systems to manage the risks,
- Remains valid for a reasonable period of time,
- Provides a basis for training of employees, and
- Improves working procedures and introduce long term controls.

The requirements of the Construction Regulations will not be satisfied by a single risk assessment exercise that holds good for all time. The risk assessment process on the Works is an ongoing process.

The objectives of risk assessments are to:


- Identify the risks that are mostly in need of reduction,
- Identify the various options for achieving such reduction,
- Identify the risks that require careful ongoing management, and
- Identify the nature of the required ongoing attention.

8.3.2 Forms of Risk Assessment

In order to ensure compliance with the Construction Regulations, the Contractor will be required to carry out the following three forms of risk assessment:

8.3.2.1 Activity based risk assessment

The Contractor will be required to carry out activity based risk assessment before the commencement of construction activities on the Works. This risk assessment will form part of the Contractor's Health and Safety Plan. The risks and hazards to which persons, plant, vehicles and facilities may be exposed during the construction of the Works should be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

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8.3.2.2 Issue based risk assessments


The Contractor will be required to carry out separate risk assessments during construction of the Works when methods and procedures are varied, for example when:

- Designs are amended,
- New machines are introduced,
- Plant is periodically cleaned and maintained,
- Plant is started-up or shut-down,
- Systems of work change or operations alter,
- Incidents or near-misses occur, or
- Technological developments invalidate prior risk assessments

8.3.2.3 Continuous risk assessments

The Occupational Health and Safety Act specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk free environment on an ongoing basis. This is achieved by continuous risk assessments, the most important form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Regular audits,
- Maintaining general hazard awareness,
- Pre-work risk assessment

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8.3.4 Methodology for the Preparation of Risk Assessments

The Contractor shall in the preparation of risk assessments, follow the following general principles:


- Appoint in writing a suitably competent risk assessor
- The appointed risk assessor shall lead the risk assessment process
- Provide the team with background data, scope of work, potential hazards and underlying causes, and
- Where necessary employ experts for complex risk assessments and aspects of risk assessments that require experiential judgment,
- Institute an ongoing system of identifying aspects of the work that require risk assessment.

8.3.5. Elements of a Risk Assessment

The process of carrying out a risk assessment consists of a number of well-defined steps. These steps improve decision-making by providing a greater understanding of the risks and their impacts.

The main steps or elements of the risk assessment process are as follows:

- 1) Consider scope and nature of risks involved, determine purpose and physical and legal bounds of assessment and define risk evaluating criteria,
- 2) Systematically identify risks,
- 3) Analyze risks with regard to causes, likelihood of occurrence and possible consequences against the background of existing controls and its effectiveness,
- 4) Evaluate risks in terms of pre-established criteria to determine need and priority for attention,

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- 5) Treat risks through a process of risk elimination, substitution, controlling risk at source, risk mitigation such as training and as far as risk remains, provide personal protective equipment (PPE),
- 6) Monitor and review progress and performance in terms of management system, and
- 7) Communicate and consult.

The above steps are as depicted in Figure 1, below.

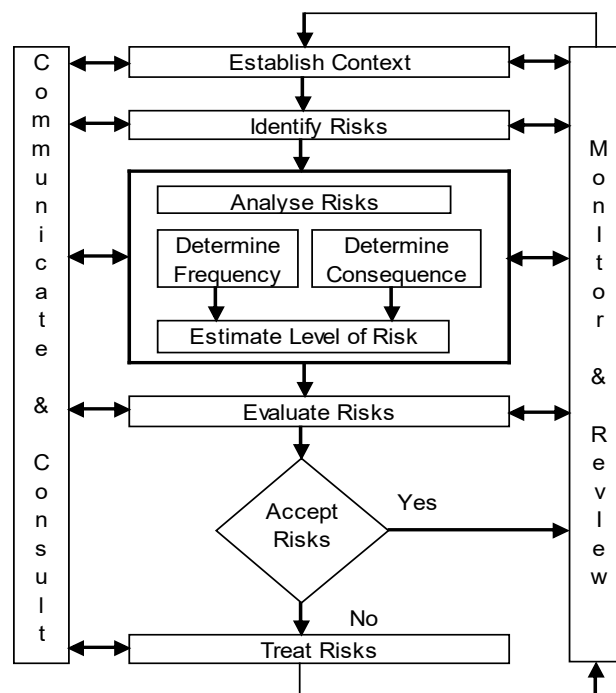



Figure 1: Risk Management Process

The Contractor shall ensure that the risk assessment compiled as part of his Health and Safety Plan contains at least these items.

Refer to Baseline Risk Assessment Annexure 2 of this specification..


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8.3.5.1 Risk Identification

The Contractor should regard this step of the risk assessment as the most important. Subsequent analysis and evaluation of risks and the development of risk control measures are wasted if the risks or hazards on the Works are not carefully identified.

The Contractor should bear the following principles in mind when identifying the risks:

- i) Systematically address all risks or hazards on the Works,
- ii) Review all aspects of the work, but consider only those that have a potential to cause harm,
- iii) Rank the risks identified in order of importance and then use appropriately advanced techniques to deal with major risks,
- iv) Deal mainly with major risks and don't obscure these with unimportant information, especially minor risks,
- v) Address what actually happens in the workplace during the work activity
- vi) Consider all persons that may be affected,
- vii) Highlight those groups and individuals who may particularly be at risk, and
- viii) Review the adequacy and effectiveness of existing safety controls and measures

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8.3.5.2 Risk Analysis


In this step, the Contractor will be required to analyze the risks identified by determining each risks frequency and magnitude or severity of the consequence of the risk or hazard.

The frequency of occurrence of a hazard may be expressed as the number of times that it may occur in year, decade, lifetime, century, or longer period, according to comparative human experience. The magnitude of the likely consequence of a hazard may be expressed in terms of the degree of incapacitation, number of people or costs involved. The frequency of occurrence of a hazard and the magnitude of its consequence may be compounded as the risk that it poses as shown in the “risk matrix” in Figure 2 below.

Frequency of Occurrence of Hazard	Severity of Consequences of Potential Hazard					
	1 Medically treatable injury	1 Compensable injury	10 Compensable injuries	1 Permanently disabling injury	1 Fatality	10 Fatalities
Frequent; 1 or more occurrences per year	Medium	High	Very high	Severe	Severe	Severe
Several times during a career; 0.1 occurrences per year	Medium-low	Medium	High	Very high	Severe	Severe
Unlikely, but possible during a career; 0.01 occurrences per year	Low	Medium-low	Medium	High	Very high	Severe
Very unlikely during a career; 0.001 occurrences per year	Low	Low	Medium-low	Medium	High	Very high
Barely credible; 0.0001 occurrences per year	Low	Low	Low	Medium-low	Medium	High

Figure 2: Compounded Risk Matrix

The columns in the table represent the likely consequence of the hazard and the rows, the frequency of occurrence. The scales for both quantities represent consistent progressions, able they qualitative. The risks evidently range from low to severe. Note that diagonals in the matrix represent the risks of the identified hazards, taking the effectiveness of controls into consideration.

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The table represents a typical risk matrix that need not necessarily be adopted by the Contractor. The Contractor may use an alternative risk matrix provided that it is approved as part of his Health and Safety Plan.


8.3.5.3 Risk Evaluation

In this step the Contractor will be required to compare the risks found during the analysis process with similar risks previously experienced for the purpose of deciding how to treat the risk. A useful systematic approach for this purpose is as follows:

- If the assessed risk exceeds similar risks that have occurred in the past and that are considered to be unacceptable, the assessed risk would require treatment depending upon its magnitude as discussed in Section 4.4.5, or
- If the assessed risk exceeds similar historical risks that are acceptable, treatment of the assessed risk will depend on the extent by which it exceeds the historical risks, or
- If the assessed risk is less than historical risks that are unacceptable, treatment of the assessed risk will depend on the extent by which it is less than the historical risks, or
- If the assessed risk is less than historical risks that are acceptable, the assessed risk would also be acceptable and would not require any treatment.

8.3.5.4. Risk Treatment


The contractor must select one or more options of modifying risks, and implementing those options. The option(s) selected must be covered in the safety plan and be followed as prescribed. Reference can be made to SANS31000:2009 for different risk treatment options. SANS 31000:2009, clause 5.5.3 may be consulted in preparing and implementing risk treatment plans.

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8.3.6. Reporting and Recording of Risks

The Principal Contractor shall ensure that the risk assessment process is recorded and included in the Health and Safety Plan. The risk assessment document should be easily accessible to the Contractor's employees, their representatives, to inspectors, the Employer or his Safety Agent. The essential contents of the document should be as follows:

- Objectives and expected outcomes,
- Description of the Works under assessment,
- Summary of context of study
- Composition of risk assessment team, (including qualifications and relevant experience),
- Approach used to systematically identify risks,
- Identified risks (ranked in order of priority),
- Method adopted for assessing frequencies and consequences of risks,
- Consequences (ranked in order of magnitude),
- Identification of individuals and groups who may be affected by major hazards and risk and who may especially be at risk,
- Basis for defining safety standards to be achieved,
- Contractor's resources devoted to risk assessment,
- Actions proposed to reduce unacceptably high risks,
- Review effectiveness of existing safety measures to control risks, and
- Implementation of program of selected treatments (including controls to manage unacceptably high risks).

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8.3.7. Monitoring and Review

The contractor must indicate in the safety plan the monitoring and review plan to be used during the construction work.

8.3.8. Communication and Consultation

The Principal Contractor will be required to communicate and consult with internal and external stakeholders during each step of the risk assessment process. Stakeholders will include the Client or Safety Agent, the Engineer and the Contractor's employees and consultants.

8.4 Resources


8.4.1 General

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 85 of 1993 and all its Regulations and related incorporated standards with regards to the resources and facilities intended for use on the project (construction work)

3.3.5.2 Employees

The Principal Contractor shall provide in his Health and Safety Plan his intended Staffing Organogram for the construction work. The organogram should include all applicable legal appointments and supervisors as contemplated in the Construction Regulations 2014.

Copies of the supervisory staffs' curriculum vitae or portfolio of evidence, proof of competence and their appointment letters should be appended to the Contractor's Health and Safety Plan.

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The Principal Contractor's Health and Safety Plan should in addition cover at least the following aspects:

- The number of unskilled, semi-skilled and skilled (including Foreman, Charge hands, Artisans, Operators, Drivers, Clerks, Store man and Team Leaders) employees he intends employing on the Works,
- The health and safety training to be provided to the Contractor's employees,
- The program of the health and safety training,
- Systems for the review of the effectiveness of the training provided, and
- Systems to determine further training requirements throughout the construction period.


Pro-forma letters of appointment for the various inspectors, supervisors and issuers as contemplated in the Construction Regulations, 2014 are included in Annexure 1 to this specification for use by the Contractor. The Contractor shall ensure that he includes in his Health and Safety Plan the appointment letters for all his inspectors, supervisors and issuers appointed for the Works.

The Contractor may make other additional legal appointments that are applicable to the project.

8.4.3. Competencies

The Principal Contractor shall appoint competent person to perform duties that require competency.

8.4.4. Physical and Psychological Fitness

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The Principal contractor shall ensure that all employees are in possession of a valid medical certificate of fitness to work in such an environment and issued by an occupational health practitioner in the form of Annexure 3 of the Construction regulations.

8.4.5 Subcontractors

The Contractor shall with reference to the use of subcontractors on the Works and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- The steps intended to ensure that his Subcontractors prepare, implement and maintain Health and Safety Plans,
- How health and safety information will be made available to his Subcontractors when changes are brought about to the design,
- How he intends determining that his Subcontractors are registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works,
- How he intends determining if his Subcontractors have made provision in their tenders for the cost of health and safety measures during the construction of the Works,
- How he intends satisfying himself on the competencies and resources of Subcontractors he intends appointing, and
- How he intends ensuring that his Subcontractors perform risk assessments prior to commencing their respective portions of the Works.

8.5 Fall Protection Equipment

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The Contractor shall with reference to Section 10: Fall Protection Equipment of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:


- Compilation of a fall protection plan,
- How the fall protection plan will be implemented and maintained,
- How employees will be screened and declared medically fit to work in areas where fall protection equipment is needed,
- How the safeguarding of persons, plant, vehicles, equipment and facilities on the construction site is contemplated,
- Training of staff working at heights and in the use of fall protection equipment,
- How a continuous assessment of the situation will be executed,
- How fall protection equipment will be inspected for safety, and
- How corrective actions will be implemented
- Emergency plans and procedures for treatment of incidents relating to falls from height.

8.8 Excavation work

Principal Contractor is required to adhere to Section 13: Excavation work, of the Construction Regulations, 2014.

The Principal Contractor must discuss the following in detail in his safety plan:

- How will the Principal contractor ensure competent supervision of excavation work
- How will the Principal Contractor establish the stability of ground prior to excavations,
- What steps will the Principal Contractor follow to ensure that bolstering, shoring and bracing is sufficient to ensure the safety of the excavation, and

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- What steps will the Contractor follow to ensure the equipment used to safeguard an excavation is sufficient and safe?


8.15. Cranes

This section of the specification shall be read in conjunction with the provisions of the Driven Machinery Regulations, 1988.

The Principal Contractor shall with reference to Section 22: Cranes, of the Construction Regulations 2014 and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How will environmental factors be taken into account in respect to the use of cranes,
- What systems he intends using to ensure the safety of all cranes in use,
- How he intends maintaining cranes in use,
- What tests will be performed to establish the safety of all cranes in use,
- What safety procedures and precautions are envisaged to ensure the safe operation of all cranes in use,
- How he will proof the medical fitness of the tower crane operators,
- How he will document the design, testing, maintenance and inspections of all cranes in use, and
- The Principal contractor shall proof compliance of the Driven Machinery Regulation, 1988, with reference to the lifting machinery and tackle being used.

8.16. Construction vehicles and mobile plant

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The Principal Contractor shall with reference to Section 23: Construction vehicles and mobile plant of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends ensuring that construction vehicles and mobile plant are:
 - Of acceptable design and construction,
 - Maintained and in good working order,
 - Used according to design specifications, and
 - Are protected from falling into excavations, water or areas lower than the working surfaces,
- How he intends ensuring that workers are competent, authorised and physically fit to operate construction vehicles and mobile plant,
- What traffic arrangements and safety precautions will be implemented to ensure safe operation of construction vehicles and mobile plant on the Works,
- How he intends to comply with the National Road Traffic Act 1996, and
- How he intends safeguarding employees against construction vehicles and mobile plant moving on the construction site.

8.17. Electrical Installation and Machinery on construction sites

This section of the specification shall be read in conjunction with the provisions contained in the Electrical Installation Regulations, 1992.

The Principal Contractor shall with reference to Section 24: Electrical Installation and machinery on construction sites of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

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- Appointment of competence person for all temporary control and inspection of all temporary electrical installations,
- How he intends safeguarding employees against electrical cables or apparatus under, over or on site, and
- How he will ensure that electrical installations are of adequate strength to withstand working conditions on a construction site.

8.20. Housekeeping and general safeguarding on construction sites

Principal Contractors will be required to adhere to Section 27: Housekeeping and general safeguarding on construction sites, of the Construction Regulations, 2014.


This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Principal Contractor must discuss the following in detail in his safety plan:

- How will contractors ensure the neatness of construction sites
- What measures does the Contractor envisage to
 - Store and/or stack materials,
 - Remove debris from site,
 - Prevent unauthorized entrance to the site
 - Protect employees or passers-by from falling objects

8.21. Stacking and storage on construction site

This section of the specification shall be read in conjunction with the provisions for the stacking of articles contained in the General Safety Regulations.

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The Contractor shall with reference to Section 28: Stacking and storage on construction sites of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- Who will supervise the stacking and storage of materials on site,
- What systems are intended to ensure the safe stacking and storage of materials on the site ,and
- How he will keep the storage areas neat and under control


8.22. Fire precaution on construction sites

Principal Contractors will be required to adhere to Section 29: Fire precautions on construction sites, of the Construction Regulations, 2014.

This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Principal Contractor must discuss the following in detail in his safety plan:

- How the Principal Contractor will minimize the risk of fire on the site
- How the Principal Contractor will identify potential fire hazards
- What prohibitions the Contractor will implement to manage risk areas
- How many employees the Principal Contractor will train in firefighting as per risk assessment
- What organization the Principal Contractor envisage to combat fires on sites
- What precautions and procedures will be followed to evacuate employees in the case of a fire

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8.23. Project employees' facilities

Principal Contractors will be required to adhere to Section 30: Construction welfare facilities of the Construction Regulations, 2014.

This regulation must be read in conjunction with the provisions of the Facilities Regulations, 1990 (as amended) and SANS 10400.

The Principal Contractor must discuss the following in detail in his safety plan:

- How will the Principal Contractor establish the amount of facilities required for employees to shower, change, eat and attend to sanitary needs

What measures will the employer take to house employees on site who lives far from their residences or for the provision of transport?


8.24. Operational Control of the Construction Site

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its regulations and related incorporated standards with regards to the execution of all categories of work.

-

8.24.1. Personnel Safety Equipment and Facilities

The Contractor shall comply with Section 2 of the General Safety Regulations, and shall in particular provide all necessary personnel protective equipment for his personnel for the duration of the construction period. To this end the Contractor shall without limiting his obligations indicate in his Health and Safety Plan:

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- Identify training requirements in the use and maintenance of personal protective equipment,
- The type of personnel safety equipment he will provide,
- How he intends issuing it to his employees, and

How he will maintain the personnel safety equipment issued.

8.24.2. Display of substituted notices and Signs


The following notices and signs are, where applicable, compulsory on the construction site as well as the contraction yards.

Area/Activity where construction sign is needed	Notice or sign required in
Display of notices and signs	General Safety Regulation 2b
Entry	General Safety Regulation 2 (c)
First Aid box	General Safety Regulation 3 (6)
Toilets and Change rooms	Facilities Regulation 2(5).4 (2) (f)
Hazardous and Chemical Storage area	General Safety Regulation 4 (8) (i) and (ii)
Machinery	General Machinery Regulation 9
Prohibition of smoking and eating or drinking at workplaces where high risk substances are stored or handled	Facilities Regulation 7

8.24.3. First Aid, Emergency Equipment and Procedures

The Principal Contractor shall comply with Section 3 of the General Safety Regulations regarding first aid, emergency equipment and procedures.

- How he intends to ensure competence of first aiders and
- What emergency equipment will be used

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8.24.6 Ladders


The Principal Contractor shall with reference to Section 13A of the General Safety Regulations and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends ensuring that ladders used are safe and constructed of materials approved for its intended use, and
- What precaution will be made to ensure the stability of ladders in use?

8.24.7. Environmental Conditions

The Principal Contractor shall comply with the Environmental Regulations for Workplaces, 1987, and shall address the following aspects as described in the regulations in his Health and Safety plan:

- Thermal requirements,
- Lighting,
- Windows,
- Ventilation,
- Housekeeping,
- Noise and hearing conservation,
- Precautions against flooding, and
- Fire precautions and means of egress.

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8.25. Implementation of Contractors' Health and Safety Plan

8.25.1. General


The Principal Contractor shall describe in his Health and Safety Plan how he intends implementing his OHS plan.

The Principal Contractor shall indicate the methods he intends using to ensure accurate record keeping of all critical elements identified in his risk assessment and covered in his Health and Safety Plan.

The Principal Contractor shall indicate:

- How internal audits will be carried out,
- How audit findings will be addressed,
- How he would implement the corrective measures and recommendations of internal audits or inputs of employees.
- How he intends to review the safety plans,
- How he would train staff and keep training records

8.25.2 Administrative Requirements

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The Principal Contractor shall comply with the administrative requirements of the Occupational Health and Safety Act and Regulations 85 of 1993 and other legal requirements. The Principal contractor's administrative system will without limiting his obligations cover the following:

- Keeping of a safety file on site,
- Maintenance of his Health and Safety plan,
- Procedures to follow for the appointment of competent persons,
- Construction work permits (where applicable)
- Procedures to follow for notifications,
- Injury on duty [IOD] administration,
- Minutes of safety meetings,
- Inspection checklists/registers,
- Safe keeping of checklists/registers, and
- Internal audits documentation.

The Principal Contractor shall in particular ensure that at least one copy of the Occupational Health and Safety Act, 1993 and its Regulations is available on site for every 5 employees employed.

8.25.3. Incident Reporting, Investigation and Recording

The Principal Contractor shall comply with Section 9 of the General Administrative Regulations, 1996 and shall in particular (in accordance with section 12) furnish an inspector with information relating to health and safety on the construction site, when requested to do so.

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The Principal Contractor shall report all incidents and or occurrences to the Client, investigate and keep record as contemplated by the Occupational Health and Safety Act 85 of 1993 and Regulations.

8.25.4. Training

The Principal Contractor shall train all his employees in accordance with the requirements of section 13 of the Occupational Health and Safety Act, 1993. The Principal Contractor shall ensure that every employee is informed of the following:


- The hazards of any work he has to perform or plant machinery or equipment he is permitted to use, and
- The precautionary measures which should be taken regarding the above.

The Principal Contractor shall, without limiting his obligations, indicate in his Health and Safety Plan how he intends:

- Identifying the training needs of the personnel he intends employing, and
- Implementing the training identified
- What proof of induction training will be carried by his employees

8.25.4.1. General induction Training

- All members of the contractor's management as well as all the people appointed as responsible for Occupational Health and Safety in terms of the OHS Act, Construction Regulations and other Regulations are required to attend a general safety Induction
- All employees of the principal contractor and other contractors must be in possession of proof of Induction Training

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- All subsequent and newly appointed employees must also be subjected to the Induction Training as soon as possible after the appointment but prior to start work on site.
- All visitors must undergo an induction training on arrival to site

8.25.4.2. Site Specific Induction Training

The principal contractor will be required to prepare the Task based Induction training based on the risk assessment for the contract work and train all employees who will be involved in the selected task. All employees must have a proof of such training and copies in the Safety File

8.25.4.3. Other Training


1. All operators, drivers and users of construction vehicles and mobile plants must be in possession of a valid proof of training and where applicable licenses and proof of competency
2. All employees in jobs requiring competence in terms of the OHS Act and Regulations must be in possession of valid proof of training.

8.25.4.4. Awareness and Promotion

The Principal Contractor is required to have a promotion and awareness program in place to create an Occupational Health and Safety culture within employees as well as subcontractors.

The following are some of the methods that may be used:

- Toolbox Talks
- Posters
- Videos
- Competitions
- Participative activities such As Occupational Health and Safety Circles

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8.26. Safety Meetings

The Principal Contractor shall conduct at least one formal safety meeting per month with his employees to ensure safety awareness and shall maintain appropriate records of attendance and meeting content. Such records shall be included in the safety file. The meetings shall address at least the following:

- Accident / safety incidents
- Hazardous conditions
- Hazardous materials / substances
- Job or work projections
- Safe Work procedures
- Protective clothing / equipment
- Housekeeping
- Inspections
- General safety topics

8.27. Occupational Health and Safety Committees

The principal contractor must establish Occupational Health and Safety committees consisting of all designated Occupational Health and Safety Representatives together with a number of management Representatives that are not allowed to exceed the number of Safety Reps on the committee. The members of the Safety Committee must be appointed in writing and the appointment letters must be in the Safety File.

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The Safety Committee must meet but at least twice a month and consider at least the following agenda items:

- Opening and Welcome
- Members present, apologies and absent
- Minutes of previous meeting
- Matters arising from the previous meeting
- Safety Representatives inspection reports
- Incident and/or accident investigation reports
- Incident, accident and /or injury statistics
- Audit feedback
- Medical surveillance
- Endorsement of legal OHS registers and other statutory documents by a duly authorized representative of the principal contractor
- General
- Close and next meeting

8.28. Inspections and Monitoring

The Principal Contractor shall be required to inspect each workplace prior to works commencing to ensure that minimum control measures and protective equipment are in place and that by entering the workplace no person will be exposed to any hazard which could affect his health or safety. The Principal Contractor shall without limiting his obligations, indicate the following in his Health and Safety Plan:

- The inspection and monitoring procedures he intends employing to determine the safety of workplaces, and

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- Who will be responsible for the checking of each workplace at the commencement of each shift?

The Principal Contractor shall include in his Health and safety Plan all the checklists he intends using during the inspection and monitoring of the implementation of his Health and Safety Plan.

The Principal Contractor can expect inspections of the works by any of the following parties:

- The Client or Safety Agent,
- Department of Labour Inspector or any authorized person appointed by the Minister as Chief Inspector or his representative.

The Client, Safety Agent or his representative will stop the work at any time under the following conditions:


- If the Contractor is not compliant with his Health and Safety Plan
- Imminent threat to the health and safety of any person on site
- Continuous non-conformance to corrective action requests.
- In the occurrence of section 24 incident

8.29. Auditing

8.29.1. Internal Audits

The Principal Contractor shall conduct periodic site audits as contemplated in section 7.(1.c.vii) of the Construction Regulations 2014

The Principal Contractor will ensure that the same arrangement detailed above be implemented with his Sub Contractors to ensure his compliance with the Construction Regulations.

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8.29.2. Audits by Client or Safety Agent


The Client or Safety Agent will carry out period audits or follow-up audits, as the case may be, at any time during the construction period provided that:

- i) The audit or follow-up audit are carried out during ordinary working hours, and
- ii) The Client or Safety Agent gives the Contractor at least 48 hours' notice of his intention to carry out such audits.


The audits described above only constitutes part compliance by the Client or the Safety Agent with section 5.(1)(o) of the Construction Regulations, 2014.

The Principal Contractor's employees as indicated in the OHS organogram and the Client's project manager will be present during any audit carried out by the Employer or his Safety Agent.

NB: The office space of the Principal contractor utilized for the project duration will be audited in line with the requirements of the Occupational Health and Safety Act 85 of 1993 and Regulations.

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ANNEXURE 1 LEGAL APPOINTMENTS TEMPLATES

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Attention: *(Assistant Construction Manager's Name)*

APPOINTMENT OF THE ASSISTANT CONSTRUCTION MANAGER IN TERMS OF CONSTRUCTION REGULATION 8(2)

I, *(contractor's name)* hereby appoint you *(assistant construction manager's name)* as the assistant manager responsible for *(site address)* to carry out the construction work of *(description of construction work and area of responsibility)*.

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all persons are aware and understand the hazards attached to the work being carried out;
3. That the required risk assessments are carried out;
4. That precautionary measures are identified and implemented;
5. That discipline is enforced at the construction site at all times;
6. That all identified statutory requirements are met; and
7. That any other interest in terms of health and safety with respect to the responsible area is met.
8. You will accept the duties of the Construction manager in his absence.

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You are required to report any deviations of the above-mentioned instruction to (***construction manager's name***) and in his absence to the contractor's representative.

This appointment is valid from (***date***) to the completion of the stipulated construction work.


You shall submit a written weekly report or any non-compliance with the Construction Regulations, 2014.

_____	_____	_____
Contractor's Representative full name	Signature	Date
.....		
.....		

Kindly confirm your acceptance of this appointment by completing the following:

I, (***assistant construction manager***) understand the implications of the appointment as detailed above and confirm my acceptance.

_____	_____	_____
Assistant construction Manager	Signature	Date

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Attention: *(Safety Officer's Name)*

APPOINTMENT OF THE CONSTRUCTION HEALTH AND SAFETY OFFICER IN TERMS OF CONSTRUCTION REGULATION 8(5)

I, *(contractor's name)* hereby appoint *(safety officer's name)* as the Construction Health and Safety Officer responsible for *(site address)* to manage all the health and safety issues as required in terms of the Act by establishing a health and safety program with elected health and safety Representatives.


You shall ensure that all the requirements in terms of the Act and in particular in terms of the Construction Regulations, 2014 are met. You shall also ensure that all appointed sub-contractors comply with the requirements as stipulated in the Construction Regulations, 2014.

You shall further ensure that all records, registers and required lists are maintained and shall stop construction work upon identifying any non-compliance by any contractor; this includes stopping any work should the competency of the person carrying out such work be questionable.

This appointment is valid from *(date)* to the completion of the stipulated construction work.

Contractor's Representative full name Signature Date

.....

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	PROJECT DESCRIPTION	TENDER FOR CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS
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Kindly confirm your acceptance of this appointment by completing the following:

I, (*construction health and safety officer's name*) understand the implications of the appointment as detailed above and confirm my acceptance.

Construction Health & Safety Officer's full name Signature Date

Attention: (*Construction Vehicle and Mobile Plant Inspector*)

APPOINTMENT OF THE CONSTRUCTION VEHICLE AND MOBILE PLANT INSPECTOR IN TERMS OF CONSTRUCTION REGULATION 23(1) (d)

I, (*contractor's name*) hereby appoint (*construction vehicles and mobile plant inspector's name*) as the construction vehicles and mobile plant inspector responsible for (*site address*) to inspect on a daily basis all construction vehicles and mobile plant, as per the provided checklist.


You shall ensure that when becoming aware of any health and safety hazards in respect to construction vehicles and mobile plant that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2014 are at all times met.

This appointment is valid from (*date*) to the completion of the stipulated construction work.

Contractor's Representative full name Signature Date

.....

	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
	PROJECT LOCATION	
	PROJECT DESCRIPTION	TENDER FOR CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS
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Kindly confirm your acceptance of this appointment by completing the following:

I, ***(construction vehicles and mobile plant inspector's full name)*** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction vehicles and mobile plant Signature Date

Inspector's full name

Attention: ***(Sub-Contractor's Name)***

APPOINTMENT OF SUB-CONTRACTOR IN TERMS OF THE CONSTRUCTION REGULATION 7(c)

I, ***(contractor's name)*** hereby appoint ***(sub-contractor's name)*** as the sub-contractor responsible for ***(site address)*** to carry out the construction work of ***(description of construction work)***.


You shall ensure that you meet all the requirements in terms of the Act and in particular in terms of the section 37(2) agreement and the Construction Regulations, 2014. You shall also ensure that all contractors appointed by yourself and reporting to you comply with the requirements as stipulated in the Construction Regulations, 2003.

You shall also ensure that all the information and specifications to ensure that the construction work is carried out in a safe manner are carried over to all contractors appointed and reporting to you.

You shall further ensure that all records, registers and required lists are maintained and that all persons appointed to carry out tasks as stipulated by these regulations are competent and have the necessary resources to complete their tasks effectively in such a manner that health and safety is not in any manner compromised.

This appointment is valid from ***(date)*** to the completion of the stipulated construction work.

You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

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Contractor's Representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, (*sub-contractor's name*) understand the implications of the appointment as detailed above and confirm my acceptance.

Sub-Contractor's Representative full name

Signature

Date


Attention: (*Construction Manger's Name*)

APPOINTMENT OF THE CONSTRUCTION MANAGER IN TERMS OF CONSTRUCTION REGULATION 8(1)

I, (*contractor's name*) hereby appoint (*construction manager's name*) as the Manager responsible for (*site address*) to carry out the construction work of (*description of construction work and area of responsibility*).

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all statutory appointments have been completed;
3. That, where required, health and safety committees are established and that meetings are accordingly held;
4. That all persons are aware and understand the hazards attached to the work being carried out;

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5. That the required risk assessments are carried out;
6. That precautionary measures are identified and implemented;
7. That discipline is enforced at the construction site at all times;
8. That all identified statutory requirements are met; and
9. That any other interests in terms of health and safety with respect to the responsible area is met.
10. You will in writing delegate your duties to the Assistant Construction Supervisor while absent from site.

You are required to report any deviations of the above-mentioned instructions to **(contractor's name)**. This appointment is valid from **(date)** to the completion of the stipulated construction work. You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

Contractor's Representative full name Signature Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction manager)** understand the implications of the appointment as detailed above and confirm my acceptance.

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Construction Manager's full name

Signature

Date

Attention: *(Excavation Work Supervisor's Name)*


APPOINTMENT OF THE EXCAVATION WORK SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 13 (1)(a)

I, *(contractor's name)* hereby appoint *(excavation work supervisor's name)* as the excavation work supervisor responsible for *(site address)* to supervise and carry out all the necessary inspections in terms of all excavation work as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to excavation work that that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met.

This appointment is valid from *(date)* to the completion of the stipulated construction work.

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	PROJECT LOCATION	
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Contractor's representative full name Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, (*excavation work supervisor's full name*) understand the implications of the appointment as detailed above and confirm my acceptance.

Excavation Work Supervisor full name Signature

Date

Attention: (*Ladder Inspector's Name*)


APPOINTMENT OF THE LADDER INSPECTOR IN TERMS OF THE GENERAL SAFETY REGULATION 13(A)

I, (*contractor's name*) hereby appoint (*ladder inspector's name*) as the ladder inspector responsible for (*site address*) to manage ladders on site. You should inspect the ladders as per the checklist at least once a week.

You shall ensure that when becoming aware of any health and safety hazards in respect to ladders that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2003 are at all times met.

This appointment is valid from (*date*) to the completion of the stipulated construction work.

 CITY OF TSHWANE <small>IGNITING EXCELLENCE</small>	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
	PROJECT LOCATION	
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Contractor's representative full name Signature

Date


Kindly confirm your acceptance of this appointment by completing the following:

I, (***ladder inspector's full name***) understand the implications of the appointment as detailed above and confirm my acceptance.

Ladder inspector's full name

Signature

Date

	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
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Attention: **(Risk Assessor's Name)**

APPOINTMENT OF THE CONSTRUCTION SITE RISK ASSESSOR IN TERMS OF CONSTRUCTION REGULATION 9(1)

I, **(contractor's name)** hereby appoint **(risk assessor's name)** as the construction site risk assessor responsible for **(site address)** to carry out risk assessments prior to the commencement of construction work and any other risk assessment that may be required for the duration of the construction work.

You shall ensure that all risks are identified and analyzed and that safe working procedures are drafted and implemented to reduce, mitigate or controls the hazards that were identified.

You will at least use the risk evaluation program with the provided checklists.


This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name Signature Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction site risk assessor's name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction site Risk Assessor's Signature Date
full name

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Attention: *(Stacking and Storage Supervisor's Name)*

APPOINTMENT OF THE STACKING AND STORAGE SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 28 (a)

I, *(contractor's name)* hereby appoint *(stacking and storage supervisor's name)* as the stacking and storage supervisor responsible for *(site address)* to manage all stacking and storage on site.

You shall inspect all new stacking and thereafter as often as needed according to the checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to stacking and storage that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met. On identifying any shortfalls or hazards convey such information in writing to the construction supervisor.


This appointment is valid from *(date)* to the completion of the stipulated construction work.

Contractor's Representative full name Supervisor Date

Kindly confirm your acceptance of this appointment by completing the following:

I, *(stacking and storage supervisor's full name)* understand the implications of the appointment as detailed above and confirm my acceptance.

Stacking and Storage Supervisor's Signature Date

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Attention: First Aider

OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993), GENERAL SAFETY REGULATIONS 3(4) – FIRST AIDER

I, _____, having been appointed as contemplated in Section 16(2) of the Occupational Health and Safety Act (85 of 1993), hereby appoint you, _____, as First Aider for the _____.

RESPONSIBILITIES


1. Ensure you inspect the contents of the first aid box at least once per month.
2. Ensure all dressing undertaken is recorded on the treatment register.
3. Ensure deviations noted are reported to your supervisor.
4. Ensure the necessary signage is placed to define first aid box placement and responsible first aider's name.

Kindly confirm your acceptance of this appointment and understanding of the duties involved by signing this legal appointment.

Yours faithfully

SECTION 16 (2) APPOINTEE

I accept the appointment as set out above and confirm my understanding of the duties involved.

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Signed: _____

Date: _____

Attention: Safety Representative

OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)


SECTION 17 – HEALTH AND SAFETY REPRESENTATIVE

I, _____, having been appointed as contemplated in Section 16(2) of the Occupational Health and Safety Act (85 of 1993), hereby appoint you, _____, as Health and Safety Representative, as contemplated in Section 17 of the Occupational Health and Safety Act (85 of 1993).

You are hereby appointed from _____ until _____ as a Health and Safety Representative for the following project:
_____.

RESPONSIBILITIES

1. Review the effectiveness of the Health and Safety measures within your area of responsibility;
2. Assess the potential hazards to the Health and Safety of the employees at the workplace;
3. Investigate the causes of incidents and all complaints from the employees relating to their Health and Safety;
4. Inspect the workplace and report on such inspection, and the aspects mentioned in (1), (2) and (3) above, to the employer;
5. Participate in the investigations into incidents, in your designated area as contemplated in Section 18 of the Occupational Health and Safety Act (85 of 1993).

 CITY OF TSHWANE <small>IGNITING EXCELLENCE</small>	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
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Kindly confirm your acceptance of this appointment and understanding of the duties involved by signing this legal appointment.


Yours faithfully

SECTION 16 (2) APPOINTEE

I accept the appointment as set out above and confirm my understanding of the duties involved.

Signed: _____

Date: _____

 CITY OF TSHWANE <small>IGNITING EXCELLENCE</small>	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
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ANNEXURE 2

Identified Hazards


In terms of Regulation 9 (1) (a) of the Construction Regulations 2003 the following hazards anticipated with the scope of work have been identified.

NOTE: The list of potential hazards is by no means intended to be all inclusive and is not limited to this list, and it remains the responsibility of the Contractor to identify all possible hazards with regards to his scope of work and to put measures in place to mitigate, reduce or control these hazards.


- Deep excavation
- Dust
- Incorrect use of hand tools.
- Broken hand tools
- Working at elevated points, using cherry picker and ladders.
- Working on the shoulder of the road and pedestrians.
- Failure to comply with traffic accommodation plan.
- Potential live circuits.
- Substandard lifting operation – Danger to employees and equipment.
- Swinging loads



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BASELINE RISK ASSESMENT AND SAFETY SPECIFICATION.

	City of Tshwane: Energy and Electricity Division	
	Baseline Risk Assessment	

PROJECT INFORMATION:

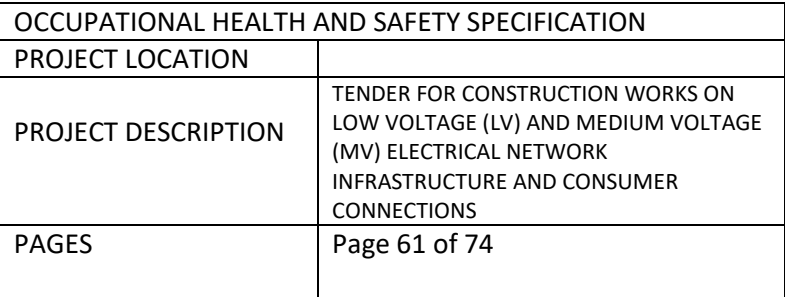
LOCATION:	SCOPE OF WORK:
Throughout City of Tshwane Electricity Network	CONSTRUCTION OF PUBLIC LIGHTING INFRASTRUCTURE: THREE-YEAR PERIOD, AS AND WHEN REQUIRED

RISK RATING AND ABBREVIATIONS:


Risk Rating	Abbreviations
15-25 EXTREME	S = SAFETY
8 - 14 HIGH	H = HEALTH
4 - 7 MEDIUM	E = ENVIRONMENT
1 - 3 LOW	Q = QUALITY




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RISKS		CONSEQUENCES	PROBABILITY				
			Almost Certain	Likely	Possible	Unlikely	Almost Impossible
			5	4	3	2	1
SHEQ	Multiple fatalities, or significant irreversible effects to >50 persons	5	25	20	15	10	5
	Serious, long term environmental impairment of ecosystem function						
	Very serious impact on quality of product/service. Definite loss of customer or discontinuation of contract with service provider						
SHEQ	Single fatality and/or severe irreversible disability to one or more persons	4	20	16	12	8	4
	Serious medium term environmental effects						
	Serious impact on quality of product / Probable loss of customer or discontinuation of contract with service provider						

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S	Moderate irreversible disability or impairment (<30%) to one or more persons.	3	15	12	9	6	3
H							
E	Moderate, short-term effects but not affecting ecosystem function						
Q	Moderate impact on quality of product / Possible loss of customer or discontinuation of contract with service provider						
S	Objective but reversible disability requiring hospitalization	2	10	8	6	4	2
H							
E	Minor effects on biological or physical environment						
Q	Minor impact on quality of product / Minor impact on relationship with customer or service provider						
S	No medical treatment required.	1	5	4	3	2	1
H							
E	Limited damage to minimal area of low significance						
Q	Limited impact on quality of product / Minimal impact on relationship with customer or service provider						

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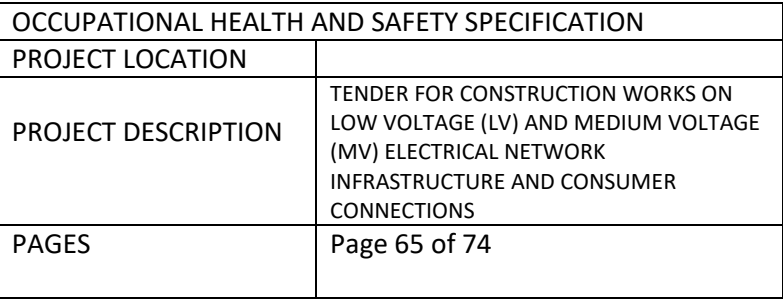
PROJECT BASELINE RISK ASSESSMENT:

N o:	Task	Activities	Hazards in Carrying out this Activities:	Risk (Harm):	Risk Analyses:				Risk Reducing Control Measures:
					SHEQ:	Consequence:	Probability	Risk Rating:	




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1	GENERAL	EXCAVATIONS AND BACKFILLING.	<p>Incompetent operator.</p> <p>Defective mobile plant. Oil / fuel leaks. No spotter to guide</p> <p>Operating for long hour.</p> <p>Underground service (electrical cables).</p> <p>Dust.</p> <p>Noise.</p> <p>Unmanned open trenches.</p> <p>Exposure to strike from working with local labourers.</p> <p>Working on the shoulder of the road and pedestrians</p> <p>Working with hand tools(shovel, pickle)</p>	<p>Damage of company property.</p> <p>Serious injuries may lead to fatal.</p> <p>Fatigue</p> <p>Electrocutions. Explosions.</p> <p>Inhalation of dust</p> <p>NIHR (Noise induce hearing loss).</p> <p>Falling into trenches can cause serious injuries.</p> <p>Injuries from attacks by local labourers</p> <p>Accidents</p> <p>Injuries from incorrectly used of hand tools.</p>	S H E	4	4	1 6	<p>Conduct HIRA</p> <p>Training of workers and local labourers</p> <p>Conduct safety talks</p> <p>Tool box talks / awareness training</p> <p>Pre use inspections of TLB for leaks, defects and report immediate to your supervisor</p> <p>When operating machine ensure that there are a spotter always, to assist operator and secure no unauthorized entry in area.</p> <p>Monitoring operators hours and stop operations to rest if necessary</p> <p>Operator must take frequent breaks and adequate rest after hours.</p> <p>Obtain excavation permit from client</p> <p>Client to point out all underground cables, waterlines, Areas must be marked and excavation must be done by hand. (don't make use of picks, forks or jack hammers)</p> <p>Noise levels to be monitored and dealt with accordingly. Issue hearing protection and enforce the use there of in noisy zones.</p> <p>Dust to be controlled by wetting access roads by means of water bowser.</p> <p>Wear proper PPE (Safety gloves, safety goggles, hard hat, safety boots, earplugs, dust masks, long sleeve overall, reflector vest.</p> <p>Adequate supervision at all times.</p> <p>Enforce good housekeeping.</p> <p>All open excavations to be clearly demarcated for employees and public not to fall into trenches.</p> <p>Comply with traffic accommodation plan always.</p>
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2	CABLES and SWITCHING BOXES ABLES	INSTALLATION ,TERMINATION AND JOINTING OF CABLES	Deep excavation	Injuries from collapsing excavation and falling into excavation.	S H E	4	4	16	Appoint competent excavation supervisor. Do soil survey, excavation must use shored and barricade.
		Dust	Lung and Eye irritation due inhalation from exposure to dust.	Dust mask must be used.					
		-Incorrect use of hand tools.	Hand Injuries from incorrect use of hand tools.	All hand tools must be listed on the prescribed checklist and checked for integrity at prescribed intervals					
		Broken hand tools							
		INSTALLATION AND REPAIR OF DEFECTS.							

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3	OVERHEADS	INSTALLATION AND REPAIR OF DEFECTS	Working at elevated points, using cherry picker and ladders. Working on the shoulder of the road and pedestrians. Failure to comply with traffic accommodation plan. Potential live circuits. Substandard lifting operation – Danger to employees and equipment. Swinging loads	Injuries/fatalities from falling. Injuries/fatalities from bee stings. Injuries/fatalities from electrocutions. Injuries/fatalities from falling objects.	S H E	4	4	16	<p>Conduct HIRA</p> <p>Fall protection in place and employees trained in plan</p> <p>If you come across a bees' nest, do not confront them but move away.</p> <p>Inform the client on whose premises you work and arrange for the bees to be removed by a competent person or contractor.</p> <p>If the bees should attack, attempt to lock yourself in side your vehicle if you are out doors or in a room if you are close to a building.</p> <p>If you have been stung, arrange for medical attention a.s.a.p.</p> <p>Comply with traffic accommodation plan always.</p> <p>Always test the circuit to check whether it is live or dead.</p> <p>Make use of guide rope to prevent loads from swinging</p> <p>Safe work procedures</p>
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ANNEXURE 3 **MANDATORY** **AGREEMENT(SECTION37.2)**

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ARTICLE OF AGREEMENT IN TERMS OF SECTION 37(2) OF THE
OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 BETWEEN
THE CITY OF TSHWANE METROPOLITAN MUNICIPALITY
(Hereinafter referred to as the “CLIENT ”)
AND

.....

Herein represented by in
his/her capacity as duly
authorised by virtue of a resolution dated
Attached hereto as Annexure A of the said
(hereinafter referred to as the “CONTRACTOR”).

WHEREAS the CONTRACTOR is the mandatory of the CLIENT as contemplated in an agreement in respect of

.....

Contract number


.....

AND WHEREAS section 37 of the Occupational Health and Safety Act, 1993 (Act 85 of 1993, hereinafter referred to as the “ACT”), imposes certain powers and duties upon the CLIENT.

AND WHEREAS the parties have agreed to enter into an agreement in terms of section 37(2) of the ACT.

NOW THEREFORE the parties agree as follows:

1. The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.
2. The CONTRACTOR undertakes that all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations will be fully complied with: Provided that should the CLIENT prescribe certain arrangements and procedures, that same shall be observed and adhered to by the

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CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.

3. The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures, if any, imposed by the ACT and Regulations and the CONTRACTOR expressly absolves the CLIENT from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedures as the case may be.

4. The CONTRACTOR agrees that any duly authorised officials of the CLIENT shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with this undertaking as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

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

Thus signed at PRETORIA for and on behalf of the CLIENT on this the.....day of..... 20

AS WITNESSES:

1.

2.


.....
SIGNATURE

.....
NAME AND SURNAME

.....
CAPACITY

Thus signed at PRETORIA for and on behalf of the CONTRACTOR on this the

..... day of 20

 <p>CITY OF TSHWANE IGNITING EXCELLENCE</p>	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
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AS WITNESSES:

1.

2.


.....
SIGNATURE

.....
NAME AND SURNAME

.....
CAPACITY



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	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
	PROJECT LOCATION	
	PROJECT DESCRIPTION	TENDER FOR CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS
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ANNEXURE 4 **ACKNOWLEDGEMENT OF** **RECEIPT OHS SPECIFICATION**

Acknowledgement of receipt of OHS Specification:

Name of Designer/Contractor

I, the undersigned, hereby acknowledge that I have obtained copies of OHS Specification and confirm full compliance to the conclusion of project or construction work.


Signed aton this Day of.....20.....

Signature of Designer /Contractor Manager

Date

Signature of Contractor Supervisor

Date

 CITY OF TSHWANE <small>IGNITING EXCELLENCE</small>	OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION	
	PROJECT LOCATION	
	PROJECT DESCRIPTION	TENDER FOR CONSTRUCTION WORKS ON LOW VOLTAGE (LV) AND MEDIUM VOLTAGE (MV) ELECTRICAL NETWORK INFRASTRUCTURE AND CONSUMER CONNECTIONS
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