

# OR TAMBO DISTRICT MUNICIPALITY



**O.R. TAMBO  
DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

## **APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

**APRIL 2021**

**Prepared for:**

Water Services  
OR Tambo District Municipality  
Private Bag x 6043  
UMTHATHA  
5100

Tel. No. (047) 501 6400

**Prepared by:**

Water Services Provision  
OR Tambo District Municipality  
Private Bag x 6043  
UMTHATHA  
5100

Tel. No. (047) 501 6492

NAME OF BIDDER: \_\_\_\_\_

CSD SUPPLIER NO.: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

TENDER AMOUNT: \_\_\_\_\_

# **OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS  
FOR 36 MONTHS**

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PROJECT NO: ORTDM SCMU 57-20/21

**TENDERS ARE HEREBY INVITED FOR:**

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

To ensure that your proposal is not exposed to invalidation, documents are to be completed in accordance with the conditions and Tender rules contained in the Tender documents. Supporting documents must be sealed and externally endorsed **CONTRACT ORTDM SCMU 57-20/21-: APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

Tenderers should have a CIDB contractor grading designation of **5ME** and higher. Tenderers must be registered with the CIDB in a Mechanical Engineering class of construction works. Tender Documents must be submitted in the tender box, second floor, OR Tambo District Municipality, Nelson Mandela Drive, OR Tambo House, Myezo, Umthatha, not later than the closing date and time as stated.

The lowest or any Bid will not necessarily be accepted and the OR Tambo District Municipality reserves the right not to consider any tender not suitably endorsed or comprehensively completed as well as the right to accept a Tender in whole or part. Tenders will be adjudicated in accordance with the Supply Chain Management Policy of the OR Tambo District Municipality.

The following documents must be completed, signed (where applicable) and submitted as a complete set:

Document	
Number	Heading
T1.1	Tender Notice and Invitation to Tender
T1.2	Tender Data
T2.1	List of Returnable Documents
T2.2	Returnable Documents for tender evaluation purposes
C1.1	Form of Offer and Acceptance
C1.2	Contract Data
C2.1	Proposal and Methodology
C3.1	Specifications
C3.2	Scope of Work (Terms of Reference)
C.4	Pricing Schedule

## **OR TAMBO DISTRICT MUNICIPALITY**

PROJECT NO: ORTDM SCMU 57-20/21

### **APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

T1 TENDERING PROCEDURES
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T1.1 Tender Notice and invitation to tender

T1.2 Tender Data

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21  
APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS  
FOR 36 MONTHS**

<b>T1.1 TENDER NOTICE AND INVITATION TO TENDER</b>
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Tenders are hereby invited from suitably qualified and experienced service providers for **APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**. Tenderers should have a CIDB contractor grading designation of **5ME** and higher. Tenderers must be registered with the CIDB in a Mechanical Engineering class of construction works

Tender Number	Name and Description	Briefing session
ORTDM SCMU 57-20/21	APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS	<b>Date:</b> 06 May 2021 <b>Time:</b> 11.00am <b>Venue:</b> O.R. Tambo District Municipality Ground floor Foyer, Myezo Park

A compulsory briefing/clarification meeting with representatives of the Municipality will take place on the aforementioned date(s), time(s) and venue(s).

**THE MUNICIPALITY WILL NOT REPEAT ANY MATTERS ALREADY COVERED IN THE COMPULSORY BRIEFING MEETING TO BIDDERS WHO ARRIVE MORE THAN 10 MINUTES LATE TO THE MEETING, NOR WILL IT ALLOW SUCH BIDDERS TO COMPLETE THE ATTENDANCE REGISTER. PLEASE ADHERE TO ALL THE COVID 19 REGULATIONS.**

**Bid documents may be downloaded on the e-Tender website ([www.etenders.gov.za](http://www.etenders.gov.za)) alternatively on the O.R Tambo District Municipality ([www.ortambodm.gov.za](http://www.ortambodm.gov.za)) at no cost.**

Bids must be completed in black ink, enclosed in a sealed envelope clearly marked with the “**Tender number, tender name and description**”, and deposited in the Tender Box, Ground Floor, O. R. Tambo District Municipality Building, Nelson Mandela Drive, Myezo Park, Mthatha, Eastern Cape, not later than 12H00pm on **Monday, 31<sup>st</sup> May 2021**.

It must be expressly understood that the Municipality accepts no responsibility for ensuring that bid submissions sent by courier or post, or delivered in any other way, are deposited in the Tender Box. It is therefore preferable for the bidder to ensure that its bid submission is placed in the Tender Box by its own staff or representative(s).

The Municipality reserves the right not to accept the only or lowest priced tender or any tender at all, or to accept the whole or part of any tender.

**RETURNABLE DOCUMENTS TO BE SUBMITTED WITH BID:**

- Original or certified copy of BBBEE certificate; or sworn affidavit confirming annual total revenue and level of black ownership, if bidder is an Exempted Micro Enterprise (EME) or Qualified Small Enterprise (QSE);
- Certified copies of business registration documents, as issued by CIPC;
- Certified copy of identity documents of directors/ shareholders/ partners / members, as the case may be.

**INVALID OR NON-SUBMISSION OF THE FOLLOWING RETURNABLE DOCUMENTS WILL DISQUALIFY A BID SUBMISSION:**

- CSD supplier number;
- Proof of latest municipal rates and taxes statement indicating that rates and taxes are not in arrears for more than 3 months;
- Audited annual financial statements of the bidding entity (for projects in excess of R10 million) or where necessary;
- Joint Venture Agreement or Consortium Agreement, signed and initialled on each page (if applicable).
- Certified Copies of CIDB certificate grading 5ME or Higher

**EVALUATION OF BIDS IN TERMS OF THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK REGULATIONS, 2017:**

Bids will be evaluated in two stages, namely:

Stage 1- Functionality

Stage 2- Price and B-BBEE status level

ORTDM SCMU 57-20/21: APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS  
 Only Bidders who score a minimum of 60 points in Stage 1 will proceed to be evaluated further in Stage 2.

Item	Weight
<b>Stage 1 of Evaluation-Functionality</b>	<b>100</b>
Similar Projects	40
Experience of the Project Team	45
Methodology	15
<b>Stage 2 - Price &amp; B-BBEE Status Level</b>	<b>100</b>
Price	80
B-BBEE status level of contributor	20

**Tenders may only be submitted on tender documentation issued. No alterations may be made to the tender documentation. No late, faxed, e-mailed, telephonic or other electronic submissions will be accepted.**

Should a bidder commit any corrupt or fraudulent act during the bidding process, its tender shall be disqualified.

The Municipality reserves the right to extend the tender advert period at its own discretion, by notice published in the Daily Dispatch Newspaper; the e-Tender Publication Portal, and by notice sent to all parties who purchase this bid document.

**ENQUIRIES: General Manager Water Service Provision Mr. L. Mashiya; Email: [mashiyal@ortambodm.gov.za](mailto:mashiyal@ortambodm.gov.za); or Telephone No. 047 501 6400/6492. All Supply Chain Management enquiries may be directed to the General Manager SCM, Mr. Sakhiwo Hopa; Email: [sakhiwoh@ortambodm.gov.za](mailto:sakhiwoh@ortambodm.gov.za) or Telephone No.: 047 501 6449 during office hours: Monday to Friday 08H00-13H00 and 13H30-16H30.**

Tenders will be evaluated in terms of the Supply Chain Management policy of the O. R. Tambo District Municipality. The lowest tender will not necessarily be accepted and the Municipality reserves the right to accept the whole or part of any tender or not to consider any tender not suitably endorsed. An 80/20 point system shall apply where 80 points is allocated for price and 20 points allocated for B-BBEE status level of contributor as follows:

B-BBEE status level of contributor	Number of points
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

Unincorporated Joint Ventures and Consortia will only be allocated B-BBEE points provided they submit their consolidated B-BBEE certificate and that such consolidated B-BBEE certificate is prepared for every separate tender.

**PAX Dunywa  
 Acting Municipal Manager**

**O. R. TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

T1.2 TENDER DATA

The conditions of tender are the **Standard Conditions of Tender** as contained in Annexure F of the 30 January 2009 edition of the **CIDB Standard for Uniformity in Construction Procurement**. The Standard Conditions of Tender Procurements make several references to the Tender Data for details that apply specifically to the Tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of Tender. Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

*Please note that the word "Client" is used in this document and referred to as "Employer" in the Standard Conditions of Tender document.*

Clause Number	
<b>F.1</b>	<b>General</b>
F.1.1	The Client is: O. R. Tambo District Municipality Private Bag x 6043 Mthatha 5100
F.1.2	The Tender documents issued by the Client comprise: <b>Tender</b> T1.1 Tender Notice and invitation to tender T1.2 Tender Data T2.1 List of Returnable Documents T2.2 Returnable Documents for tender evaluation purposes T2.3 Returnable Documents to be incorporated into the contract
	<b>Contract</b> <b>Part 1 : Agreements and Contract data</b> C1.1 Forms of Offer and Acceptance C1.2 Contract Data <b>Part 2 : Pricing Data</b> C2.1 Pricing Instructions C2.2 Bill of Quantities <b>Part 3 : Scope of Work</b> C3.1 Project Specifications C3.2 Project Scope
F1.3	<b>Interpretation</b>

	The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these tender conditions.
F.1.4	<p><b>Communication:</b></p> <p>Communication with all stakeholders shall be through the O. R. Tambo Municipality's District Representative. Communications shall be in the English language. The Employer shall not take any responsibility for non-receipt of communications from or by a tenderer</p>
	<p>Contact person: <u>Mr. L Mashiya</u></p> <p>Tel: 047 501 6400 / 6492</p>
F.1.5	<b>The employer's right to accept or reject any tender offer</b>
F.1.5.1	<p><b>Reject or accept</b></p> <p>The employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such a cancellation and rejection, but will give written reasons for such action upon written request to do so.</p>
F.1.6	<b>Procurement procedures</b>
F.1.6.1	a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.
F.2	<b>Tenderer's obligations</b>
F.2.1.1	<p><b>Eligibility</b></p> <p>Only those tenders who are registered with CIDB and have in their employ management and supervisory staff satisfying the requirement of the scope of work for labour intensive competencies for supervisory and management staff are eligible to submit tenders.</p>
F.2.1.2	<p><b>CIDB Grading</b></p> <p>CIDB grading 5ME or Higher is required.</p>
F.2.2	<p><b>Cost of tendering</b></p> <p>Accept that the Employer will not compensate the tenderers for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer satisfy requirements.</p>
F.2.3	<p><b>Check documents</b></p> <p>Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.</p>
F.2.4	<p><b>Confidentiality and copyright</b></p> <p>Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.</p>
F.2.5	<p><b>Reference documents</b></p> <p>Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.</p>
F2.6	<p><b>Acknowledge Addenda</b></p> <p>Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension of the closing time stated in the tender data, in order to take the addenda into account.</p>



F.2.7	The arrangements for a <b>compulsory clarification meeting</b> are:	
	<b>Date:</b> 06 May 2021 <b>Starting time:</b> 11h00	<b>Location:</b> O. R. Tambo District Municipality Ground Floor Foyer MTHATHA, Myezo Park
F.2.8	<b>Seek clarification</b> Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.	
F2.10	<b>Pricing the tender</b>	
F.2.10.1	Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the tender data.	
F.2.10.2	Show VAT payable by the employer separately as an addition to the tendered total of the prices.	
F.2.10.3	Provide rates and prices that are fixed for the duration of the Contract, and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.	
F.2.10.4	State the rates and prices in South African Rand	
F2.11	<b>Alterations to documents</b> Not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations. Erasures and the use of masking fluid are prohibited.	
F.2.12	<b>Alternative tender offers</b> Alternative offers may be submitted only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. The alternative tender offer is to be submitted with the main tender offer together with a schedule that compares the requirements of the tender documents with the alternative requirements the tenderer proposes.	
F.2.13.5	The Client's address for delivery of Tender offers and identification details to be shown on each Tender offer package are:	
	<b>Location of Tender box:</b> Tender Box, Ground Floor, O. R. Tambo District Municipality Building, Nelson Mandela Drive, Myezo Park, Mthatha, Eastern Cape.	
	<b>Physical address:</b> O. R. Tambo House, Nelson Mandela Drive, Mthatha	
F.2.14	<b>Information and data to be completed in all respects</b> Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.	
F.2.15	<b>Closing time</b> The closing times for submission of Tenders are <b>12H00 on Monday 31 May 2021</b>	
F.2.15	Telephonic, telegraphic, telex, facsimile or e-mailed Bid offers will <b>not</b> be accepted.	
F.2.16	<b>Tender offer validity</b> The Tender offer validity period is 90 Days as stated in the tender data.	
F.2.17	<b>Clarification of tender offer after submission</b> The tenderer shall provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.	

F.2.18	<p><b>Provide other material</b>                  The tenderer shall, when requested by the Employer to do so, Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), referencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.                  Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.</p>
F.2.20	<p><b>Submit securities, bonds, policies</b>                  Submit to the employer before formation of the contract, certificates of insurance required in terms of the conditions of contract identified in the contract data.</p>
F.2.23	<p><b>The tenderer is required to submit with his tender:</b>                  Tax Clearance Certificates issued by SARS with pin code to verify tax status                  Valid Tax Verification issued by SARS                  Certified Copies of CIDB certificate grading 5ME or Higher                  Certified copies of the original Company documents issued by register of Companies.                  Certified Copy of the original green bar-coded IDs of Members or directors                  Certified Copy of the B-BBEE Certificate or an original certified sworn affidavit of the BBEE status                  JV agreement in where applicable in CIDB format (signed and initialled on each page)                  Proof of Registration with Central Supplier Database                  Proof of address with municipal services not owing more than 3 months</p>
F.3	<p><b>The employer's undertakings</b></p>
F.3.1	<p><b>Respond to requests from the tenderer</b></p>
F.3.1.1	<p>Respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.</p>
F.3.2	<p><b>Issue Addenda</b>                  If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until seven days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who drew documents.</p>
F.3.4	<p><b>Opening of tender submissions</b></p>
F.3.4.1	<p>The employer shall open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.</p>
F.3.4.2	<p>Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated                  in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, preferences claimed and time for completion for the main tender offer only.</p>
F.3.4.3	<p>The client shall not be obliged to make available the record outlined in F.3.4.2 to any tenderer who fail to attend the tender opening.</p>
F.3.6	<p><b>Non-disclosure</b>                  The client shall not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.</p>
F.3.7	<p><b>Grounds for rejection and disqualification</b>                  Determine whether there has been any effort by a tenderer to influence the processing of tender offers</p>

	and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.
F3.9	<b>Arithmetical errors, omissions and discrepancies</b>
F.3.9.1	Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.
F.3.9.2	Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.3.11 for:  a) the gross misplacement of the decimal point in any unit rate; b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in: line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or ii) The summation of the prices.
F.3.9.3	Notify the tenderer of all errors or omissions that are identified in the tender offer and invite the tenderer to either confirm the tender offer as tendered or accept the corrected total of prices.
F.3.9.4	Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows: a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected. b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.
F.3.10	<b>Clarification of a tender offer</b>  Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

F3.11

**Evaluation of tender offers**

*Replace the contents of the entire sub-clause with the following:*

The procedure for evaluation of responsive tender offers will be method 2 of table F.1 of SANS 294: 2004. Financial offer & Preferences. The bid will be awarded to the bidder who has scored the highest points for price and preferences combined **BUT** the prerequisite will be to obtain at least **60%** of total points for quality (functionality), which will be explained in Second Stage below.

Nevertheless, O. R. Tambo District Municipality retains the right to accept or reject any bid.

C. First stage in evaluation: Compliance with Bid Rules and other Requirements

The bids will be checked to ensure that they comply with the bid rules and all other requirements of the project document. In particular the following documentation must be completed and/or included within the bid.

The form of Offer and acceptance

Tax documentation

Certified company registration documents and ID of members

Form C: Compulsory Enterprise Questionnaire

Form D: Certificate of Authority for Signature

Form E: Amendments, Qualifications and Alternatives

Form H: Certificate of Good Standing

Form I: Relevant experience

Form J: Details of key staff and CVs

Form M: Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2011

All information supporting the above forms such as Curricula Vitae of staff who will work on the project and their functions, details of ownership, relevant experience etc.

Addenda issued during the bid period, if any.

The pricing schedule

Failure to supply the required information will compromise the bid

D. Second Stage in Evaluation: Quality / Functionality

Only bidders who score **60% or more** on stage 1 will be evaluated further and therefore eligible for award.

The maximum score for functionality shall be 100, distributed as follows:

**STAGE 1: FUNCTIONALITY/QUALITY EVALUATION**

Item	Weight
<b>Stage 1 of Evaluation-Functionality</b>	<b>100</b>
Similar Projects	40
Experience of the Project Team	45
Methodology	15
<b>Stage 2 of Evaluation- Price &amp; B-BBEE</b>	<b>100</b>
Price	80
B-BBEE	20

<b>Tender functionality / quality claimed</b>		
	Category of Quality / Functionality	Maximum tender evaluation points provided
<b>B1.1</b>	<b>Similar Projects</b>	<b>40</b>
	Tenderer must have completed 4 similar projects of a total value R4 000 000.00. <b>Copies of Completion Certificates or proof of such MUST be submitted with the bid. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.</b>	40
	Tenderer must have completed 3 similar projects of a total value R3 000 000.00. <b>Copies of Completion Certificates or proof of such MUST be submitted with the bid. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.</b>	30
	Tenderer must have completed 2 similar projects of a total value R2 000 000.00. <b>Copies of Completion Certificates or proof of such MUST be submitted with the bid. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.</b>	20
	Tenderer must have completed 1 similar projects of a total value R1 000 000.00. <b>Copies of Completion Certificates or proof of such MUST be submitted with the bid. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.</b>	10
	Tenderer must have completed any similar projects. No Copies of Completion Certificates or proof of such submitted with the bid. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.	0
<b>B1.2</b>	<b>Experience of Project Team</b>	<b>45</b>
	Experience of key personnel (NB no key personnel member may be assigned more than one duty on the Contract, i.e. different personnel must be assigned for each of the following key positions) Mechanical Engineer = ND Mechanical Engineering, Electrical Engineer = ND Electrical Engineering / Artisan Milwright = Trade Test certificate / Artisan Boiler Maker/Welding = Trade Test certificate; Health & Safety Officer = N6 + OHS Course / Certificate (In case of foreign qualifications, please attach SAQA equivalent or certified proof thereof)	
	<b>Mechanical Engineer/Technologist</b>	<b>10</b>
	Previous experience in the Mechanical Engineering Practice with a minimum of 5 years; <b>Mechanical Engineer</b> = 10 points, 3-4 years = 5 points & 0-2 years = 3 points. <b>(Attach CV and Qualification)</b>	
	<b>Electrical Engineer/Technologist</b>	<b>10</b>
	Previous experience in the Electrical Engineering Practice with a minimum of 5 years; <b>Electrical Engineer</b> = 10 points, 3-4 years = 5 points & 0-2 years = 3 points. <b>(Attach CV and Qualification)</b>	
	<b>Artisan Mechanical/Milwright</b>	<b>10</b>
	Previous experience in the as a Milwright with a minimum of 5 years; <b>Milwright</b> = 10 points, 3-4 years = 5 points & 0-2 years = 3 points. <b>(Attach CV and Qualification)</b>	
	<b>Artisan Electrician</b>	<b>05</b>
	Previous experience in the as an Electrician with a minimum of 5 years; <b>Electrician</b> = 5 points, 3-4 years = 3 points & 0-2 years = 1 points. <b>(Attach CV and Qualification)</b>	
	<b>Artisan Boiler Maker/Welder</b>	<b>05</b>

	Previous experience in the as a Boiler Maker/Welder with a minimum of 5 years; Boiler <b>Maker/Welder</b> = 5 points, 3-4 years = 3 points & 0-2 years = 1 points. <b>(Attach CV and Qualification)</b>	
	<b>Safety Officer</b>	<b>05</b>
	Previous experience in the as a Health and Safety Officer with a minimum of 5 years; Boiler <b>Health and Safety Officer</b> = 5 points, 3-4 years = 3 points & 0-2 years = 1 points. <b>(Attach CV and Qualification)</b>	
	<b>Where no CVs and Qualification attached</b>	<b>0</b>
	<b>Methodology</b>	<b>15</b>
	A clear methodology with clear time frames, organogram and cashflows , indicating the innovative methods of executing works	15
	A clear methodology with organogram and cash flows only , indicating the innovative methods of executing works	10
	A clear methodology with cashflows only , indicating the innovative methods of executing works	5

**STAGE 2: EVALUATION FOR PRICE AND PREFERENCE (80/20)**

The procedure for Stage 2 of evaluation of responsive tenders is **Method 1**

**a) PRICE: ..... 80**

**B-BBEE STATUS LEVEL OF CONTRIBUTION: ..... 20**

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

Where-

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration; and

Pmin = Price of lowest acceptable tender

The following table must be used to calculate the score out of 20 for BBBEE:

B-BBEE status level of contributor	Number of points
1	20
2	18
3	16
4	14
5	12
6	10
7	8
8	6
Non-compliant contributor	0

**F.3.13 Acceptance of tender offer**

F3.13.1 Accept the tender offer, if in the opinion of the employer, it does not present any unacceptable commercial risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
- c) has the legal capacity to enter into the contract,
- d) is not insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
- e) complies with the legal requirements, if any, stated in the tender data, and

	f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.
F3.13.2	Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period. Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the employer and the successful tenderer as described in the form of offer and acceptance.
F.3.14	<p><b>Notice to unsuccessful tenderers</b></p> <p>After the successful tenderer has acknowledged the employer's notice of acceptance, after written request, the employer will notify the tenderers that their tender offers have not been accepted in O.R Tambo District Municipality's website: <a href="http://www.ortambodm.gov.za">www.ortambodm.gov.za</a> by listing the successful tender.</p>
F.3.15	<p><b>Prepare contract documents</b></p> <p>If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:</p> <ul style="list-style-type: none"> <li>a) addenda issued during the tender period,</li> <li>b) inclusion of some of the returnable documents,</li> <li>c) other revisions agreed between the employer and the successful tenderer, and</li> <li>d) The schedule of deviations attached to the form of offer and acceptance, if any.</li> </ul>
F.3.16	<p><b>Issue final contract</b></p> <p>Prepare and issue the final draft of the contract to the successful tenderer for acceptance as soon as possible after the date of the employer's signing of the form of offer and acceptance (including the schedule of deviations, if any).</p>



**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS  
FOR 36 MONTHS**

**T2 RETURNABLE DOCUMENTS**

**T.2. LIST OF RETURNABLE DOCUMENTS**

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS  
FOR 36 MONTHS**

**Returnable Documents (T2)**

**T2.1 List of Returnable Documents**

**T2.2 Returnable Schedules**

## OR TAMBO DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 57-20/21

### APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS

#### **T2.1: LIST OF RETURNABLE DOCUMENTS**

##### **T. 2.1. Returnable Documents Required for Tender Evaluation Purposes (T2.1)**

- Form 2.1.1 Ownership of Tenderer's Entity
- Form 2.1.2 Municipal Bidding Documents (MBDs)
- Form 2.1.3 Authority for Signatory
- Form 2.1.4 Schedule of Work Carried Out by Tenderer
- Form 2.1.5 Proposed Key Personnel
- Form 2.1.6 Schedule of Infrastructure and Resources
- Form 2.1.7 Financial References

##### **T. 2.2. Other Documents Required for Tender Evaluation Purposes.**

- Form 2.2.1 Declaration of Good Standing regarding Tax.
- Form 2.2.2 CV'S of Key Personnel to be used in this Project.

**FORM 2.1.1 OWNERSHIP OF THE TENDERER'S ENTITY**

State whether the Tenderer is a company, a partnership, a person or a closed corporation by making an X in the appropriate space.

Company	<input type="checkbox"/>
---------	--------------------------

Partner-ship	<input type="checkbox"/>
--------------	--------------------------

Person	<input type="checkbox"/>
--------	--------------------------

Closed Corporation	<input type="checkbox"/>
--------------------	--------------------------

(Make an X in the appropriate space)

**2. Information to be provided**

**2.1 IF THE TENDERER IS A COMPANY:**

- (a) Affix a certified copy of the Certificate of Incorporation and on the following page.
- (b) List the Directors and each Director's date of appointment

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*(Attach Certified copies of ID'S of the Directors)*

**(c) List the Shareholders**

Name	% Share	Male/Female	HDI (Yes/No)*
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*(Attach Certified Copies of ID'S of Shareholders)*

- (d) List all companies of which your Company is a shareholder

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**2.2 IF THE TENDERER IS A PARTNERSHIP:**

(a) List the partners and state each partner's share in the partnership

Name	% Share	Male/Female	HDI (Yes/No)*
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***(Attach Certified Copies of ID'S of Members of the Partnership)***

**2.3 IF THE TENDERER IS A PERSON:**

(a) Provide the full name and qualifications of the person

Name	% Share	Male/Female	HDI (Yes/No)*
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**2.4 IF THE TENDERER IS A CLOSED CORPORATION:**

(a) Affix a certified copy of the CK 2 Form on the following Page.

(b) List the members and state each member's share in the closed corporation

Name	% Share	Male/Female	HDI (Yes/No)*
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***(Attach Certified Copies OF ID'S of Members of the CC***

**LOCALITY OF TENDERS** (attach copy of recent municipal services account on

the following page):

.....  
SIGNATURE OF TENDERER

.....  
DATE

**Affix and Attach Relevant Documents Here (ck FORM)**

**FORM T 2.1.2. MUNICIPAL BIDDING DOCUMENTS**

**MBD 1**

**PART A  
INVITATION TO BID**

<b>YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF O.R. TAMBO DISTRICT MUNICIPALITY</b>					
<b>BID NUMBER:</b>	ORTDM SCMU 57-20/21	<b>CLOSING DATE:</b>	31 MAY 2021	<b>CLOSING TIME:</b>	12.00PM
<b>DESCRIPTION:</b>	APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS				

**BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT:**

<b>TENDER BOX, GROUND FLOOR, O.R. TAMBO DISTRICT MUNICIPALITY BUILDING</b>
<b>MYEZO PARK, NELSON MANDELA DRIVE</b>
<b>MTHATHA</b>
<b>EASTERN CAPE</b>

**SUPPLIER INFORMATION**

<b>NAME OF BIDDER</b>					
<b>POSTAL ADDRESS</b>					
<b>STREET ADDRESS</b>					
<b>TELEPHONE NUMBER</b>	<b>CODE</b>		<b>NUMBER</b>		
<b>CELLPHONE NUMBER</b>					
<b>FACSIMILE NUMBER</b>	<b>CODE</b>		<b>NUMBER</b>		
<b>E-MAIL ADDRESS</b>					
<b>VAT REGISTRATION NUMBER</b>					
<b>TAX COMPLIANCE STATUS</b>	<b>TCS PIN:</b>		<b>OR</b>	<b>CSD No:</b>	
<b>B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No		<b>B-BBEE STATUS LEVEL SWORN AFFIDAVIT</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

**[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]**

<b>ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]	<b>ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER PART B:3 ]
------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	---------------------------------------------------------------------------------	----------------------------------------------------------------------------------------

<b>TOTAL NUMBER OF ITEMS OFFERED</b>		<b>TOTAL BID PRICE</b>	R
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<b>SIGNATURE OF BIDDER</b>	.....	<b>DATE</b>	
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**CAPACITY UNDER WHICH THIS BID IS SIGNED**

**BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:      TECHNICAL INFORMATION MAY BE DIRECTED TO:**

<b>DEPARTMENT</b>	SCM Department	<b>CONTACT PERSON</b>	Mr. L. Mashiya
<b>CONTACT PERSON</b>	Mr. Sakhiwo Hopa	<b>TELEPHONE NUMBER</b>	047 501 6492
<b>TELEPHONE NUMBER</b>	047 501 6448/6449	<b>FACSIMILE NUMBER</b>	N/A
<b>E-MAIL ADDRESS</b>	sakhiwoh@ortambodm.gov.za	<b>E-MAIL ADDRESS</b>	mashiya@ortambodm.gov.za

**PART B  
TERMS AND CONDITIONS FOR BIDDING**

**BID SUBMISSION:**

BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

**ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED-(NOT TO BE RE-TYPED).**

THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

**TAX COMPLIANCE REQUIREMENTS**

BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE [WWW.SARS.GOV.ZA](http://WWW.SARS.GOV.ZA).

FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.

BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.

WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

**QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS**

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?  YES  NO

DOES THE ENTITY HAVE A BRANCH IN THE RSA?  YES  NO

DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?  YES  NO

DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?  YES  NO

IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?  YES  NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

**NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID. NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.**

**SIGNATURE OF BIDDER:** .....

**CAPACITY UNDER WHICH THIS BID IS SIGNED:** .....

**DATE:** .....



**DECLARATION OF INTEREST**

1.No bid will be accepted from persons in the service of the state<sup>1</sup>.

Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

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

3.1 Full Name of bidder or his or her representative:.....

3.2 Identity Number: .....

3.3 Position occupied in the Company (director, trustee, shareholder<sup>2</sup>):  
.....

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.....  
.....

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 particular.....

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

Full name	Identity number	State employee number

.....  
**Signature**

.....  
**Date**

.....  
**Capacity**

.....  
**Name of Bidder**

**DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)**

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

NO.	QUESTION	ANSWER (TICK WHICH RESPONSE IS APPLICABLE)	
		YES	NO
1.	Are you by law required to prepare annual financial statements?		
1.1	If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the last 3 years.		

NO.	QUESTION	ANSWER (TICK WHICH RESPONSE IS APPLICABLE)	
		YES	NO
2.	Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than 3 months or any other service provider in respect of which payment is overdue for more than 30 days?		
2.1	If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than 3 months or other service provider in respect of which payment is overdue for more than 30 days.		
2.2	If yes, provide details: ..... ..... .....		

NO.	QUESTION	ANSWER (TICK WHICH RESPONSE IS APPLICABLE)	
		YES	NO
3.	Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?		
3.1	If yes, provide details: ..... ..... .....		

NO.	QUESTION	ANSWER (TICK WHICH RESPONSE IS APPLICABLE)	
		YES	NO
4.	Will any portion of the goods or services be sourced from outside the Republic, and if so, what portion, and whether any portion of payment from the municipality is expected to be transferred outside of the Republic?		
4.1	If yes, provide details: ..... ..... .....		

**CERTIFICATION**

I, THE UNDERSIGNED (NAME) .....

**CERIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.**

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

.....  
Signature

.....  
Date

.....  
Position

.....  
Name of Bidder

**PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017**

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

**NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.**

**GENERAL CONDITIONS**

The following preference point systems are applicable to all bids:

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

The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or

The 80/20 preference point system will be applicable to this tender.

Points for this bid shall be awarded for:

Price; and

B-BBEE Status Level of Contributor.

The maximum points for this bid are allocated as follows:

	<b>POINTS</b>
<b>PRICE</b>	<b>80</b>
<b>B-BBEE STATUS LEVEL OF CONTRIBUTOR</b>	<b>20</b>
<b>Total points for Price and B-BBEE must not exceed</b>	<b>100</b>

Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

**DEFINITIONS**

**“B-BBEE”** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

**“B-BBEE status level of contributor”** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

**“bid”** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

**“Broad-Based Black Economic Empowerment Act”** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

**“EME”** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

**“functionality”** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

**“prices”** includes all applicable taxes less all unconditional discounts;

**“proof of B-BBEE status level of contributor”** means:

B-BBEE Status level certificate issued by an authorized body or person;

A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

Any other requirement prescribed in terms of the B-BBEE Act;

“QSE” means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

“rand value” means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

**POINTS AWARDED FOR PRICE**

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

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

$$P_s = 80 \left( 1 - \frac{P_t - P_{min}}{P_{min}} \right) \quad \text{or} \quad P_s = 90 \left( 1 - \frac{P_t - P_{min}}{P_{min}} \right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

**POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR**

In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

**BID DECLARATION**

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

**B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1**

B-BBEE Status Level of Contributor: . = .....(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

**SUB-CONTRACTING**

Will any portion of the contract be sub-contracted?

(Tick applicable box)

YES		NO	
-----	--	----	--

If yes, indicate:

What percentage of the contract will be subcontracted.....%

The name of the sub-contractor.....

The B-BBEE status level of the sub-contractor.....

Whether the sub-contractor is an EME or QSE

**(Tick applicable box)**

YES		NO	
-----	--	----	--

Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

<b>Designated Group: An EME or QSE which is at last 51% owned by:</b>	<b>EME</b>	<b>QSE</b>
	√	√
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
<b>OR</b>		
Any EME		
Any QSE		

**DECLARATION WITH REGARD TO COMPANY/FIRM**

Name of company/firm:.....

VAT registration number:.....

Company registration number:.....

**TYPE OF COMPANY/ FIRM**

- Partnership/Joint Venture / Consortium
- One person business/sole propriety
- Close corporation
- Company
- (Pty) Limited

[TICK APPLICABLE BOX]

**DESCRIBE PRINCIPAL BUSINESS ACTIVITIES**

.....

.....

.....

.....

**COMPANY CLASSIFICATION**

- Manufacturer
- Supplier
- Professional service provider
- Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

**MUNICIPAL INFORMATION**

**Municipality where business is situated:** .....

**Registered Account Number:** .....

**Stand Number:**.....

Total number of years the company/firm has been in business:.....

I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

The information furnished is true and correct;

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

In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

disqualify the person from the bidding process;

recover costs, losses or damages it has incurred or suffered as a result of that person’s conduct;

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;

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

forward the matter for criminal prosecution.

<p>WITNESS:</p> <p>1. ....</p> <p>2. ....</p>
-----------------------------------------------

<p>.....</p> <p>SIGNATURE(S) OF BIDDER(S)</p> <p>DATE: .....</p> <p>ADDRESS: .....</p> <p>.....</p>
-----------------------------------------------------------------------------------------------------



**DECLARATION OF BIDDER’S PAST SUPPLY CHAIN MANAGEMENT PRACTICES**

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

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.

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

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

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

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

been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

Item	Question	Yes	No
4.1	<p>Is the bidder or any of its directors listed on the National Treasury’s Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied).</p> <p><b>The Database of Restricted Suppliers now resides on the National Treasury’s website(<a href="http://www.treasury.gov.za">www.treasury.gov.za</a>) and can be accessed by clicking on its link at the bottom of the home page.</b></p>	<p>Yes <input type="checkbox"/></p>	<p>No <input type="checkbox"/></p>
4.1.1	If so, furnish particulars:		
4.2	<p>Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? <b>The Register for Tender Defaulters can be accessed on the National Treasury’s website (<a href="http://www.treasury.gov.za">www.treasury.gov.za</a>) by clicking on its link at the bottom of the home page.</b></p>	<p>Yes <input type="checkbox"/></p>	<p>No <input type="checkbox"/></p>
4.2.1	If so, furnish particulars:		

4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.3.1	If so, furnish particulars:		
<b>Item</b>	<b>Question</b>	<b>Yes</b>	<b>No</b>
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.7.1	If so, furnish particulars:		

**CERTIFICATION**

**I, THE UNDERSIGNED (FULL NAME) ..... CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.**

**I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.**

.....  
**Signature**

.....  
**Date**

.....  
**Position**

.....  
**Name of Bidder**

**CERTIFICATE OF INDEPENDENT BID DETERMINATION**

1. This Municipal Bidding Document (MBD) must form part of all bids<sup>1</sup> invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).<sup>2</sup> Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
  - a. Take all reasonable steps to prevent such abuse;
  - b. Reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
  - c. Cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

<sup>1</sup> Includes price quotations, advertised competitive bids, limited bids and proposals.

<sup>2</sup> Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

**CERTIFICATE OF INDEPENDENT BID DETERMINATION**

I, the undersigned, in submitting the accompanying bid:

**ORTDM SCMU 57-20/21 – APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

in response to the invitation for the bid made by:

**O.R. Tambo District Municipality**

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

I certify, on behalf of: \_\_\_\_\_ that:

(Name of Bidder)

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

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

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

Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:

has been requested to submit a bid in response to this bid invitation;

could potentially submit a bid in response to this invitation, based on their qualifications, abilities or experience; and

provides the same goods and services as the bidder and/or is in the same line of business as the bidder

**MBD 9**

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

In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

prices;

geographical area where product or service will be rendered (market allocation)

methods, factors or formulas used to calculate prices;

the intention or decision to submit or not to submit, a bid;

the submission of a bid, which does not meet the specifications and conditions of this invitation; or

submitting a bid with the intention not to win the bid.

In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

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

I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....  
Signature

.....  
Date

.....  
Position

.....  
Name of Bidder

**FORM 2.1.3 AUTHORITY FOR SIGNATORY**

Signatories for companies must establish their authority by attaching to this form a copy of the relevant resolution by their Board of Directors, duly signed and dated.

"By resolution of the Board of Directors taken ..... 20.....

Mr .....

has been duly authorized to sign all documents in connection with Contract No.....

and any Contract which may arise therefrom on behalf of (block capitals) .....

.....

.....

**IN HIS CAPACITY AS:**.....

**DATE**.....

**SIGNATURE OF SIGNATORY**.....

**SIGNED ON BEHALF OF THE COMPANY BY MEMBERS OF THE COMPANY OR CLOSED COOPERATION OR ENTERPRISE AS FOLLOWS;**

No	Member's Name	Capacity	% Shareholding	Signature

**AFFIX COMPANY LETTER HEAD CERTIFYING THE ABOVE RESOLUTION ON THE FOLLOWING PAGE.**

**Affix Company letter here**

**FORM 2.1.4: SCHEDULE OF WORK CARRIED OUT BY TENDERER**

Provide the following information on relevant previous experience (indicate specifically projects of similar or larger size and/or which is similar with regard to type of work. This information is material to the award of the Contract.

Description	Value in Rands	Year Completed	Client and Representative	Contact No

**APPOINTMENT OF SERVICE PROVIDERS FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

Signature of the Tenderer: \_\_\_\_\_



**FORM 2.1.5 PROPOSED KEY PERSONNEL**

The Tenderer shall list below the key personnel (including first nominee and the second choice alternate), whom he proposes to employ on the project should his Tender be accepted, both at his headquarters and on the Site, to direct and for the execution of the work, together with their qualifications, experience, positions held and their nationalities.

No	Name	Qualification	Designation	HDI Status	PR Number

*(Provide more details on the CV'S to attached as per form 2.2.5 in the returnable schedules)*

Signature of the Tenderer: \_\_\_\_\_

**FORM 2.1.6: SCHEDULE OF INFRASTRUCTURE AND RESOURCES**

Provide information on the following:

**Infrastructure and resources available**

**Physical facilities and Buildings.**

Description	Address	Area (m <sup>2</sup> )

**Equipment**

Provide information on equipment and resources that you have available for this project.

<b>Description:</b>	<b>Number of units</b>
<b>Description :</b>	<b>Number of units</b>
<b>Description:</b>	<b>Number of units</b>

**Size of enterprise and current workload**

What was your turnover in the previous financial year? -----

What is the estimated turnover for your current financial year? -----

---

**List your current contracts and obligations**

Description	Value (R)	Start date	Duration	Expected completed date

**Staffing Profile**

Provide information on the staff that you have available to execute this contract (attach a separate list if the space provided is insufficient)

Permanently employed staff : gender and race	Number of staff

---

Temporary staff to be employed for the project : gender and race	<b>Number of staff</b>

Signature of the Tenderer : \_\_\_\_\_

**FORM 2.1.7 SCHEDULE OF PROPOSED SUBCONTRACTOR**

The Tenderer shall, in accordance with the provisions of condition of tender, list below the subcontractors he proposes to employ for part(s) of the work.

*The naming of any proposed sub consultant/s hereunder shall not be deemed to constitute a qualification of the Tender, and acceptance of a Tender shall not be construed as approval of any or all of the listed sub consultant/s, neither shall it in any way limit or detract from the powers of the Engineer and the obligations of the Contractor pertaining to subcontracting as stated in the Contract, nor shall it prevent the Tenderer from deviating In any way during the Contract from the list of proposed sub consultant/s hereunder if the Tender is accepted*

*If any or all of the sub consultant/s listed hereunder are not approved subsequent to acceptance of the Tender, it shall in no way invalidate the Tender or the Contract, and the Tendered unit rates for the respective items of work shall remain final and binding even if a sub consultant/s not listed below is approved by the Client.*

<b>Part or Type of Work</b>	<b>Proposed Sub-Contractor</b>	<b>Work Recently Executed by Subcontractor</b>

Signature of the Tenderer: \_\_\_\_\_

**FORM 2.1.8: FINANCIAL REFERENCES**

**FINANCIAL STATEMENTS**

I/We agree, if required, to furnish an audited copy of the latest set of financial statements together with my/our Directors' and Auditors' report for consideration by the Client.

**DETAILS OF TENDERING ENTITY'S BANK**

I/We hereby authorise the Client/Engineer to approach all or any of the following banks for the purposes of obtaining a financial reference.

<b>DESCRIPTION OF BANK DETAIL</b>	<b>BANK DETAILS APPLICABLE TO TENDERER'S HEAD OFFICE</b>
<b>Name of bank</b>	
<b>Branch name</b>	
<b>Branch code</b>	
<b>Street address</b>	
<b>Postal address</b>	
<b>Name of manager</b>	
<b>Telephone number</b>	(    )
<b>Fax number</b>	(    )
<b>Account number</b>	

**TENDERER'S TAX DETAILS**

Tenderer's VAT vendor registration number: -----

Tenderer's SARS tax reference number: -----

Signature of the Tenderer: \_\_\_\_\_

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

**T. 2.2. Other Documents Required for Tender Evaluation Purposes.**

- Form 2.2.1 Certificate of Tenderers attendance at the clarification meeting.
- Form 2.2.2 Declaration of Good Standing regarding Tax.
- Form 2.2.3 CV'S of Key Personnel to be used in this Project.

**FORM 2.2.1 CERTIFICATE OF TENDERER'S ATTENDANCE AT THE COMPULSORY SITE/CLARIFICATION MEETING**

This is to certify that I, -----  
-----

Representative of (Tenderer) -----  
-----

-----Of (address)-----  
-----  
-----

Fax number -----

(Visited and examined the Site)/ attended Clarification Meeting on (date) -----  
-----  
-----

In the company of (Engineer/Engineer's Representative) -----  
-----  
-----

TENDERER'S REPRESENTATIVE: -----  
-----  
-----

CLIENT'S REPRESENTATIVE: -----  
-----



**FORM 2.2.2 DECLARATION OF GOOD STANDING REGARDING TAX**

<b>SOUTH AFRICAN REVENUE SERVICES</b>	Bid No: .....	
	Closing Date: .....	
<b>DECLARATION OF GOOD STANDING REGARDING TAX</b>		
<b>PARTICULARS</b>		
1. Name of Taxpayer/Bidder: .....		
2. Trade Name: .....		
3. Identification Number: (If applicable)	<input style="width: 100%;" type="text"/>	
4. Company / Close Corporation registration number:	<input style="width: 100%;" type="text"/>	
5. Income Tax reference number:	<input style="width: 100%;" type="text"/>	
6. VAT registration number: (If applicable)	<input style="width: 100%;" type="text"/>	
7. PAYE employer's registration number: (If applicable)	<input style="width: 100%;" type="text"/>	
8. Monetary value of bid:	<input style="width: 100%;" type="text"/>	
<b>DECLARATION</b>		
I, ..... the undersigned, the above taxpayer/bidder, hereby declare that my Income Tax, Pay-As-You-Earn (PAYE) and Value-Added-Tax (VAT) obligations of the above-mentioned taxpayer, which include the rendition of returns and payment of the relevant taxes:		
(i) Have been satisfied in terms of the relevant Acts; or		
(ii) That suitable arrangements have been made with the Receiver of Revenue, ..... to satisfy them.*		
..... <b>SIGNATURE</b>	..... <b>CAPACITY</b>	..... <b>DATE</b>
<b>PLEASE NOTE:*</b> The declaration (ii) cannot be made unless formal arrangements have been made with the Receiver of Revenue with regard to any outstanding revenue/outstanding tax returns.		

**FORM 2.2.3 CV'S OF KEY PERSONNEL TO BE USED IN THIS PROJECT.**

Provide two paged CV of Each key Personnel to be used in this project.

Attach certified copies of the following to the CV;

ID  
Highest Qualification.  
Certification

***(Affix the CV's and Attachments in a form of a booklet to the following Page.)***

**Attach CV Booklet on this Page**

OR TAMBO DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 57-20/21

APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36  
MONTHS

## **PART 1**

**C1 CONTRACT DATA**

**C1 AGREEMENT AND CONTRACT DATA**

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

**AGREEMENT AND CONTRACT DATA (C2)**

**C1.1 Form of offer and acceptance**

**C1.2 Contract Data**

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

**C. 1. FORM OF OFFER AND ACCEPTANCE**

**PART 1: FORM OF OFFER**

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of: **APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL FOR 36 MONTHS**. 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 Tender 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.

**THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS**

.....  
.....Rand (in words); R ..... (In figures),

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_ Capacity: \_\_\_\_\_

For the  
Tenderer: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
(Tenderer's address)

Name &  
Signature of Witness \_\_\_\_\_ Date \_\_\_\_\_

**PART B: ACCEPTANCE** *(To be completed by the Employer)*

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the, Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement, between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the, Contract that is the subject of this Agreement.

The terms of the contract, are contained in

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

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 6 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, which must be duly signed by the authorised representative(s) of both parties.

The Tenderer shall within two weeks after receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the, Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. 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.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Capacity \_\_\_\_\_

For the Employer \_\_\_\_\_

\_\_\_\_\_  
(Name and address of organisation)

Name & Signature of Witness \_\_\_\_\_ Date \_\_\_\_\_

## OR TAMBO DISTRICT MUNICIPALITY

### APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS

#### C1.2 CONTRACT DATA

##### CONTRACT SPECIFIC DATA

The following contract specific data are applicable to this Contract as per the **GOVERNMENT PROCUREMENT: GENERAL CONDITIONS OF CONTRACT (GCC)** issued by National Treasury of the Republic of South Africa.

The meaning of “purchaser” in the GCC shall have the same meaning as “Employer”

##### **Compulsory Data**

Clause 1.21

The name of the Employer is O.R Tambo District Municipality.

Clause 7

Deed of Guarantee is not applicable on this Contract.

Clause 8

All pre-bidding testing or trial tests are not applicable.

Clause 10

The works shall be completed within 36 months after the signing of the contract

Clause 11

The service provider shall have an Indemnity cover of not less than R3 million.

Clause 16.3

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

Clause 49.3

Disputes will be settled through arbitration.

Signature of the Tenderer: \_\_\_\_\_



**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

**PART 3**

**C3 SCOPE OF WORK (TERMS OF REFERENCE)**

**C.3 SPECIFICATIONS AND SCOPE OF WORKS**

**OR TAMBO DISTRICT MUNICIPALITY**

**PROJECT NO: ORTDM SCMU 57-20/21**

**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS FOR 36 MONTHS**

C3.1. SPECIFICATIONS

**PART 1: SECTION 5:**

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

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

The Employer and the Contractor hereby agree, in terms of the provisions of Sections 37(2), 9 and 8(2) of the Occupational health and Safety, Act No. 85 of 1993, hereinafter referred to as "the Act" that the Contractor as an employer in its own rights and in its capacity as contractor for the execution of the works, shall have certain obligations and that the following arrangements shall apply between them to ensure compliance by the Contractor with the provisions of the Act, namely:

(i) The Contractor undertakes to acquaint the appropriate officials and the employees of the Contractor with all relevant provisions OHS the Act, and the regulations promulgated in terms of the Act; and

(ii) the Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with; and

(iii) the Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations and expressly absolves the Employer and the Employer's consulting engineers from being obliged to comply with any of the aforesaid duties, obligations and prohibitions.

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

SIGNED at: \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_

For and on behalf of the Contractor: \_\_\_\_\_ Print name: \_\_\_\_\_

AS WITNESSES:

1. \_\_\_\_\_ 2. \_\_\_\_\_

Important note: This document required to be completed by the Bidder before the closing date of the BID.

**PART 2:**  
**STANDARD TECHNICAL SPECIFICATION**

## **PART 2: SECTION 1: GENERAL REQUIREMENTS**

### **1. GENERAL**

1.1. This Standard Technical Specification contains the general requirements with regard to material, equipment, workmanship, installation and commissioning of the Works and should be read together with the Conditions of BID, Conditions of Contract and the Detailed Technical Specification.

1.2. Where any conflict may exist between the Standard Technical Specification and the Detailed Technical Specification, the relevant clauses of the Detailed Technical Specification shall take preference over the clauses contained in the Standard Technical Specification.

1.3. Should any conflict arise between the requirements embodied in this Standard Technical Specification and the Conditions of Contract, then the relevant clauses in the Conditions of Contract will take preference.

1.4. If at any stage of this contract it is found that the Contractor has deviated from the requirements of this specification, except for the exceptions as set out in par. 1.2 and par. 1.3 above, whether it be by the installation of equipment not specified, etc. or otherwise, without prior WRITTEN consent from the Engineer, the Engineer shall have the right to order the Contractor to remove such items, equipment, etc. constituting the deviation and replace it with the exact item, equipment, etc. specified, without any adjustment in the BID price.

1.5. The Contractor shall be responsible for the acquisition of adequate insurance cover that may be required for all equipment, in temporary storage and in transit, to and from the site, to be supplied in terms of this contract. In addition, the Contractor shall ensure that such insurance cover will include the transport of equipment by The District, should the Contractor request The District to assist in the transportation of any equipment at any time prior to the lapsing of the original maintenance period (see par. 8.1).

### **2. REGULATIONS AND STANDARDS**

2.1. All work carried out on The District's equipment and premises shall be strictly in accordance with the latest revisions and amendments of the following:

2.1.1. SABS 0142: Code of Practice for the wiring of Premises (hereafter referred to as the 'Wiring Code').

2.1.2. IEC 1024 (Part 1 and Part 1.1): Code for the protection of structures against lightning hazards.

2.1.3. SABS 1069 Part 1 and Part 2/93: Land Mobile Communications, in conjunction with ETS 300086: Radio equipment and - systems - Land Mobile Service.

2.1.4. The Occupational Health and Safety Act, Act No. 85 of 1993, as amended.

2.1.5. The Municipal by-laws and any special requirements of the local Supply Authority.

NB: Notwithstanding the above list the Contractor shall comply with all Acts, regulations, By-laws etc. which shall apply to The District's sites and entry thereto.

2.2. Any conflict that might arise between any regulation of the above-mentioned documents and this specification shall forthwith be referred to the Engineer IN WRITING for his subsequent ruling, BEFORE the Contractor attempts any modification to any part of the works to comply with said regulation.

2.3. If any equipment or material to be used complies with a standard issued by a recognised international standards organisation, then such compliance should be stated in the BID documents (Price Schedule).

2.4. All equipment or material to be used in this installation shall be new and of an acceptable quality to the Engineer.

### **3. TECHNICAL CLARIFICATION MEETING**

3.1. A Technical Clarification Meeting, to discuss and clarify any technical queries there may exist regarding the extents of the Detail Specification, shall be held subsequent to the awarding of the BID and thereafter at monthly intervals.

### **4. VISIT TO THE DISTRICT SITES**

4.1. Bidders are advised to visit the site to acquaint themselves with the local conditions.

4.2. Claims that may arise at a later stage due to lack of information in this regard WILL NOT BE CONSIDERED.

4.3. Prospective Bidders are further advised to make their own arrangements for such a site visit, a general site visit will be arranged by the Engineer. Bidders wishing to obtain access to site shall contact the Engineer, who will co-ordinate such visit with the municipal personnel.

## **5. SUB-CONTRACT WORK**

5.1. Should subcontractors be proposed for use, details shall be submitted to the Engineer for approval. Refer to the Schedule of proposed sub-contractors.

## **6. WORKSHOP ASSEMBLY**

6.1. To minimise actual on-site time and to assist in the erection and installation activities to be performed on site, all components, equipment and sub-assemblies shall be assembled at the Contractor's workshop.

6.2. Individual components, units etc. of which the prior installation / assembly is not feasible or advisable, shall be clearly marked in such a manner that the actual installation/ assembly thereof on site can be completed in the minimum time with a minimum of fitting and adjusting required.

6.3. Equipment should be delivered to site in the largest sub-assemblies that are practical and advisable.

6.4. For the purpose of performing factory tests as required in terms of this Specification and where considered practical according to the discretion of the Engineer, complete assemblies will be required.

## **7. TESTS**

7.1. All equipment, materials used and workmanship performed shall be as required and described in terms of this Contract and the Engineer's instructions and shall be subjected to such tests conducted by such persons as the Engineer may direct from time to time. These tests may be conducted at the place of manufacture, at the Contractor's Works, on site or at any or all of the aforementioned places.

7.2. The Contractor shall supply such assistance, instruments, machines, labour and materials as will normally be required for the examining measuring and testing of any work or the quality of materials used.

7.3. The cost of performing all tests as clearly intended by or provided for in this Specification shall be borne by the Contractor.

7.4. All individual sub-systems shall be set up at the Contractors Works for the performance of functional and operational tests, so as to prove satisfactory operation thereof as a working system. The Engineer or his designated representative shall witness these tests. Each system shall only be released for transfer to site when so authorised by the Engineer or his designated representative. UNDER NO CIRCUMSTANCE SHALL SYSTEMS BE TRANSFERRED TO SITE BEFORE THE SUCCESSFUL COMPLETION OF THE ABOVE-MENTIONED FACTORY TESTS.



7.5. The Engineer shall be notified in writing of the completion of all systems/subsystems for the purpose of factory tests. Such tests shall commence within 14 days of receipt of the Contractor's written notice to this effect.

## **8. MAINTENANCE**

### **8.1. Period of Maintenance**

8.1.1 The minimum maintenance period, which is acceptable in terms of this Contract and shall henceforth be applicable to ALL quotations called for in terms of section 6 of this Contract, shall be 12 months and shall commence at the date of issue of the Commissioning Certificate.

8.1.2 The period of maintenance, with respect to all equipment/systems, which have been factory tested and accepted by the Engineer, will commence on the date of acceptance, as signified IN WRITING by the Engineer.

In the event of the Contractor being required to rectify/repair or being in the process of rectifying/repair of defects/faults prior to or at the date when the Period of Maintenance is due to expire, the Engineer shall have the right to extend the Period of Maintenance in respect of the portion of the Works being or to be rectified/repared, until the work of rectification/repair have been completed. The expression 'Period of Maintenance' shall be held to include any such extension.

### **8.2. Contractor's obligation during the Maintenance Period**

8.2.1. During the period of maintenance, as described in clause 8.1. above, the Contractor shall maintain and keep all systems and sub-systems in a complete and operational condition, to the satisfaction of the Engineer.

8.2.2. The Contractor shall be required to provide the Engineer with written 3-monthly reports:

- indicating the status/condition of the various systems
- summarising all work performed during the preceding period

8.2.3. Should any of the systems as installed cease to operate satisfactorily during the Period of Maintenance, the contractor shall be obliged to investigate and repair the fault within a period as required by the Engineers Representative. If in the opinion of the said representative, the fault is deemed to need urgent repair the Contractor holds himself available for 24 hours per day and 7 days per week.

### **8.3. Remedy on Contractor's failure to carry out work as required**

8.3.1. Should the Contractor fail to commence investigation/repair as required per above par. 8.2.3. within a period of 10 days after receipt of written notice thereof, the Employer shall be entitled to have such work carried out by his own staff or by other Contractors.

8.3.2. If such work is work which the Contractor should have carried out at his own cost, as detailed in par. 8.4. below, the Employer shall be entitled to recover from the Contractor the cost thereof or deduct the same amount from any moneys due or that become due to the Contractor.

8.4. Cost of execution of work (investigation/repair) during the Maintenance Period

8.4.1. All work to be carried out by the Contractor during the Period of Maintenance as described in par. 8.2 shall be at his own expense if the necessity thereof shall, in the opinion of the Engineer, be due to the use of materials or defective design not in accordance with the Contract or due to neglect or failure on the part of the Contractor to comply with any obligation expressed in this Contract.

8.4.2. If, in the opinion of the Engineer, any work is to be carried out by the Contractor due to any other cause, the value of such work will be ascertained and paid for as if it were additional work.

8.5. Materials used for repair during the Period of Maintenance

When, in the opinion of the Engineer, any material used or intended for use is not in accordance with the requirements of the Contract, he may order the Contractor in writing to remove any objectionable part of the material immediately and to replace it with acceptable material, without cost to the Employer.

### **Maintenance and Servicing Facilities**

8.6.1. Each Bidder shall be able to clearly demonstrate possession of adequate servicing and maintenance facilities, including a comprehensive range of spares, to the satisfaction of the Engineer.

8.6.2. To this effect, each Bidder shall include a statement in his offer, describing the facilities available for servicing and maintenance, as well as the availability of adequate spares for the equipment offered in his BID.

8.6.3. As a further requirement, the precise physical street address and telephone number of the premises nearest to this installation, as well as the availability of adequate spares for the equipment offered in his BID.

8.6.4. Bidders shall accept as a condition of this contract that any premises indicated in this statement may be inspected prior to the awarding of the contract. It shall be noted that offers may be passed over where, in the opinion of the Engineer, these facilities are inadequate in terms of the foregoing requirements.

8.7. Personnel used for repair work during the period of maintenance. The Contractor shall only allow properly qualified and skilled staff to work on the equipment and installation at all times.

#### 8.8. Fault Reports

8.8.1. All faults and problems experienced shall be reported to the Contractor by telephone, followed by written confirmation thereof via fax. The Contractor shall promptly acknowledge receipt of such fault report and shall make the necessary arrangements to get the fault/problem attended to within a period of time acceptable to the Engineers Representative.

8.8.2. The Employer shall keep a fault report book on site. The Employer's personnel shall enter all faults experienced into this book. The Contractor shall countersign next to the reported fault once the fault have been attended to and rectified, complete with time and date of repair.

### 9. DOCUMENTATION

9.1. The contractor shall ensure that ALL the relevant documentation required as pertaining to ALL aspects of the equipment and systems as supplied and called for under this contract, is COMPLETE AND THOROUGH in all aspects, to enable staff to operate, understand and maintain the equipment and systems fully and to utilise the equipment to it's full potential:

9.2. All the documentation called for in par. 9.3. below, except where otherwise noted, shall be made available BEFORE installation and commissioning of the equipment will take place. Bidders should note that NO commissioning will be considered by the Engineer until such time as when this condition is met.

The Contractor shall make provision for the following documentation to be supplied in terms of this contract:

9.3.1. A commissioning manual, as described in par. 9.5.

9.4. To this extent, the Contractor shall ensure that these manuals called for, are so prepared that in the opinion of the Engineer a competent and qualified technician can trace any fault, identify any defective component, replace it with the correct spare and follow, without any difficulty, the exact function of every component. To this end, care shall be taken to correlate the text with the circuit diagrams, to relate the diagrams one with the other and to provide a simple method of diagnosis and test to be used wherever problems and faults occur.

9.5. The Contractor shall keep accurate record of all tests carried out and the results thus obtained; all meter readings taken of critical system parameters after installation of the equipment, etc. This information shall be contained in the commissioning manual, which will form the reference to which system performance will be equated during and after the maintenance period have elapsed.

9.6. The relevant service manuals supplied shall contain complete equipment schematics; test and alignment procedures, all circuit diagrams, all spares and parts lists and complete troubleshooting procedures. NOTE: NO Photostatted material will be acceptable.

9.7. General aspects:

9.7.1. Binding

The manuals shall be securely bound in A4 size durable, hard-backed plastic 4 ring binders with a black finish, with clear pockets on the spine and front cover for insertion of title slips containing the contract number, etc. Complete title slip information will be supplied by the District to the Contractor at an appropriate time. Drawings larger than A4-size shall be contained in separate pockets.

Layout

A master index, indicating the different sections incorporated into the manual, shall be required. Furthermore, the sections shall be separated by plastic binders, clearly and visibly marked to match the master index, complete with title page and sub-index.

9.8. **Six (6) copies** of the documentation called for in par. 9.3. shall be supplied.

## **10. TRAINING**

**10.1.** All training to be provided by the Contractor shall be directly applicable to the actual equipment being installed on site. Training will consist of the following components:

Training at the Contractor's Works.

10.1.2. Training on site.

Training at the Contractor's Works will be provided for the Employer's technical staff only. This will entail a detail practical workshop session, sufficiently comprehensive to enable the Employers technical staff to locate and correct problems on site. Attention will be given to all aspects of the maintenance, servicing and fault-finding procedures on all equipment supplied. The Contractor will provide all course material, including manuals. For the purpose of compliance regarding the supply of documentation as required per par. 9 (DOCUMENTATION), all manuals provided to the Employers staff will be deemed as subtracted from the total copies to be supplied, as called for in par. 9.7. The Workshop will be attended by a minimum of two persons as appointed by the Employer.

10.3. First-line maintenance training on site will be provided for the Employer's site personnel, preferably during the installation period and definitely before the date of acceptance.

10.4. In view of the above and to allow personnel to become familiar with the equipment and installation, the Employer reserves the right to appoint certain staff to the Contractor's team during installation and commissioning phases. A maximum of two people per each district will attend.

10.5. At the conclusion of the respective training periods, the Engineer will evaluate the training given and will subsequently issue a signed statement to the Contractor, should it be found that these training sessions were adequate.

## **PART 2: SECTION 2: GENERAL INFORMATION**

### **2.1 SCOPE**

2.1.1 This BID is for a three-year contract for the refurbishment, upgrade, maintenance and project/contract/Contractor supervision of mechanical and electrical installations and equipment associated with OR TAMBO DISTRICT MUNICIPALITY installations in the Eastern Cape Province. Prospective Bidders must take note of the fact that the contract will be executed on the basis of a "Bill of Quantities" contract. BID prices must include all additional site establishment cost, site movement cost and transport cost. Refer to specific pricing schedules.

The quantities indicated in the Schedule of Quantities are for adjudication purposes only and shall not be regarded as an indication of the eventual value of the work to be done.

#### **2.1.2 Service**

The service to be provided shall be deemed to include preventative maintenance, condition monitoring and emergency repairs. The Contractor shall have substantial capacity and facilities to handle all the equipment listed in Part 3 Section 2: Equipment Description. Sub-contractors may be appointed for specialised activities, subject to the approval of the Engineer.

#### **2.1.3 Phasing of the works**

The Contractor must take note of the fact that only inter-construction site movements will be paid for. It is also important to take note of the fact that such payment will be made only for the Contractor's first equipment team (if more than one team are fielded) to move to a specific site. Inter-construction site move payments shall be made only once per installation. Only transport rates are applicable.

Should the Contractor be requested by the Engineer to do work not included in this abovementioned programme, he will then be paid for the movement according to transport rates included in the Pricing Schedules. These movements are those which would infringe any programme predetermined and agreed to between the Contractor and the Engineer.

The Engineer reserves the right to require from the Contractor urgent repair services in the event of an emergency. Under these circumstances the Engineer's representative reserves the right to require the Contractor to provide such urgent repair facilities to be available 24 hours a day for 7 days a week at the rates quoted in the specific pricing schedules.

The Contractor must have the facilities or have acceptable written agreements with associate companies to do a preponderance of the work listed. Only one main contractor will be appointed for the services required for each group of price schedules and for a maximum of one specific service centres (refer to paragraph 2.4).

The Engineer at his discretion reserves the right to allocate any of the services described to other Contractors and may request the Main Contractor, again at his discretion, to be the supervisor and

carry the responsibility for the guarantee as if this Contractor is the nominated Sub-Contractor or to appointed contractors from other districts nor to furnish a reason for requiring the specific service.

The work to be carried out during the currency of the contract may be given as separate tasks. Each task to be undertaken will be issued as a written instruction (District Order) by the Engineer and will consist of a detailed scope of work and relevant drawings where applicable for each particular task.

Quantities may change during the construction period. The Engineer will then issue a written instruction to the contractor to reduce or increase the scope of work. The invoice amount will then also be reduced where applicable.

#### Increasing of Quantities

The Contractor will then be required to submit a separated quotation for approval by the engineer. The District will then issue an additional order for the increasing of quantities (or scope of work).

2.1.4 The contract shall be governed by the "General Conditions of Contract for use in connection with Electrical and Mechanical Works – 1975" of the DWAF, as revised.

**2.1.5 The Government procurement: General Conditions of contract shall apply, unless otherwise stipulated in this document.**

2.1.6 These documents are available for inspection at the offices of the O.R.T.DM, in Mthatha.

## **2.2 SITE DESCRIPTION AND ACCESS**

The work to be undertaken is generally in or near existing Works in the District mentioned above. The access to the individual sites in generally is very poor and it could be expected that four-wheel drive vehicles might be required at times.

**This contract comprises engineering work where one term contractor will be appointed in each local municipality in all five local municipalities in the District, viz. King Sabatha Dalindyebo, Mhlontlo, Nyandeni, Port St Johns and Ingquza Hill**

## **2.3 PROJECT MANAGEMENT**

### 2.3.1 Contract control

- (a) Control of the Contract is vested in the Engineer in terms of the General Conditions of Contract and will be the General Manager Water Service Provision or such Engineering Representative as he may appoint from time to time.

The contact persons are:

Mr L Mashiya  
Tel: (047) 501 6492  
e-mail: mashiyal@ortambodm.gov.za  
Fax:

### 2.3.2 Point of service

The point of service provided and work that may be required by the municipalities shall be to the operation and maintenance offices of the District.

### 2.3.3 Project names

Mechanical and Electrical Works associated with Water Services and Water Resource Management Works in OR Tambo District Municipality.

### 2.3.4 Implementing authority: OR TAMBO DISTRICT MUNICIPALITY – Department of Water and Sanitation Services

(a) Address of Implementing Authority	The Municipal Manager Private Bag X6043 MTHATHA 5100
(b) Contact person	Mr L Mashiya Tel: 047 501 6492 e-mail: mashiyal@ortambodm.gov.za Fax:
(e) Validity period of BID (days)	90 days

## 2.4 BIDED RATES AND ADJUDICATION

2.4.1 The Bidder shall complete the price schedules for each works and the District reserves the right to award the contract to different Bidders for different works.

2.4.2 This BID will be adjudicated based upon the offers received.

2.4.3 Only complete offers for any group of price schedules will be considered. Incomplete offers for any group of price schedules will not be adjudicated.



#### **2.4.5 IMPORTANT INFORMATION**

- (a) The District reserves the right to deal with the Contractor and his principals throughout the duration of the contract.
- (b) The services are required for a period of three years from the date of award and no specific quantity of work has been identified. Orders will be placed as and when required by the various Schemes of the Districts over the 3-year period.
- (c) Refer to the conditions specified in the "Instructions to Bidders" paragraph 9 "Adjudication".

#### **2.5 REQUIREMENTS**

- 2.5.1 When implementing a planned maintenance system, the Bidder shall advise the District when servicing or repairs are required. The District nevertheless has the authority and reserves the right to make units available for servicing or repair purposes or to disregard the advice of the Bidder.
- 2.5.2 All services to be supplied shall meet the requirements as stipulated in Part 3.
- 2.5.3 When awarded all written communication in respect of this contract is to be addressed to:

The Municipal Manager  
O.R. TAMBO DISTRICT MUNICIPALITY  
Private Bag X6043  
MTHATHA, 5100

Department of Water and Sanitation Services  
**Attention: Luthando Mashiya**

All correspondence between the Contractor and the Employer shall be routed via the General Manager: Water and Sanitation Services at the above address. This includes ALL faxes, letters and emails.

The Contractor to be appointed for this Contract shall undertake to forthwith acknowledge IN WRITING the receipt of ALL correspondence for the Engineer and/or Employer and shall provide suitable response within a period of fourteen (14) days. Failure of the Contractor to comply with this requirement shall be interpreted as a breach of contract, in terms of clause 65(1) of the General Conditions of Contract.

## **2.6 GUARANTEE PERIOD**

- 2.6.1 When the work for which an order has been issued is deemed to be satisfactorily completed, a **Commissioning Certificate** will be issued and the guarantee period will commence.
- 2.6.2 **The guarantee period for any work done shall be at least one year from date as specified or may be increased as required.**
- 2.6.3 The guarantee period for spare parts or materials acquired or manufactured will be one year, unless otherwise specified by suppliers thereof and accepted in writing by the Engineer.
- 2.6.4 During the guarantee period the Contractor shall rectify at his own cost any defects which are attributable to faulty material or workmanship.

## **2.7 MATERIAL AND SERVICE REQUIREMENTS**

- 2.7.1 Materials and services to be supplied under this BID shall be to the prior approval of the Engineer and in addition the work performed shall be to the satisfaction of the Engineer.
- 2.7.2 No material and services shall be supplied or performed extra to those approved by the Engineer.

## **2.8 PHASING OF THE WORKS**

The works will be scheduled, as far, as is practically possible, so that the Contractor can work uninterrupted for the duration of the contract order.

The Contractor must take note of the fact that only inter-construction site movements will be paid for. It is also important to take note of the fact that such payment will be made only for the Contractor's first equipment team (if more than one team are fielded) to move to a specific site. No inter-district movements will be paid. Inter-construction site move payments shall be made only once per installation. Refer to the transport rates. All other cost form part of that specific item of the price schedule.

Should the Contractor be requested by the Engineer to do work not included in his abovementioned programme, he will then be paid for the movement according to transport rates included in the Pricing Schedules. The movements are those which would infringe any programme predetermined and agreed to between the Contractor and the Engineer.

## **2.9 INTERRUPTION IN WORK SCHEDULE**

Should insufficient or particulars be available from the Employer regarding the works for any period of time, the Contractor will be ordered in writing to discontinue work. The Contractor will then be granted an extension of time. When the Contractor is requested to resume work, the

establishment cost will be paid as if the Contractor moved in from another site as per the BID. (Transport rates.) No adjustment will be made in any of the rates in the Pricing Schedules.

## **2.10 COMMISSIONING**

2.10.1 All items, as covered in this BID and where applicable, shall be commissioned by the Contractor on site, with a suitably qualified Departmental representative in attendance, directly after the successful repair or service whereupon a Commissioning Certificate will be issued.

2.10.2 At the discretion of the Engineer, and where required, a Final Approval Certificate will be issued at the end of the guarantee period.

## **2.11 SUB-CONTRACTORS**

2.11.1 Bidders shall submit with BID details, names and addresses of all sub-contractors whom they propose to employ for any work listed to be performed. Payment of these sub-contractors will be the responsibility of the Contractor.

2.11.2 During the course of the contract, should the additional use of sub-contractors or the use of new sub-contractors be proposed for use within the scope of work described in activities to be performed, prior approval by the Engineer is required. No mark-up on Bided rates will be allowed.

2.11.3 When sub-contractors, emerging sub-contractors or engineer are employed, with the approval of the District Engineer, to perform work -

- (i) Outside the scope of the activities to be performed;
- (ii) To obtain equipment beyond the definition of spare parts: and
- (iii) To supervise and/or train and/or carry responsibility for contractors recommended by the Engineer or an Engineer nominated by the District.

Then these shall be deemed to be nominated sub-contractors, emerging sub-contractor, Engineer and a mark-up will be allowed on the relevant quoted prices according to the pricing schedule "Rates".

2.11.4 By appointing a sub-contractor, emerging sub-contractor or nominated sub-contractor, nominated engineer, the Contractor shall not diminish his responsibility to the District. The Contractor shall be solely responsible for all work performed under this BID. All payments received by the main contractor must immediately be paid over to the nominated sub-contractor, emerging sub-contractor, or nominated engineer. "Failure to comply" will lead to immediate action or cancellation of the "contract with the District".

2.11.5 Any sub-contractor, emerging sub-contractor or nominated sub-contractor/engineer appointed by the Contractor shall comply in all respects with the requirements set out in this document.

## 2.12 QUOTATIONS

2.12.1 All work to be performed in terms of this contract will be by means of a quotation, which, after approval by the engineer, will be initiated by means of an official order. Only in an emergency at the specific request in writing to the Engineer, can this work be performed without the issuing of such an order. The Engineer confirmation in writing must be issued before work may commence.

2.12.2 All quotations shall be addressed to the official initiating the work with a copy to the Engineer and shall include all of the following:

The Contract Number

The quotation number

Scheme for which the quotation is intended

Scope of work (refer to the price schedules)

Site establishment cost (where applicable)

Site movement cost (where applicable)

Material costs (all relevant documentation shall be attached to the quotation documentation)

General costs (e.g. consumables, special products, etc.)

Nominated sub-contractor's quotations (where applicable)

## 2.13 PAYMENT

2.13.1 Part payments shall not be considered unless agreed upon in writing by the District.

2.13.2 Invoices may be submitted to the District offices for payment following the successful and agreed completion of the work and commissioning form with a copy for certification to the following address:

The Municipal Manager

OR TAMBO DISTRICT MUNICIPALITY

Private Bag X6043

MTHATHA, 5100

The General Manager: Water Service Provision **Attention:** Luthando Mashiya

2.13.3 All invoices for payment shall clearly state the following:

- (a) This contract number
- (b) The Contractor's quotation number
- (c) ORTDM order number

- (d) Scheme for which its service has been provided
- (e) Scope of work performed
- (f) Date of commissioning

Note :

(1) Invoices deviate from the quotation will not be accepted, except when the invoice amount is lower than the quotation amount.

(2) When deviate from the original quotation, a separate quotation with all relevant documentation must immediately be forwarded to the District to request a separate order before the additional work may commence by the contractor.

## **2.14 ESCALATION**

2.14.1 Escalation is to be claimed by means of a quotation and must form part of the quotation and invoice for each and every order. NOTE: late claims for escalation will not be accepted.

2.14.4 Escalation will only be applied to contract works for which contract labour rates have been used to calculate value or price. The month from which escalation calculations shall commence shall be the month in which the BIDs closed.

2.14.5 The labour rates in the BID document shall be firm for 6 (six) months where after it may be escalated in accordance with final SEIFSA indices. Labour rates may again be escalated after 3 (three) months.

2.14.6 These rates shall be submitted to the Engineer together with the escalation calculations for approval. All escalation claims will form part of the quotation for each and every work. Late claims that do not form part of the original quotation will not be accepted.

### **2.14.7 No back dating of rates shall be accepted**

2.14.9 Labour cost escalation valuation will be applied on an individual quotation basis and will not be collective.

2.14.10 Materials purchased using the "cost plus agreed mark-up" method of pricing will be considered "current" and will not attract escalation.

2.14.11 Prices/Rates/Variations quoted for work for which no contract rates exist, shall be considered current, and quoted as such, and will not attract escalation adjustment.

2.14.12 Transport rates form part of the site establishment and site movement cost. NB: Additional transport rate claims does not form part of this Contract BID prices must include transport cost. See pricing schedules.

2.14.13 Transport cost

Transport cost is applicable for small work, site establishment, site movements and maintenance work. Refer to the applicable Price Schedule.

**2.15 SERVICE/TEST REPORTS**

2.15.1 Service/test reports shall be provided on all activities and tests performed at the request of the Engineer.

2.15.2 No invoice shall be approved for payment if not accompanied by a full service report, stipulating inter alia the work performed parts replaced, applicable comments and, most important, the signatures of designated officials of the District, whose names and details will be provided at the issue of each order/ instruction attached to the commissioning form.

**2.16 SUFFICIENCY OF BIDS**

2.16.1 All services or any item referred to in this BID shall be treated on an individual order basis.

**2.17 GENERAL**

The services are required for a period of three years from the date of award and no specific quantity of work as has been identified. Orders will be placed as and when required by the District Schemes over the three-year period.

2.18 The District may appoint any other available bidder from other works to provide the required service because of non-conformance caused by the original Bidder.

**PART 3:**

**PROJECT SPECIFICATION**

**SECTION 1: GENERAL REQUIREMENTS**

**SECTION 2: EQUIPMENT DESCRIPTION**

**SECTION 3: REQUIREMENTS**

## **PART 3: SECTION 1: GENERAL REQUIREMENTS**

### **SERVICES TO BE RENDERED**

- 1.1. The services to be rendered in response to this specification comprise a three-year contract for the refurbishment upgrade, maintenance and project supervision of mechanical and electrical installations and equipment associated with the DISTRICT MUNICIPALITY installations, all accompanied by written reports. The service to be provided may include preventative maintenance and condition monitoring.
- 1.2. The offered service, as a whole and regarding all component parts, is to be in strict accordance with each and every term of the documents listed below:
  - 1.2.1. The General Conditions of Contract, for use in connection with Electrical and Mechanical Works.
  - 1.2.2. The Special Conditions of Contract.
  - 1.2.3. The Standard Specification.
  - 1.2.4. This Project Specification
  - 1.2.5. The information provided in the Technical Schedules.
- 1.3. Bidders shall only offer high performance services strictly complying with the requirements specified in par. 1.2 above.
- 1.4. The Contractor must have the in-house capacity or must have acceptable written agreements with associate companies to do a preponderance of the work

### **2. DEPARTURES FROM SERVICES TO BE RENDERED**

- 2.1. If, in their offers to meet these specifications, there are any departures whatsoever from any of the provisions, or from any of the terms set out in par. 1 above, then Bidders shall list each and every departure in Part 4. The list, which shall accompany the BID offer, shall be so numbered as to correlate each and every departure with the relative paragraph contained in any of the documents listed in par. 1.2 above.
- 2.2. Failure on the part of any Bidder to comply with the above requirement in full MAY INVALIDATE THE OFFER.
- 2.3. Should it be found at any stage up to the end of the contract period that the services performed or any component thereof deviates from the specified requirements and that such deviation had not been noted by the Bidder in his BID offer, the Contractor will be required to redo such services or any component thereof with work complying with the requirements specified in the documents listed in par. 1.2 above, at no extra cost to the Employer.

### **3. ADMINISTRATION AND SUPERVISION OF CONTRACT**

The control of this project is vested in:



The General Manager of Water Services Provision  
OR TAMBO DISTRICT MUNICIPALITY  
Private Bag X6043  
MTHATHA, 5100

3.2 This contract will be administered by the General Manager: Water Service provision of the O.R. TAMBO DISTRICT MUNICIPALITY hereafter referred to as the Engineer. The contact persons are:

The General Manager of Water Services Provision  
OR TAMBO DISTRICT MUNICIPALITY  
Private Bag X6043  
MTHATHA, 5100

Attention:

Mr L Mashiya

Tel: 047 501 6492

Fax

Or his representative appointed from time to time.

ALL correspondence between the Contractor and the Employer should be routed via the General Manager: Water Services Provision at the address indicated in par. 3.1. This includes ALL telefaxes, letters, claims for payment, etc.

The Contractor to be appointed for this Contract shall undertake to forthwith acknowledge IN WRITING the receipt of ALL correspondence from the Engineer and/or the Employer and shall provide suitable response within a period of fourteen (14) days. Failure of the Contractor to comply with this requirement shall be interpreted as a breach of contract, in terms of clause 65(1) of the General Conditions of Contract.

3.5 Employer reserves the right at any time during the execution of this Contract to nominate a Specialist Engineer to fulfil part or all of the duties of the Employer for such portion of the Works as the Employer will confirm in writing.

A provisional sum has been included in Schedule 1 of the Price Schedules for payment of the nominated Specialist Engineer.

#### **4. TESTING AND COMMISSIONING**

4.1. All equipment refurbished, upgraded or repaired in terms of the requirements of this contract shall be set up at the Contractor's or Sub Contractors works for thorough inspection and testing by the Engineer BEFORE being transferred to site. All work performed in the scope of this Contract is required to be reported upon in the form of acceptable reports/test certificates etc. at no extra cost.

4.2. Any faults, deviations, etc. from the specification discovered during this inspection and testing opportunity at the Contractor's works shall be fully rectified BEFORE any equipment is transported to site.

4.3. Final testing will be performed on site during commissioning of the installation.

4.4. The Contractor shall submit all test and calibration certificates received from specialist suppliers to the Engineer for his approval.

## **5. TRAINING**

In terms of the requirements of this contract the Contractor may be required to facilitating training from time to time.

5.1. Such training shall include: operation, special maintenance requirements and aspects of design, fabrication and assembly.

## **6. MAINTENANCE AND SPARES**

6.1. The Contractor shall provide for maintenance of the installation and any additional equipment supplied for a minimum period of one (1) year, commencing from the DATE OF COMMISSIONING of the completed installation.

6.2. In terms of the Special Conditions of Contract, the Contractor shall submit maintenance reports to the Engineer, using the maintenance schedules as prescribed by the Engineer. NO additional payment for the execution of said maintenance and inspection trips shall become due to the Contractor, unless by agreement with the Engineer these are deemed to be beyond the scope of the guarantee.

6.3. The Contractor shall only allow properly qualified and skilled staff to work on the equipment and installation.

6.4. The Contractor shall provide the spare equipment as listed in the paragraph: SCOPE OF SUPPLY. During the period of maintenance as described in par. 6.1, the Contractor shall be obliged to maintain all spare equipment in proper working condition. Any failed equipment shall be repaired and returned promptly.

## **7. MANUALS AND DOCUMENTATION**

7.1. Complete sets of manuals, numbers of which will be specified by the Engineer, giving a complete and precise description of the operation, construction and maintenance of the equipment used, shall be supplied by the Contractor. Care shall be taken by the Contractor to ensure that the manuals supplied contains ALL documentation on all equipment supplied, including all system and wiring diagrams, schematic lay-outs and interconnection drawings.

7.2. The manuals and system documentation offered shall be to the satisfaction of the Engineer. If this should not be the case, the Contractor will be obliged to update/complete the manuals and/or documentation offered.

**8. TECHNICAL SCHEDULES**

8.1. Bidders are advised that it is in their best interest to provide accurate and detailed information in answer to all questions asked in the TECHNICAL SCHEDULES, which appears as Part 4 of this Specification.

**9. SCHEDULE OF PRICES**

9.1 The Engineer reserves the right to correct any arithmetical errors found in the completed schedules.

## **PART 3: SECTION 2: EQUIPMENT DESCRIPTION**

### **2.1 ELECTRICAL EQUIPMENT**

- 2.1.1 General electrical reticulation and lights.
- 2.1.2 Induction and synchronous motors.
- 2.1.3 Low voltage switchgear.
- 2.1.4 Medium voltage switchgear.
- 2.1.5 Transformers.
- 2.1.6 Generators.
- 2.1.7 Control panels for pump sets and valves.
- 2.1.8 Meters, general instrumentation and controllers.
- 2.1.9 Electrical circuits on other equipment (valves etc.).
- 2.1.10 Radio and telemetry equipment.
- 2.1.11 Instruments and computer controlled equipment.

### **2.2 MECHANICAL EQUIPMENT**

- 2.2.1 Horizontal split, vertical, axial flow, single and multistage centrifugal pumps.
- 2.2.2 Positive displacement pumps.
- 2.2.3 Stationary diesel engines.
- 2.2.4 Pipelines.
  - 2.2.4.1 Pipe material: Steel, pre-stressed concrete, asbestos cement, glass reinforced plastic and fibreglass.
  - 2.2.4.2 Pipeline coatings.
  - 2.2.4.3 Pipeline linings (bitumen, paints and mortar).
- 2.2.5 Valves to fit the relevant pipelines.
  - 2.2.5.1 Types of valves: Butterfly, gate, reflux, ball, sleeve and float control valves.
- 2.2.6 Electrically, hydraulically and air opened actuators for operation of the valves.

2.2.7 Trash racks/screens.

### **2.3 GENERAL**

2.3.1 Water flow meters (ultrasonic, magnetic, differential pressure, propeller) for pipelines.

2.3.2 Water purification plants for bulk water supply purposes.

2.3.3 Sewerage plants.

## **PART 3: SECTION 3: REQUIREMENTS**

### **3.1 SAFETY CONDITIONS**

3.1.1 All work, materials and equipment **shall** comply with the relevant requirements of the Occupational Health and Safety Act (Act 85 of 1993).

3.1.2 It is the sole responsibility of the Contractor to ensure that the equipment to be serviced is safe to work on. The District does not and will not accept any liability.

3.1.3 It is an explicit condition of this BID that the Contractor is solely responsible for the safety of all personnel involved in the maintenance service or repair of equipment.

3.1.4 It is the Contractor responsibility to ensure that all possible safety procedures are followed when working on any equipment or structure and to bring unsafe conditions under the attention of the respective Scheme Manager before commencing any service or repair work whatsoever.

3.1.5 The work area has to be in a safe and clean order at all times.

#### **3.1.6 GMR = General Machinery Regulations**

3.1.6.1 It is an expressed condition that the Contractor shall execute the contract under the supervision of a person appointed under GMR 2(1).

3.1.6.2 A certified copy of this letter shall be submitted with the BID offer.

3.1.6.3 The minimum requirements which the District will consider for this "competent person" (GMR1) will be as stated in subparagraph (b) of GMR1 in mechanical engineering.

### **3.2 REPLACEMENT PARTS**

3.2.1 All replacement parts shall be new, unused or fully refurbished and comply fully with the original manufacturers specifications or as otherwise stated by the Engineer.

3.2.2 Replacement parts will preferably be obtained from the original manufacturer or as otherwise approved by the Engineer.

3.2.3 If the original manufacturer is unable or unwilling to supply the parts as may be required, refurbished parts may be used subject to the written authority of the Engineer. The Contractor shall guarantee these parts for a period of no less than 12 months from date of installation or as otherwise specified in writing by the Engineer.

3.2.4 Any replacement part that was not obtained from the original manufacturer, as well as the supplier of the replacement part, shall be clearly specified on the service report.

3.2.5 Where spare parts are obsolete it is expected from the Contractor to reverse engineer components where possible and provide the necessary guarantee.

3.2.6 Materials used for repair during the period of maintenance.

When, in the opinion of the Engineer, any material used or intended for use is not in accordance with the requirements of the contract, he may order to Contractor in writing to remove any objectionable part of the material immediately and to replace it with acceptable material, without cost to the Employer.

### **3.3 INSPECTION AND MAINTENANCE**

The recommendations as specified in this BID are supplementary and will be read in conjunction with the manufacturer's operation and maintenance instructions. The manufacturer's operation and maintenance instructions have preference.

### **3.4 MODIFICATIONS TO MANUALS**

Any alteration to the operation and maintenance of any equipment shall be updated in the relevant Operation and Maintenance Manuals.

### **3.5 SERVICE PROGRAMME**

All specifications shall be adhered to except if the Contractor wishes to follow a proven and generally accepted better method of operation, in which case it shall be to the approval of the Engineer.

### **3.6 ACTIVITIES**

Using proven experience and ability the Contractor shall be able to evaluate malfunction, diagnose failure, repair, refurbish, upgrade, test, commissioning and provide skilled maintenance of the following plant equipment:

- 3.6.1 Compressors: Reciprocating, single/multistage centrifugal and lobe compressor units.
- 3.6.2 Switchgear.
- 3.6.3 Switchgear protection equipment.
- 3.6.4 Transformers: Up to 200 kVA.
- 3.6.5 Valves: Total refurbishment.
- 3.6.6 Small schemes/structures: Small sluice gates, screens, hydraulic equipment, etc.
- 3.6.7 All types of pipelines e.g. steel pipes, bitumen wrapped/epoxy, bitumen or mortar lined, mortar pipes, fibreglass, glass reinforced polyester, PVC, etc.
- 3.6.8 Small electrical actuators.
- 3.6.9 Electric motors.

- 3.6.10 Diesel and petrol driven Gensets.
- 3.6.11 Diesel engines.
- 3.6.12 Internals of pumps.
- 3.6.13 Water purification plants/systems.
- 3.6.14 Sewerage plants/systems.
- 3.6.15 Electricity distribution systems for offices, personnel housing and all other relevant equipment.
- 3.6.16 Electrified security fencing.
- 3.6.17 Such equipment as may be specified from time to time by the Engineer.

Competence in providing the following engineering services:

- 3.6.18 Efficiency tests on pump sets.
- 3.6.19 Condition monitoring of pump sets with the issue of appropriate quality test reports.
- 3.6.20 Reports associated with condition of plant, review of modifications and reports/manuals.
- 3.6.21 Rebuilding of pumps to an alternative specification.
- 3.6.22 Balancing of rotating elements and alignment according agent's specification.
- 3.6.23 Vibration monitoring on rotating elements.
- 3.6.24 Non-destructive testing using ultra sonic, magnetic particle inspections, dye penetrate testing, hardness testing and radiography methods by sub-contracting specialists.
- 3.6.25 Machine facilities: Light, medium and heavy machining facilities.
- 3.6.26 Corrosion protection coatings as specified by the O.R. TAMBO DISTRICT MUNICIPALITY, (Blasting & Coating).
- 3.6.27 Mechanical, electrical and technical investigation expertise.
- 3.6.28 Mechanical manufacturing in accordance with drawings of the OR TAMBO DISTRICT MUNICIPALITY of small structures.
- 3.6.29 Reverse mechanical engineering techniques.
- 3.6.30 Underground cable fault location



3.6.31 Radio and telemetry equipment.

3.6.32 Instruments and computer controlled equipment.

3.6.33 Such engineering services as the Engineer may specify from time to time.

Competence in providing the following services:

3.6.34 Project management.

3.6.35 Preventative maintenance plans on small and medium size installations with regard to auxiliary and main equipment.

3.6.36 Liaison with original engineering manufacturers.

3.6.37 Implementation of statutory safety standards.

3.6.38 Working procedures on all relevant equipment.

3.6.39 Safety: All maintenance services must comply to the Occupational and Health Safety Act 85 of 1993.

3.6.40 Test reports: test reports shall be provided on all tests performed or as requested by the Engineer.

3.6.41 Existing documents: The District will furnish the necessary documents with regard to the form of reports, such as technical details, components, test results, items replaced and comments where possible.

3.6.42 New documents: Prospective Bidders should have the capabilities of drafting report documents/forms where no official documents currently exist including full Operating and Maintenance Manuals.

## **3.7 CAPACITIES OF BIDDER**

### **3.7.1 Managers**

Managers shall have an applicable qualification and at least five year related experience.

### **3.7.2 Engineers**

Engineers shall be at least Graduate Engineers preferably registered as a Professional Engineer/Technologist with ECSA.

### **3.7.3 Technicians**

Technicians shall be at least Diploma Technicians.

### **3.7.4 Artisans**

Artisan staff shall be in the possession of the qualifications appropriate to the skills required for the activities listed. An artisan qualified for example as a diesel mechanic is not suitably qualified to be considered an artisan on valves, cranes, welding, etc.

### **3.7.5 Specialists**

Specialists (production specialist) shall at least be a suitably qualified artisan or technician with a minimum of three years' experience in the applicable specialist field.

The District request details and qualifications of personnel working for the Contractor or any subcontractor.

## **3.8 ELECTRICAL REQUIREMENTS**

### **3.8.1 General requirements**

#### **Scope**

This specification describes the usual materials required for the maintenance of electrical installations and general methods of installing these materials. This specification forms part of any specific maintenance contract, where such drawings are attached to this specification, or where such drawings are issued specifically for a project.

This specification covers the maintenance of electrical installations as well as all switchgear, equipment and instrumentation used in conjunction with such installations.

#### **Statutory requirements**

The maintenance and installation of electrical equipment shall always comply with the requirements, stipulations and regulations contained in the following acts:

Machinery and Occupational Safety Act 85 of 1993 with special reference to section 1(Act & Regulations), Section 2 (Administrative Regulations), Section 6 (Electrical Installation Regulations), Section 13 (Driven Machinery Regulations), Section 14 (Electrical Machinery Installations), Section 15 (General Machinery Regulations) and Section 16 (General Safety Regulations).

Special mention is made to Annexure A1 of section 6, which will be applicable on completion of the work.

The Mines and Works Act, No. 27 of 1956 and subsequent amendments and regulations issued thereunder.

The Electricity Act No. 40 of 1958.

Explosives Act No. 26 of 1956.

Code of Practice for the Wiring of Premises – SABS 0142.

### **Standards**

Unless otherwise specified all materials must comply with SABS specification.

## **3.9 ELECTRICAL REQUIREMENTS FOR BOREHOLE AND SMALL ELECTRICAL INSTALLATIONS**

### **3.9.1 Standard drawings**

Bidder's shall, however, prepare their own GA and diagrammatic drawings which shall contain all numbering and types of equipment to be used by them when a BID is prepared for the District. Also refer to the section on the submission of drawings further in this specification.

### **3.9.2 Earthing and Lightning Protection**

This section covers the lightning protection and earthing of electrical installations in buildings, open structures or in "stand alone" installation such as borehole control panels or distribution or control gear pillars or kiosks. The earthing of all electrical installation shall be in complete accordance with SANS 0142 and the machinery and Occupational Safety Act 85 of 1993.

The earthing described further herein is mainly applicable to the general earth systems of the pump station, reservoirs, purification works and other treatment plants.

#### **3.9.2.1 General**

It is a specific requirement of this contract specification that all electrical installation maintained under this contract be properly earthed. This requires that the earthing shall be tested and where earthing is found incomplete or earth values found outside the acceptable limits, this be repaired or improved and that the earthing system(s) again be tested and the values submitted together with the regular site report.

#### **3.9.2.2 General recommendations of the Practical Installation of Earth electrodes**

This section describes the requirements of the practical earthing of installations and the materials which shall normally be used to obtain proper earthing.

Earth systems employed at the various installations which are maintained under this contract may vary in type and scope from the recommendations of this specifications and this specification must thus be used as a guideline to enable maintenance personnel to install or repair an earth system for compliance with the standard requirements and earth values as mentioned further herein.

### 3.9.2.3 Requirements of an effective earth

An effective earth must prevent dangerous over-voltages arising between metallic structures, frames, supports or enclosures of electrical equipment and the ground during fault conditions.

An effective earth must be able to permit fault currents of sufficient magnitude to flow so as to operate protective devices to isolate the fault before damage can occur.

The ohmic resistance of an effective earth must be low enough to ensure that the step potential on the ground in the vicinity of the earthing point is within safe limits under fault conditions i.e. a voltage gradient not exceeding 40 V/m fault durations exceeding 1 sec.

### 3.9.2.4 Types of earth electrodes

Three types of earth electrodes are suitable:

#### (a) Trench earths

Trench earths shall comprise a bare copper conductor laid at a minimum of 500 mm below ground level, usually when underground cables are installed. This type of earth electrode provides a relatively large contact area between electrode and surrounding ground, makes contact with a variety of types of soil and soils of varying moisture content en-routed and is economical to install.

#### (b) Spike earths

Spike earths comprise rods of bare copper, copper-coated steel, stainless steel or galvanised steel designed for the purpose of penetrating ground to depths of up to several metres. A low resistance earth may sometimes be obtained by driving multiple spikes at some distance from each other in order to provide parallel paths.

In hard or rocky ground, it is usually necessary to drill holes into which earth spikes are inserted and then packed with soft soil.

#### (c) Foundation earths

Foundation earths comprise bare copper galvanised iron conductors laid under the foundations of buildings, miniature substations, distribution pillars, bases of wooden, concrete or steel poles and structures. Because soil under foundations usually retains moisture, foundation earths are located to take advantage of this favourable condition. Furthermore, they are economical to install.

### 3.9.2.5 Materials for earth electrodes

Bare copper, either in stranded, strip or rod form, is considered the most suitable general-purpose material for earth electrodes. Its main disadvantage is its cost and susceptibility to theft.

Bare galvanised iron and steel, either in stranded, strip or rod form, has a satisfactory record of survival in non-aggressive soils and is more economical than copper.

Bare aluminium is unsuitable as electrode material.

Earthing electrodes used for earth systems shall preferably be solid steel with bonded copper protection.

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

Each earth electrode shall be provided complete with an earth electrode coupling supplied by the earth electrode supplier. The coupling shall be suitable to accommodate the earth wire specified, as well as the type and size of earth electrode used.

Each electrodes designed for coupling by means of external sleeves shall be provided with an adequate quantity of hydro-carbon or silicone grease to be applied to the coupling before the joint is made.

Earth electrodes designed for coupling by means of internal pins or splines shall be provided with thin walled tubes and hydro-carbon or silicone grease to seal the joints.

The material of the clamps shall be electrologically compatible with the electrodes and the conductor materials.

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

### **3.9.2.6 Corrosion**

Because galvanised ferrous metals corrode sacrificially to copper, galvanised iron and steel electrodes should not be buried in close proximity to bare copper.

### **3.9.2.7 Technical Requirements of Neutral Earthing of Distribution System (Multiple Earthed Neutral (MEN) and Protective Multiple Earthing (PME) systems)**

NOTE: The following relevant aspects have been extracted from the "AMEU CODE OF PRACTICE FOR THE APPLICATION OF NEUTRAL EARTHING ON LOW VOLTAGE DISTRIBUTION SYSTEMS"

Distribution equipment associated with transformer substations that are either ground mounted or pole mounted and fed by underground cable or overhead line, with or without an earth continuity conductor, (ECC), should be installed, connected and earthed in accordance with the following requirements:

(i)Where the resistance to earth of the HV equipment earth is 1 ohm or less, it is permissible to earth the LV neutral to the HV earth electrode.

(ii)Where the HV equipment earth exceeds 1 ohm the LV neutral shall be earthed at a minimum distance of 6 m from the HV equipment earth (i.e. 6m from the HV electrode/s and also from any earthed metal work connected thereto).

(iii)Notwithstanding the requirements of (i) above, where transformers are associated with HV overhead lines, it is considered good practise to separate the HV and LV earth electrodes. The minimum earth separation should be 6m or 1 LV span.

(iv)The overall resistance to earth of the neutral of an LV distributor or distribution system must not exceed 10 ohms.

(v)The LV neutral may be connected to other supply neutrals, earth electrodes, cable sheaths and armouring and these connections used to obtain the required earthing value of 10 ohms or less specified in par. (iv) above.

(vi)The neutral of underground and overhead LV distributors must be earthed at the remote ends of each distributor.

(vii)Where the overall resistance to earth of the neutral of the distribution system exceeds 10 ohms, the neutral shall be earthed at intermediate positions on the distributor/s to reduce its resistance to earth to below this limit.

(viii)The cross-sectional area of the neutral of all LV distributors must not be less than that of a phase conductor.

(ix)No circuit breakers, isolators, fuses, switches or removable links shall be installed in the neutral between the transformer star point and the remote end of any LV distributor or service connection.

(x) All metallic sheathing and armouring of cables and all metal work associated with meter cabinets, fuse pillars, etc., supporting or enclosing LV cables shall be bonded to the distributor neutral conductor.

(xi)Where a separate Neutral Earth (SNE) cable is part of an MEN or PME system, the armouring and/or metallic sheath and any ECC shall be bonded to the neutral at the supply end of the cable.

(xii)To ensure the integrity of the neutral, it is recommended that all connections and joints on or to overhead line conductors be made by compression fittings or, alternatively double bolted connectors.

(xiii) MEN or PME may be applied to any single LV distributor without alterations to other LV distributors supplied from the same transformer.

### **3.9.2.8 Substation earthing**

In order to comply with the requirements of the previous paragraphs, an earth receptivity measurement shall be undertaken at the site of a substation or miniature substation, preferably by a specialist firm.

The Contractor may undertake this measurement himself but in compliance with SANS 0142 by using the nul-balance megger method and employing test electrodes. The earth resistance measurement in this case shall preferably be 5, referred to zero.

The Contractor shall then submit to The District or Engineer the details of a proposed substation earth indicating whether a trench earth, spike earth or foundation earth is intended and the proposed inter-connections with the installation.

### **3.9.2.9 Fence Earth System of Outdoor Substations**

In case where substations contain transformers or switchgear installed outdoors, the fence enclosure shall be earthed as follows:

A 70 mm<sup>2</sup> earth wire shall be installed 600 mm below ground level and 500 – 1 000 mm from the fence on the outside of the substation along the entire length of the fence. This earth loop shall be lugged and earthed at each corner pole of the wire mesh enclosure. The earth resistance of this installation shall preferably be <20Ω, referred to zero.

If a 20 Ω resistance cannot be obtained, then 1,8 m earth rods shall be installed at each corner post of the fence enclosure and bonded to the pole by means of a 70 mm<sup>2</sup> earth wire tail.

Such a fence earth system shall also be bonded to the main meter box earth point or 400 V switchgear earth bare of the substation (if available) by means of lugged 70 mm<sup>2</sup> earth wire.

This earth system shall further be earthed to the tank earth point of the transformer and the tank earth point shall be earthed to the neutral (star point) of the transformer, all by means of 70 mm<sup>2</sup> earth wire.

If the earth systems of the MV lightning arrestors are within 9 m of the fence earth system, the MV lightning arrestor earth shall also be bonded to the fence earth system. This connection shall only be carried out if ESKOM or the Supply Authority allows the Contractor to carry out this work.

### **3.9.2.10 Trench earth system**

This section shall be applicable where pole mounted transformers and ESKOM meter boxes supply the power to a site.

Two separate 1,8 m earth electrode shall placed at least 9 m apart and at 600 mm below ground level in the cable trench for the LV cables leading away from the transformer or meter to the main Committee or motor control centre of the installation.

These earth electrode shall be connected together with 70 mm<sup>2</sup> bare copper earth wire by means of clamping the earth wire to the earth electrode with standard earth electrode clamps and the earth wire shall further be laid in the trench together with the main cables to the main Committee or motor control centre of the installation.

The earth electrode nearest to the ESKOM supply point shall be connected to the earth point in the ESKOM meter box.

All earth conductor ends connected to earth bars in meter boxes or Committees shall be lugged.

In the case where a fenced enclosure is used for a ground mounted transformer, the trench earth conductor must be connected to one of the earth points at a corner post or the earth point on the tank of the transformer.

Any trench earth system earth resistance shall preferably be 5Ω, referred to zero.

#### **3.9.2.11 MV equipment earth (where applicable)**

Any MV switchgear earths, shall be bonded to the fence earth system or the trench earth system if such MV earth systems is within 9 m of the fence earth system or the trench earth system.

Any support steelwork for MV equipment or the transformer support steelwork shall be bonded to the fence earth system or the trench earth system with 70 mm<sup>2</sup> bare copper earth wire.

This connection shall only be carried out if ESKOM or the Supply Authority allows the Contractor to carry out this work.

#### **3.9.2.12 Substations building earths**

In the case of a substation building which contains MV switchgear and/or transformers, the following section shall apply.

A main earth mat shall be placed 700 mm, below ground level in a position outside the substation building in a position as instructed on site.

The earth mat shall consist of 5 earth rods driven into the bottom of ground trenches with 4 rods placed in a 2 m x 2 m square pattern with the fifth rod at the centre thereof.

The 4 outer rods shall be connected to the centre rod by means of 70 mm<sup>2</sup> bare copper earth wire.

A 70 mm<sup>2</sup> bare copper earth wire shall be connected to the centre rod and shall terminate on a main earth bar in the main LV switch Committee.



A 70 mm<sup>2</sup> bare copper earth wire shall further be connected to the transformer tank and LV star bushing (neutral bushing) of the transformer and to the MV switchgear earth point or bar and shall be terminated on the earth bar of the main Committee.

### **3.9.2.13 Earthing of general electrical installations**

#### **3.9.2.13.1 General**

All earth conductors shall be stranded copper with or without green PVC insulation. Trench earths shall preferably be bare copper earths.

All earth conductor sizes shall be determined in accordance with SABS 0142, where the earth does not form an integral part of the cable.

#### **3.9.2.13.2 Switch-Committees**

A separate earth connection shall be supplied between the earth bus bar of the main switch-Committee and the earth busbar of every sub-switch Committee. The connections shall consist of bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised.

#### **3.9.2.13.3 Sub-circuit**

The earth conductors of all sub-circuits shall be connected to the earth busbar in the supply switchCommittee in accordance with SANS 0142.

#### **3.9.2.13.4.Ring mains**

Common earth conductors may be used where various circuits are installed in the same wiring channel in accordance with SANS 0142.

Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or be soldered. The common earth shall not be broken.

#### **3.9.2.13.5.Connections**

Under no circumstances shall connection points, bolts, screws, etc., used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided. Unless earth conductors are connected to proper terminals, the ends shall be tinned and lugged. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirement of BS 4579, Part 1: "COMPRESSION JOINTS IN COPPER".

### 3.9.2.13.6 Non-metallic conduit

Where non-metallic conduit is specified or allowed, stranded copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including switch boxes, socket-outlet boxes, draw-boxes, switch-Committees, luminaries, etc. The securing of earth conductors by means of self-treading screws are not permitted.

### 3.9.2.13.7 Flexible conduit

An earth conductor shall be installed in all non-metallic flexible conduits. This earth conductor shall not be installed external to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

### 3.9.2.13.8 Water pipes

Metal domestic cold water mains shall be bonded to the earth busbar in the main switch-Committee by solid 15 x 2 mm copper strapping. All other domestic metal water pipes shall be connected by 12 x 0,8 mm perforated or solid copper strapping (not conductors) to the nearest switch-Committee. The strapping shall be fixed to the pipe work by brass nuts and bolts and against walls by brass screws at 150 mm centres.

In all cases where metal water pipes, down pipes, flues, etc., are positioned within 1,6 m of switch-Committees, an earth connection consisting of copper strapping shall be installed between the pipe work and the Committee. In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each switch-Committee.

### 3.9.2.13.9 Roofs

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10 mm<sup>2</sup> copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor of each switch-Committee. The roof and gutters shall be connected at 15 m intervals to this conductor by means of 12 x 0,8 mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

### 3.9.2.13.10 Pump station buildings, roof earths and reservoirs

A ring earth consisting of a 70 mm<sup>2</sup> bare copper earth wire shall be installed all around the perimeter of each pump station or building on site at 600 mm below ground level and 1 m from the building structure.

The building roof and steel columns (where applicable) shall be bonded to this ring earth in two places at diagonal corners of the building.

The roof earth connections shall be housed in 25 mm Ø hot dipped galvanised conduit with the conduit saddled to the walls of the buildings by means of hot dipped galvanised conduit spacer saddles. The conduit shall reach from below the roof overhang to 300 mm below ground level.

This earth system shall also be bonded to the earth bar of the main switch Committee or motor control centre.

In the case of a concrete roof of a building or a reservoir with a concrete roof which is not protected against lightning. The Contractor shall first enquire whether the District requires such a structure to be protected. Some reservoirs and buildings are already fitted with foundation earths and will not require additional earthing.

In the case where a structure must be protected against lightning, the Contractor shall submit a report (preferably by an earthing specialist firm) to the District in terms of SABS 03/1985 (as amended), of the type of system required and the cost thereof.

#### 3.9.2.13.11 Corrosion protection

Steel pipeline employing corrosion protection systems, must not be earthed, but the District must be informed of such systems and advice must be obtained from corrosion protection specialists before any earthing of such pipelines are attempted.

### 3.9.3 Installation and testing of electrical equipment

#### 3.9.3.1 Distribution Committees and motor control centres

##### General construction

##### 3.9.3.1.1 Size

All switch-Committees shall be of ample size to accommodate the specified switchgear and provide space for future switchgear. For every 4 (or part of 4) 5 kA circuit breakers on a switch-Committee, space for an additional 5 kA circuit breaker shall be allowed for unless future space requirements are clearly specified. For circuit breakers above 5 kA, this factor shall be 15 %.

##### 3.9.3.1.2 External dimensions

The maximum allowable height of free-standing switch-Committees is 2,2 m. Cubicle type Committees may be up to 2,4 m high if they can be fully dismantled into individual cubicles. Where, due to space restrictions, a Committee exceeds 2,2 m in height, equipment not normally requiring access, shall be installed in the top section, enabling equipment normally requiring access to be installed lower down in the Committee.

All other specified external dimensions for switch Committees shall be strictly adhered to. If the proper clearances cannot be adhered to as a result of restricting external dimensions, the

Contractor shall obtain the approval of the Engineer before manufacturing the switch Committees.

#### 3.9.3.1.3 Moisture and vermin

All switch Committees shall be rendered moisture proof and vermin proof and shall be adequately ventilated.

#### 3.9.3.1.4 Load balance

The load shall be balanced as equally as possible across multiphase supplies.

#### 3.9.3.1.5 General work

Note: Care must be taken when using megger test equipment on electrical installations due to damage which can result to MOV type lightning arrestors, electronic motor protection units and electronic instrumentation.

The following work shall be carried out on electrical installations whenever any work is carried out on any site.

(a) The earthing of the whole installation shall be tested and checked in accordance with the requirements of the section PB 12.2 of this specification.

(b) Clean inside and outside of all distribution Committees and control panels. Note severe rust problems and reports to the District.

(c) All wiring connections to terminals in Committees, joint boxes, lock-stop button boxes, stop-start remote station boxes, instrument casings and in motor cable boxes shall be tightened.

Overheating damage to conductor ends and terminals or switchgear due to loose connections shall be repaired as set out further herein.

(d) All light circuits shall be checked for operation and lamps shall be replaced as necessary.

(e) All plug circuits shall be checked for correct polarity and for earthing problems. Damage 16A 3 pin switch-plugs shall be replaced as necessary.

(f) All earth leakage units shall be checked with an earth leakage tester. Where a 100 mA earth leakage unit is used in conjunction with a shunt trip main incoming circuit breaker, the manufacturers specification for testing of the unit shall be followed.

(g) Any over/under voltage or phase failure/phase rotation protection monitor relays shall be tested for proper operation.

(h) Check all voltmeters, voltmeter switches and ammeters for correct operation and log all maximum demand currents before resetting ammeters.

- (i) Log all motor running hour meters.
- (j) Check all recorded data (if available) on electronic motor protection units. Time lapse since last trips and cause of trips must be logged.
- (k) Check all instrumentation fuses and all control circuit supply fuses and circuit breakers.
- (l) Test all indication lamps and replace blown lamps as necessary.
- (m) All Committee doors and covers shall be checked for proper closing. All open connections such as found in broken or missing light switches, plugs and lights shall be close off with cover plates or replaced, as the case may be.

No live open connection or live metalwork on any appliance or Committee shall be left in that state by the Contractor.

- (n) All surge arrestors and lightning protection equipment shall be inspected for damage or burnout. Damaged units shall be replaced. Carbon granule type of arrestors (for power) must be replaced with MOV arrestors with a fault rating of not less than 40 kA.

Instrumentation surge arrestors must be replaced with the correct type as prescribed by the supplier of the instrument, for digital signals and current loops.

#### 3.9.3.1.6 Starter and distribution Committees (such as used for boreholes and small plants)

Committees shall be constructed and maintained as follows: over and above the work specified in 3.9.3.15 above:

- (a) Circuit breakers or main switches.

Circuit breakers shall comply with SANS 156.

Contacts of circuit breakers shall be silver alloy and shall close with a high pressure wiping action.

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

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

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

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

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

The circuit breaker shall have a rating plate indicating the current rating, voltage rating and breaking capacity.

Extension type operating handles shall be provided for units which are placed inside a Committee and shall be mounted on a chassis on the back plate of the Committee so that the operating shaft is as short as possible.

Extension shafts shall engage easily with the door handle cavity. The handle shall have a mechanical interlock so that the face panel or front door of the panel cannot be opened whilst the breaker is ON.

Isolators used as main switches for Committees shall comply in principle with requirements of the previous paragraphs of 3.1.2(a) above.

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

Isolators shall have a high-speed closing and opening feature.

Isolators shall be suitably rated for the continuous carrying, making and breaking of the rated current specified as well as the through-fault current capacity as specified.

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

When checking for proper operation the main switch or circuit breaker must be switched ON and OFF and voltage measurements taken on the outgoing side in both cases to check that all three poles switch properly and that the supply to the switchgear is OFF when the main switch or circuit breaker is switched OFF.

#### (b) Contactors

Contactors shall be of the open or totally enclosed, triple or double pole, electromechanically operated, air-break type suitable for 380/433 V or 220/250 V supplies and shall comply with SANS 1092

Contactors shall have the following characteristics:

- (1) Enclosed coil easily replaceable.
- (2) A permanent air gap in the magnetic circuit to prevent sticky operation.
- (3) Provision for quick and simple inspection of contacts.
- (4) Clearly marked main and auxiliary terminals.

All parts shall be accessible from the front.

In addition to the required current carrying capacity and switching duty of a contactor, the contactor chosen for a particular application shall be rated for the maximum through fault current allowed by the back-up protection devices at the point where the contactor is installed. Careful co-ordination of the short circuit devices shall take place.

All laminations of the magnetic system of the contactor shall be tightly clamped. Noisy contactors will not be accepted.

Non-current carrying metallic parts shall be solidly interconnected and a common screwed terminal shall be provided. The contactor shall be earthed to the switch Committee earth bar.

Latched contactors shall be provided with a trip coil and a closing coil. The contactor shall remain closed after de-energising the closing coil and shall only trip on energising the trip coil.

Contactor operating coils shall have a voltage rating as required by the control circuitry and shall have limits of operation and temperature rise as specified in clause 7.5 and Table Iv of IEC 158-1. Latched contactors shall be capable being tripped at 50 % of the rated coil voltage.

Contactors with provision to add auxiliary contacts on site are preferred. Contactors with permanently fixed auxiliary contacts shall have at least 1 x N/O and 1 x N/C spare auxiliary contacts in addition to the contacts specified for control purposes and in addition to the contacts required for self-holding operations or economy resistances. Where the number of auxiliary contacts required is greater than the number of contacts that can be accommodated on the contactor, an auxiliary relay or additional contactor shall be provided to supply the additional contacts. It shall be possible to replace main-contacts without disconnecting wiring.

Auxiliary contacts shall be capable of making, carrying continuously and breaking 6A at 220 V AC, unity power factor for contactors used on 380-433/220-250 V systems.

Auxiliary contact functions required e.g. "lazy" contacts, late-make, late-break, make-before-break, etc. shall be inherent in the contact design. Under no circumstances may these functions be improvised by bending contacts, loading contacts, etc. These functions shall be available in all contactors.

Spare auxiliary contacts shall be wired to numbered terminal strips in the switch Committee and shall appear on the switch Committee drawings.

All contactors on a specific project shall be from a standard range of one single manufacturer, unless specified to the contrary.

Contactor(s) which are tested for proper operation must be operated to ensure that the coil of the unit is in order and voltage measurements taken on the outgoing side to check that all three sets of contacts make evenly.

Contactors shall not emit a humming noise when pulled in and contactors shall further be checked for sticky moving parts.

Auxiliary contacts of contactors shall be inspected likewise.

Faulty contactor coils shall be replaced and badly worn or burned contacts sets must be replaced as a set.

Contactors which cannot be maintained must be replaced with an equivalent unit, if faulty, and maintainable units must preferably be used in that case.

Malfunctioning auxiliary contact blocks of contactors must be replaced.

If the same manufacture and model of maintainable contactor or parts thereof cannot be obtained, the whole unit must be replaced with an equivalent unit.

Contactor rating shall be determined by using one size larger than the correct AC3 rating which would normally be used.

Star contactor must be of the same rating as main or delta contactors, in the case of star-delta starters.

#### (c) Connections to busbars

Conductor ends shall be fitted with crimped or solid sweated lugs which are bolted to the busbar.

Busbar clamps with bolted connections are acceptable for smaller circuit conductors.

Where lugs are crimped evidence shall be submitted that the crimping technique used will comply with the performance requirements of BS 479, Part 1: "COMPRESSION JOINTS IN COPPER".

#### (d) Busbars

Busbars in panels where the main switch or circuit breaker exceeds 150A, shall be manufactured of solid drawn high conductivity copper with rectangular cross-section in accordance with SANS 1195 and BS 159 and BS 1433, where applicable.

Busbars in Committees where the main switch or circuit breaker is less than 150A may be done in the form of flexible welding cable, installed in PVC trunking along with small-bore wiring.

Although SABS 784 refers to overhead and rising busbards, busbars in miniature substations shall comply with applicable sections of this specification, especially as far as insulation and clearance values, creepage distance, joints insulation resistance, dielectric



strength, deflection test, absorption resistance and rated short time withstand current are concerned.

Busbars shall be supplied for the following applications:

- (1) Distribution of supply voltage.
- (2) Connection of equipment with ratings exceeding the current rating of 70 mm<sup>2</sup> conductors.
- (3) Connection of outgoing circuits with current ratings in excess of that followed for 70 mm<sup>2</sup> conductors.
- (4) Collector bars for parallel cables.
- (5) Connection bars for neutral conductors.
- (6) Earth busbars.
- (7) Connections to miniature circuit breakers.

All busbars shall be covered with coloured heat-shrinkable or air dying shrinkable.

The colour shall correspond to the colour of the supply phase.

Busbars shall be radius-edged where they change direction.

Neutral conductors for circuits protected by a single-pole circuit breaker or fuse-switch shall be connected to a neutral busbar mounted in a suitable position.

A separate neutral bar shall be provided for each earth leakage unit provided.

Neutral bars shall have a cross-section of at least 6,3 x 25 mm and shall be long enough for the lugs of all neutral conductors to be bolted separately to the busbar without overlapping the lugs.

#### (e) Wiring

Incoming and outgoing cables shall be terminated on the glad plate.

Cable tails with sizes up to 70 mm<sup>2</sup> may terminate on clamp type terminals where the clamping screws are not in direct contact with the conductor. All cables larger than 70 mm<sup>2</sup> shall terminate on busbar studs which are connected directly to the equipment. Parallel connected to a collector busbar or busbar stud without crossing the conductors.

External wiring for low voltage, control, interlocking, alarm, measuring and DC. Circuits shall terminate on numbered wiring terminals.

The correct terminal size as recommended by the manufacturer for each conductor to be connected shall be used throughout. The terminal numbers shall appear on the wiring diagrams of the switchgear.

Terminals for power wiring shall be separated from other terminals. Terminals for internal wiring shall not be interposed with terminals for external circuits. All connections to terminals shall be identified with numbers.

Where switchgear consists of separate sections, the control wiring passing between sections shall be terminated on strips in each section so that control wiring can be readily re-installed when reassembling the gear.

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

PVC wiring channels shall be used throughout and shall be installed horizontally and vertically. Under no circumstances may power and low voltage control circuit wiring be installed in the same wiring channel. Channels shall not be more than 40 % full and shall preferably be of the finger type of channel.

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

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

Conductors connected to terminals shall be soldered or ferruled. Connections to circuit breakers, isolators or contactors shall be made by one of the following methods:

- (i) A ferrule or lug of the correct size.
- (ii) Soldering the end of the conductor.

All conductors terminating on meters, fuse holders and other equipment with screwed terminals shall be fitted with lugs. The lugs shall be soldered or crimped to the end of the conductor. The correct amount of insulation shall be stripped from the end to fit into the terminal. Strands may not be cut from the end of the conductor.

Neutral wires may not be cut where these are looped on control gear terminals, but the insulation must be removed and the wire looped and crimped or soldered into the lug.

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

All other conductors in the Committee, supplying control circuits, etc., shall be coded in colours other than those specified above. A colour code shall be devised from each Committee and the colour code shall be shown on the wiring diagrams.

All conductors that terminate at wiring terminals and all conductors used for the internal wiring of the switch Committee, shall further be identified at both ends by means of durable cable marking ferrules. PVC or other tape is not acceptable.

The numbers on the markers shall be shown on the wiring diagrams.

#### (f) Labelling

Care shall be taken to ensure that all equipment is fully labelled and that accurate descriptions and safety warning notices appear in English only. The Engineer must be approached by the Contractor to obtain the specific requirements for labels before the labels are manufactured.

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

All other equipment including meters, instruments, indicator lights, switches, push buttons, circuit breakers, fuses, contactors, control relays, protection relays, etc., shall be identified. The function of the equipment and circuits shall be clearly indicated. The main switch shall be labelled as such and designated:

"SWITCH OFF IN CASE OF EMERGENCY"

Flush mounted equipment within doors or front panels shall be identified with labels fixed to the doors or front panels respectively.

The labels for equipment installed behind panels, shall be fixed to the chassis close to the equipment. If this equipment is positioned too close together to accommodate descriptive engraved labels, the equipment may be identified by a code or number on an engraved label which shall be fixed close to the equipment. The code number shall be identified on a legend card which shall be installed on the switch Committee behind a plastic or other protective cover.

#### (g) Instruments

Instruments shall be suitably rated for the supply voltage and frequency to be applied, which shall be 400/230 Volt, 50 Hz unless specified to the contrary.

All the instruments used for a particular application or a specific project shall be from the range of a single reputable supplier and shall have the same face dimensions. The face dimensions shall be square and not less than 96 x 96 mm.

All instruments shall comply with BS 89 and/or IEC 51.

Instruments shall be screened against magnetic interference and shall have anti-static, impact-resistant glass or "MACROLON" faces.

Preference will be given to locally manufactured instruments.

Instruments shall be insulated to achieve a 2 kV insulation resistance to earth.

All instruments shall be splash-proof and dust-proof unless more stringent requirements are specified for hazardous locations.

Instruments shall be sufficiently resistant to vibrating that may be encountered in the specific application.

For normal environmental and supply conditions, instruments shall be suitable for use inside the limits specified in Tables III and IV of IEC 51.

All instruments shall be capable of withstanding overloads of continuous or short duration in accordance with section 8.3 of IEC 51.

Instruments shall be provided with studs for rear connection. Shrouds shall be provided to prevent accidental contact where instruments are to be installed in hinged panels of switch Committees.

#### (h) Voltmeters and Voltmeter Selector

Unless specified to the contrary, voltmeters shall be scaled from 0-250 Volt in the case of LV applications.

Voltmeters shall be of the moving iron type with class 1,5 accuracy as specified in IEC 51.

A zero adjustment screw shall be provided.

Unless specified to the contrary, a single voltmeter and selector switch shall be provided. The voltmeter switch shall have an "OFF" and three metering positions to indicate readings between neutral and each of the three phases.

The marking shall be indicated clearly on the face plate of the selector switch and the handle position shall be accurate in relation to the marking on the face plate.

The selector switch shall be of the cam-actuated or wiping air-break type with two breaks per pole.

(i) Ammeters

Ammeters shall have a moving iron element to indicate instantaneous values.

Direct reading ammeters up to a maximum rating of 60 A may be used. Current transformer operated ammeters shall be 5 A full scale, calibrated to read actual primary circuit currents. The current transformer ratio shall be indicated on the face plate.

A zero adjustment screw shall be provided.

Where combined maximum demand and indicating ammeters are specified, a bimetallic spiral element shall be provided in the same housing to indicate mean value over a 15 minute period.

The bi-metal element shall drive a residual pointed to indicate maximum mean current between resettings. The pointer shall operate on the main scale and shall be of a distinctive colour. The pointer shall be resettable from the face of the meter.

The bi-metal element shall be designed to compensate for limits of ambient temperature between – 20°C and 70°C.

Full load or rated current shall be clearly indicated, preferably with a red line. Unless specified to the contrary, a 100 % condensed over scale for combined maximum demand ammeters.

intrinsic error, expressed in terms of the fiducial value in accordance with IEC 51, shall be class 1,5 for the instantaneous readings and class 2,5 for the mean maxima.

Where saturation current transformers are required, these shall form an integral part of the meter. Separate saturation current transformers are unacceptable to the Engineer.

(j) Running Hour-meters

Running hour-meters shall be of the electrically operated cyclometer type, suitable for flush mounting.

Numerals shall be clearly defined white on a black background.

The range of hour-meters shall be five digits, the fifth digit indicating one-tenth of an hour, i.e. from 0 to 9999,9 hours.

The accuracy class shall be class in accordance with IEC 51 unless otherwise specified.

(k) Earth Leakage Relays

Earth leakage relays shall be single or three-phase units with a sensitivity of 20 mA, with associated circuit breaker or on-load switch for use on 220/250 Volt single phase or 380/433 Volt three-phase, 50 Hz, supplies.

The units shall be suitable for installation in switch Committees in clip-in trays or bolted to the chassis.

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

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

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

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

#### (l) Current Transformers

Current transformers shall comply with the requirements of BS 3938 and IEC 185 with the exception of the required impulse test level as specified below.

##### (1) Ratings

Current transformers shall be suitable for the primary currents listed hereunder and their decimal multiples: 10, 12.5, 15, 20, 25, 30, 40, 50, 60 and 75.

The preferred values are: 10, 15, 20, 30, 50 and 75.

Current transformers shall have secondary ratings of 1, 2 and 5A, with 5A being preferred.

Current transformers shall have standard outputs of 2,5, 5, 10, 15 or 30 VA as applicable in terms of the burden of the instruments and interconnecting wiring. The current transfer output shall match the actual instrument burden as possible in order not to introduce unnecessary errors.

##### (2) Accuracy Class

For metering applications, accuracy classes of 0.1, 0.2, 0.5, 1, 3 or 5 are applicable. Where no accuracy class has been specified, the following table may be used as a guide:

Application	Primary Current	Suggested Class
Indicating instruments	All	5

Metering applications	Up to 200 A	1
Metering applications	250 to 600 A	0.5
Metering applications	800 A and above	0.2

Where ring type current transformers are specified, the aperture shall not be unnecessary large as accuracy is thereby reduced.

The classes for protection are 5P, 10P, 15P, 20P or 30P with 5P and 10P being standard. Turns compensation shall not be employed on protection current transformers for ratios greater than 150/5.

Class X current transformers shall be used in differential protection systems.

Manufacturers shall supply the magnetization curve details and saturation factors for each different transformer ratio.

### (3) Markings

All current transformers shall come complete with a label on which the following information is indelibly stamped:

Manufacturer.

Serial No. or Type.

Rated primary and secondary current.

Rated frequency.

Rated output and accuracy class.

Highest system voltage.

Rated insulation level.

### (4) Fault current

Current transformers shall be capable of withstanding the dynamic forces resulting from the maximum through-fault current which may be encountered at the point where they are installed. The short time current rating of current transformers shall be as least equal to that of the associated circuit breaker.

### (5) Impulse Level

Current transformers used in system voltages in excess of 660 Volt shall withstand an impulse test level of 95 kV. Impulse levels for current transformers used in system voltages up to 660 Volt shall comply with BS 3938.

(6) Tests of Current Transformers

One protection current transformer of each type used in a contract shall be tested to confirm the estimated characteristics. The following results shall be submitted:

- (a) Magnetization curve.
- (b) Secondary resistance.
- (c) Secondary leakage reactance, if not negligible or if required by the Engineer.

The power frequency, secondary to earth and over-voltage interturn test in accordance with BS 3938 shall be conducted on all current transformers. Impulse tests shall be conducted on all current transformers intended for use in system voltages in excess of 660 Volt.

(m) Tests of Committees

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

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

(n) Drawings for Approval

A set of three prints of the shop drawings for the switch Committees shall be submitted to the Engineer for approval before the Committees are manufactures. The following information shall be presented:

- (i) A complete wiring diagram of the equipment on the Committees.
- (ii) A complete layout of the arrangement of the switch Committees indicating all equipment dimensions and the construction of the Committees. The positions and method of fixing and sizes of busbars shall be shown.
- (iii) All labelling information on a separate sheet.
- (iv) The make, catalogue number and capacity of all equipment such as isolators, circuit breakers, fuses, contactors, etc. on a separate sheet.

The approval of drawings shall not relieve the Contractor of his responsibility to supply the switch Committees according to the requirements of Department.

(o) Final Drawings



Five complete sets of "as built" drawings of all switch Committees shall be submitted to the Engineer within two weeks after delivery of the Committees. The following basic information shall be presented:

- (1) Item (i) to (iv) of the previous paragraph.
- (2) Terminal strip numbers, numbers and colours of conductors connected to the terminal strips and numbers and colours of the conductors utilized for the internal wiring.
- (3) A separate schedule of all equipment with the name of the equipment, name of the manufacturer, type of equipment, model of equipment, address and telephone number of the supplier.

All further information and data shall also be submitted as specified further herein.

(p) Manuals

Five sets of manuals for all specified main and sub-main switch Committees shall be supplied to the Engineer at no extra cost. These manuals shall include the following information:

- (1) Complete information on the operation of the equipment.
- (2) Complete information for maintenance of the equipment.
- (3) Brochures and ordering information.
- (4) A complete equipment list indicating quantities and relevant catalogue numbers.

### 3.9.4 Electric Motors

#### 3.9.4.1 Standards

Electric motors shall comply with SABS 0157, Part 1, as far as quality is concerned and the performance of motors shall comply with SANS 948, Part 1 (1978) and with IEC 34-1 and with BS4999: Part 30, 31 and 32. Insulation of motors shall be Class "F" (B-rise) and shall comply with BS2757 (1955).

The dimensions of motors shall be in accordance with SANS 948, Part 1 (1978) and IEC 72-1, 72-2 and BS 49999, Part 10.

Frames of motors shall comply with IP55 and cooling shall comply with ICO 141.

#### 3.9.4.2 Types

The motors shall be 380 Volt, 3-phase, 6-terminal, 50 Hz, T.E.F.C. type, squirrel cage induction motors and suitable for DOL or star-delta starting. The method of starting of the different sizes of motors covered by this specification, is tabled further herein.

The transformers supplying power to the installations will normally be standard 400/231 V secondary voltage (SANS 780) type. The supply voltage at the terminals of the motors during start-up shall not be less than + 385 Volt whilst the supply voltage shall not be less than + 395 Volt at full-load current.

### 3.9.4.3 Construction

#### 3.9.4.3.1 Frames and End Shields

Motors shall have stator frames with deep external cooling ribs. The frames, feet and end shields shall be manufactured from cast iron. Alloy cast frames will only be accepted after written approval has been granted by the Engineer. Frames shall be machined to accept the stator core after which the registers shall be finish machined with particular regard to concentricity of the stator bore. All frames, end shields and terminal box fixing holes shall be jig drilled to ensure interchange ability of components.

Motors shall be foot mounted and will be used in a vertical position situation with the motor shaft at the top.

The underside of the frame (feet) shall also be machined to obtain correct centre height to and parallelism with the shaft axis.

#### 3.9.4.3.2 Stator

The stator shall be built of electrical steel lamination having semi-closed slots. Thick end plates shall prevent spreading of the laminations and burrs shall be removed before winding takes place.

Windings shall consist of pre-formed coils of synthetic resin covered copper wire.

Slot liners shall consist of thick durable insulating material to give additional protection. The wound core shall be impregnated before being hydraulically pressed into the frame and shall thereafter be fixed into position.

#### 3.9.4.3.3 Rotor and shaft

Motors shall have rotor windings of cast aluminium or copper bar as the case may be. End rings and wafer blades shall form an integral part of the casting procedure where this is employed. Rotors shall be dynamically balanced and shafts shall consist of 080M40 (EN8) steel.

#### 3.9.4.3.4 Terminal Boxes and Terminals

Terminal boxes and lids shall be manufactured from cast iron or heavy duty cast alloy and terminal boxes shall be mounted on the right hand side of the motor, as seen from the shaft end.

Boxes for motors shall be suitable to accept 4-core PVC armoured cables as tabled further herein.

Terminals shall be brass stud type in rigid insulated mountings and shall be suitable for the lugs of the cables and specification herein. Six winding end terminals, complete with removable brass straps for DOL or star-delta connections, and one earth terminal shall be provided in the box.

Each terminal shall be provided with three brass nuts and two brass washers per stud, as well as with the solid brass straps as specified. The terminals shall be suitably sized to accept the lugs of the cables specified further herein.

IP55 seals shall be provided between the cable box frame and the motor and between the box lid and the cable box.

#### 3.9.4.3.5 Bearings

Bearings shall be of the ball or roller type with shields and shall be enclosed in dust proof housings. Bearings shall be charged with BP Energrease LS3 upon assembly of the motor under dust and grit free conditions. Standard high quality bearings shall be used on motors.

#### 3.9.4.3.6 Markings

All motors shall be supplied with a riveted on metal place label on top of the motor on which the following information engraved (not stamped):

- Manufacturer of Motor
- Serial number of motor
- Rated voltage of motor
- Full load current of motor (for delta operation)
- Output kW rating on shaft
- Rotational speed in RPM
- Continuous duty cycle
- Temperature insulation class
- SABS or IEC mark
- All markings required further by BS 4999 and not already specified above
- Other manufacturers data as required

#### 3.9.4.4 Rating

Motors complying with the following ratings used in a project must be connected with cables and shown in the following table.

Motors up to and including 7,5 kW shall be started DOL and motors from 11 kW to 22 kW shall be started Star-Delta.

The specific size of motor for a site shall be sized for a rating applicable to the project requirements.

<b>MOTOR RATING</b>	<b>METHOD OF STARTING</b>	<b>CABLE TERMINAL BOX SUITABLE FOR THE FOLLOWING CABLES</b>
5,5 kW	DOL	1 x 6 mm <sup>2</sup> 4-core PVC cable
7,5 kW	DOL	1 x 6 mm <sup>2</sup> 4-core PVC cable
11 kW	Star-Delta	2 x 10 mm <sup>2</sup> 4-core PVC cable
15 kW	Star-Delta	2 x 10 mm <sup>2</sup> 4-core PVC cable
18,5 kW	Star-Delta	2 x 10 mm <sup>2</sup> 4-core PVC cable
22 kW	Star-Delta	2 x 10 mm <sup>2</sup> 4-core PVC cable

### 3.9.5 Cables

#### 3.9.5.1 Construction

Cables shall be manufactured in accordance with SANS 150, shall come only from fresh stocks, and shall be constructed as follows:

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

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

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

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

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

Where specified, an earth continuity conductor shall be provided in the armouring in accordance with SABS 150.

#### 3.9.5.2 Resin Filled Joints

The resin filled joint kit shall comprise a self-sealing plastic mould of high mechanical strength having sufficient connector space.

The exact amount of cold hardening resin shall be provided in a two-compartment plastic bag.

The resin shall have absolute minimum shrinkage.

The mould and resin shall be completely waterproof and non-hygroscopic and shall be resistant to ultraviolet radiation.

### 3.9.5.3 Cable Box Joints

Cable boxes shall be manufactured of die cast aluminium material for normal conditions or glass fibre reinforced thermosetting compound where exposed to corrosive conditions.

The lid shall provide an absolute moisture barrier.

Boxes shall contain 2, 3 or 4 entries as required.

Unused entries shall be sealed with watertight blanking plugs.

Earth continuity shall be maintained through the box by means of the material of the box in the case of aluminium boxes or by means of earth straps and studs in the case of glass fibre reinforced boxes.

### 3.9.5.4 Glands for PVC-insulated cables

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

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

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

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

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

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

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

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

Suitable accessories shall be provided with glands to be used on ECC armoured cables to facilitate a bolted lug connection of the earth continuity conductors. Grooves cut into the barrel or cone bush to accommodate the earth continuity conductor are not acceptable.

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

### 3.9.5.5 Trenching

#### 3.9.5.5.1 General

The Contractor shall be responsible for all trenching excavations unless specified to the contrary.

The Contractor shall, before trenching commences, familiarize himself with the routes and site conditions and the procedure and order of doing the work shall be planned in conjunction with the general construction program for other services and building requirements.

The Contractor shall acquaint himself with the position of all the existing services such as storm water pipes, water mains, sewer mains, gas pipes, telephone cables, etc. before any excavations are commenced. For this purpose, he shall approach this Engineer's representative, the local municipal authority and any other authority which may be involved, in writing.

The Contractor will be held responsible for damage to any existing services brought to his attention by the Engineer and shall be responsible for the cost of repairs.

The Contractor shall take all the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

The Contractor shall ensure that the excavations will not endanger existing structures, roads, railways, other site constructions or other property.

#### 3.9.5.5.2 Routes

Trenches shall connect the points shown on the drawings in a straight line. Any deviations due to obstructions or existing services shall be approved by the Engineer beforehand. Refer also to par. 9.10.

The Engineer reserves the right to alter any cable route or portion thereof in advance of cable laying. Payment in respect of any additional or wasted work involved shall be at the documented rates.

The removal of obstructions along the cable routes shall be subject to the approval of the Engineer.

#### 3.9.5.5.3 Dimensions of Trenches

Cable trenches for one or two cables shall not be less than 300 mm wide and need not be more than 450 mm wide. This dimension shall be valid for the total trench depth.

The width shall be increased where more cables are installed to allow for spacing of 100 mm between cables.

Where trenches change direction or where cable slack is to be accommodated, the Contractor shall ensure that the requirements of the relevant SABS Specification regarding the bending radii of cables are met when determining trench widths.

Trench depths shall be determined in accordance with cable laying depths and bedding thickness.

Payment will be made on a volumetric excavation rate calculated on the basis of the given maximum dimensions or the actual dimensions, whichever is the lesser.

Cable shall be installed at a minimum depth of 600 mm below final ground level.

All cable depth measurements shall be made to the top of the cable when laid directly in ground or to the top of the duct or sleeve where these are provided.

The above depths shall apply to the top layer where cables are installed in layers.

The Contractor may only deviate from the above depths provided prior authority in writing has been obtained from the Engineer. In this event the cable shall be protected with a suitable concrete covering.

The depth of cable pipes or ducts beneath railway lines or roads shall be not less than 1,1 m below the formation level.

#### 3.9.5.5.4 Testing of Cables

Each cable shall be tested after installation in accordance with SANS 150.

LV cables shall be tested by means of suitable megger at 1 kV and the insulation resistance shall be tabulated and certified.

#### 3.9.5.5.5 Completion

The Engineer reserves the right to inspect the installation at any stage during the course of construction. Such inspections will, however, not deem the portions inspected as being complete or accepted and the Contractor shall remain responsible for completing the installation fully in accordance with the Contract Documents.

The Contractor shall carry out a final "as built" survey of the cable routes and present to the Engineer "as built" route plans of the complete installation. The following information shall be reflected on the plans or submitted as separate scheduled with the plans:

- (a) Overall length of each cable.

- (b) Locations of all joints (if any) in relation to permanent reference points.

Dimensions shall be shown and the method of triangulation i.e. two dimensions to each joint, shall be used.

- (c) Identification of each cable

The works will be deemed to be incomplete until all tests have been conducted successfully and all "as built" drawings and schedules have been handed to the Engineer.

### 3.9.6 Light switches

#### 3.9.6.1 General

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

#### 3.9.6.2 Flush and surface mounted switches

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

Switches shall be of tumbler operated micro-gap type rated at 16A, 220/250 Volt.

Switches shall have protected terminals for safe wiring.

Contacts shall be of silver material.

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

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

The covers of surface mounted switches shall have toggle protectors.

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

#### 3.9.6.3 Watertight switches

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

The housing shall be of galvanized cast iron or the cast aluminium with watertight cover plate and toggle.



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

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

### 3.9.7 Switched socket-outlets

#### 3.9.7.1 General

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

#### 3.9.7.2 Flush and surface mounted switched sockets

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

Switches shall be of the tumbler operated micro-gap type rated at 16A, 220/250

Terminals shall be enclosed for safe wiring.

Contacts shall be of silver material.

Safety shutters shall be provided on live and neutral openings.

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

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

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

#### 3.9.7.3 Watertight switched sockets

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

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

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

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

#### 3.9.7.4 Three-phase switched socket-outlets

Three-phase switched socket-outlets shall have 5 pins, one for each phase, neutral and earth. The current rating shall be a minimum of 32A.

The units shall be interlocked to prevent switching on if the plug top is not installed.

The units shall be supplied complete with plug top.

The live terminals shall be shrouded and shall be completely safe when the plug top is removed.

Samples shall be submitted to the Engineer for approval prior to the installation.

### 3.9.8 Tubular fluorescent lamp luminaries for interior applications.

#### 3.9.8.1 General

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

Lamps shall be delivered separately.

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

#### 3.9.8.2 General Technical Requirements

##### (a) General

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

##### (b) Construction

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

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

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

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

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

(c) Internal Wiring

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

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

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

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

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

(d) Lamp Holders

Lamp holders shall preferably be of the telescopic spring loaded type. Where twist-lock type lamp holders are provided, the mounting of the holders shall be able to accommodate the tolerances experienced in the length of lamps and in the manufacture of luminaries.

(e) Control Gear

The control gear, ballasts, capacitors and starters shall be designed and manufactured to suit the control circuitry adopted.

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

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

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

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

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

(f) Capacitors

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

#### (g) Lamps

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

The light colour shall correspond to colour 2 (4 300 K) of SANS 1041.

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

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

#### 3.9.8.3 Channel Luminaries

Channel luminaries shall consist of a ventilated, enclosed channel body with one or more lamps as specified. The channel body shall house the ballast, capacitor, terminals and internal wiring.

Provision shall be made for the addition of reflector wings and/or diffusers.

Three sets of mounting slots and knock-outs suitable for mounting onto standard round conduit boxes and/or 20 mm Ø conduit pendant rods, shall be provided in the rear of the channel, one in the centre and one approximately one sixth from each end.

A knockout suitable for a 20 mm Ø conduit entry shall be provided at each end of the channel. The distance between the back of the luminary and centre of the knockout shall be approximately 25 mm.

The knockouts shall be positioned on the centre line of the channel.

The body channel shall incorporate a removable cover acting as a reflector, manufactured of cold rolled steel, not less than 0,8 mm thick, designed and mounted to completely cover the interior of the body channel and its contents and extending over the full length of the luminary up to the lamp holders.

The reflector shall be firmly held in position with a latching device consisting of knurled, coin slot, captive screws. Plastic, used as a spring mechanism, is not acceptable as a latching device for reflectors. The action of the latching device shall not deteriorate due to use and/or ageing.

#### 3.9.8.4 Dust and Spray Proof Luminaries

##### 3.9.8.4.1 Construction

The fluorescent luminary shall be totally enclosed and dust- and moisture-proof with an IP55 rating. It shall be designed for and supplied with 2 x 58 watt lamps.

The body of the luminary shall consist of the die-formed glass-fibre reinforced polyester (GRP), which has an exceedingly long life under corrosive conditions or ultraviolet radiation.

The diffuser of the luminary shall consist clear injection moulded polycarbonate with prisms on the inside and smooth outside.

The diffuser of the luminary shall be firmly held in position by at least 8 injection moulded thermoplastic clamp type catches.

A closed cell foam gasket shall be provided as a seal between the body and the reflector.

The gear tray of the fitting shall be retained in place by two rotary latches obviating the need for tools when servicing the luminary. It shall be secured to the body by nylon safety straps from which it can hang during opening of the fitting. The sheet metal gear tray shall be finished in white polyester powder paint.

Rotolock lamp holders shall prevent accidental lamp removal. The lamp holders shall be of the bi-pin polycarbonate type which can accommodate both 26 mm and 38 mm diameter lamps.

The conductors shall be covered with a high temperature insulation rated at 1050C, 600 V.

The electrical connection to the fitting shall be via a three-way, 15A terminal block.

One 20 mm diameter entry shall be provided at each end of the luminary.

Switch start ballasts comply with the requirements of SABS 890 to operate both 26 mm and 38 mm lamps shall be used in the fitting.

Any openings cut into the back of the body of the fitting shall be sealed again with silicone rubber after wiring or cabling is complete.

Contractors shall ensure that the fitting is left completely dust and insect proof after working on the fitting for whatever reason.

#### 3.9.8.5 Exterior Security Lights

The luminary shall consist of a high pressure die cast aluminium body with non-discolouring prismatic high impact acrylic diffuser bowl and shall be designed to operate 125 Watt mercury vapour and 70 Watt high pressure sodium/metal halide lamps.

The luminary shall bear the SABS 1464 safety mark.

The luminary shall have a degree of protection that complies with SANS 1222:

The lamp compartment shall have a rating of IP66.

The body shall be supplied with three mounting holes. Electrical cable entry shall be via a compression type gland at the rear of the luminary.

The diffuser bow shall be manufactured from borosilicate glass with internal prisms.

The prisms shall be restricted to the inside of the bow and shall be carefully formed to work in conjunction with the reflector to provide a spacing to mounting height ratio of up to 8:1, whilst controlling excessive glare. The bowl shall be seated in a rigid high-pressure die cast aluminium frame with two silicon sponge gasket systems.

This frame assembly shall be held to the body by four stainless steel M6 Alien head captive screws located outside the sealed lamp compartment.

A wire guard shall be installed over the fitting. The type of wire guard offered shall be approved by The District as most commercially available wire guards are not suitable to withstand vandalism.

A high purity, single piece, the formed aluminium reflector shall be mounted on the reflector back plate.

Fine slots in the reflector, aligning with the reflector plate, shall ensure precise positioning and consistent optical performance.

The control gear shall be mounted directly onto the body to provide optimum heat dissipation. It shall be suitable for operation with the specified rating of the lamp on a 230 V + 30%/-10%/50 Hz single-phase system.

All control gear components shall be removable and bear the relevant SANS mark.

All internal wiring shall be Teflon's coated with protective sleeving to prevent damage by possible abrasion. All screws, bolt and metal parts shall be stainless steel or non corrosive material.

Mains connections shall be by means of a suitable screw terminal block with a wire clamping contact. Igniters, where applicable, shall be of the superposed pulse type.

The luminary shall be power factor corrected to a minimum of 0,85.

Contractors shall ensure that the fitting is left completely dust and insect proof after working on the fitting for whatever reason.

### 3.10 General Requirements of Electrical Work at Boreholes and Small Installation

#### 3.10.1 Scope of Electrical Installation Work

This section includes the design, manufacture, supply delivery, offloading, storing, if necessary, erection, painting commissioning, testing and maintenance during the maintenance period and final handing-over of all the necessary electrical equipment (unless otherwise indicated below) which shall include the following:

- Supply and installation of the power supply cables from the ESKOM meter point to the MCC or starter panel.
- Supply and installation of motor control switchgear panels.
- All control cabling in pump stations or on sites.
- Earthing and lightning protection of electrical equipment.
- Installation of all instrumentation and control devices.

This specifications covers electrical installations using transformers up to and including 1 000 kVA rating, 600/1 000 V cables up to 240 mm<sup>2</sup> 4-core, motors up to 185 kW as well as all switchgear, equipment and instrumentation used in conjunction with such installations.

This Specification further describes the usual materials required for electrical installations and general methods of installing these materials. This Specification forms a part of any project specifications which are bound together with this Specification, or issued as a separate volume. Where drawings are issued with this Specification, or where standard drawings of The District are referred to in this Specification, such drawings shall be read together with this Specification and shall form part of this Specification for all intents and purposes.

### 3.10.2 Application

The Specifications here following are essentially functional specifications only. The contractor shall design the various installations and produce complete constructional drawings and complete lists of equipment complying with the requirements set out below and with those of the standard specifications listed further herein. The Contractor shall then submit all this information to the Engineer for approval before commencing manufacture of any motor control panels or small starter panels or power distribution Committees.

### 3.10.3 General Requirements

All material and equipment supplied and/or installed under this Contract shall be new and of high class quality and shall comply with the requirements laid down in the latest editions of the SANS, BSS or IEC specifications.

All materials shall be subject to the approval of the District.

Similar equipment supplied under this contract must be identical in all respects and it shall be possible to interchange parts of identical equipment.

A Contract shall contain equipment of only one supplier for a specific type of equipment, such as, for instance, contractors or circuit breakers, unless the project specification or this specification allows deviation from this requirement.

Materials wherever possible must be locally available in South Africa and must preferably be of South African manufacture.

Materials removed from a specific site or has become redundant shall not be re-used on another site without the written permission of the District.

The uses of second hand materials are strictly forbidden.

The District will also not for over supply of materials. Contractors shall plan their work and shall assess the quantities of material to be used. Unused materials shall be removed from site after the completion of the project as the District will not accept for material on site which have not been built into the Contract.

Cables, wire and conduit lengths will be paid on the basis of "As Built" quantities only.

Any quantities in any Schedule which may form part of this document or which may be issued as a separate schedule must be regarded as being provisional as far as re-measurable material is concerned and the value of such material on site will be paid for per installed quantity.

Invoices for payment shall contain full details of the material installed and work done since the previous payment and shall also show the materials and work done as per previous certificates so that an assessment can be made of the progress of the work.

Test or commissioning results obtained shall be submitted in detail reports together with the invoices. Word such as "motor not earthed" will not be acceptable.

The serial number of equipment or specific detail descriptions of positions and types of equipment worked on shall be shown on invoices and schedule item work shall refer to the schedule item number and the specific application or position where applied shall be detailed on invoices.

Invoices for materials purchased, together with the signatures of the recipients, shall be submitted together with invoices.

#### 3.10.4 Compliance with Law and Regulations

The installation, testing and commissioning of electrical equipment shall always comply with the requirements, stipulations and regulations contained in the following Act:

Machinery and Occupational Safety Act 85 of 1993 with special reference to section 1 (Act & Regulations), section 2 (Administrative Regulations), section 6 (Electrical Installation Regulations), section 13 (Driven Machinery Regulations), section 14 (Electrical Machinery Installations), section 15 (General Machinery Regulations) and section 16 (General Safety Regulations).

The Mines and Works Act, No. 27 of 1956 and subsequent amendments and regulations issued there under.

The Electricity Act, No. 26 of 1958.

Explosives Act, No. 26 of 1956.

Code of Practice for the Wiring of Premises – SANS 0142.



The contractor shall be responsible for serving of all notices and paying of all fees due in terms of the above laws and regulations.

### 3.10.5 Transport of Equipment

Contractors will be responsible for the transport of all materials and equipment to the site and on the site.

All material and equipment must be thoroughly packed and any damage that may occur must be repaired or corrected by the Electrical Contractor before installation and testing proceeds.

### 3.10.6 Local Authority

The Contractor must arrange with the Supply Authority, Administration, TELKOM and other authorities to make sure that their regulations are met when the main incoming supply and the substation equipment is installed.

### 3.10.7 Drawings and Data

Where Bidder's Officer items that differ from those as specified, the BID must submit drawings, diagrams and full technical details of such items on the closing date of BIDs.

### 3.10.8 Changeability

Equipment of the same type shall be obtained from one manufacturer and components shall be changeable.

### 3.11 Maintenance and servicing facilities

3.11.1 Each Bidder shall be able to clearly demonstrate possession of adequate servicing and maintenance facilities, including a comprehensive range of spares, to the satisfaction of the Engineer.

3.11.2 To this effect, each Bidder shall include a statement in his offer, describing the facilities available for servicing and maintenance, as well as the availability of adequate spares for the equipment offered in his BID.

3.11.3 As a further requirement, the precise physical street address and telephone number of the premises nearest to this installation, where these as stated required facilities exist, together with details regarding test equipment and personnel permanently available at this address, shall be furnished along with this statement.

3.11.4 Bidders shall accept as a condition of this contract that any premises indicated in this statement may be inspected prior to the awarding of the contract. It shall be noted that offers may be passed over

where, in the opinion of the Engineer, these facilities are inadequate in terms of the foregoing requirements.

3.11.5 Personnel used for repair work during the period of maintenance. The Contractor shall only allow properly qualified and skilled staff to work on the equipment and installation at all times.

### 3.12 Performance of Contractor

3.12.1 Should it be found at any stage of the contract period that the services performed or any component thereof deviates from the specified requirements and that such deviation had not been noted by the Bidder in his BID offer, the Contractor will be required to redo such services or any component thereof with work complying with the requirements specified in the documents listed above, at no extra to the Employer.

3.12.2 If at any stage of this contract it is found that the Contractor has deviated from the requirements of this specification whether it be by the installation of equipment not specified, etc. or otherwise, without prior WRITTEN consent from the Engineer, the Engineer shall have the right to order the Contractor to remove such items, equipment, etc. constituting the deviation and replace it with the exact item, equipment, etc. specified, without any adjustment in the BID price.

3.12.3 Remedy on Contractor's failure to carry out work as required.

3.12.4 Should the Contractor fail to commence investigation/repair as required within a period of 10 days after receipt of written notice thereof, the Employer shall be entitled to have such work carried out by his own staff or by other Contractors at the Contractor's account.

3.12.5 If such work is work which the Contractor should have carried out at his own cost, as detailed below, the Employer shall be entitled to recover from the Contractor the cost thereof or deduct the same amount from any moneys due or that become due to the Contractor.

### 3.13 Radio/Telemetric Systems

3.13.1 A technical clarification to discuss and clarify any technical queries that may exist regarding the extent of the "Detail Specification and material required" shall be held subsequent to the ordering of material or before any work commences.

**C3.1 SCOPE OF WORKS**

INDEX OF PRICE SCHEDULES

**PART 6**

SCHEDULE 1	:	GENERAL (COMPULSORY)
SCHEDULE 2	:	SMALL AND MEDIUM SIZE ELECTRICAL PANELS
SCHEDULE 3	:	ELECTRIC MOTORS
SCHEDULE 4	:	BALL VALVES
SCHEDULE 5	:	BUTTERFLY VALVES (WAFER TYPE)
SCHEDULE 6	:	BUTTERFLY VALVES (DOUBLE FLANGED)
SCHEDULE 7	:	WATERWORKS GATE VALVES
SCHEDULE 8	:	RESILIENT SEAL GATE VALVES
SCHEDULE 9	:	WAFER PATTERN CHECK VALVES
SCHEDULE 10	:	HYDRAULIC FLOW CONTROL VALVES
SCHEDULE 11	:	SURGE ANTICIPATING CONTROL VALVE
SCHEDULE 12	:	PUMP (CENTRIFUGAL, AXIAL FLOW, HORIZONTAL SPLITS, DUAL STAGE)
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**SCHEDULE 1 : GENERAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b>1.1</b>	<b>SUMS STATED PROVISIONALLY BY THE ENGINEER</b> Provisional Sums				
1.1.1	For work to be executed (upon specific instruction of the Engineer) by the Contractor and valued in terms of the "valuation of variations" clause in the conditions of contract.	Sum	R500 000	-	R500 000,00
1.1.2	For work to be executed by a Nominated Subcontractor.	Sum	R500 000	-	R500 000,00
1.1.3	Overheads, charges and profit on item 1.1.2	%	R500 000	%	R_____
1.1.4	For work to be executed by a Nominated Emerging Sub-Contractor which is to be employed under this programme.	Sum	R100 000	-	R100 000,00
1.1.5	Overheads, charges and profit on item 1.1.4 for assisting, training, co-ordinating and supervision of a Nominated Emerging Sub-Contractor which is to be employed under this programme.	%	R100 000	%	R_____
1.1.6	Payment to Eskom in respect of electrical connection fees	sum	R500 000	-	R500 000,00
1.1.7	Overheads, charges and profit on item 1.1.6	%	R500 000	%	R_____
1.1.8	For work to be executed by Nominated Engineer (rate according ECSA approved guidelines)	%		%	
1.1.9	Nominated Engineer disbursements	%	0.05	%	0.05
<b>1.2</b>	<b>PRIME COSTS ITEMS</b>				
1.2.1	Prime cost of goods or materials to be supplied to the site of the Works upon specific instruction of the Engineer.	PC Sum	R100 000	-	R100 000,00
1.2.2	Overheads, charges and profit on item 1.2.1	%	R100 000	%	R_____
1.2.3	Specialist Contractors/Engineer	PC Sum	R500 000	-	R500 000,00
1.2.4	Overheads, charges and profit on item 1.2.3	%	R500 000	%	R_____
1.2.5	Percentage mark-up as items approved by the client or his representative with attached invoices for material used.	%	R500 000	%	R_____
	<b>TOTAL SCHEDULE 1 CARRIED FORWARD TO SUMMARY</b>			<b>R</b>	
Note: BID price must include value added tax. _____					

**SCHEDULE 2 : SMALL & MEDIUM SIZE ELECTRICAL PANELS**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b>3.1</b>	<b><u>Testing of earthing installation for the electrical panel :</u></b>				
3.1.1	Test earthing of distribution panel back to main earth point (per panel)	no	1	R	R
3.1.2	Testing of earth connections at light fittings, power points, motors and instrumentation (per circuit )	no	1	R	R
<b>3.2</b>	<b><u>Supply and installation of earthing materials to obtain proper earthing of installation from panel. Installation in conduit, wiring trunking, building trench or ground : ( Excavations measured separately)</u></b>				
3.2.1	2,5mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.2	4mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.3	6mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.4	10mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.5	16mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.6	25mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.7	35mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.8	50mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.9	70mm <sup>2</sup> bare copper or insulated earth wire	m	1	R	R
3.2.10	2,5mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.11	4mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.12	6mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.11	10mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.13	16mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.14	25mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.15	35mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.16	50mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R
3.2.17	70mm <sup>2</sup> earth wire end lugged and connected	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.2.18	1,8 m copper clad steel core earth rod installed in ground, complete with clamp and connections.	no	1	R	R
3.2.19	5 x 25 mm copper earth strap installed on surface of structure or cable ladders, including fixings	m	1	R	R
<b>3.3</b>	<b>Supply and installation of 600/1 000 V. grade PVC PVC SWA PVC cable in trench or in ground.</b> Fixings or excavations as well as cable ends are measured elsewhere				
3.3.1	1,5 mm <sup>2</sup> 3 or 4 core armoured	m	1	R	R
3.3.2	2,5 mm <sup>2</sup> 3 or 4 -core armoured.	m	1	R	R
3.3.3	1,5mm <sup>2</sup> 7-core armoured	m	1	R	R
3.3.4	4 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.5	6 mm <sup>2</sup> 4 -core armoured.	m	1	R	R
3.3.6	10 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.7	16 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.8	25 mm <sup>2</sup> 4 -core armoured.	m	1	R	R
3.3.9	35 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.10	50 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.11	70 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.12	95 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.13	120 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.14	150 mm <sup>2</sup> 4 core armoured	m	1	R	R
3.3.15	185 mm <sup>2</sup> 4 core armoured	m	1	R	R
<b>3.4</b>	<b>Supply and installation of 600/1 000 V. grade PVC SWA PVC cable ends complete with lugs, connections to motor terminals, stub bars, small terminals, etc., (include for labels, wire number markers and testing)</b>				
3.4.1	1,5 mm <sup>2</sup> 3 or 4 core armoured	no	1	R	R
3.4.2	2,5 mm <sup>2</sup> 3 or 4 -core armoured.	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.4.3	1,5mm <sup>2</sup> 7-core armoured	no	1	R	R
3.4.4	4 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.5	6 mm <sup>2</sup> 3 -core armoured.	no	1	R	R
3.4.6	10 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.7	16 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.8	25 mm <sup>2</sup> 3 -core armoured.	no	1	R	R
3.4.9	35 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.10	50 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.11	70 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.12	95 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.13	120 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.14	150 mm <sup>2</sup> 4 core armoured	no	1	R	R
3.4.15	185 mm <sup>2</sup> 4 core armoured	no	1	R	R
<b>3.5</b>	<b>Cable Trenches</b> Excavation, laying 150 mm bedding, backfilling in 150mm layers, and stabilising to original stability of cable trench. (660mm wide x 1m deep) :				
3.5.1	Hard rock	m <sup>3</sup>	1	R	R
3.5.2	Soft rock	m <sup>3</sup>	1	R	R
3.5.3	Soil	m <sup>3</sup>	1	R	R
<b>3.6</b>	<b><u>General maintenance of electrical equipment as per Section 3 of the maintenance specification</u></b>				
3.6.1	Clean inside and outside of panel (per panel)	no	1	R	R
3.6.2	Tighten all connections in panel (per panel)	no	1	R	R
3.6.3	Tighten connections in lock stop button box (per box)	no	1	R	R
3.6.4	Tighten connections in remote stop-start station box (per box)	no	1	R	R
3.6.5	Tighten connections in motor connection box, including thermal sensor wiring terminals	no	1	R	R
3.6.6	Tighten connections at instrument terminals (per instrument)	no	1	R	R
3.6.7	Repair ends of damaged conductors due to overheating at circuit breakers, contactors, overloads or motor terminals, including				



ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	installation of ferrules, lugs, heatshrink materials or insulated sleeving :				
	(a) Conductor sizes up to 16 mm <sup>2</sup> , per terminal	no	1	R	R
	(b) Conductor sizes from 25 mm <sup>2</sup> to 50 mm <sup>2</sup> , per terminal	no	1	R	R
3.6.8	Testing of single phase or three phase earth leakage unit	no	1	R	R
3.6.9	Testing of under/over voltage relay or phase monitor relay per unit	no	1	R	R
3.6.10	Checking of all voltmeters and voltmeter switches for correct operation	no	1	R	R
3.6.11	Logging of all motor running hour meter readings and trip data of electronic motor protection units on a site (per site)	no	1	R	R
3.6.12	Checking of all indicator lamps on panel	no	1	R	R
3.6.13	<u>Replacement of indicator lamps as follows:</u>				
	(a) Incandescent lamps per lamp	no	1	R	R
	(b) LED type removable lamp	no	1	R	R
	(c) LED type, whole unit	no	1	R	R
3.6.14	Checking of all instrumentation fuses on a site (per site)	no	1	R	R
3.6.15	<u>Replacement of blown fuses as follows:</u>				
	(a) HRC up to 10 A	no	1	R	R
	(b) HRC above 10A and up to 32 A	no	1	R	R
3.6.16	Checking of all lightning arrestors on a site (per site)	no	1	R	R
3.6.17	<u>Replacing of lightning arrestors as follows:</u>				
	(a) Class 2 over voltage surge arrestors - 275V MOV type - 40 kA fault rating	no	1	R	R
	(b) Class 2 overvoltage surge arrestors - 275V MOV type - 65 kA fault rating	no	1	R	R
	(c) Class 2 overvoltage surge arrestors - 275V MOV type - 100 kA fault rating	no	1	R	R
	(d) IT Blitzductor surge arrestor -24V	no	1	R	R
3.6.18	Transformers from 220Vac to 24Vac	no	1	R	R
	220Vac to 24Vdc	no	1	R	R
3.7	<b>Megger testing of 600/ 1000 V cables</b> with both ends of cables disconnected for the following sizes of cable :				
	(a) Cables with 3 to 7 cores up to 2,5mm <sup>2</sup> per cable	no	1	R	R
	(b) Cable with 3 or 4 cores from 4mm <sup>2</sup> to 25mm <sup>2</sup>	no	1	R	R
	(c) Cable with 3 or 4 cores from 35mm <sup>2</sup> to 50mm <sup>2</sup>	no	1	R	R
3.8	<u>Supply and installation of PVC warning tape</u> in top 300 mm of				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	trench backfill 300 mm of trench backfill	m	1	R	R
3.9	<b>Supply and fitting of cable labels</b> on ends of cable with strap-on type label with up to 10 digits on label (per label)	no	1	R	R
3.10	<b>Testing and checking of motors</b> of all size sand comparing current readings with current rating of motor and logging of data as follows per motor:				
3.10.1	Megger between phases and phases and phases to earth and log data (per motor)	no	1	R	R
3.10.2	Measuring line currents of motor and logging data (per motor)	no	1	R	R
3.11	<b>Maintenance of panels</b> executing the following various tasks per unit of equipment :				
3.11.1	Inspecting all circuit breakers and testing to see that circuit breakers can handle the current of the particular circuit without tripping under normal load conditions and under transient conditions of motors starting for all sizes and types of circuit breakers, single pole and triple pole, as well as checking for overheating of circuit breakers (per panel)	no	1	R	R
3.11.2	Inspecting contactors and measuring outgoing voltages to determine if contactors are closing properly and that one or more phase contacts are not malfunctioning or that the contactor is not overheating (per contactor)	no		R	R
3.11.3	Checking that overloads are of correct rating and that setting is correct for the rating of the motor protected with the overload. Also check for malfunctioning of overload and nuisance tripping as well as overheating of overloads. Check that overload is not set for " Auto" reset. (per panel)	no	1	R	R
3.11.4	Checking and setting of star-delta starter timer for proper changeover of star-to-delta (per timer)	no	1	R	R
3.12	<b>Installation of Circuit breakers</b> Supply, installation, connection, testing and commissioning of the following circuit breakers for distribution boards or motor controls : (per circuit breaker)				
3.12.1	100 A TP on-load isolator	no	1	R	R
3.12.2	100 - 250 A TP on-load isolator	no	1	R	R
3.12.3	160A TP MCB (5kA)	no	1	R	R
	225A TP MCB (10 kA)	no	1	R	R
3.12.4	500 A TP mcb (15 kA)	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.12.5	750 A TP mcb (25kA)	no	1	R	R
3.12.6	1000 A TP ACB - Fixed (65kA)(with tripping unit similar to Micro Logix 2)	no	1	R	R
3.12.7	1500 A TP ACB - Withdrawable ( 65kA)(with tripping unit - similar to Micrologix 2)	no	1	R	R
3.12.8	2000 A TP ACB - Withdrawable ( 65kA)(with tripping unit - similar to Micrologix 2)	no	1	R	R
<b>3.13</b>	<b><u>Installation of Electronic Overload Relays</u></b> Supply, installation, connection, testing and commissioning of the following protection relays for distribution boards or motor controls : (per relay & CT's as shown)				
3.13.1	Similar or equal to Newelec KC25 with door mounted reset and <b>no CT's</b>	no	1	R	R
3.13.2	Similar or equal to Newelec KC50 with door mounted reset and 3 x50/5A CT's	no	1	R	R
3.13.3	Similar or equal to Newelec KC200 with door mounted reset and 3 x200/5A CT's	no	1	R	R
3.13.4	Similar or equal to Rockwell Automation 825-P with line voltage card	no	1	R	R
3.13.5	Similar and equal to Rockwell Automation 825-MCM180 CT installed in busbars	no	1	R	R
3.13.5	Similar and equal to Rockwell Automation 825-MCM420 CT installed in busbars	no	1	R	R
3.13.5	Similar and equal to Rockwell Automation 825-MCM630 CT installed in busbars	no	1	R	R
<b>3.14</b>	<b><u>Installation of Contactors and Components</u></b> Supply, installation, connection, testing and commissioning of the following equipment for distribution boards or motor controls.				
<b>3.14.1</b>	<b><u>Complete New Contactor for:</u></b>				
	(a) 4 to 5,5kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(b) 7,5 to 11kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(c) 11 to 15kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(d) 18,5kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(e) 22kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(f) 30kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(g) 37kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(h) 45kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(i) 55kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(j) 75kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(k) 90kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(l) 110kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(m) 132kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(n) 150kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(o) 185kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(o) 220kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
<b>3.14.2</b>	<b><u>Replacing contactor contacts per set of three for the following sizes:</u></b>				
	(a) 4 to 5,5kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(b) 7,5 to 11kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(c) 11 to 15kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(d) 18,5kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(e) 22kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(f) 30kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(g) 37kW AC-3 rating contactor(Similar or equal to Siemens)	set	1	R	R
	(h) 45kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(i) 55kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(j) 75kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(k) 90kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(l) 110kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(m) 132kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(n) 150kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(o) 185kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(c) 220kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
<b>3.14.3</b>	<b><u>Replacing contactor coil in the following sizes of contactors:</u></b>				
	(a) 4 to 5,5kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(b) 7,5 to 11kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(c) 11 to 15kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(d) 18,5kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(e) 22kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(f) 30kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(g) 37kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(h) 45kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(i) 55kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(j) 75kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(k) 90kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(l) 110kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(m) 132kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(n) 150kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(o) 185kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
	(o) 220kW AC-3 rating contactor (Similar or equal to Siemens)	no	1	R	R
<b>3.15</b>	<b>Installation of Standard Adjustable Overloads</b>				
	Supply, installation, connection, testing and commissioning of the following adjustable (standard electronic) motor overloads for motor controls.				
	(a) 0,1 - 1A	set	1	R	R
	(b) 1,6 - 5 A	set	1	R	R
	(c) 12 - 32 A	set	1	R	R
	(d) 14 - 45A	set	1	R	R
	(e) 23 - 75A	set	1	R	R
	(f) 60 - 85A	set	1	R	R
<b>3.16</b>	<b><u>Replacing star-delta timer for star-delta starters as follows:</u></b> <b><u>(per unit)</u></b>				
	(a) Electronic type	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) Magnetic type	no	1	R	R
	(c) Vacuum type	no	1	R	R
<b>3.17</b>	<b>Motor Control Centres (complete assemblies)</b>				
	Design drawings, manufacture, supply, delivery, installation, connections, testing and commissioning of floor standing motor control centre cabinets consisting of 2mm 3CR12 steel, powder coated, and each cabinet with dimension of not less than 2000mm high x 700mm wide x 600 mm deep and complete with internal sheet steel divisions, busbars, busbar supports, ventilation openings and gland plates for :				
3.17.1	Main incoming power panel for loads not exceeding 150A (complete assembly) (Supply Dwg. W0031-WTE/1)(test certificate in accordance with SANS 1765) (<10kA)	no	1	R	R
3.17.2	Main incoming power panel for loads from 150 to 450A, <u>excluding main circuit breaker.</u> (Supply to Dwg. W0031-WTE/2)(test certificate in accordance with SANS 1765)(<10kA)	no	1	R	R
3.17.3	Main incoming power panel for loads from 550 to 750A, <u>excluding main circuit breaker.</u> (Supply r to Dwg. W0031-WTE/2)(test certificate in accordance with SANS 1473)(>10kA)	no	1	R	R
3.17.4	Main incoming power panel for loads from 750 to 1500A, <u>excluding main circuit breaker.</u> (Supply to Dwg. W0031-WTE/2)(test certificate in accordance with SANS 1473)(>10kA)	no	1	R	R
3.17.5	DOL starter panel with <u>standard overload</u> for motors up to 11 kW (excluding motor mcb (miniature circuit breaker) and contactor)	no	1	R	R
3.17.6	DOL starter panel with <u>electronic overload</u> for motors up to 11 kW (excluding motor mcb, electronic overload and contactor)	no	1	R	R
3.17.7	Star-delta starter panel with <u>electronic overload</u> for motors from 15kW up to 22 Kw (excluding motor mcb, contactors & electronic overload relay)	no	1	R	R
3.17.8	Star-delta starter panel with <u>electronic overload</u> for motors from 30kW up to 55 Kw (excluding motor mcb, contactors & electronic overload relay)	no	1	R	R
3.17.9	Star-delta starter panel with <u>electronic overload</u> for motors from 90kW up to 132 Kw (excluding motor mcb, contactors & electronic overload relay)	no	1	R	R
3.17.10	Star-delta starter panel with <u>electronic overload</u> for motors from 150kW up to 220 Kw				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(excluding motor mcb, contactors & electronic overload relay)	no	1	R	R
3.17.11	Variable speed drive for motors from 22kW	no	1	R	R
	30kW	no	1	R	R
	37Kw				
	45kW	no	1	R	R
	55kW	no	1	R	R
	75kW	no	1	R	R
	90kW	no	1	R	R
3.17.12	Voltage Invector from 220V up to 400V	no	1	R	R
3.17.13	Voltage Regulator 75kVA	no	1	R	R
<b>3.18</b>	<b><u>Drawing up and delivery of "As Built" drawings of boards to the Department for the following :</u></b>				
3.18.1	12 way power distribution board	no	1	R	R
3.18.2	24 way power distribution board	no	1	R	R
3.18.3	Motor control centre with main incoming panel and up to 2 starters	no	1		
3.18.4	Motor control centre with main incoming panel and up to 4 starters	no	1		
<b>3.19</b>	<b><u>Mark-up rates</u></b>				
3.19.1	Percentage mark-up on rates listed in term contracts	%	R	%	R
3.19.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in the execution of work ordered by the Employer	%	R	%	R
<b>3.20</b>	<b><u>Tip Trucks</u></b>				
	(a) 6 m <sup>3</sup>	H	1	R	R
	(b) 10 m <sup>3</sup>	H	1	R	R
<b>3.21</b>	<b><u>Flat bed trucks</u></b>				
	(a) 5t	Km	1	R	R
	(b) 7t	Km	1	R	R
<b>3.22</b>	<b><u>LDV</u></b>				
PSA 15	(a) 2 x 4WD	Km	1	R	R
	(b) 4 x 4WD	Km	1	R	R
	Subtotal			R	R
	<b>TOTAL OF SCHEDULE 2 CARRIED FORWARD TO SUMMARY</b>			<b>R</b>	<b>R</b>

**SCHEDULE 3 : ELECTRICAL MOTORS**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.1	Megger testing of electric motors between phases and between phase and frame (earth) & report findings to Department.	no	1	R	R
4.2	Disconnection and removal of existing electric motors and placing in store of Department or delivery to position required by Department for:				
4.2.1	Motors of 5,5 and 7,5 kW	no	1	R	R
4.2.2	Motors of 11 up to 18,5 kW	no	1	R	R
4.2.3	Motors of 22 up to 37 kW	no	1	R	R
4.2.4	Motors of 45 up to 75 kW	no	1	R	R
4.2.5	Up to 110 kW	no	1	R	R
4.2.6	Up to 160 kW	no	1	R	R
4.2.7	Up to 200 Kw	no	1	R	R
4.2.8	Up to 260 Kw	no	1	R	R
4.2.9	Motor 220 Kw	no	1	R	R
4.3	Installation and connection of <b>existing</b> motors for pumps, including shaft alignment of motor for V-belts or pump coupling for:				
4.3.1	Motors of 5,5 and 7,5 kW, TEFC, foot mounted	no	1	R	R
4.3.2	Motors of 11 up to 18,5 kW, TEFC, foot mounted	no	1	R	R
4.3.3	Motors of 22 up to 37 kW, TEFC, foot mounted	no	1	R	R
4.3.4	Motors of 45 up to 75 kW, TEFC, foot mounted	no	1	R	R
4.3.5	Motors of 90 and 110 kW, TEFC, foot mounted	no	1	R	R
4.3.6	Motor 132 kW, TEFC, foot mounted	no	1	R	R
4.3.7	Motor 150 kW, TEFC, foot mounted	no	1	R	R
4.3.8	Motor 185 kW, TEFC, foot mounted	no	1	R	R
4.3.9	Motor 220 kW, TEFC, foot mounted	no	1	R	R
4.3.10	Motor 250 kW, TEFC, foot mounted				
4.3.11	Motor 400 kW, TEFC, foot mounted				
4.3.12	Motor 500 kW, TEFC, foot mounted				
4.3.13	Motor 660 kW, TEFC, foot mounted				
4.3.14	Motors of 5,5 and 7,5 kW, TEFC, flange mounted	no	1	R	R
4.3.15	Motors of 11 and 15 kW, TEFC, flange mounted	no	1	R	R
4.3.16	Motors of 18,5 and 22 kW, TEFC, flange mounted	no	1	R	R



ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b>4.4</b>	Supply, installation, connection, testing and commissioning of new motors for pumps, including shaft alignment of motor for V-belts or pump coupling for:				
4.4.1	5,5 kW,400/230 V, TEFC, foot mounted	no	1	R	R
4.4.2	7,5 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.3	11 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.4	15 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.5	18,5 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.6	22 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.7	30 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.8	37 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.9	45 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.10	55 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.11	75 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.12	90 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.13	110 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.14	132 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.15	185 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.16	220 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.4.17	5,5 kW,400/230 V, TEFC, flange mounted	no	1	R	R
4.4.18	7,5 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.4.19	11 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.4.20	15 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.4.21	18,5 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.4.22	22 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.5	Disconnection, removal and transportation of existing motors to re-winders, rewinding of motors, replacement of bearings, testing of motor in factory, installation of motor on site, connection of motor, alignment of motor shaft for V-belts or pump coupling, testing of motor on site and commissioning for :			R	R
4.5.1	5,5 kW,400/230 V, TEFC, foot mounted	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.5.2	7,5 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.3	11 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.4	15 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.5	18,5 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.6	22 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.7	30 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.8	37 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.9	45 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.10	55 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.11	75 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.12	90 kW, 400/230 V, TEFC, foot mounted	no	1	R	R
4.5.19	11 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.5.20	15 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.5.21	18,5 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
4.5.22	22 kW, 400/230 V, TEFC, flange mounted	no	1	R	R
<b>4.6</b>	<b><u>Mark-up rates</u></b>				
4.6.1	Percentage mark-up on rates listed in term contracts	%	R		%R
4.6.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list used in the execution of work ordered by the Employer	%	R		%R
<b>4.70</b>	<b><u>Tip Trucks</u></b>			R	
	(a) 6 m <sup>3</sup>	H	1	R	R
	(b) 10 m <sup>3</sup>	H	1	R	R
<b>4.71</b>	<b><u>Flat bed trucks</u></b>				
	(a) 5t	Km	1	R	R
	(b) 7t	Km	1	R	R
<b>4.72</b>	<b><u>LDV</u></b>				
PSA15	(a) 2 x 4WD	Km	1	R	R
	(b) 4 x 4WD	Km	1	R	R
<b>TOTAL OF SCHEDULE 3 CARRIED FORWARD TO SUMMARY</b>					

**SCHEDULE 4 : BALL VALVES**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5.	<b><u>BALL VALVES</u></b> Ball valve with split body; straight through pigable bore, ball supported by a double-offset bearing arrangement, with resilient seal. <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
5.1	<u>Servicing and repair of existing valves in the following diameters; 25 bar rating:</u>				
5.1.1	<u>Remove valve</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.2	<u>Transport from site</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.3	<u>Dismantle</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.4	<u>Blast</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.5	<u>Clean</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.6	<u>Inspect</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.7	<u>Submit inspection report</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.8	<u>Lap</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.9	<u>Re-blast</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.10	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.11	<u>Reassemble</u>				
	a) 150 DN	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5.1.12	b) 200 DN	no	1	R	R
	<u>Pressure test</u>				
	a) 150 DN	no	1	R	R
5.1.13	b) 200 DN	no	1	R	R
	<u>Submit pressure test certificate</u>				
	a) 150 DN	no	1	R	R
5.1.14	b) 200 DN	no	1	R	R
	<u>Install</u>				
	a) 150 DN	no	1	R	R
5.1.15	b) 200 DN	no	1	R	R
	<u>Commission</u>				
	a) 150 DN	no	1	R	R
5.2	b) 200 DN	no	1	R	R
	Supply, install and commission the following completely new ball valves, flanged, gear operated with handwheel:				
	a) 150 DN PN 25 ref. no. .... Name of Manufacturer: .....	no	1	R	R
5.3	b) 200 DN PN 25 ref. no. .... Name of Manufacturer: .....	no	1	R	R
	<u>Mark-up rates</u>				
	5.3.1 Percentage mark-up on rates listed on term contracts	%	R		% R
5.3.2 Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer.	%	R		% R	
5.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
5.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
5.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
<b>TOTAL OF SCHEDULE 4 CARRIED FORWARD TO SUMMARY</b>					

**SCHEDULE 5 : BUTTERFLY VALVES (WAFER TYPE)**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.	<b>BUTTERFLY VALVES</b> (Wafer Type) Handlever or geared operator, with or without actuator. <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
6.1	<u>Servicing and repair of existing valves in the following diameters and pressure ratings:</u>				
6.1.1	<u>Remove valve</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.2	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	<u>Dismantle</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.3	<u>Blast</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.1.4	<u>Clean</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.5	<u>Inspect</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.6	<u>Submit inspection report</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.7	<u>Lap</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
6.1.8	<u>Re-blast</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
6.1.9	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25  (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
6.1.10	<u>Reassemble</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u>				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
6.1.11	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
	<u>Pressure test</u>					
	a) <u>100 DN</u>					
	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
	b) <u>150 DN</u>					
	(i) PN 16	no	1	R	R	
(ii) PN 25	no	1	R	R		
(iii) PN 40	no	1	R	R		
6.1.12	<u>Submit pressure test certificate</u>					
	a) <u>100 DN</u>					
	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
	b) <u>150 DN</u>					
	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
	c) <u>200 DN</u>					
(i) PN 16	no	1	R	R		
(ii) PN 25	no	1	R	R		
6.1.13	(iii) PN 40	no	1	R	R	
	<u>Install</u>					
	a) <u>100 DN</u>					
	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
	b) <u>150 DN</u>					
	(i) PN 16	no	1	R	R	
	(ii) PN 25	no	1	R	R	
	(iii) PN 40	no	1	R	R	
c) <u>200 DN</u>						
(i) PN 16	no	1	R	R		
(ii) PN 25	no	1	R	R		
(iii) PN 40	no	1	R	R		
6.1.14	<u>Commission</u>					
	a) <u>100 DN</u>					
	(i) PN 16	no	1	R	R	



ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
<b>6.2</b>	Supply, install and commission the following completely new gear operated (with handwheel) wafer type butterfly valves:				
	a) <u>100 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	(iii) PN 40 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	b) <u>150 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	(iii) PN 40 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	c) <u>200 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	(iii) PN 40 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
<b>6.3</b>	<b><u>Mark-up rates</u></b>				
6.3.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
6.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer.	%	R	%	R
6.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
6.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
6.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			<b>R</b>	<b>R</b>
	<b>TOTAL SCHEDULE 5 CARRIED FORWARD TO SUMMARY</b>			<b>R</b>	<b>R</b>

**SCHEDULE 6 : BUTTERFLY VALVES (DOUBLE FLANGED)**

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7.	<b>BUTTERFLY VALVES</b> (Double Flanged) Gear operated, with or without actuator.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
7.1	<u>Servicing and repair of existing valves in the following diameters and pressure ratings:</u>				
7.1.1	<u>Remove valve</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.2	<u>Dismantle</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.3	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	<u>Blast</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25  (iii) PN 40	no no  no	1 1  1	R R  R	R R  R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.4	<u>Clean</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.5	<u>Inspect</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.6	<u>Submit inspection report</u>				

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.7	<u>Lap</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u>				

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.8	<u>Re-blast</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.9	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u>				
	(i) PN 16	no	1	R	R

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.10	<u>Reassemble</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.11	<u>Pressure test</u>				
	a) <u>100 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.12	<u>Submit pressure test certificate</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	c) <u>200 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	d) <u>250 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	e) <u>300 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	f) <u>350 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
7.1.13	<u>Install</u>				
	a) <u>100 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u> (i) PN 16 (ii) PN 25 (iii) PN 40	no no no	1 1 1	R R R	R R R



ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	c) <u>200 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.14	<u>Commission</u> a) <u>100 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) <u>150 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) <u>200 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) <u>250 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) <u>300 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) <u>350 DN</u> (i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.2	Supply, install and commission the following completely new gear operated (with handwheel) double flanged butterfly valves:				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) <u>100 DN</u> i) PN 16 ref. no. .... ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....	no no no	1 1 1	R R R	R R R
	b) <u>150 DN</u>  i) PN 16 ref. no. .... ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....  c) <u>200 DN</u>  i) PN 16 ref. no. .... ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....	no no no  no no no	1 1 1  1 1 1	R R R  R R R	R R R  R R R
	d) <u>250 DN</u> ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....  e) <u>300 DN</u> i) PN 16 ref. no. .... ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....  f) <u>350 DN</u> i) PN 16 ref. no. .... ii) PN 25 ref. no. .... iii) PN 40 ref. no. ....  Name of Valve Manufacturer: .....	no no  no no no  no no no	1 1  1 1 1  1 1 1	R R  R R R  R R R	R R  R R R  R R R
<b>7.3</b>	<b><u>Mark-up rates</u></b>				
7.3.1	Percentage mark-up on rates listed on term contracts	%	R		%R
7.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R		%R
7.4	Tip trucks				

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ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
(a)	6 m <sup>3</sup>	h	1	R	R
(b)	10 m <sup>3</sup>	h	1	R	R
	Flat bed trucks				
(a)	5t	km	1	R	R
(b)	7t	km	1	R	R
	LDV				
(a)	2 x 4WD	km	1	R	R
(b)	4 x 4WD	km	1	R	R
<b>Carried Forward</b>				R	R

<b>TOTAL OF SCHEDULE 6 CARRIED FORWARD TO SUMMARY</b>					
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**SCHEDULE 7 : WATERWORKS GATE VALVES**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8.	Valves fitted with wedge gates. Valves in compliance with SABS 664, waterworks applications with plain thrust collar, non-rising spindle and flanged ends.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
8.1	<u>Servicing and repair of valves in the following diameters and pressure ratings:</u>				
8.1.1	<u>Remove valve</u>				
	a) <b>80 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <b>100 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <b>150 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <b>200 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.2	<u>Transport from site</u>				
	a) <b>80 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <b>100 DN</b>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <b>150 DN</b>				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8.1.3	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Dismantle</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.4	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Blast</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
(ii) PN 16	no	1	R	R	
(iii) PN 25	no	1	R	R	
8.1.5	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Clean</u>				
	a) <u>80 DN</u>				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.6	<u>Inspect</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.7	<u>Submit inspection report</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>			R	
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8.1.8	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Lap</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.9	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
<u>Re-blast</u>					
a) <u>80 DN</u>					
(i) PN 10	no	1	R	R	
(ii) PN 16	no	1	R	R	
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(iii) PN 25	no	1	R	R
8.1.10	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
8.1.11	(iii) PN 25	no	1	R	R
	<u>Reassemble</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
8.1.12	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Pressure test</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R



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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.13	<u>Submit pressure test certificate</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.14	<u>Transport to site</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	c) <u>150 DN</u> (i) PN 10 (ii) PN 16	no no	1 1	R R	R R
	(iii) PN 25	no	1	R	R
8.1.15	d) <u>200 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25 <u>Install</u>	no no no	1 1 1	R R R	R R R
	a) <u>80 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25	no no no	1 1 1	R R R	R R R
	b) <u>100 DN</u> (i) PN 10 (ii) PN 16  (iii) PN 25	no no no	1 1 1	R R R	R R R
	c) <u>150 DN</u> (i) PN 10	no	1	R	R
8.1.16	(ii) PN 16 (iii) PN 25	no no	1 1	R R	R R
	d) <u>200 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25 <u>Commission</u>	no no no	1 1 1	R R R	R R R
	a) <u>80 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25	no no no		R R R	R R R
	b) <u>100 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25	no no no	1 1 1	R R R	R R R
	c) <u>150 DN</u> (i) PN 10	no	1	R	R
	(ii) PN 16 (iii) PN 25	no no	1 1	R R	R R
	d) <u>200 DN</u> (i) PN 10 (ii) PN 16 (iii) PN 25	no no no	1 1 1	R R R	R R R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8.2	Supply, install and commission the following gate valves fitted with wedge gates. Valves to comply with SABS 664, waterworks applications with cap top, plain thrust collar, non-rising spindle, clockwise closing and having flanged ends:				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.3	<b><u>Specialist Dayworks ( compulsory)</u></b>				
8.3.1	Dayworks labour by specialist valve subcontractor.	hr	1	R	R
8.4	<b><u>Mark-up rates</u></b>				
8.4.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
8.4.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R	%	R
8.5	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
8.6	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
8.7	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
<b>Carried Forward</b>				R	R
<b>TOTAL SCHEDULE 7 CARRIED FORWARD TO SUMMARY</b>				R	

**SCHEDULE 8 : RESILIENT SEAL GATE VALVES AND SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.	<b><u>WATERWORKS GATE VALVES</u></b> Valves fitted with wedge gates. Valves in compliance with SABS 664, waterworks applications with plain thrust collar, non-rising spindle and flanged ends.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
9.1	<u>Servicing and repair of valves in the following diameters and pressure ratings:</u>				
9.1.1	<u>Remove valve</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.2	<u>Dismantle</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.1.3	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Blast</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.4	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
(i) PN 10	no	1	R	R	
(ii) PN 16	no	1	R	R	
(iii) PN 25	no	1	R	R	
9.1.5	<u>Clean</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.5	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Inspect</u>				
a) <u>80 DN</u>					

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
9.1.6	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Submit inspection report</u>				
	a) <u>80 DN</u>			R	R
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
9.1.7	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>La</u>				
	<u>p</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.8	<u>Re-blast</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.9	<u>Epoxy coat (min thickness 300 micron)</u>				
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.1.10	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Reassemble</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
(i) PN 10	no	1	R	R	
9.1.11	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	<u>Pressure test</u>				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
b) <u>100 DN</u>					
(i) PN 10	no	1	R	R	
9.1.12	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
<u>Submit pressure test certificate</u>					



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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.1.13	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
d) <u>200 DN</u>					
(i) PN 10	no	1	R	R	
(ii) PN 16	no	1	R	R	
(iii) PN 25	no	1	R	R	
	<u>Install</u>				
9.1.14	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	No	1	R	R
	(iii) PN 25	No	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	No	1	R	R
	(ii) PN 16	No	1	R	R
	(iii) PN 25	no	1	R	R
d) <u>200 DN</u>					
(i) PN 10	no	1	R	R	
(ii) PN 16	no	1	R	R	
(iii) PN 25	no	1	R	R	
	<u>Commission</u>				
a) <u>80 DN</u>					
(i) PN 10	no	1	R	R	
(ii) PN 16	no	1	R	R	
(iii) PN 25	no	1	R	R	
b) <u>100 DN</u>					

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
<b>9.2</b>	Supply, install and commission the following gate valves fitted with wedge gates. Valves to comply with SABS 664, waterworks applications with cap top, plain thrust collar, non-rising spindle, clockwise closing and having flanged ends:				
	a) <u>80 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) <u>100 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) <u>150 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) <u>200 DN</u>				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
<b>9.3</b>	<b><u>Mark-up rates</u></b>				
9.3.1	Percentage mark-up on rates listed on term contracts	%	R1		% R
9.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R		% R
9.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
9.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
<b>TOTAL OF SCHEDULE 8 CARRIED FORWARD TO SUMMARY</b>					

**SCHEDULE 9 : WAFER PATTERN CHECK VALVES AND THE SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.	<b>WAFER PATTERN CHECK VALVES</b> Compact, single door, wafer pattern check valves.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.			R	
10.1	<u>Servicing and repair of valves in the following diameters and pressure rating PN25</u>				
10.1.1	<u>Remove valve</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.2	<u>Dismantle</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.3	<u>Blast</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.4	<u>Clean</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.5	<u>Inspect</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.6	<u>Submit inspection report</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.7	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.8	<u>Reassemble</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.9	<u>Pressure test</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.1.10	<u>Submit pressure test certificate</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.11	<u>Install</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.12	<u>Commission</u>				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
<b>10.2</b>	<p>Supply, install and commission the following completely new compact wafer pattern check valves, having a free unobstructed orifice when open.                      Valve to have a cast iron body, a <u>single stainless steel disc</u> with torsion spring and inserted seat with sealing O-ring. Valve suitable for installation between the specified flange pressure ratings.</p> <p>a) <u>100 DN</u>                      (i) PN 25 ref. no. ....                      (ii) PN 40 ref. no. ....</p> <p>Name of Manufacturer:                      .....</p> <p>b) <u>150 DN</u>                      (i) PN 25 ref. no. ....                      (ii) PN 40 ref. no. ....</p> <p>Name of Manufacturer:                      .....</p> <p>c) <u>200 DN</u>                      (i) PN 25 ref. no. ....                      (ii) PN 40 ref. no. ....</p> <p>Name of Manufacturer:                      .....</p>	no no  no no  no no	1 1  1 1	R R  R R	R R  R R
<b>10.3</b>	<b><u>Mark-up rates</u></b>				
10.3.1	Percentage mark-up on rates listed on term contracts	%			% R
10.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%			% R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
10.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
10.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			R	R
	<b>TOTAL SCHEDULE 9 CARRIED FORWARD TO SUMMARY</b>			R	

**SCHEDULE 10 : HYDRAULIC FLOW CONTROL VALVES AND THE SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.	<b>HYDRAULIC FLOW CONTROL VALVES</b> Hydraulically operated, Y-pattern body, flow rate control valve with double-chambered diaphragm actuator, complete with pitot tube, flow rate pilot valve and large control filter.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
11.1	<u>Servicing and repair of valves in the following diameters and pressure rating:</u>				
11.1.1	<u>Remove valve</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.2	<u>Dismantle</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.3	<u>Blast</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.4	<u>Clean</u>				
	a) <u>100DN</u>				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.1.5	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	<u>Inspect all wearing parts including pilot valve</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.6	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.7	<u>Submit inspection report</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
11.1.8	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.8	<u>Replace body seats</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.8	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
11.1.8	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	<u>Epoxy coat (min thickness 300 micron)</u>				



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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) <u>100DN</u> (i) PN 16 (ii) PN 25	no no	1 1	R R	R R
	b) <u>150DN</u> (i) PN 16 (ii) PN 25	no no	1 1	R R	R R
	c) <u>200DN</u> (i) PN 16 (ii) PN 25	no no	1 1	R R	R R
11.1.9	<u>Reassemble</u>				
	a) <u>100DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
	b) <u>150DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
	c) <u>200DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
11.1.10	<u>Pressure test and reset operation limits</u>				
	a) <u>100DN</u> (i) PN 16 (ii) PN 25	no no	1 1	R R	R R
	b) <u>150DN</u> (i) PN 16 (ii) PN 25	no no	1 1	R R	R R
11.1.11	<u>Submit pressure test certificate and confirm correct setting of operation limits</u>				
	c) <u>200DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
	a) <u>100DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
	b) <u>150DN</u> (i) PN 16  (ii) PN 25	no  no	1  1	R  R	R  R
	c) <u>200DN</u> (i) PN 16	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 25	no	1	R	R
11.1.12	<u>Install</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.13	<u>Commission</u>				
	a) <u>100DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) <u>150DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) <u>200DN</u>				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.2	Supply, install and commission the following completely new flanged, hydraulically operated, Y-pattern body, flow rate control valve with double-chambered diaphragm actuator, complete with pitot tube, flow rate valve and control tubing:				
	a) <u>100 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	b) <u>150 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	c) <u>200 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	Name of Manufacturer: .....				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b>Subtotal Carried Forward</b>				R	
<b>11.3</b>	<b><u>Mark-up rates</u></b>				
11.3.1	Percentage mark-up on rates listed on term Contracts	%	R	% R	
11.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R	% R	
11.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
11.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
11.5	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			R	R
	<b>TOTAL SCHEDULE 10 CARRIED FORWARD TO SUMMARY</b>			R	

**SCHEDULE 11 : SURGE ANTICIPATING CONTROL VALVE**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12.	<b><u>HYDRAULICALLY OPERATED SURGE ANTICIPATING CONTROL VALVE</u></b> Hydraulically operated, Y-pattern body, surge anticipating control valve with double-chambered diaphragm actuator, complete with 3 way sustaining pilot, relief pilot, V-port throttling plug and large control filter. <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
12.1	<u>Servicing and repair of valves in the following diameters and pressure rating:</u>				
12.1.1	<u>Remove valve</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.2	<u>Dismantle</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.3	<u>Blast</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.4	<u>Clean</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.5	<u>Inspect all wearing parts including pilot valve</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.6	<u>Submit inspection report</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.7	<u>Replace body seats</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.8	<u>Epoxy coat (min thickness 300 micron)</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.9	<u>Reassemble</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.10	<u>Pressure test and reset operation limits</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12.1.11	<u>Submit pressure test certificate and confirm correct setting of operation limits</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.12	<u>Install</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.13	<u>Commission</u>				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
<b>12.2</b>	Supply, install and commission the following completely new flanged, hydraulically operated, Y-pattern body, surge anticipating control valve with double-chambered diaphragm actuator, complete with 3-way sustaining pilot, relief pilot, V-port throttling plug, large control filter and control tubing:				
	a) <u>150 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
	b) <u>200 DN</u>				
	(i) PN 16 ref. no. ....	no	1	R	R
	(ii) PN 25 ref. no. ....	no	1	R	R
	Name of Manufacturer: .....				
<b>12.3</b>	<b><u>Mark-up rates</u></b>				
12.3.1	Percentage mark-up on rates listed on term contracts	%	R		%R
12.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R		%R
12.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
12.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
12.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			R	R
	<b>TOTAL SCHEDULE 11 CARRIED FORWARD TO SUMMARY</b>			R	R

**SCHEDULE 12 : PUMP (CENTRIFUGAL, AXIAL FLOW, VERTICAL OR HORIZONTAL SPLITS, MULTI STAGE)**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
13.	<b><u>PUMP</u></b> Centrifugal, axial flow, horizontal split case, dual stage, flow rate 100 l/s, motor rating 185 kW.  <u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
13.1	<u>Servicing and repair of one pump:</u>				
13.1.1	Operate pumpset on site in its installed position, establish and record:				
	a) Current drawn on each phase	set	1	R	R
	b) Vibration tests on pump bearings	set	1	R	R
	c) Vibration tests on motor bearings	set	1	R	R
	d) Check alignment of pump and motor	set	1	R	R
13.1.2	Disconnect mechanical coupling between pump and motor and record: vibration tests on motor Bearings	set	1	R	R
13.1.3	Remove (on site) top half casing of pump, inspect and report	set	1	R	R
13.1.4	Uncouple shaft coupling and loose pipework	set	1	R	R
13.1.5	Remove pump	no	1	R	R
13.1.6	Dismantle pump in workshop	no	1	R	R
13.1.7	Clean pump	no	1	R	R
13.1.8	Inspect	no	1	R	R
13.1.9	Submit inspection report	no	1	R	R
13.1.10	Blast	no	1	R	R
13.1.11	Epoxy coat internally	no	1	R	R
13.1.12	Supply and replace shaft with new	no	1	R	R
13.1.13	Supply and replace 425 dia bronze suction impeller with new	no	1	R	R
13.1.14	Supply and replace 425 dia bronze delivery impeller with new	no	1	R	R
13.1.15	Supply and fit new shaft sleeves	set	1	R	R
13.1.16	Supply and fit new bearing (DE + NDE)	set	1	R	R
13.1.17	Supply and fit new neckrings and wearing rings	set	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
13.1.18	Supply and fit new water flingers	set	1	R	R
13.1.19	Balance rotating assembly and submit test report	no	1	R	R
13.1.20	Supply and replace packings	set	1	R	R
13.1.21	Reassemble pump	no	1	R	R
13.1.22	Coat pump externally to existing colour code	no	1	R	R
13.1.23	Supply test report	no	1	R	R
13.1.24	Install, connect and align	set	1	R	R
13.1.25	Test run and commission	set	1	R	R
13.1.26	Supply condition of plant report on all work done as well as alignment control sheet	set	1	R	R
13.1.27	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor for V-belts or pump coupling for horizontal multistage pumps:				
	(i) 2 stage	no	1	R	R
	(ii) 3 stage	no	1	R	R
	(iii) 4 stage	no	1		
	(iv) 5 stage	no	1		
	(v) 6 stage			R	R
	(vi) 7 stage	no	1	R	R
	(vii) 11 stage	no	1		
	(viii) 14 stage				
13.1.28	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor for V-belts or pump coupling for vertical multistage pumps:				
	(i) 0.5kW				
	(ii) 1.1kW				
	(iii) 5.5kW	no	1	R	R
	(iv) 7.5kW	no	1	R	R
	(v) 11kW	no	1	R	R
	(vi) 37kW	no	1	R	R
13.1.29	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor or pump coupling and end-suction pumps:				
	(i) 065 – 40 - 160	no	1	R	R
	(ii) 065 – 40 - 250	no	1	R	R
	(iii) 065 – 40 - 315	no	1	R	R
	(iv) 065 – 50 - 200	no	1	R	R
	(v) 065 – 50 - 250	no	1	R	R
	(vi) 065 – 50 - 315	no	1	R	R
13.1.30	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor or pump coupling and progressive cavity pumps:				
	(i) HD 7	no	1	R	R
	(ii) HD 10 H	no	1	R	R
	(iii) HD 20 H	no	1	R	R
	(iv) HD 45 H	no	1	R	R
	(v) HD 115 H	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
13.1.31	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor or pump coupling and Split case pumps:				
	(i) Omega 100	no	1	R	R
	(ii) Omega 250	no	1	R	R
	(iii) EME 200 - 250	no	1	R	R
13.1.32	Supply, installation, connection, testing and commissioning of new pumps, including shaft alignment of motor or pump coupling and Submersible pumps:				
	(i) 0.5kW	no	1	R	R
	(ii) 1.1kW	no	1	R	R
	(iii) 2.2kW	no	1	R	R
	(iv) 3kW	no	1	R	R
	(v) 18Kw	no	1	R	R
	(vi) 22kW	no	1	R	R
	(vii) 30kW	no	1	R	R
	(viii) 37kW	no	1	R	R
<b>13.2</b>	<b><u>Mark-up rates</u></b>				
13.2.1	Percentage mark-up on rates listed on term contracts	%	R		% R
13.2.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R		% R
13.3	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
13.4	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
13.5	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			R	
	<b>TOTAL SCHEDULE 12 CARRIED FORWARD TO SUMMARY</b>			R	

Note: BID price must include value added tax.



**SCHEDULE 13 : SCREENS (TRASH RACKS) AND THE SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
15.	<b><u>SCREENS</u></b> Trash racks (repairs)			R	
	<u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
15.1	<u>Repairs to screens</u> Note: differentiation made between screened areas.				
15.1.1	<u>Remove screen</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.2	<u>Dismantle</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.3	<u>Remove algae growth and clean</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.4	<u>Inspect and deliver report</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.5	<u>Supply material and repair</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.6	<u>Corrosion protection by hot-dip galvanizing</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.7	<u>Assemble and transport to site</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
15.1.8	<u>Install and test</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
15.1.9	<u>Submit test reports</u>				
	a) up to 2,5m <sup>2</sup>	no	1	R	R
	b) exceeding 2,5m <sup>2</sup> up to 5m <sup>2</sup>	no	1	R	R
	c) exceeding 5m <sup>2</sup> up to 16m <sup>2</sup>	no	1	R	R
<b>15.3</b>	<b><u>Mark-up rates</u></b>				
15.3.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
15.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R	%	R
15.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
15.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
15.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
	<b>SUBTOTAL</b>			<b>R</b>	<b>R</b>
	<b>TOTAL SCHEDULE 13 CARRIED FORWARD TO SUMMARY</b>			<b>R</b>	<b>R</b>

**SCHEDULE 14 : DOSING (CHEMICAL) AND THE SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE RATE	AMOUNT
<b>16.</b>	<b><u>DOSING (CHEMICAL)</u></b>				
	Chemical dosing equipment as installed in water treatment works.				
	<u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
16.1	<u>Repairs to chemical dosing equipment</u>				
16.1.1	Inspect operation of diaphragm actuated chemical dosing pump on site	set	1	R	R
16..2	Disconnect and remove	set	1	R	R
16.1.3	Dismantle, inspect and deliver report	set	1	R	R
16.1.4	Refurbish by the supply and installation of the following new spare parts:				
	a) motor drive unit; 3 ph; 0,09 Kw	no	1	R	R
	b) motor drive unit; 3 ph; 0,25 Kw	no	1	R	R
	c) PVC dosing head (max. capacity 100 l/h; max pressure 10 bar)	no	1	R	
	d) Stainless steel dosing head (max. capacity 100 l/h; max pressure 10 bar)	no	1	R	R
	e) Piston spring	no	1	R	R
	f) Diaphragm	no	1	R	R
	g) Diaphragm protection valve	no	1	R	R
	h) O-rings	set	1	R	R
16.1.5	Assemble and transport to site	set	1	R	R
16.1.6	Install and test	set	1	R	R
16.1.7	Submit test reports	set	1	R	R
<b>16.2</b>	Supply, install and commission the following completely new diaphragm actuated chemical dosing pumps:				
	a) with PVC dosing head (max. capacity 100 l/h; max. pressure 10 bar) and 0,25 kW drive motor (3 phase) Model reference: ..... Manufacturer: .....	set	5	R	R
	b) with stainless steel dosing head (max. capacity 100 l/h; max pressure 10 bar) and 0,25 kW drive motor (3 phase) Model reference: ..... Manufacturer: .....	set	5	R	R
<b>16.3</b>	<b><u>Mark-up rates</u></b>				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
16.3.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
16.4.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R	%	R
16.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
16.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
16.6	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
<b>SUBTOTAL</b>				<b>R</b>	<b>R</b>
<b>TOTAL SCHEDULE 14 CARRIED FORWARD TO SUMMARY</b>				<b>R</b>	

**SCHEDULE 15 : CHLORINATION SYSTEM AND THE SUPPLY OF ALL MATERIAL**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
17.	<b><u>CHLORINATION EQUIPMENT</u></b>				
	<u>Note:</u> Rates to include the cost of all staff required plus overheads where appropriate and the guarantee of all parts, materials and workmanship, but exclude the cost of spares unless the latter is specified.				
17.1	<u>Service and repair of chlorine gas dosing equipment</u>				
17.1.1	Disconnect and inspect the following chlorine gas dosing equipment (with capacity of 250 g/h) on site:				
	a) vacuum regulator	set	1	R	R
	b) dosing unit	set	1	R	R
	c) automatic change-over device	set	1	R	R
	d) Injector	set	1	R	R
17.1.2	Remove equipment on site	set	1	R	R
17.1.3	Dismantle in workshop and inspect:				
	a) vacuum regulator	set	1	R	R
	b) dosing unit	set	1	R	R
	c) automatic change-over device	set	1	R	R
	d) Injector	set	1	R	R
17.1.4	Supply and install the following new spare parts for the vacuum regulator and dosing unit:				
	a) contact manometer	no	1	R	R
	b) cylinder connection valve	no	1	R	R
	c) pressure spring	no	1	R	R
	d) diaphragm disc and ring	no	1	R	R
	e) O-ring	set	1	R	R
	f) Gaskets	set	1	R	R
	g) valve seat	no	1	R	R
17.1.5	Supply and install the following new spare parts for the injector:				
	a) Diffuser	no	1	R	R
	b) O-ring	set	1	R	R
	c) screw-in connection	no	1	R	R
	d) Diaphragm	no	1	R	R
	e) diaphragm disc and ring	set	1	R	R
	f) pressure spring	no	1	R	R
	g) Piston	no	1	R	R
17.1.6	Return the chlorination equipment to site and re-install the following:				

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) vacuum regulator	set	1	R	R
	b) dosing unit	set	1	R	R
	c) automatic change-over device	set	1	R	R
	d) Injector	set	1	R	R
17.1.7	Commission and test:				
	a) vacuum regulator	set	1	R	R
	b) dosing unit	set	1	R	R
	c) automatic change-over device	set	1	R	R
	d) Injector	set	1	R	R
17.2	Supply, install and commission one completely new chlorine gas dosing unit (with capacity of 250 g/h) Model: ..... Manufacturer: .....	no	1	R	R
17.3	<b>Mark-up rates</b>				
17.3.1	Percentage mark-up on rates listed on term contracts	%	R		% R
17.3.2	Percentage mark-up on items (with attached invoices) approved by the Employer or his representative for materials, (other than those set out in this list) used in execution of work ordered by the Employer	%	R		% R
17.4	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
	LDV				
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
<b>SUBTOTAL</b>				<b>R</b>	<b>R</b>
<b>TOTAL SCHEDULE 15 CARRIED FORWARD TO SUMMARY</b>				<b>R</b>	

**SCHEDULE 16 : DAYWORKS**

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b>18.1</b>	<b>DAYWORKS LABOUR</b>				
	(a) Contractor's Representative	h	1	R	R
	(b) Surveyor	h	1	-	R
	(c) Qualified Artisan				
	(i) Plumber	h	1	R	R
	(ii) Boilermaker	h	1	R	R
	(iii) Bricklayer	h	1	R	R
	(iv) Plasterer	h	1	R	R
	(v) Welder with API 1104 Certificate	h	1	R	R
	(vi) Electrician	h	1	R	R
	(d) Foreman, leader-hand	h	1	R	R
	(e) Semi-skilled labourer	h	1	R	R
	(f) Labourer	h	1	R	R
	(g) Other				
	(i) .....	h	1	R	Rate only
	(ii) .....	h	1	R	Rate only
	(iii) .....	h	1	R	Rate only
	(iv) .....	h	1	R	Rate only
<b>18.2</b>	<b>PLANTHIRE: WORK RATES ON SITE</b>				
18.2.1	Crane 65 t - 80 t capacity	h	1	R	R
18.2.2	TLB 60 kW - 70 Kw	h	1	R	R
18.2.3	Crawler Excavator 140 kW - 150 Kw	h	1	R	R
18.2.4	Bulldozer 160 kW - 170 Kw	h	1	R	R
18.2.5	Wheel loader 140 kW - 150 Kw	h	1	R	R
18.2.6	Motor graders 150 kW - 160 kW	h	1	R	R
18.2.7	Wheel excavators 0,4 - 1,25 m <sup>3</sup> bucket size	h	1	R	R
18.2.8	Wheel tractor scrapers 15,0 - 16 m <sup>3</sup>	h	1	R	R
18.2.9	Tow tractors 200 kW - 250 kW	h	1	R	R
18.2.10	(a) Water tankers 5 000 litre	h	1	R	R
	(b) Water tankers 10 000 litre	h	1	R	R
18.2.11	Dump trucks 10 - 15 m <sup>3</sup>	h	1	R	R
18.2.12	Tip trucks				
	(a) 6 m <sup>3</sup>	h	1	R	R
	(b) 10 m <sup>3</sup>	h	1	R	R
18.2.13	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
18.2.14	LDV				
	(a) 2 x 4WD	km	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) 4 x 4WD	km	1	R	R
18.2.15	Lowbed 50 ton	km	1	R	R
18.2.16	Plate compactors & tampers	h	1	R	R
18.2.17	Grid rollers. Ballasted mass 14 600 kg	h	1	R	R
18.2.18	Pneumatic tyred rollers 4 000 load/wheel kg	h	1	R	R
18.2.19	Self propelled vibrating roller (smooth) 7000 – 11 300 kg	h	1	R	R
18.2.20	Self propelled vibrating roller (padfoot) 5 900 – 12 000 kg	h	1	R	R
18.2.21	Walk-behind vibrating rollers				
	(a) 500 - 630 kg	h	1	R	R
	(b) 980 - 1 350 kg	h	1	R	R
18.2.22	Towed vibrating roller	h	1	R	R
18.2.23	Portable compressors - Diesel (9,0 - 10,0 m <sup>3</sup> /min.)	h	1	R	R
18.2.24	Concrete mixer (350 ℓ: diesel driven)	h	1	R	R
18.2.25	Concrete saw (self propelled) 10 - 15 kW	h	1	R	R
18.2.26	Concrete vibrators (35 - 60 mm DN)	h	1	R	R
18.2.27	Dumpers 0,5 m <sup>3</sup> (Hydraulic tip)	h	1	R	R
18.2.28	Water pump with 80 mm DN outlet (diesel driven)	h	1	R	R
18.2.29	Arc-welding unit (300 A)	h	1	R	R
18.2.30	Generating sets				
	(a) 1,5 kVA (petrol) 220V	h	1	R	R
	(b) 5 kVA (petrol) 220V	h	1	R	R
	(c) 30 kVA (diesel) 380V - 3ph	h	1	R	R
	(d) 50 kVA (diesel) 380V - 3ph	h	1	R	R
	(e) 100 kVA (diesel) 380V - 3ph	h	1	R	R
<b>18.3</b>	<b>LABOUR BASED TOOLS</b>				
	(a) Pick	day	1	R	R
	(b) Shovel	day	1	R	R
	(c) Crowbar	day	1	R	R
	(d) Bucket (10 ℓ )	day	1	R	R
	(e) Wheelbarrow	day	1	R	R
18.4	Percentage mark-up on items approved by the client or representative with attached invoices for material used.	%	R	R	R
	SUBTOTAL			R	R
<b>TOTAL SCHEDULE 16 CARRIED FORWARD TO SUMMARY</b>				<b>R</b>	<b>R</b>



**APPOINTMENT OF SERVICE PROVIDER FOR MECHANICAL AND ELECTRICAL WORKS 36 MONTHS**

**SUMMARY OF SCHEDULES**

SCHEDULE 2	:	SMALL AND MEDIUM SIZE ELECTRICAL PANELS	R_____
SCHEDULE 3	:	ELECTRIC MOTORS	R_____
<b>SUBTOTAL</b>		<b>SCHEDULES 2- 3,</b>	<b>R_____</b>
SCHEDULE 4	:	BALL VALVES	R_____
SCHEDULE 5	:	BUTTERFLY VALVES (WAFER TYPE)	R_____
SCHEDULE 6	:	BUTTERFLY VALVES (DOUBLE FLANGED)	R_____
SCHEDULE 7	:	WATERWORKS GATE VALVES	R_____
SCHEDULE 8	:	RESILIENT SEAL GATE VALVES	R_____
SCHEDULE 9	:	WAFER PATTERN CHECK VALVES	R_____
SCHEDULE 10	:	HYDRAULIC FLOW CONTROL VALVES	R_____
SCHEDULE 11	:	SURGE ANTICIPATING CONTROL VALVE	R_____
SCHEDULE 12	:	PUMP (CENTRIFUGAL, AXIAL FLOW, HORIZONTAL SPLITS, DUAL STAGE)	R_____
SCHEDULE 13	:	SCREENS (TRASH RACKS)	R_____
SCHEDULE 14	:	DOSING (CHEMICAL)	R_____
SCHEDULE 15	:	CHLORINATION SYSTEM	R_____
<b>SUBTOTAL SCHEDULES 4-15,</b>			<b>R_____</b>
<b>SUBTOTAL SCHEDULES 2-15 CARRIED FORWARD TO "FORM OF BID"</b>			<b>R_____</b>
SCHEDULE 1	:	GENERAL (COMPULSORY)	R_____
SCHEDULE 16	:	DAYWORKS( COMPULSORY)	R_____
<b>SUBTOTAL SCHEDULES 1, 16</b>			<b>R_____</b>
<b>TOTAL SCHEDULES 1-16</b>			<b>R_____</b>

CONTRACTOR: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_  
COMPANY NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

SBD 7.5

*Contractor* *Witness 1* *Witness 2* *Employer* *Witness 1* *Witness 2*