OR TAMBO DISTRICT MUNICIPALITY

O.R. TAMBO
DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

SEPTEMBER 2022

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

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PROJECT NO: ORTDM SCMU 07-22/23

TENDERS ARE HEREBY INVITED FOR:

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 07-22/23: APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS.**
Tenderers should have a CIDB contractor grading designation of **6ME** 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, ground 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 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

T1 TENDERING PROCEDURES

OR TAMBO DISTRICT MUNICIPALITY
PROJECT NO: ORTDM SCMU 07-22/23
APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

T1.1 TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited from suitably qualified and experienced service providers for **APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 07-22/23	APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS	Date: 12 October 2022 Time: 10H00 Venue: O.R Tambo Hall, Government Printers, Southernwood, Mthatha

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.

Bid documents should be downloaded on the e-Tender website (www.etenders.gov.za) alternatively on the OR Tambo website (www.ortambodm.gov.za).

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, Second Floor, O. R. Tambo District Municipality Building, Nelson Mandela Drive, Myezo Park, Mthatha, Eastern Cape, not later than 12H00pm **Friday, 11 November 2022**.

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).

Tender submissions will be opened in public at 12h00pm on the tender closing date. Bids will be opened by the Supply Chain Management Unit at ground Floor, O.R. Tambo House, Myezo, Mthatha.

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.

NB: CERTIFICATION OF DOCUMENTS MUST NOT BE MORE THAN SIX (6) MONTHS FROM DATE CERTIFIED BY COMMISSIONER OF OATHS.

THE BID WILL BE REJECTED IF THE BIDDER FAILS TO:

- Complete fully the bid document or to provide the information requested, or to sign the bid at the appropriate spaces provided or next to errors, his/her/ its bid
- Fill and properly sign the form of offer.

- Attach proof of registration with CSD.
- Attach proof of registration with Construction Industry Development Board (CIDB)
- Attach proof of latest municipal rates and taxes statement of the bidder indicating that rates and taxes are not in arrears for more than 3 months.
- Attach proof of latest municipal rates and taxes statement of each company director indicating that rates and taxes are not in arrears for more than 3 months.
- Attach proof of latest municipal water and sanitation charges statement of the bidder indicating that rates and taxes are not in arrears for more than 3 months for bidders who reside in the O. R. Tambo District Municipality area.
- Attach proof of latest municipal water and sanitation charges statement of each company director indicating that rates and taxes are not in arrears for more than 3 months for bidders who reside in the O. R. Tambo District Municipality area.
- Attach confirmation of address from a ward councillor where the bidder and company directors operate and reside in a peri-urban area where no rates and taxes and service charges are not billed.
- Attach a copy of a valid lease agreement where the bidder does not own the property they are operating from.
- Attach joint Venture Agreement or Consortium Agreement signed and initialled on each page (if applicable).
- Certified Copies of CIDB certificate grading 6ME 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

Only Bidders who score a minimum of 60 points in Stage 1 will proceed to be evaluated further in Stage 2.

Item	**Weight**
Stage 1 of Evaluation-Functionality	**100**
Similar Projects	40
Experience of the Project Team	45
Plant and Equipment	15
Stage 2 - Price & B-BBEE Status Level	**100**
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; or Telephone No. 047 501 6400/6492.

ORTDM SCMU 07-22/23: APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

Supply Chain Management enquiries may be directed to the General Manager SCM, Mr. Sakhiwo Hopa; Email: sakhiwoh@ortambodm.gov.za or Telephone No.: 047 501 6448 / 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.

S MKHIZE
Municipal Manager

O. R. TAMBO DISTRICT MUNICIPALITY

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APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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	
F.1	**General**
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: **Tender** 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
	Contract **Part 1 : Agreements and Contract data** C1.1 Forms of Offer and Acceptance C1.2 Contract Data **Part 2 : Pricing Data** C2.1 Pricing Instructions C2.2 Bill of Quantities **Part 3 : Scope of Work** C3.1 Project Specifications

	C3.2 Project Scope
F1.3	**Interpretation** 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	**Communication:** Communication with all stakeholders shall be through the O. R. Tambo Municipality's District Representative. Ccommunications shall be in the English language. The Employer shall not take any responsibility for non-receipt of communications from or by a tenderer
	Contact person: Mr. L Mashiya Tel: 047 501 6400 / 6492
F.1.5	**The employer's right to accept or reject any tender offer**
F.1.5.1	**Reject or accept** 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.
F.1.6	**Procurement procedures**
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	**Tenderer's obligations**
F.2.1.1	**Eligibility** 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.
F.2.1.2	**CIDB Grading** CIDB grading 6ME or Higher is required.
F.2.2	**Cost of tendering** 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.
F.2.3	**Check documents** Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.
F.2.4	**Confidentiality and copyright** Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.
F.2.5	**Reference documents** Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.
F2.6	**Acknowledge Addenda**

	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.	
F.2.7	The arrangements for a **compulsory clarification meeting** are:	
	Date: 12 October 2022 **Starting time:** 10h00	**Location:** O. R. Tambo District Hall, Government Printers, Southernwood, Mthatha
F.2.8	**Seek clarification** Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.	
F2.10	**Pricing the tender**	
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	**Alterations to documents** 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	**Alternative tender offers** 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:	
	Location of Tender box: Tender Box, Ground Floor, O. R. Tambo District Municipality Building, Nelson Mandela Drive, Myezo Park, Mthatha, Eastern Cape.	
	Physical address: O. R. Tambo House, Nelson Mandela Drive, Mthatha	
F.2.14	**Information and data to be completed in all respects** Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.	
F.2.15	**Closing time** The closing times for submission of Tenders are **12H00 on Friday, 11 November 2022**	
F.2.15	Telephonic, telegraphic, telex, facsimile or e-mailed Bid offers will **not** be accepted.	
F.2.16	**Tender offer validity** The Tender offer validity period is 90 Days as stated in the tender data.	
F.2.17	**Clarification of tender offer after submission** 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	**Provide other material** 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.
F2.20	**Submit securities, bonds, policies** 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.
F.2.23	**The tenderer is required to submit with his tender:** 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 6ME or Higher Certified copies of the original Company documents issued by register of Companies. Certified copies 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 BBBEE 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 moths
F.3	**The employer's undertakings**
F.3.1	**Respond to requests from the tenderer**
F.3.1.1	Respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.
F.3.2	**Issue Addenda** If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until 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.
F.3.4	**Opening of tender submissions**
F.3.4.1	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.
F.3.4.2	Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, preferences claimed and time for completion for the main tender offer only.
F.3.4.3	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.
F.3.6	**Non-disclosure** 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.
F.3.7	**Grounds for rejection and disqualification** Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.
F3.9	**Arithmetical errors, omissions and discrepancies**
F.3.9.1	Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words 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	**Clarification of a tender offer** Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

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
Stage 1 of Evaluation-Functionality	**100**
Similar Projects	40
Experience of the Project Team	45
Plant and Equipment	15
Stage 2 of Evaluation- Price & B-BBEE	**100**
Price	80
B-BBEE	20

Tender functionality / quality claimed

	Category of Quality / Functionality	Maximum tender evaluation points provided
B1.1	**Similar Projects (Electrical & Mechanical works)**	**40**
	Tenderer must have completed 4 projects or similar of a total value R8 000 000.00. **Copies of Completion Certificates or proof of such MUST be STAMPED & SIGNED by Client. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.**	40
	Tenderer must have completed 4 similar projects of a total value R6 000 000.00. **Copies of Completion Certificates or proof of such MUST be STAMPED & SIGNED by Client. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.**	30
	Tenderer must have completed 4 similar projects of a total value R4 000 000.00. **Copies of Completion Certificates or proof of such MUST be STAMPED & SIGNED by Client. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.**	20
	Tenderer must have completed 4 similar projects of a total value R2 000 000.00. **Copies of Completion Certificates or proof of such MUST be STAMPED & SIGNED by Client. No points will be awarded where proof or Completion Certificates have not been submitted with the Bid.**	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
B1.2	**Experience of Project Team** 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)**	**45**
	Mechanical Engineer/Technologist	**10**
	Previous experience in the Mechanical Engineering Practice with a minimum of 5 years; **Mechanical Engineer** = 10 points, 3-4 years = 5 points & 1-2 years = 3 points. **(Attach CV & Certificate/Qualification)**	
	Electrical Engineer/Technologist	**10**
	Previous experience in the Electrical Engineering Practice with a minimum of 5 years; **Electrical Engineer** = 10 points, 3-4 years = 5 points & 1-2 years = 3 points. **(Attach CV & Certificate/Qualification)**	
	Artisan Mechanical/Millwright	**10**
	Previous experience in the as a Milrwight with a minimum of 5 years; **Milrwight** = 10 points, 3-4 years = 5 points & 1-2 years = 3 points. **(Attach CV & Certificate/Qualification)**	
	Artisan Electrician	**05**
	Previous experience in the as an Electrician with a minimum of 5 years; **Electrician** = 5 points, 3-4 years = 3 points & 1-2 years = 1	

	points. **(Attach CV & Certificate/Qualification)**	
	Artisan Boiler Maker/Welder	**05**
	Previous experience in the as a Boiler Maker/Welder with a minimum of 5 years; Boiler **Maker/Welder** = 5 points, 3-4 years = 3 points & 1-2 years = 1 points. **(Attach CV & Certificate/Qualification)**	
	Safety Officer	**05**
	Previous experience in the as a Health and Safety Officer with a minimum of 5 years; Boiler **Health and Safety Officer =** 5 points, 3-4 years = 3 points & 1-2 years = 1 points. **(Attach CV & Certificate/Qualification)**	
	Where no CV and Qualification attached	**0**
	Plant and Equipment **(12 Ton Crane Truck, TLB, 12 Ton Low bed) Proof of Ownership or contract with the owner of the plant/equipment**	**15**
	All 03 of the above	**15**
	Crane plus TLB	**10**
	Crane plus Lowbed	**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

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

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	**Notice to unsuccessful tenderers** 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: www.ortambodm.org.za by listing the successful tender.
F.3.15	**Prepare contract documents** If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of: a) addenda issued during the tender period, b) inclusion of some of the returnable documents, c) other revisions agreed between the employer and the successful tenderer, and d) The schedule of deviations attached to the form of offer and acceptance, if any.
F.3.16	**Issue final contract** 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).

OR TAMBO DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

T2 RETURNABLE DOCUMENTS

T.2. LIST OF RETURNABLE DOCUMENTS

OR TAMBO DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

Returnable Documents (T2)

T2.1 List of Returnable Documents

T2.2 Returnable Schedules

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF SERVICE PROVIDERS FOR BOREHOLE EQUIPPING 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		Partner-ship		Person		Closed Corporation	

(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

_____

_____

_____

_____

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

(c) **List the Shareholders**

Name % Share Male/Female HDI (Yes/No)*

_____

_____

_____

_____

_____

_____

(Attach Certified Copies of ID'S of Shareholders)

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

_____

_____

_____

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)*

_____

_____

_____

(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)*****

_____

_____

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)*

_____

_____

_____

(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

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF *O.R. TAMBO DISTRICT MUNICIPALITY*					
BID NUMBER:	**ORTDM SCMU 07-22/23**	**CLOSING DATE:**	**11 NOVEMBER 2022**	**CLOSING TIME:**	**12.00PM**
DESCRIPTION:	APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS				

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

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

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	**CODE**		**NUMBER**		
CELLPHONE NUMBER					
FACSIMILE NUMBER	**CODE**		**NUMBER**		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	**TCS PIN:**		**OR**	**CSD No:**	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ **Yes** ☐ **No**		**B-BBEE STATUS LEVEL SWORN AFFIDAVIT**	☐ **Yes** ☐ **No**	

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

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐**Yes** ☐**No** **[IF YES ENCLOSE PROOF]**	**ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?**	☐**Yes** ☐**No** **[IF YES, ANSWER PART B:3]**
TOTAL NUMBER OF ITEMS OFFERED		**TOTAL BID PRICE**	**R**
SIGNATURE OF BIDDER	……	**DATE**	
CAPACITY UNDER WHICH THIS BID IS SIGNED			

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT	**SCM Department**	**CONTACT PERSON**	**Mr. L. Mashiya**
CONTACT PERSON	**Mr. Sakhiwo Hopa**	**TELEPHONE NUMBER**	**047 501 6492**
TELEPHONE NUMBER	**047 501 6449**	**FACSIMILE NUMBER**	**N/A**
E-MAIL ADDRESS	**sakhiwoh@ortambodm.gov.za**	**E-MAIL ADDRESS**	**mashiyal@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.

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: ……..

MBD 4

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state[1].

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

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

3.1 Full Name of bidder or his or her representative……

3.2 Identity Number: …….

3.3 Position occupied in the Company (director, trustee, shareholder[2]):

…….....

3.4 Company Registration Number……...

3.5 Tax Reference Number: ……

3.6 VAT Registration Number: ……

3.7 The names of all directors / trustees / shareholders' members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state?..... **YES / NO**

3.8.1 If yes, furnish particulars…….....

……

[1] MSCM Regulations: "in the service of the state" means to be –
a member of –
any municipal council;
any provincial legislature; or
the national Assembly or the national Council of provinces;

a member of the board of directors of any municipal entity;
an official of any municipality or municipal entity;
an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
a member of the accounting authority of any national or provincial public entity; or
an employee of Parliament or a provincial legislature.

[2] Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months? ……. **YES / NO**

3.9.1 If yes, furnish particulars……..……
…….....

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?.....**YES / NO**

3.10.1 If yes, furnish particulars ……
……
3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?.....**YES / NO**
3.11.1 If yes, furnish particulars……
……
3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?..... **YES / NO**
3.12.1 If yes, furnish particulars…….....
……
3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?.....**YES / NO**
3.13.1 If yes, furnish particulars…….....
……..
3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?..... **YES / NO**
3.14.1 If yes, furnish particular…….....
……
4. Full details of directors / trustees / members / shareholders.

Full name	**Identity number**	**State employee number**

…… ……
Signature **Date**

…… ……..
Capacity **Name of Bidder**

MBD 5

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

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

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 of 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

MBD 6.1

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

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

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

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:

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

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:

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

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

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

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:

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

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

……
……
……

ORTDM SCMU 07-22/23: APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

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.

WITNESS: 1. …… 2. ……	…….. SIGNATURE(S) OF BIDDER(S) DATE: …….. ADDRESS: ……..

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	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 *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		

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

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ……..…… CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM 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**

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all bids[1] invited.

2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. Take all reasonable steps to prevent such abuse;

b. Reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. Cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

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:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

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

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

ORTDM SCMU XX-20/22 – APPOINTMENT OF SERVICE PROVIDERS FOR BOREHOLE EQUIPPING 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[3] 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.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

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

Signature of the Tenderer: _____

FORM 2.1.5 PROPOSED KEY PERSONNEL

The Tenderer shall list below the key personne1 (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^2)

Equipment

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

Description:	**Number of units**
Description :	**Number of units**
Description:	**Number of units**

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	**Number of staff**

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.

Part or Type of Work	Proposed Sub-Contractor	Work Recently Executed by Subcontractor

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 TENDERDING 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.

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

TENDERDER'S TAX DETAILS

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

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

Signature of the Tenderer: _____

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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) ----------

---

TENDERDER'S REPRESENTATIVE: ----------

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

FORM 2.2.2 DECLARATION OF GOOD STANDING REGARDING TAX

SOUTH AFRICAN REVENUE SERVICES	Bid No: ……..…….. Closing Date: ……

DECLARATION OF GOOD STANDING REGARDING TAX

PARTICULARS

1. Name of Taxpayer/Bidder: .....
2. Trade Name: .....
3. Identification Number: (If applicable) | | | | | | | | | | | | | |
4. Company / Close Corporation registration number: | | | | | | | | | | |
5. Income Tax reference number: | | | | | | | | | | |
6. VAT registration number: (If applicable) | | | | | | | | | | |
7. PAYE employer's registration number: (If applicable) | | | | | | | | | | |
8. Monetary value of bid: | |

DECLARATION

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.*

……	……	……
SIGNATURE	**CAPACITY**	**DATE**

PLEASE NOTE:* **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 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

PART 1

C1 CONTRACT DATA

C1 AGREEMENT AND CONTRACT DATA

OR TAMBO DISTRICT MUNICIPALITY

PROJECT NO: ORTDM SCMU 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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:_____

_____

_____
(Tenderder'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 Tenderder'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 PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 R5 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 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING 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 07-22/23

APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

C3.1. SPECIFICATIONS

ORTDM SCMU 07-22/23: APPOINTMENT OF PANEL OF SERVICE PROVIDERS FOR MECHANICAL & ELECTRICAL WORKS AND BOREHOLE EQUIPPING FOR 36 MONTHS

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/repaired, 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.

Works are to be executed in the District, in all five local municipalities viz. King Sabatha Dalindyebo, Mhlontlo, Nyandeni, Port St Johns and Ingquza Hill.
District municipality will appoint one service provider per local municipality:

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 addressed 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 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 sued 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 Provion 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 Electricity distribution systems for offices, personnel housing and all other relevant equipment.

3.6.14 Electrified security fencing.

3.6.15 Such equipment as may be specified from time to time by the Engineer.

Competence in providing the following engineering services:

3.6.16 Efficiency tests on pump sets.

3.6.17 Condition monitoring of pump sets with the issue of appropriate quality test reports.

3.6.18 Reports associated with condition of plant, review of modifications and reports/manuals.

3.6.19 Rebuilding of pumps to an alternative specification.

3.6.20 Balancing of rotating elements and alignment according agent's specification.

3.6.21 Vibration monitoring on rotating elements.

3.6.23 Non-destructive testing using ultra sonic, magnetic particle inspections, due penetrate testing, hardness testing and radiography methods by sub-contracting specialists.

3.6.24 Machine facilities: Light, medium and heavy machining facilities.

3.6.25 Corrosion protection coatings as specified by the O.R. TAMBO DISTRICT MUNICIPALITY, (Blasting & Coating).

3.6.26 Mechanical, electrical and technical investigation expertise.

3.6.28 Mechanical manufacturing in accordance with drawings of the OR TAMBO DISTRICT MUNICIPALITY of small structures.

3.6.27 Reverse mechanical engineering techniques.

3.6.28 Underground cable fault location.

3.6.29 Radio and telemetry equipment.

3.6.30 Instruments and computer controlled equipment.

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

Competence in providing the following services:

3.6.32 Project management.

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

3.6.34 Liaison with original engineering manufacturers.

3.6.35 Implementation of statutory safety standards.

3.6.36 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/Technologists

Engineers shall be at least Graduate Engineers 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 trade test 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 electr4odes. 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 electrolitically 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 PRACTIVE 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^2 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^2 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^2 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^2 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^2 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^2 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^2 bare copper earth wire.

A 70 mm^2 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^2 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 mm2 copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the admin earth conductor of each switch-Committee. The proof 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^2 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. Fir 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 switchCommittees 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.

Contractor 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 leas 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 replay 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^2 conductors.

(3) Connection of outgoing circuits with current ratings in excess of that followed for 70 mm^2 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^2 may terminate on clamp type terminals where the clamping screws are not in direct contact with the conductor. All cables larger than 70 mm^2 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 sued throughout. The terminal numbers shall appear on the wiring diagrams of the switchCommittee.

Terminals for power wiring shall be separated from other terminals. Terminals for internal wiring shall no be interposed with terminals for external circuits. All connections to terminals shall be identified with numbers.

Where switch Committees consist 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-instated when reassembling the Committee.

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^2.

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 switchCommittees 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 contractors 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 an 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 sped 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.

MOTOR RATING	**METHOD OF STARTING**	**CABLE TERMINAL BOX SUITABLE FOR THE FOLLOWING CABLES**
5,5 kW	DOL	1 x 6 mm^2 4-core PVC cable
7,5 kW	DOL	1 x 6 mm^2 4-core PVC cable
11 kW	Star-Delta	2 x 10 mm^2 4-core PVC cable
15 kW	Star-Delta	2 x 10 mm^2 4-core PVC cable
18,5 kW	Star-Delta	2 x 10 mm^2 4-core PVC cable
22 kW	Star-Delta	2 x 10 mm^2 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 place 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 ficing 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 sand metal parts shall be stainless steel or no 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^2 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

Section 4.2

PROJECT SPECIFICATIONS

Portion 1: The Works

PROJECT SPECIFICATIONS

PORTION 1: THE WORKS

PS 1 GENERAL DESCRIPTION OF THE WORKS

BIDs are invited for civil engineering works associated with Water Services and Water Resource Management in O.R. Tambo District Municipality.

Works are to be executed in O.R. Tambo District Municipality

The operation area is in the Locality Plans of O.R. Tambo District Municipality. 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 site establishment cost (see PSA 15).

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

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

The works to be executed under this contract comprise the following:

1.1 General

1.2Small diameter clear water supply pipelines

1.12Palisade Fencing

1.13Complete pumphouse installation for boreholes & small installations

1.1410 kl PVC storage tank on floor – 3 metre high tank stand and 6 metre high tank stand

1.15Dayworks

1.16Training

1.17Appointment of Small Contractors

Execution of the work will be done by one of the following methods, or as a combination of

the methods:

(i) Main contractor to employ people from the vicinity where work is to be executed.

(ii) Nominated emerging sub-contractors, which are also to be formally contracted and trained by the established contractor.

(iii) Established and emerging contractor which have entered into a joint venture agreement.

The Bidders must take note of the fact that it will be expected of the successful Bidder to enter into a formal agreement with the Nominated Emerging Contractor (=NEC) and/or the "normal" Emerging Contractor (=EG). The established/main Contractor (=MC) will be responsible for the

quality of the work of the NEC and/or EC. Provision has been made in Schedule 1 of the Schedule of Rates for a % mark-up on the amount payable to the NEC by the MC.

The various local municipalities in Sekhukhune District are indicated on the map. Although not foreseen at this stage, it may happen that it will be expected of the Contractor to execute some work outside the existing borders of the area of jurisdiction. If the Bidders have any objection to it, it must be clearly indicated in Section 7.1, i.e. Alterations by Bidder, in this document.

The contract will consist of one main type of activity namely **Civil Engineering Works**. 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 by the Engineer and will consist of a detailed scope of work and relevant drawings for each particular task.

The main activities are set out in the Pricing Schedules.

PS2 DESCRIPTION OF SITE AND ACCESS

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

It is of critical importance that Contractors should under all circumstances; liaise with O.R. Tambo District Authority's representative **prior** to going on site to ensure that the District could inform people of work to be carried out by the Contractor. If the representative cannot be contacted, the Contractor should then **not** enter a site for working purposes.

PS3 NATURE OF GROUND AND SUBSOIL CONDITIONS

The nature of ground and sub-soil conditions may vary from site to site. The Contractor must familiarize himself as far as is practically possible with soil conditions in the region.

PS4 DETAILS OF THE CONTRACT

(i) The work required to be done entails that listed in PS1, measured in the Pricing Schedules as work of generalised nature. Specific details will be supplied by the Engineer, based on the Pricing Schedules, for each specific project.

(ii) All sections of the Works shall be subject to a respective maintenance period (Defects Liability Period) of 12 months.

PS5 CONSTRUCTION PROGRAMME

PS5.1 Information to be made available

The Engineer will provide the Contractor with a list of specifications regarding the relevant part of the Works. It is envisaged that the information will be made available not less than four weeks prior to the installation date, to enable the contractor to order the materials and programme the works.

PS5.2 Labour Intensive Construction

The principle of labour intensive construction for certain portions of the works to be executed is to be introduced. See clause PS20.3 for details regarding the above-mentioned.

PS5.3 Phasing of the Works

(a) 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.

Note: All other movement cost will be deemed to be included in the rates Bidded for various items of the work.

(b) 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 for transport expenditures.

(Refer to the applicable transport rates, Bidded in the pricing schedules).

(c) Should the Contractor be requested by the Engineer to do work not included in his above-mentioned programme, he will then be paid for the movement according to rates included in the Pricing Schedules for transport expenditures only. These movements are those, which would infringe any programme predetermined and agreed to between the Contractor and the Engineer.

(Refer to the applicable transport rates).

(d) Note: Transport rates outside the borders of O.R. Tambo District cannot be claimed, except for "nominated specialised work".

Example: When the District require the services of a specialised agent. All transport costs and mark-up rates for material can be claimed from the District.

PS5.4 Interruption in Work Schedule

If information or particulars as mentioned in Clause PS4 are not 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. No adjustment will be made in any of the rates in the Pricing Schedules.

PS5.5 Format and Approval

As soon as information is available with regard to a specific Works, the Contractor shall supply, within 14 days, a suitable and realistic construction programme for the consideration of the Engineer. This programme shall show the proposed scheduling and methods of execution of the Works and the resources to be allocated to each item or phase of execution of the Works and the resources to be allocated to each item or phase of the work. Quantities proposed for execution for a specific Works and the anticipated cash flow based upon these quantities should be shown, due allowance being made for price escalations and retention moneys.

The Contractor will be expected to progress with the Works in accordance with the approved programme and shall not deviate from the order of execution shown in the programme without the prior approval of the Engineer or his Representative. Should such approval be given, an adjusted programme shall be produced within 7 days and submitted to the Engineer for evaluation. Progress in advance of the programme or certain phase of the Works shall not be considered adequate reason for poor progress on another portion or phase.

PS5.6 Partial Completion and Monthly Take Over

Specific completed Works will be taken over within two weeks after completion for which a Certificate of Completion will be issued. The maintenance period on the work completed will commence with the issuing of the Certificate of Completion.

PS 5.7 Penalties

The penalties for late completion are indicated in the Appendix to BID.

The penalty in respect of each Works shall remain in force until the work for that Works has been completed. The penalties for the Works will be applied independently and are accumulative.

PS 6 SITE FACILITIES AVAILABLE

PS 6.1 Contractor's Camp

An area will be made available by the Employer for the Contractor's camp and depot, where materials can be stored and from which the administration of the contract will be undertaken by the Contractor. However, the Contractor will be responsible to arrange with the necessary authorities at each Works site to store equipment and material.

PS 6.2 Source of Water Supply

Water supply will not necessarily be available at the camp or depot nor each construction site.

The Contractor shall be responsible under the Contract for the supply and distribution at his cost of all water that he may require for purposes of constructing the Works. Accordingly, the Contractor shall pay all connection fees and consumption charges, and at his cost provide all connections, consumption meters, pipework, storage tanks, transport and other items associated with the supply of water for the Works.

Water for filling, testing and disinfecting the pipelines and structures will be made available by the Employer at no cost to the Contractor. However, should the pipelines and/or structures have to be drained and refilled due to defective materials or workmanship by the Contractor or by his subcontractors, then the water required for refilling will be for the account of the Contractor.

PS 6.3 Source of Power Supply

Power supply will not necessarily be available at the camp or depot nor at each construction site

PS 6.4 Housing

The Contractor will be permitted to house Key Personnel only within his camp site(s). At the commencement of the Contract, the Contractor shall inform the Engineer of his intentions regarding the housing of Key Personnel on Site, and he shall thereafter ensure that all such accommodation is kept neat and tidy, hygienic and properly controlled at all times. Should at any stage of the Contract the Employer and/or the Engineer be of the opinion that the housing of Key Personnel within the camp site(s) of the Contractor is causing disturbance or inconvenience to the landowner or to nearby residents, then the authority granted by this clause for the Contractor to house Key Personnel on Site may be withdrawn, either partially or entirely.

The Contractor shall at all times conform with all requirements contained in law or bylaws, as well any other requirements set by the controlling local authority.

PS 6.5 Ablution Facilities

No ablution facilities are available at the camps and depots or construction sites.

PS 7 SITE FACILITIES REQUIRED

PS 7.1 For the Contractor

Whatever may be required for the satisfactory execution of the Contract.

PS 7.2 For the Engineer

As specified under Section PSAB (Portion 2 of the Project Specifications).

PS 7.3 Sanitary facilities

Water borne sewerage is not available on site. Chemical or flush toilets with on-site disposal shall be provided and maintained for the use of the Contractor's personnel, the Engineer and representatives of the Employer at all camp sites that the Contractor may establish for construction of the Works. In addition, the Contractor shall at all times during construction of the Works provide adequate sanitary facilities on the construction site so that all employees are at all times within easy reach of sanitary facilities.

PS 8 STATUTORY REGULATIONS

The Occupational Health and Safety Act, Act 85 of 1993 (referred to as "the Act" below), and all regulations promulgated thereunder must be adhered to by the Contractor, with specific reference to the safety of all employees and the public, irrespective of whether such employees are employed by the Contractor or by his subcontractors (including local subcontractors). The Contractor, in entering into this Contract, hereby agrees with the Employer in terms of Section 37(2) of the Act, that the Contractor as an employer in its own right and in its capacity as Contractor for the execution of the Works, shall have certain obligations and that the following arrangement shall at all times for the duration of the Contract apply between the Contractor and the Employer 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 of the Act, and the regulations promulgated in terms of the Act;

(ii) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations 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 Engineer from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the Works; and

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

PS9 COMMUNICATION LIAISON AND COMMUNITY RELATIONS

In all dealings with communities through which the Works are to be constructed, and in all dealings with workers employed from within such communities, the Contractor shall take due cognisance of the character, culture and circumstances of the specific community, and shall at all times use his best endeavours to avoid the development of disputes and rather to foster a spirit of co-operation and harmony towards the project.

The Contractor shall at all times, keep the Engineer fully informed regarding all matters affecting or negotiated between the Contractor and the community, and he shall attend all liaison meetings as may be arranged by the Engineer and/or the Employer. All matters concerning the community shall be discussed and where possible, resolved at such meetings.

Where any resolution during such negotiations or at such meetings shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect thereto without a prior written instruction from the Engineer. Where the Contractor is of the opinion that any instruction of the Engineer issued in terms of this clause will result in the incurring of additional costs which were not provided for in his Bidded rates and prices and/or that a delay in the progress of the Works will result, he shall be entitled to submit a claim in terms of the Conditions of Contract, provided always that the period of fourteen (14) days referred to be reduced to three (3) normal working days in respect of all claims submitted in terms of this clause.

PS10 WORKMANSHIP AND QUALITY CONTROL

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

The costs of the Contractor's supervision and process control, including all testing carried out by the Contractor, will be deemed to be included in the rates Bidded for the various items of work. The Contractor's attention is drawn to the provision of the various Standardised Specifications regarding the minimum frequency of process control testing that is to be executed. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control of the quality of the Works at all times. Upon completion submission of each portion of the Works to the Engineer for examination, the Contractor shall furnish the Engineer with the results of relevant tests, measurements and levels, thereby indicating compliance with the Specifications. **The Engineer will not examine or inspect any portion of work submitted for approval unless the request for inspection and approval is accompanied by relevant tests, measurements and levels indicating compliance**.

PS11 FEATURES REQUIRING SPECIAL ATTENTION

PS 11.1 Other Contractors

Other works as well as normal maintenance contracts may be under way at any site. No additional payments will be made in this regard to the Contractor.

PS11.2 Construction within Built-up Areas

The bulk of the work is situated in inhabited residential areas. Meticulous care is required to ensure:

(a) convenient access provided for the public to their property during all stages of construction;

(b) ensuring the safety of the public during all stages of construction;

(c) extended liaison with concerned parties, including the local Tribal Authority, District Councils, traffic Districts, residents and management of business, imperative.

This will include notification in advance of the commencement of proposed works, etc.

PS11.3 Trenches in Narrow Road Reserves

Prospective Bidders must take note of the fact that at some places trench excavation will take place in fairly narrow road reserves/alleys. The difficulty to overcome this obstacle must be incorporated in the Bidded rates. No separate and/or additional payment will be made in this regard.

PS11.4 Reinstatement of Fences

The Contractor shall give all land owners and residents a minimum of 48 hours notice of his intent to dismantle fences to properties, where indicated on the Drawings or so ordered by the Engineer. The Contractor shall note all aspects relevant to the condition of existing fencing and shall take photographs thereof prior to dismantling, and shall acquire the signature of the owner/occupant agreeing to such conditions.

After reinstatement, both the Contractor and the owner/occupant shall sign the form confirming that the condition of the fence is at least equivalent to its condition before dismantling.

PS11.5 Protection of Buildings and Structures

The Contractor shall give all residents or other parties owning a building or structure within an appropriate radius (not less than 100 m) from any point of blasting, a minimum of 48 hours notice of his intent to execute any blasting work. The Contractor shall note all aspects relevant to the condition of the affected buildings and/or structures prior to blasting. In the event of damage to existing buildings/or structures as a result of blasting, remedial work shall be done to the satisfaction of the owner/occupants at the Contractor's expense.

Compliance with this clause will not relieve the Contractor of any of his responsibilities in terms of the Contract, or in terms of sub-clause 5.1.1.3 of SANS 1200D.

PS11.6 Care of the Site

At all times during construction of the Works and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store all material s and equipment for which he is responsible in an orderly manner, and shall keep the Site free from debris and obstructions.

PS11.7 Control of Water

The Contractor shall at all times and in all respects be responsible for the handling of stormwater from higher-laying areas above the Works, and for the handling of any subsurface water that may affect Works. No separate payment shall be made in this regard, as all costs related thereto should be deemed to be included in the rates Bidded

for the various items of work that are included in the Pricing schedules. Refer also to SANS 1200 A, clause 5.5, in this regard.

PS12 DRAWINGS, OPERATION AND MAINTENANCE MANUALS

All information in the possession of the Contractor that is required by the Engineer's Representative in order to complete the As-Built drawings and prepare a completion report for the Employer must be submitted to the Engineer's Representative before a Certificate of Practical Completion will be issued for the Works. Similarly, the Contractor will be required to submit full details of all pipes, valves, meters and specials in a suitable loose bound format, including any special operational and maintenance procedure related thereto for incorporation in the overall operation and maintenance manual for the Scheme prior to the issue of a Certificate of Completion for the Works.

Only figure dimensions on the Drawings may be used in the interpretation thereof, and the Drawings shall not be scaled unless the Contractor is so instructed by the Engineer in writing. The Engineer will upon written request provide any dimensions that may have been omitted from the Drawings.

PS13 SAMPLES

Materials or work that do not conform to the approved samples submitted in terms of the Conditions of Contract, will rejected. The Engineer reserves the right to submit samples for testing to ensure that the material represented by the sample meets the specified requirements.

PS14 NOTICES, SIGNS, BARRICADES AND ADVERTISEMENTS

Notice signs and barricades (required in terms of the Conditions of Contract) as well as advertisements may only be erected where approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his Bidded rates. The Engineer shall have the right to have any sign, notice or advertisement moved to another location, or to have it removed form the Site of the Works, should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

PS15 OPEN TRENCHES

Trenches may not be left open during the builder's holidays, and shall be safeguarded at all times from danger to the public. Safe trench-crossings shall be provided at all intersections with accesses to properties and with public roads and paths. The length of trench left open at any one time may be restricted by the Engineer, should he consider such restriction to be in the interest of public safety.

PS16 SPOIL MATERIAL

No indiscriminate spoiling of materials will be permitted. Surplus or unsuitable materials shall be spoiled at sites designated by the Engineer for this purpose. All spoiling shall comply with the applicable statutory and municipal regulations of the local or rural authority in whose area it is located.

PS17 INFORMATION IN RESPECT OF PLANT

Information relating to plant on Site shall be recorded in the Daily diary. In addition, the Contractor shall deliver to the Engineer, on a monthly basis, a detailed summary of construction

plant kept on the Site, full particulars given for each day of the month. Distinction shall be made between plant in working order and plant out-of-order. Such inventory shall be submitted by the first day of the month following the month to be reported.

PS18 INFORMATION IN RESPECT OF EMPLOYEES

Information relating to labour and management on Site shall be recorded in the Daily Diary. In addition, the Contractor shall deliver to the Engineer, on a monthly basis, a detailed summary of supervisory staff, labour employed (own and local labour) by category, and sub-contractors (both local and imported) for each day of the month. Such return shall be submitted by the first day of the month following the month to be reported.

PS19 ABNORMAL RAINFALL

Extension of time for completion of the Contract shall be allowed in the event of abnormal rainfall in accordance with the following formula:

$$V = (N_w - N_n) + (R_w - R_n)/20$$

Where

V = Extension of time in calendar days for the calendar month under onsideration

Nw = Actual number of days the calendar month under consideration on which a rainfall of 10 mm and more is recovered

R_w = Actual total rainfall in mm recorded during the calendar month under consideration.

Nn = Average number of days, derived from rainfall records, on which a rainfall of 10 mm and more was recorded during the relevant calendar month as per the data tabulated hereinafter

Rn = Average total rainfall in mm for the relevant calendar month, derived from rainfall records, as tabulated hereinafter.

Where the extension of time due to abnormal rainfall has to be calculated for portion of a calendar month, pro rata values shall be used. Should V be negative for any particular month, and should its absolute value exceed the corresponding value of N_n, then V shall be taken as being equal to minus N_n. The total extension of time to be granted shall be the algebraic sum of

all the monthly extensions, provided that if this total is negative then the time for completion shall not be reduced due to subnormal rainfall.

Rainfall records for the period of construction shall be taken on Site. The Contractor shall provide and install all the necessary equipment for accurately measuring the rainfall **per site**. The Contractor shall also provide, erect and maintain a security fence plus gate, padlock and keys at each measuring station, all at his own cost. The Engineer or his Representative shall take and record the daily rainfall readings. The Contractor shall be permitted to attend these readings, in the company of the Engineer's Representative. Access to the measuring gauge(s) shall at all times be under the Engineer's control.

The rainfall records applicable to this Contract (unless more appropriate records for the site are made available by the Weather Bureau) are those recorded at Polokwane from 1898-1989. The following values of N_n and R_n shall apply:

MONTH	**N_n (days)**	**R_n (mm)**
January	91	3
February	72	2
March	61	2
April	31	1
May	11	0
June	4	0
July	5	0
August	4	0
September	14	1
October	41	1
November	80	3
December	91	3
TOTAL	505	16

PS20 LABOUR AND PERSONNEL

PS20.1 Contractors Personnel

The Contractor shall limit the utilisation of his permanently employed personnel to that of key personnel only on the Works, as defined below, and shall execute and complete the Works utilising a temporary workforce employed directly by the Contractor and/or by his sub-contractors, using the assistance of the Labour Desk(s), or similar arrangements which have been established for this purpose from the local community which is established in proximity to the Works or which will be consumers from the Scheme.

Without derogating from the Contractor's obligations to complete the Works within the specified time for completion in terms of Clause 45(1) of GCC 1990, the numbers in each category of the Contractor's key personnel, as stated by the Contractor in Section 7 of his BID, will be strictly controlled during the contract period and any increase in numbers will be subjected to the prior approval of the Employer.

Key personnel means all contracts managers, site agents, site clerks, materials and survey technicians, quantity surveyors, trainers, supervisors, foremen, skilled plant operators, brick layers, welders, shutter hands and the like, and all other personnel in the permanent employ of the Contractor or his sub-contractors who possess special skills, and/or who play key roles within the Contractor's or his subcontractor's operations.

The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor, and where he deems the circumstances so warrant, authorise in writing that the Contractor may utilise in the execution of the Works, workers not being his key personnel but who are in his permanent employ. Without limiting the generality of application of this sub-clause, circumstance which may be considered by the Engineer to warrant authorisation of the use of the Contractor's permanent employees other than key personnel, include:

(a) The unavailability from local sources of sufficient numbers of temporary workers and/or sub-contractors to execute the Works, provided always that the Contractor has satisfied the Engineer that he has exercised his best endeavours and taken all reasonable actions to recruit sufficient temporary workers and sub-contractors from local sources.

(b) The unavailability within the temporary worker pool and/or from subcontractor sources available to the Contractor in terms of Contract, of sufficient skills necessary to execute the Works or specific portions thereof, in situations where the completion period allowed in the Contract is insufficient to facilitate the creation of the necessary skills through the provision of suitable training, as contemplated in the Contract;

(b) Any other circumstances which the Engineer may deem as constituting a warrant.

PS20.2 Temporary Workforce

The Contractor shall draw labour from the local communities through the Labour Desk(s), or similar arrangements, which have been established for this purpose. Accordingly, the workforce that is employed on Site shall consist of local residents, except for approved key staff in the permanent employ of the Contractor, to the maximum extent that is compatible with the requirements of the Conditions of Contract.

The Labour Desk(s), or similar arrangements which have been established for this purpose shall assist in identifying available local labour and, where available, semiskilled labour as well as local subcontractors. The Labour Desks shall also assist and advise regarding conditions of employment, minimum wages, disputes and disciplinary procedures. The function of the Labour Desk(s) shall however in no way diminish the responsibilities of the Contractor in terms of the Conditions of Contract. Although the Contractor shall adhere to the statutory minimum wage rates of the Conditions of Contract), he is however at liberty to negotiate additional incentive payments based on performance.

A contract of employment or subcontract should be signed between the Contractor and each of his employees or sub-contractors, as the case may be. Likewise contracts of employment must be entered into between each such sub-contractor, and each of the specific subcontractor's employees. Employment and subcontract agreements shall make clear reference to at least the following conditions:

- The minimum agreed wage rate per hour in respect of labourers;
- The agreed pay rate per unit production where applicable;
- UIF and WCA payments;
- Minimum working hours per day;
- Start and end times of a daily shift;
- Lunch break times;
- Company Policy regarding:
    - Rain time
    - Sickness and absenteeism

- Disciplinary matters
- Grievances

- Method and frequency of payment;
- Work clothes and safety equipment to be issued.

PS20.3 Labour Intensive Construction

The Northern Province has decided that labour intensive construction methods are to be introduced and practised in some of the equipment activities of this project.

Labour Intensive Construction shall mean the economically efficient employment of as great a portion of labour as is technically feasible to produce a standard of construction demanded by the Specifications with completion by Due Completion Date, thus the effective substitution of labour for equipment.

Appropriate portions included in the Contract shall be executed using labour intensive construction methods. These portions of the Works shall be constructed utilising only locally employed labour and/or the labour of local sub-contractors, supplemented to the extent necessary and unavoidable by the Contractor's key personnel as provided for in sub-clause PS20.1, unless otherwise instructed by the Engineer and in accordance with the further provisions of the relevant sections of Portion 2 of the Project Specifications. The portions of the Works to be executed using labour intensive construction methods (where feasible) are:

- clearing and grubbing of the Site;
- bedding, selected fill, backfilling and compaction of all pipe trenches irrespective of depth, but assisted by mechanical compaction equipment in order to achieve the specified densities;
- excavation of pipe trenches where the soil conditions and trench depths permit economic production;
- transportation and spoiling of all trench materials, where the disposal site in located within 20 metres of source;
- removal of oversized materials to the edge of the roadway during the construction of roads and streets;
- laying and testing of all pipelines, including all fittings, valves and house/erf connections;
- construction of all manholes, valve chambers, thrust blocks pipeline markers and the like (earth-, concrete-, brick- and metal works);
- construction of the rudimentary draw-off assemblies;
- mixing, transporting, placing and finishing of all concrete;

- dismantling and re-erection of fences; and
- cleaning and tidying up of the Site.

In respect of those portions of works which are not listed above, the construction methods adopted and plant utilised shall be at the discretion of the Contractor, provided always that the construction methods adopted and plant utilised by the Contractor are appropriate in respect of the nature of the Works to be executed and the standards to be achieved in terms of the Contract.

PS 21 SUBCONTRACTING

PS 21.1 The Contractor shall appoint specialist subcontractors nominated by the Employer or the Engineer for those portions of the Works that are described in Section PSA in Portion 2 of the Project Specification.

PS 21.2 The Contractor shall sub-let to local small sub-contractors appropriate portions of the works that are designated in Clause PS 20.3 as being reserved for labour intensive construction methods.

PS 21.3 As required by Clause 6.4 of the Conditions of Contract, the Contractor shall be responsible for all work carried out by sub-contractors (whether nominated by the Employer or selected by the Contractor) on his behalf. The Engineer will not liaise directly with any such sub-contractor, nor will he become involved in any problems and/or disputes related to payments, programming, workmanship, etc, unless provided for in the Conditions of Contract. Such problems and/or disputes shall remain the sole concern of the Contractor and his sub-contractors.

PS 21.4 The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor, and where he deems the circumstances so warrant, and provided always that the Contractor has complied fully and in all respects with provisions of the Contract pertaining to subletting to local sub-contractors or has utilised his best endeavours to comply therewith, authorise in writing that the Contractor may employ local residents in terms of Clause PS 20.2 with the sole intent of executing on-the-job training of such local residents to suitable levels of skill that will enable the Contractor to sub-let appropriate portions of the Works as specified in Clause PS 20.2 to such local residents.

Without limiting the generality of application of this sub-clause, circumstances, which may be considered by the Engineer to warrant such authorisation, include:

(a) non-receipt of valid or acceptable BIDs/quotations from local sub-contractor;

(b) serious default or failure of appointed local sub-contractor;

The Engineer shall not grant such authority in cases where it may reasonably be concluded on the available evidence that the invitation of further BIDs/quotations in accordance with the terms of the Contract, is likely to result in the successful completion of the portions of the Works concerned by local sub-contractors.

Should the Contractor, after suitable due endeavour, be unable to identify local residents suitable for and desiring to train as sub-contractors for portions of the Works as specified in Clause PS 20.2, then the Contractor shall be permitted to undertake the Works in question with his own workforce as provided for in Clause PS 20.1 above.

The Engineer shall monitor progress achieved with subcontractor training, and successful completion of this training shall be subject to his approval or instruction. The Contractor shall BID rates for the training of sub-contractors and labour. See Clause PS 22 in this regard.

PS 21.5 As specified in Clause PS 20, the Contractor shall approach the Labour Desk or similar arrangements which have been established for purposes of the Contract for assistance and advice regarding conditions of employment, minimum wages, disputes and disciplinary procedures in respect of local sub-contractors.

PS 22 TRAINING

PS 22.1 Artisan and Skills Training

When required in respect of those portions of the Works that are listed under PS 20.3 and where insufficient skills are currently available within the identified communities via the Labour Desks or from local sub-contractors, the Engineer may, after due consideration and subject to budget constraints, authorise, in writing, the training of local labour in specific trades or other skills for direct employment of the Works or as local sub-contractors. Such training shall be carried out by specialists and shall be consistent with standards that are approved at industry level, such as training provided by CEITS or by the APEX Training Centre, or by training organisations that are certified by these bodies. The cost of this training shall be borne by the Employer, and the Contractor will be compensated for actual costs incurred in this regard under the Prime Cost item that has been included for this purpose in Schedule 1.

PS 22.2 In-house Training

Alternatively, under similar conditions and subsequent to due evaluation of all relevant factors, the Engineer may authorise, in writing, that in-house training of local labour be executed by the Contractor utilising the services of approved skilled key-personnel or artisans in his employ. The Contractor shall BID rates for such training , inclusive of all training materials, construction materials (pipes, fitting, brick, sand, cent etc.) and small tools. Payment will be made to the Contractor as provided in Schedule 23 of the Pricing schedules.

END OF SECTION

Section 4.2

PROJECT SPECIFICATIONS

Portion 2

Variations to Standardized Specifications

and Additional Clauses

PORTION 2: VARIATIONS AND ADDITIONAL CLAUSES

PSA GENERAL

PSA2 QUALITY

All material used in the Works shall, where such mark has been awarded for a specific type of material, bear the SANS mark. Alternatively, the Contractor shall furnish the Engineer with certificates of compliance of materials, which bear the official mark of the appropriate standard.

PSA2.1 DEFINITIONS

PSA2.1 Definitions

Add the following:

Task	-	a quantified activity or operation.
Daily task	-	a task that is required to be completed within a working day.
Task remuneration (order)	-	remuneration as paid for a completed task or job (order).
Daily rate	-	the remuneration of a day's work.
Daily wage	-	see daily rate
Daily task remuneration	-	the remuneration for a completed daily task.
Labour-intensive construction	-	the economically efficient employment of as great a portion of labour as is technically feasible to produce as high a standard of construction as demanded by the specification and allowed by the funding available, thus the effective substitution of labour for equipment. (Note: This definition is not Contract specific, but applies to the project as a whole. This Contract is a part of such a project).

PSA3 MATERIALS

PSA3.1 Supply of Materials

The Contractor will be responsible to supply all the materials necessary for the proper execution of the works. He shall also be fully responsible for quality of materials used and/or installed.

PSA4 PLANT

Except where the use of plant is essential in order to meet the specified requirements by the Due Completion Date, the Contractor shall use only hand tools and equipment in the construction of those portions(s) of the Works that are required in terms of the Project Specifications to be constructed using labour intensive construction methods.

PSA5 CONSTRUCTION

PSA5.1 Setting Out of the Works

Where labour-intensive works are specified, the Contractor shall also be responsible for the setting out of daily tasks.

PSA6 TESTING

(a) All test results obtained by the Contractor in the course of his process control of the Works shall be submitted to the Engineer or his Representative prior to requesting inspection of the relevant portions of the Works. Any request for inspection shall be submitted on the prescribed forms that are appended as annexures to the Specification

(b) The Contractor shall make suitable arrangements for process control prior to commencement with the Works. Should he intend using site personnel for this purpose he shall ensure that suitably trained and competent personnel take charge of the necessary test work, and that the necessary equipment is at their disposal prior to commencement of the Works. Failure to comply with these requirements shall be just cause for the Engineer to order suspension of the Works without additional remuneration in terms of the Conditions of Contract, or for him to recommend determination to the Employer in terms of Clause 58 thereof.

(c) The Contractor shall deliver to the Engineer, for his consideration, quality assurance programmes (as obtained from all the Contractor’s proposed suppliers of pipes, valves and specials) prior to the Contractor’s appointment of any suppliers.

PSA8 SITE MEETINGS

The Contractor and his authorised representative shall attend all meetings held on the Site with Employer and the professional team at dates and times to be determined by the Engineer. Such meetings will be held to evaluate the progress of the Contract, and to discuss matters pertaining to the Contract, which any of the parties represented, may wish to raise. It is not the intention to discuss day-to-day technical matters at such meetings.

PSA11 SUMS STATED PROVISIONALLY

PSA11.1 Contingencies

No provisional sum has been included for contingencies. No percentage mark up will be applicable to any payments made using contingency money other than those included in prices.

PSA11.3 Electrical Connection Fees

A prime cost has been included in Schedule 1 for payments to Eskom in respect of electrical connection fees. In addition to the above-mentioned amount, provision is made in Schedule 1 for a mark-up on the connection fees paid. This mark-up shall be regarded as full compensation for overheads, charges, administration and profits as provided for the Conditions of Contract.

PSA11.4 Specialist Contractor

A prime cost has been included in Schedule 1 for payments made to Specialist Contractors (agent, contractor, engineer or engineer appointed as agent for the employer). (Agent, contractor, engineer or enginer appointed as agent for the employers). In addition to the above-mentioned amount, provision is made in Schedule 1 for a mark-up on the Specialist Contractors paid. This mark-up shall be regarded as full compensation for overheads, charges, administration and profits as provided for the Conditions of Contract.

PSA11.5 Nominated Sub-Contractors

Provision is made in Schedule 1 for a mark-up on nominated Sub-Contractors in respect of overheads, charges and profit for assisting, training, co-ordinating and supervision of a nominated Emerging Sub-Contractor, who is to be employed under this programme.

PSA12 ADJUSTMENT OF PRELIMINARY AND GENERAL ITEMS DUE TO RAIN

Should the period for completion be automatically extended due to abnormal weather conditions occurring during execution of the Contract as provided for in the Project Specifications, no adjustment to the total for time-related preliminary and general items will be applicable.

PSA13 ADJUSTMENT OF PRELIMINARY AND GENERAL TIME-RELATED ITEMS

An approved extension of time will qualify the Contractor to receive additional payment for each relevant time related item at a unit rate based on the sum originally Bidded for such item, and which shall be fair and reasonable as contemplated in Clause 40 of General Conditions of Contract.

PSA14 ADJUSTMENT OF PRELIMINARY AND GENERAL ITEMS DUE TO INTERRUPTION IN WORK SCHEDULE

Should the period of completion be automatically extended in terms of clause PS5.3 as a result of interruption in the contractors work schedule during execution of the contract, no adjustment to the total for time related preliminary and general items would be applicable. Time related preliminary and general items would be paid only if the Contractor has been established on site during a specific period. Therefore, if the Contractor was not established on site, time related P & G-items would not be paid. If he was on site for only a limited period during a specific month, time related P&G items would to be paid in full for such a month.

PSA15 PAYMENT FOR ESTABLISHMENT OF FACILITIES AND ADDITIONAL ESTABLISHMENT OF FACILITIES ON THE CONTRACT

Note: The contractor shall only be paid for site establishment by means of an official District order. Site establishment can only be claimed once per site.

PSA15.1 Amend clause 8.3.2 of SANS 1200 A as follows:

Change the heading of clause 8.3.2 to:

Site establishment cost and other movement cost will be deemed to from District/Subdistrict Office including all preliminary and general costs be included in the rates Bidded for various items of work. Only transport expenditures can be claimed for.

Important Note: Transport cost outside the borders of Sekhukhune District cannot be claimed for except. "Nominated Specilised services". (Refer to Section 4.2, Portion 1, paragraph PSA 11.4).

The contractor will also not be paid any additional site establishment costs in each district/subdistrict or inter-site movements, when the contractor moves into a region or district to re-do defective or maintenance work in that region.

PSA15.2 Amend clause 8.3.4 of SANS 1200 A as follows:

Change the heading of clause 8.3.4 to:

"Remove Contractor's site establishment on completion of contract or interim de-establishment (on instruction of the Engineer)" - for the contractors own cost.

PSA15.3 Include the following Clause 8.3.6:

Village Movement / Site Movement

All movements ordered by the Engineer, shall be priced as follows:

(a) Only transport cost is applicable.

(b) Other movement cost will be deemed to be included in the rates Bidded for various items of work.

PSA15.4 Include the following clause 8.3.6

"Establishment cost payable to the Contractor on re-establishment."

This item must cover all costs incurred by the Contractor when re-establishing after a previous de-establishment on interaction of the Engineer.

Refer to PSA 15.3.

PSAB4 SURVEY ASSISTANT (Clause 5.5) (when required by the “Engineer”)

One suitably educated Assistant shall be made available for the sole use of the Engineer's Representative for the duration on the Contract. The assistant may also be required to fulfil the function of Community Liaison Officer during the Contract, should the Engineer consider this arrangement to be in the interests of the Employer. The Survey Assistants may therefore have to be appointed from the local communities.

(a) Steel pegs, 300 mm long and 12 mm dia 120 No.

(b) Measuring wheel1 No

(c) Tripod holders for ranging rods (heavy duty) 2 No.

(d) Optical square, complete with telescopic aluminium rod and levelling bubbe 1 No.

(e) 100m long 50 kg strength fish line1 No.

(f) One metre long spirit level 1 No.

(g) DCP 1 No.

PSC SITE CLEARANCE

PSC1 DISPOSAL OF MATERIAL (Sub-Clauses 3.1 and 8.2.1)

Materials arising from clearing and grubbing shall be disposed of as may be ordered by the Engineer. Trees and stumps necessarily removed shall not be burnt unless authorised by the Engineer, but shall be cut and stacked at areas designated by the Engineer.

PSC2 AREAS TO BE CLEARED AND GRUBBED (Clause 5.1)

The areas to be cleared and grubbed will be indicated by the Engineer. Should a portion or the whole of the site have been cleared and grubbed by nature or by others prior to the start of construction, then no clearing and grubbing will be ordered or payment made with respect to the applicable portion of the site.

PSC3 PRESERVATION OF TREES AND SHRUBS (Sub-Clause 5.2.3)

The penalty in respect of every individual tree and shrub designated as a tree or shrub to be preserved that is damaged or removed unnecessarily by the Contractor, shall be R1 000. Trees that fall within areas upon which the Works are to be constructed or within areas that the Contractor must occupy for the proper construction of the Works will not be designated for preservation.

PSC4 OVERHAUL (New Sub-Clause)

No overhaul will be payable on the disposal of material arising from clearing and grubbing.

PSDA EARTHWORKS (SMALL WORKS)

PSDA1 FREEHAUL AND OVERHAUL (Clause 5.2.5)

The freehaul distance for all material to be imported or spoiled shall be considered as 1 km for mechanically driven vehicles and 200 m for wheelbarrows as agreed upon in the specified case of "wheelbarrow haul".

PSDA2 BORROW PITS (Clause 5.2.2.2)

Borrow materials shall be obtained from designated borrow pits approved by the Engineer.

PSDA3 DISPOSAL OF SURPLUS MATERIAL

All surplus or unsuitable materials arising from excavation shall be spoiled and spread where indicated by the Engineer. The Engineer shall determine the point of

spoil roads that he may require for the construction of the works. No additional payment will be made in this regard.

PSDA4 HAUL AND SPOIL ROADS

The contractor shall be responsible for the provision of all haul and spoil roads that he may require for the construction of the works and that the engineer may approve. No additional payment will be made in this regard.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB1 MATERIALS (Clause 3)

PSDB1.1 Methods of classifying (Clause 3.1)

Replace the contents of this sub-clause with the following:

PSDB1.1.1 Save and except in respect of those portions of the Works which are specified in Portion 1 of the Project Specifications to be executed utilising Labour Intensive Construction Methods, the Contractor may use any method he chooses to excavate any class material, but his chosen method of excavation shall not determine the classification of the excavation. The Engineer will determine the classification of the materials.

PSDB1.1.2 The classification will be based on the specified construction methods, inspection of the material to be excavated and on the criteria given in PSDB1.2 below, as applicable.

PSDB1.1.3 Where the utilisation of Labour Intensive Construction Methods is specified in Portion 1 of the Project Specification for certain classes of excavation only, the material for those classes of material to be excavated using Labour Intensive Construction Methods will be classified in terms of PSDB1.2.2 and for those classes of excavation which are not required to be executed by Labour Intensive methods, classification will be based on the criteria given in PSDB1.2.1

(i.e. Where it is specified that the excavation of soft materials only shall be executed using Labour Intensive Construction Methods, the classification of the soft material to be so excavated will be based on the criteria given in PSDB1.2.2(a) and the Contractor will be required to excavate all such soft material by Labour Intensive methods. However, when the material is classified in terms of PSDB1.2.2(b) to be "intermediate" and is thus no longer required to be excavated by Labour Intensive methods, will be based on the criteria given in PSDB1.2.1 (thus a material classified as "intermediate" in terms of PSDB1.2.2(b) may in terms of PSDB1.2.1 be deemed to be "soft" and will be measured and paid as such under such circumstances.).

PSDB1.1.4 All tools and equipment referred to in PSDB1.2 shall be in good mechanical and operational condition.

PSDB1.1.5 "Efficiently" as used in PSDB1.2.2(a) - (c) shall be taken to mean "in a manner that can be reasonably expected of a Contractor, having regard to the production achieved".

PSDB1.1.6 The classification of material other than "soft excavatability" shall be agreed upon before excavation may commence.

PSDB1.1.7 The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material.

PSDB1.2 Classes of Excavation (Sub-Clause 3.1)

Add the following new sub-clause:

PSDB1.2.1 Classes of excavation where Labour Intensive Construction Methods are NOT specified

The excavation of material will, in the case of work, which is NOT required in terms of the Contract to be executed, utilising Labour Intensive Construction Methods, be classified according to SABS 1200D for the purpose of measurement and payment. Add the following new sub-clause:

PSDB1.2.2 Classes of excavation where Labour Intensive Construction Methods are specified

The excavation of material will, in the case of work, which is required in terms of the Contract to be executed, utilising Labour Intensive Construction Methods, be classified as follows for purposes of measurement and payment:

(a) Soft excavation

(i) Class 1

Soft excavation Class 1 shall be excavation, including the excavation of boulders not exceeding 0.04 m^3, in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 2.5 m^3 per 9.25 hour working day per labourer, using only a suitable shovel. The average volume/task can be accepted as 3.0 m^3 per labourer per day.

(ii) Class 2

Soft excavation Class 2 shall be excavation, including the excavation of boulders not exceeding 0.04 m^3, (excluding soft excavation Class 1) in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 2.0 m^3 and not more than 2.0 m^3 per 9.25 hour working day per labourer, using only picks, "crowbars", shovels and similar hand

tools. The average volume/task can be accepted as 2.5 m^3 per labourer per day.

(ii) Class 3

Soft excavation Class 3 shall be excavation, including the excavation of boulders not exceeding 0.04 m^3 (excluding soft excavation Class 2) in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 1 m^3 and not more than 2.5 m^3 per 9.25 hour working day per labourer, using only picks, "crowbars", shovels and similar hand tools, The average volume/task can be accepted as 2.0 m^3 per labourer per day.

(b) Intermediate excavation

Intermediate excavation shall be excavation (excluding soft excavation) in material which requires ripping or loosening by mechanical means prior to removal of the loosened material utilising the methods as described in PSDB1.1.1(a).

(c) Hard rock excavation

Hard rock excavation shall be excavation of boulders not yet decomposed exceeding 0.4 m^3 and excavation in solid rock occurring in bulk or in banks or ledges, which requires loosening or breaking up by drilling, wedging, splitting or blasting or by other approved quarrying methods, prior to being excavated and removed from the excavation utilising only picks, "crowbars", shovels and similar hand tools.

(NOTE: Such excavation generally includes materials such as formations of unweathered rock that can be removed only after blasting.)

The Engineer will instruct for which portions of the Works, based on the evidence provided from trial holes excavated at approximately 200 m spacing by the Contractor for this purpose, will be executed utilising Labour Intensive Construction methods. The Trial hole shall be excavated to trench depth utilising a Cat 416 Backactor or similar.

PSDB2 PLANT

PSDB2.1 Excavation Equipment (Sub-Clause 4.1)

Replace the contents of this sub-clause with the following:

(a) To the extent that the provisions of the Specifications permit the use of mechanical plant and equipment in the excavation of trenches, the Contractor may use trenching plant that will excavate to a width such that the side allowance does not exceed the appropriate value specified in 5.2 by more than 50%, except that where in terms of the Project Specifications or of the ;Drawings, the base width of a trench for a pipeline or a portion of a pipeline is not to exceed the maximum base width or a stated value, the Contractor may use trenching plant which will produce the required trench width or he shall

accept the responsibility for all costs incurred in strengthening the relevant pipeline.

PSDB3 ACCOMMODATION OF TRAFFIC (Sub-Clause 5.1.3)

Traffic must be accommodated along the lengths of the pipelines which fall within or adjacent to any road reserve.

The Contractor shall include in his rates for accommodating traffic during the duration of the Contract, which shall cover all his obligations in this regard, including but not limited to temporary barricades; the erection and re-erection of existing and/or temporary traffic signs; lights and flagmen for the guarding and protection of the Works; and for making all necessary arrangements with the applicable traffic authorities

If crossing of the road in half widths is allowed, the road shall remain continuously open to traffic. The Contractor shall make provision to ensure the safe passage of traffic using this public road whilst installing the pipe through the road, and to ensure that any disruption to public is kept to a minimum providing safe detours when so instructed by the Engineer. Each half width shall be completed in one day. No open trenches will be allowed overnight. If the half width is not completed by 16:00 the trench shall be backfilled, in which case the Contractor shall re-excavate the trench at a later stage to complete the work at his own expense. All detours and signs shall be erected and maintained in accordance with the latest issue of Road Signs Note 13 as issued by CSRA and CUTA.

PSDB4 EXISTING SERVICES (Sub-Clauses 5.1.4)

Where any existing service occurs within the specified trench excavation, and the presence of such service is known before being uncovered, then the protection of the service will be scheduled and measured as provided for in Clause 8.3.5 of 1200DB. Only known services (as defined in Clause 5.4 of 1200A) shall be measured for payment.

Where an unknown existing service is damaged during construction, and the Engineer orders that the Contractor should undertake the repair of such service, then such repair will either be measured and paid as dayworks or alternatively as a contractual variation in terms of Clause 40 of the General Conditions of Contract.

No construction activity which may affect the integrity of telephone or electrical poles or stays may be carried out without the prior written approval of the Engineer, which approval shall only be given subject to the acceptance of a modus operandi that will ensure the integrity of such structures during construction.

PSDB5 TRENCH WIDTHS (Sub-Clauses 4.1 and 5.2)

Trenches in general shall not exceed the widths laid down in Sub-Clause 8.2.3. If trenches exceed the specified width the Contractor shall be liable for the cost of measures, which may be required as a result of the additional trench width.

PSDB6 MINIMUM BASE WIDTH (Sub-Clause 5.2)

(a) Side allowance for pipes of diameter 125 mm or more (Sub-clauses 5.2 and 8.2.3):

(b) The minimum base width of trench for pipes of external diameter less than 125 mm but larger than 70 mm laid at a depth of 1,5 m or less shall be 550 mm.

(c) The minimum base width of trenches for pipes of external diameter less than 70 mm laid at a depth of 1,0 m or less shall be 400 mm.

(d) The minimum base width of trenches where labour-based excavation is concerned shall be at least 150 mm on either side of the pipe's outer diameter to allow proper compaction of backfilling materials.

PSDB7 TRENCH BOTTOMS (Sub-Clause 5.5)

Replace the first paragraph of this sub-clause "Material that ……..compacted as directed" with the following:-

Where a firm foundation cannot be obtained at the grade indicated due to soft or unsuitable material, the Engineer may instruct the Contractor to remove such unsuitable material and to backfill the excess depth with approved selected material or concrete, as directed by the Engineer in each particular case, at the cost of the Employer. Backfill other than concrete, shall be placed in layers of 100 mm uncompacted thickness, each layer thoroughly compacted to the entire satisfaction of the Engineer, to provide adequate support for the pipe bedding to be placed on top of it.

Should the Contractor remove more material than is required to secure the proper grade of the pipeline, the Contractor must, at his own cost, backfill the excess excavation with approved selected material or concrete as directed by the Engineer in each particular case.

PSDB8 DISPOSAL OF EXCAVATED MATERIAL (Sub-Clauses 5.6.3 and 5.6.4)

All surplus or unsuitable materials arising from excavation shall be spoiled and spread within or adjacent to the Site of the Works or when ordered by the Engineer be spoilt at a spoil site established by Contractor.

PSDB9 FREEHAUL AND OVERHAUL (Sub-Clause 5.6.8)

No overhaul will be payable on earthworks for pipe trenches, other than specified or approved by the Engineer.

PSDB10 AREAS SUBJECTED TO TRAFFIC LOADS (Clause 5.7.2)

The requirements of Clause 5.7.2 shall apply only to pipes and sleeves crossing streets or paved areas and pipes running parallel to the road as described below.

All service trenches running parallel to the road of which the roadside edge of the trench is located less than 1,4 m away from the edge of the travelled way, will be subject to the requirements for the above mentioned clause.

The measurement and payment will apply to the full trench width. Pipes and sleeves crossing streets or paved areas will be measured and paid for to a length

equal to the width of road or length of pavement crossed plus 1,4 m either side of the travelled edges.

Compaction of other pipe trenches running parallel to the roadway shall be considered areas subject to traffic loads only where instructed by the Engineer in writing. The volume will be computed from the minimum base width determined in accordance with Sub-Clause 5.2 and the depth from the top of the back fill to the top of the bedding as specified in Sub-Clause 8.3.3.1.

PSDB11 REINSTATEMENT OF EXISTING BITUMEN SURFACED ROADS (Clause 3.6 and 5.9.4)

Pipe trenches through the existing bitumen surfaced roads shall be reinstated with a 150 mm upper selected subgrade layer compacted to 93% mod AASHTO density, followed by a 150 mm sub base layer compacted to 95% mod AASHTO density and a 150 mm graded crushed stone base compacted to 98% of mod AASHTO density. The road shall be provided with a 25 mm thick asphalt seal.

The upper selected subgrade layer shall have a CBR of at least 15, a grading modulus of at leased 0,75 and a maximum PI of 12. The sub base shall conform to SABS 1200 ME and the base to SABS 1200 MF.

PSDB12 MEASUREMENT AND PAYMENT (Clause 8.3.2)

PSDB12.1 Basic Principles (Clause 8.1)

Insert the following heading for Clause 8.1.2:

"Trenches not required to be excavated by Labour Intensive Construction methods"

Add the following new sub-clause: (Clause 8.1.5)

"Works required to be executed utilising Labour Intensive Construction methods

Separate items will be provided for works covered by this Specification which are required to be executed by Labour Intensive Construction methods and for works for which the utilisation of such methods is not required.

The trench depth increments referred to in Clause 8.1.2(b) and the trench depth increment for 8.1.5 shall be:

(a) up to 1.5 m in depth

Trenches shall be measured volumetrically, irrespective of length.

Measurement and payment for works covered by this Specification and required to be executed utilising Labour Intensive Construction (LIC) methods shall, unless otherwise stated, be *mutatis mutandis* in accordance with the provisions of SABS 1200DB as amended in this Project Specification.

PSDB12.2 Excavation (Sub-Clause 8.3.2)

Excavate, in all materials for trenches 0 - 1,0 m wide, backfill, compact and dispose of surplus material utilising Labour Intensive Construction methods up to 1,5 m in depth m^3

Extra over the above for

(1)	Soft excavation Class 2	(refer PSDB1.2.2)	m^3
(2)	Soft excavation Class 3	(refer PSDB1.2.2)	m^3
(3)	Intermediate excavation	(refer PSDB1.2.2)	m^3
(4)	Hard rock excavation	(refer PSDB1.2.2)	m^3

Excavate, in all materials for trenches 0 - 1,0 m wide, backfill, compact and dispose of surplus material utilising Conventional Construction methods

(a)	Up to 1,5 in depth	m^3

Extra over the above for:

(1)	Intermediate material	m^3
(2)	Hard rock excavation	m^3
(3)	Backfill and compact by means of Labour Intensive Construction methods	m^3
(4)	Disposal of surplus material by means of Labour Intensive Construction methods within 20 m from the source of spoil material using wheel barrows	m^3

Backfill should be in 200 mm thick layers compacted to 90% Mod AASHTO.

Payment for the excavation and backfilling of trenches shall be made at the Bidded rates and at the following stages of the construction:

(i) Upon completion and approval of the trench bottom, prior to bedding: 40%

(ii) Upon completion and approval of top of selected backfill: 70% (cumulative)

(iii) Upon completion and approval of the mainfill: remaining 30%.

PSDB12.3 Excavation of Trial Holes

Excavation of trial holes as described in PSDB1.2.2 will be measured by number and shall include for backfilling after inspection.

PSDB12.4 Stone Bedding

Stone bedding will be measured per cubic metre under the appropriate item in SABS 1200LB. Type A bedding (crushed stone wrapped in a geotextile blanket) shall be measured per linear metre along the centreline of the trench. The provision, operation and removal of (a) de-watering pump where authorised by the Engineer will be measured as dayworks under the appropriate item in Schedule 19.

PSGA CONCRETE (SMALL WORKS)

PSGA1 CEMENT (Sub-Clause 3.2.1)

Only the use of Ordinary Portland Cement to SANS 471 will be permitted.

PSGA2 CONCRETE FINISHES (Sub-Clause 4.4.2)

Concrete against which earth will be backfilled shall be classified as rough. All exposed concrete surfaces shall be classified as smooth. Degree of accuracy II shall prevail.

PSGA3 STRENGTH CONCRETE (Sub-Clause 5.4.1.5)

The grade of concrete and nominal size of aggregate shall be as specified. The successful Bidder will be required to submit samples of the coarse and fine aggregate, which he proposes using, to the Engineer's Representative(s) for tests regarding the suitability of such aggregates. The Contractor shall prepare trail mixes. These mixes shall be designed for vibration. All data and reports prepared by the Contractor shall be submitted to the Engineer for information and approval prior to the commencement of concreting operations.

PSGA4 ANCHOR AND THRUST BLOCKS

At tees, bends, terminal valves, end caps, and where otherwise directed, anchor/thrust blocks shall be constructed to dimensions ordered, shown on the Drawings or agreed to by the Engineer. Unless otherwise specified, anchor/thrust blocks and pedestals shall be constructed of prescribed mix 15/37,5 concrete.

The concrete shall be well punned round the pipe and, if in trenches, against the undisturbed faces and bottom of the trench. Backfilling behind or under thrust faces will not be permitted. Excess excavation shall be replaced with the prescribed mix concrete given above for anchor/thrust blocks at the Contractor's expense, unless an item is scheduled to cover payment of overbreak. Care shall be taken to leave the joints accessible. No anchor/thrust blocks and pedestals shall be concreted until the approval of the Engineer has been obtained.

Anchor and thrust blocks will be measured by volume of concrete; the rate Bidded shall include for any formwork required constructing the block.

Should the Contractor offer an alternative method of coupling involving flexible joints, he shall design suitable thrust and anchor blocks in order to prevent movement of the pipeline under operating and test conditions. The working and test pressure to be used by the Contractor for the calculation of anchor and thrust blocks shall be in accordance with the design information that is issued together with the BID. The earth bearing pressure to be used for the calculation of anchor and thrust blocks shall be based on field tests. The factor of safety to be used in calculating the above shall be 2.5.

PSGA5 GROUTING TO MACHINE AND STRUCTURAL BED PLATES (Sub-clause 5.5.13)

PSGA5.1 Materials

(a) Water

Water for grout shall comply with the requirements given in sub-clause 3.3 of SANS 1200G.

(b) Aggregates

Notwithstanding the requirements of Sub-clause 3.4.1 of SANS 1200G, the grading of fine aggregate (sand) and coarse aggregate (stone or pea gravel) shall conform to the gradings given in Tables 1 and 2, respectively, below.

(c) Cement

Cement shall be ordinary Portland cement complying with SANS 471.

(d) Admixtures

Admixtures shall comply with the requirements of Sub-clause 3.5 of SANS 1200 G, and shall have a proven record of satisfactory.

(e) Proprietary Grouting Materials

Unless otherwise approved by the Engineer, Proprietary Grouting Materials shall be obtained ready mixed in sealed pockets as supplied by the manufacturers.

Table 1 - Sand		Table 2 - Stone or Pea Gravel	
1	2	1	2
Test sieve Nominal aperture size, mm	%Passing (by mass)	Test sieve aperture size, mm	%Passing (by mass)
9,5	100	9,5	100
4,75	95-100	4,74	95-100
1,18	45-65	2,36	0,5
0,3(300)	5-15		
0,15(150)	0,05		

* Portland cement (ordinary, rapid-hardening, and sulphate-resisting).

PSGA5.2 Preparation and Procedures

(a) Before a machine or structural bedplate is placed on the concrete the following shall be carried out:

(1) All defective concrete, laitance, dirt, oil, grease and loose material shall be removed from the concrete foundation by bush-hammering, chipping, or other means until sound clean concrete is obtained. The surface of the foundation shall be scabbled, but shall not be so rough as to interfere with proper placing of the grout. All foundation bolt sleeves shall be cut out, or cut off flush if the sleeves cannot be removed. The top of the foundation shall be reshaped if necessary.

(2) The underside of each steel base, particularly in the bearing areas, shall be cleaned and any burrs and ragged edges removed before the base is placed in its final location.

(3) All holding-down bolt sleeves shall be thoroughly cleaned of any materials that may prevent the grout from flowing freely to the bottom of the bolt sockets.

(b) The base shall be properly aligned and levelled and shall be maintained in that position during grouting.

(c) After the machine or structural bedplate has been placed the following precautions shall be observed:

(1) Shimming shall be kept to a minimum. Steel plates shall be used for packing and shall be ground to the required thickness, where necessary.

(2) Before grouting is started all loosed dirt, oil, grease and other foreign matter on the surface of the foundation, the underside of bed plates, and in the bolt holes shall be removed by means of compressed air or other approved means. The surface of the foundation slab shall be thoroughly saturated with clean water and free water shall be removed from the surface and the boltholes just before the grout is placed.

(3) The grouting shall not be carried out until the alignment of all units to be grouted has been checked and approved by the Engineer.

(4) Special care shall be taken with grouting in hot or cold weather to ensure proper setting and gain of strength and, in the case of Proprietary Grouting Materials, by having ice or hot water available, as the case may be, in accordance with the instructions of the manufacturer. Enclosures shall be provided for the grout such that, until it has set, its temperature will be in the range 15-27°C. Shields to protect the grout from the sun and from hot winds shall be provided by the Contractor when so ordered.

PSGA5.3 Formwork

Formwork for grouting shall comply with the applicable requirements of Sub-clause 5.2 of SANS 1200 G. Forms shall be caulked where necessary. Adequate clearance between forms and bedplates shall be provided to enable the grout to be worked into place.

PSGA4.4 Mixing (All free-flowing grouts except epoxy grouts)

The grout shall be mixed to a homogenous uniform mixture and delivered ready for placing at a temperature between 15°C and 25°C.

The materials and water shall be mixed in a mortar mixer for at least 3 min. or, in the case of small jobs only, shall be thoroughly mixed by hand, the entire mass being turned over enough times to ensure even distribution of its components.

The mixing shall be done as close as possible to the place(s) where the grout is placed. No more grout shall be mixed at any one time than can be placed in a period of 20 min. After the grout has been mixed it shall not be retempered by the addition of water.

PSGA4.5 Grouting (All free-flowing grouts except epoxy grouts)

The grout shall be placed quickly and continuously to avoid the undesirable effects of over-working. (These effects are segregation, bleeding and breaking-down of initial set). The method of placement shall be subject to approval. The means of placing the grout shall be such that the grout will completely fill the space to be grouted, will be thoroughly compacted, will be free of air pockets and will have evenly distributed contact over an area in excess of 80 % or, in the case of expanding grout, 95 % of the bearing area of the item to be supported.

Wherever applicable, grout shall be placed from one side only and where this is not practicable, care shall be taken to ensure that any entrapped air is released. After the grout has taken its initial set:

(a) the forms shall be removed;

(b) excess grout shall be so cut away as to leave a smooth and neatly finished job;

(c) except where the grout is intended to provide resistance to side thrust, all edges shall be trimmed at 45°C to the vertical, from the bottom edge of the bed plate; and

(d) all excess grout on or about the bed plate shall be removed.

Damage to paintwork, if any shall be repaired within 24 hours. Packing plates, shims and other levelling devices shall remain in position.

PSGA4.6 Dry-packed grout (Standard dry sand and cement grout)

Dry-packed grout shall have a minimum compressive strength at 28d of 20 Mpa. The quantity of water after placing shall be kept to a minimum consistent with

placing conditions, and the cement, sand and, where applicable, pea gravel proportioned by mass shall be as follows:

(a) Where the clearance between bedplate and foundation is 25 mm or less: 1 part of Portland cement, and 2 parts of sand;

(b) Where the clearance exceeds 25 mm: 1 part of Portland cement, 1 part of sand and 1 part of pea gravel. Dry-packed grout shall be rammed by means of tamping rods against formwork placed along three sides of the bedplate.

PSGA4.7 Non-shrink grout with metallic aggregate

The manufacturer instructions shall be observed when non-shrink grout with metallic aggregate is used.

Where the clearance between the bedplate and the foundation is less than 50 mm a sand-based mix shall be used. Where the clearance exceeds 50 mm the Engineer may order a mix with a base of sand plus pea gravel to be used.

PSGA4.8 Expanding grout with powdered aluminium additive

The manufacturer instruction shall be observed when the expanding grout powdered aluminium additive is used.

Where the clearance between the bedplate and the foundation is less than 25 mm, a sand-based mix shall be used. Where the clearance exceeds 25 mm the Engineer may order mix with a base of sand plus pea gravel to be used.

Each batch shall be mixed for at least 6 minutes after the powdered aluminium has been added. Where a ready-mixed grout is used, the powdered aluminium shall be added at the placing site and the batch mixed as specified. Grout shall be placed within 45 minutes after the addition of the powdered aluminium. The Contractor shall not use powdered aluminium additive when the ambient temperature is below 5°C.

PSGA4.9 Epoxy grout (epoxy mortar type only)

The manufacturer's instructions shall be observed when an epoxy grout is used.

PSHA STRUCTURAL STEEL (SMALL WORKS)

PSHA1 GRADE OF STEEL (Sub-Clause 3.1.1)

Structural cold-formed steelwork to be to Grade 43A or 43B with the minimum properties as tabled in Table B-2 of SANS 10162.

Structural hot-rolled steelwork to be to Grade 300W with the minimum properties as tabled in "Steel design date: No. 6" of the South African Rolled Steel Producers Co-ordinating Council and the South African Institute of Steel Construction.

PSHA2 SHOP DRAWINGS (Sub-Clause 5.1.2)

The contractor is to provide shop details.

Steelwork generally of welded construction with site connections bolted:

All holes 18 dia for M16 bolts

All gussets ex 8 mm U.O.S.

All welds, 6 mm fillet

The Engineer must be notified, (at least 72 hours before hand) of the completion of the fabricated steelwork at the contractors workshops, to enable him to make an inspection if he so desires. The fabricated steelwork, thus to be inspected shall be in its prepared specified state immediately before the application of prime coat painting.

PSHA3 WELDING (Sub-Clause 5.3.4)

Delete this clause in its entirety and add the following clause:

Welding shall be done in accordance with the relevant requirements of SANS 10162 BS5135 and AWS.D.1/18 (American Welding Society).

Welding shall be Grade B welding.

The qualification of welders shall be in accordance with the relevant clauses of the above standards, and specifically SABS 044 Part III and shall be Grade 1 welders. Grade 2 welders shall be permitted only with the Engineer's approval.

The Contractor shall provide evidence, acceptable to the Engineer, that welding procedures and welders have been tested in accordance with the requirements of AWS D1.1.

PSHA4 PROTECTIVE TREATMENT (Sub-Clause 5.2.10)

PSHA4.1 <u>Shop painting</u>

i) <u>Surface preparation</u>

Steelwork shall be degreased after fabrication, using an approved degreaser immediately followed by clean fresh water rinses, to obtain a water break-free surface.

Steelwork shall be thoroughly wire brushed to Grade ST3 of Standard SIS055900-1967 and the dust removed after degreasing to leave a smooth finish free of rust, scale, grease, welding slag or any substance deleterious to the final protective coating. Rough welding shall be made smooth and all welding spatter removed.

ii) <u>Primer</u>

All welds, edges and corners shall be stripe coated with high build zinc phosphate primer (75 microns) to a dry film thickness of 60-90 microns, prior to the full coat, within 4 hours after wire brushing and allowed to dry according to the manufacturers specification before overcoating.

After the stripe coating one coat of high build zinc phosphate primer (75 microns) shall be applied by hand to provide a dry film thickness between 60 and 90 microns.

PSHA4.2 Painting After Erection

i) Surface preparation

After erection all areas where the primer coat has been damaged shall be degreased, wire brushed and touched up with the primer as specified in PSHA 2.1. Degreasing shall be carried out using a sugarsoap solution followed by clean fresh water rinses and painted immediately when the surface is dry.

ii) Intermediate (second) coat

An intermediate coat of a universal / general purpose alkyd undercoat shall be applied to a dry film thickness between 25 and 35 microns within the manufacturers specified overcoating time (generally 24 hours after, but within one month after application of the primer). After this time the surface shall be degreased and lightly abraded to a matt finish and the dust removed prior to painting. The surface should be clean from grease and any trace of contaminants. The colour of the undercoat shall be distinct from the colours of the primer and topcoat.

iii) Top Coat

One coat of recoatable polyurethane acrylic enamel shall be applied according to the manufacturers specified overcoating time (generally 24 to 96 hours after the application of the intermediate coat) to provide a dry film thickness of 25 to 30 microns. The surface should be clean from grease and any trace of contaminants. Degreasing shall be carried out using a sugarsoap solution followed by clean fresh water rinses and painted immediately when the surface is dry. When the topcoat is applied after the manufacturers maximum recommended overcoating time (generally 96 hours) for the undercoat, the surface shall be degreased and lightly abraded to a matt finish and the dust removed prior to painting.

PSL MEDIUM PRESSURE PIPELINES

PSL1 WATER SUPPLY MAINS

The pipes to be used for pressure mains are as follows:

1. 63 mm and larger - Unplasticised Poly vinyl Chloride (uPVC) Fibre Cement (FC)

2. 50 mm and smaller - High density Polyethylene Type IV

Couplings for uPVC pipes to be watertight and be able to withstand the relevant test pressures, unless otherwise indicated. uPVC pipe fittings shall be cast iron or aluminium.

Couplings for HDPE pipe fittings shall be compression fittings only.

PSL2 MARKING OF ROUTE AND POSITION

The route and position of major supply mains shall be marked on the surface by Pipeline route markers.

PSL3 HANDLING AND RIGGING (Clause 4.1)

PSL3.1 Transportation

Fittings, specials and valves shall be protected during transportation and handling against damage caused by impact, dropping, etc.

PSL3.2 Off-loading and storage

Pipes, fittings and specials shall at no time be laid, stacked or rolled directly onto the ground but shall be supported on suitable padded cradles or other approved material near each end of the pipe, fitting or special. Particular care shall be taken where pipes with fitted couplings are handled or stacked to prevent any pressure on the couplings.

PSL3.3 Inspection on delivery

The Engineer's Representative will thoroughly inspect all pipes, fittings and specials delivered to the site but his acceptance of same as being in good condition shall not relieve the Contractor of any of his obligations or responsibilities under this contract. See also Clause PSA6.5 in this regard.

Materials rejected by the Engineer shall be removed from the site within 30 days and shall be replaced by other approved materials by the Contractor at his own expense.

PSL4 STANDARD HYDRAULIC PIPE TEST (Clause 7.3)

Field test pressures shall be 1,5 times the recommended maximum working pressure for the class of pipe and/or valves, specials and fittings being tested.

PSLB BEDDING (PIPES)

PSLB1 BEDDING (Sub-Clause 3.3)

PSLB1.2 Rigid Pipes

All steel, clay and concrete pipes shall be laid on a class C bedding as shown on Drawing LB-1 of SANS 1200LB.

PSLB1.3 Flexible pipes

UPVC and polyethylene pipes will be regarded as being flexible and shall be bedded as per Drawing LB-2 of SANS 1200LB.

PSLB2 MATERIAL NOT AVAILABLE FROM TRENCH EXCAVATION (Clause 3.4.2)

Bedding and selected fill materials shall be obtained from trench excavation, other necessary excavations or from borrow pits. The engineer reserves the right to

designate alternative sources. He also reserves the right to make a ruling whether special efforts must be made to construct specifically separate bedding for pipes where the insitu material proved to be of poor quality.

PSLB3 CLASS A BEDDING (Sub-Clause 5.2.1)

Concrete to be used in class A bedding to pipes shall be of grade 20/19.

PSLB4 CONCRETE CASING TO PIPES (Sub-Clause 5.4)

Concrete to be used in the casing of pipes shall be of grade 20/19.

PSLB5 TOLERANCE ON COMPACTION OF BEDDING MATERIAL

Degree of accuracy II shall prevail.

SECTION 5:

PRICE SCHEDULES

INDEX TO PRICE SCHEDULES

SCHEDULE 1: GENERAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1.1	**SUMS STATED PROVISIONALLY BY THE ENGINEER** 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
1.1.2	For work to be executed by a Nominated Subcontractor.	Sum	R500 000	-	R500 000
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
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	R100 000	-	R100 000
1.1.7	Overheads, charges and profit on item 1.1.6	%	R100 000	%	R
1.2	**PRIME COSTS ITEMS**				
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
1.2.2	Overheads, charges and profit on item 1.2.1	%	R100 000	%	R
1.2.3	Specialist Contractors/Engineers	PC Sum	R100 000	-	R100 000
1.2.4	Overheads, charges and profit on item 1.2.3	%	R100 000	%	R
1.2.5	Percentage mark-up as items approved by the client or his representative with attached invoices for material used.	%	R100 000	%	R
	TOTAL SCHEDULE 1 CARRIED TO SUMMARY				**R**

Note: BID price must include value added tax.

SCHEDULE 2: DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2.1	**DAYWORKS LABOUR**				
	(a) Contractor's Representative	h	1	R	R
	(b) Surveyor	h	1	R	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
2.2	**PLANTHIRE: WORK RATES ON SITE**				
2.2.1	Crane 65 t - 80 t capacity	h	1	R	R
2.2.2	TLB 60 kW - 70 kW	h	1	R	R
2.2.3	Crawler Excavator 140 kW - 150 kW	h	1	R	R
2.2.4	Bulldozer 160 kW - 170 kW	h	1	R	R
2.2.5	Wheel loader 140 kW - 150 kW	h	1	R	R
2.2.6	Motor graders 150 kW - 160 kW	h	1	R	R
2.2.7	Wheel excavators 0,4 - 1,25 m^3 bucket size	h	1	R	R
2.2.8	Wheel tractor scrapers 15,0 - 16 m^3	h	1	R	R
2.2.9	Tow tractors 200 kW - 250 kW	h	1	R	R
2.2.10	(a) Water tankers 5 000 litre	h	1	R	R
	(b) Water tankers 10 000 litre	h	1	R	R
2.2.11	Dump trucks 10 - 15 m^3	h	1	R	R
2.2.12	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
2.2.13	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
2.2.14	LDV				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(a) 2 x 4WD	km	1	R	R
	(b) 4 x 4WD	km	1	R	R
2.2.15	Lowbed 50 ton	km	1	R	R
2.2.16	Plate compactors & tampers	h	1	R	R
2.2.17	Grid rollers. Ballasted mass 14 600 kg	h	1	R	R
2.2.18	Pneumatic tyred rollers 4 000 load/wheel kg	h	1	R	R
2.2.19	Self propelled vibrating roller (smooth) 7 000 - 11 300 kg	h	1	R	R
2.2.20	Self propelled vibrating roller (padfoot) 5 900 - 12 000 kg	h	1	R	R
2.2.21	Walk-behind vibrating rollers (a) 500 - 630 kg	h	1	R	R
	(b) 980 - 1 350 kg	h	1	R	R
2.2.22	Towed vibrating roller	h	1	R	R
2.2.23	Portable compressors - Diesel (9,0 - 10,0 m^3/min.)	h	1	R	R
2.2.24	Concrete mixer (350 ℓ: diesel driven)	h	1	R	R
2.2.25	Concrete saw (self propelled) 10 - 15 kW	h	1	R	R
2.2.26	Concrete vibrators (35 - 60 mm DN)	h	1	R	R
2.2.27	Dumpers 0,5 m^3 (Hydraulic tip)	h	1	R	R
2.2.28	Water pump with 80 mm DN outlet (diesel driven)	h	1	R	R
2.2.29	Arc-welding unit (300 A)	h	1	R	R
2.2.30	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
2.3	**LABOUR BASED TOOLS**				
	(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
2.4	Percentage mark-up on items approved by the client or representative with attached invoices for material used.	%	R	%	R
	TOTAL SCHEDULE 2 CARRIED FORWARD TO SUMMARY				**R**

Note: BID price must include value added tax.

SCHEDULE 3: SMALL DIAMETER WATER SUPPLY PIPELINES

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.	**SMALL DIAMETER CLEARWATER SUPPLY PIPELINES**				
3.1	**EARTHWORKS (Pipe trenches)**				
3.1.1	**SITE CLEARANCE**				
	(a) Clear vegetation and trees of girth up to 1 m	m^2	1	R	R
	(b) Clear trees of girth over 1 m	no	1	R	R
	(c) Remove topsoil (150 mm depth)	m^2	1	R	R
3.1.2	**EXCAVATION**				
3.1.2.1	Excavation in all materials for trenches for 200 mm nominal diameter pipes and smaller. Rates include backfill, compact and disposal of surplus and unsuitable material.				
	(a) Up to 1,5 m deep	m	1	R	R
	(b) Over 1,5 m up to 2,5 m deep (Provisional)	m	1	R	R
3.1.2.2	Extra-over item for 3.1.2.1				
	(a) Intermediate excavation (Prov.)	m^3	1	R	R
	(b) Hard rock excavation (Prov.)	m^3	1	R	R
3.1.2.3	Excavate and disposal of unsuitable material from trench bottom (Prov.)	m^3	1	R	R
3.1.2.4	Import backfill material from designated borrow pits (Prov.)	m^3	1	R	R
3.1.2.5	Opening up and closing down of designated borrow pit	ha	1	R	R
3.1.2.6	Compaction in road reserve	m^3	1	R	R
3.1.2.7	Overhaul				
	(a) Limited overhaul (0,5 to 1,0 km) (Prov.)	m^3	1	R	R
	(b) Long overhaul (Prov.)	m^3/km	1	R	R
3.1.2.8	Shore trench opposite structure or service	m	1	R	R
3.1.2.9	Existing services that intersect or adjoin a pipe trench				
	(a) Services that intersect a trench	no	1	R	R
	(b) Services that adjoin a trench	m	1	R	R
3.1.2.10	Reinstate road surfaces complete with all courses				
	(a) Gravel on shoulders	m^2	1	R	R
	(b) Asphalt of thickness 40 mm in parking area	m^2	1	R	R
	(c) Asphalt of thickness 40 mm in roadway	m^2	1	R	R
3.2	**BEDDING (pipes)**				
3.2.1	Supply only of bedding by importation				
3.2.2.1	From other necessary excavations (Prov.)				
	(a) Selected granular material	m^3	1	R	R
	(b) Selected fill material	m^3	1	R	R
3.2.2.2	From borrow pits (Prov.)				
	(a) Selected granular material	m^3	1	R	R
	(b) Selected fill material	m^3	1	R	R
3.2.2.3	From commercial sources (Prov.)				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(a) Selected granular material	m^3	1	R	R
	(b) Selected fill material	m^3	1	R	R
3.2.3	Concrete bedding cradle class 20/19	m^3	1	R	R
3.2.4	Encasing of pipes in concrete class 20/19	m^3	1	R	R
3.2.5	Overhaul of material for bedding cradle and selected fill blanket (Prov.)	m^3/km	1	R	R
3.3	**MEDIUM PRESSURE PIPELINES**				
3.3.1	uPVC Pressure Pipes and Fittings				
3.3.1.1	Supply, lay, bed and test the following uPVC pressure pipes (conforming with SABS 946 Part 1 specifications) in 6m lengths, each pipe fitted at one end with socket for Mechanical jointing, in the following diameters:				
	(a) 200 mm dia Class 12	m	1	R	R
	(b) 200 mm dia Class 16	m	1	R	R
	(c) 160 mm dia Class 12	m	1	R	R
	(d) 160 mm dia Class 16	m	1	R	R
	(e) 140 mm dia Class 12	m	1	R	R
	(f) 140 mm dia Class 16	m	1	R	R
	(g) 125 mm dia Class 12	m	1	R	R
	(h) 125 mm dia Class 16	m	1	R	R
	(i) 110 mm dia Class 12	m	1	R	R
	(j) 110 mm dia Class 16	m	1	R	R
	(k) 90 mm dia Class 12	m	1	R	R
	(l) 90 mm dia Class 16	m	1	R	R
	(m) 75 mm dia Class 12	m	1	R	R
	(n) 75 mm dia Class 16	m	1	R	R
	(o) 63 mm dia Class 12	m	1	R	R
	(p) 63 mm dia Class 16	m	1	R	R
	(q) 50 mm dia Class 12	m	1	R	R
	(r) 50 mm dia Class 16	m	1	R	R
3.3.1.2	Extra-over item 3.3.1 for the supply, laying and bedding of specials complete with couplings. Note: Fittings to be suitable for coupling directly (mechanically) onto pipes. Each fitting socketed for mechanical jointing. Fitting for PVC Class 16; of PVC, cast iron or epoxy-painted steel.				
3.3.1.2.1	Bends 90°				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 140 mm dia	no	1	R	R
	(d) 125 mm dia	no	1	R	R
	(e) 110 mm dia	no	1	R	R
	(f) 90 mm dia	no	1	R	R
	(g) 75 mm dia	no	1	R	R
	(h) 63 mm dia	no	1	R	R
	(i) 50 mm dia	no	1		
3.3.1.2.2	Bends 45°				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 140 mm dia	no	1	R	R
	(d) 125 mm dia	no	1	R	R
	(e) 110 mm dia	no	1	R	R
	(f) 90 mm dia	no	1	R	R
	(g) 75 mm dia	no	1	R	R
	(h) 63 mm dia	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(i) 50 mm dia	no	1	R	R
3.3.1.2.3	Bends 22,5°				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 140 mm dia	no	1	R	R
	(d) 125 mm dia	no	1	R	R
	(e) 110 mm dia	no	1	R	R
	(f) 90 mm dia	no	1	R	R
	(g) 75 mm dia	no	1	R	R
	(h) 63 mm dia	no	1	R	R
	(i) 50 mm dai	no	1	R	R
3.3.1.2.4	Bends 11,25°				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 140 mm dia	no	1	R	R
	(d) 125 mm dia	no	1	R	R
	(e) 110 mm dia	no	1	R	R
	(f) 90 mm dia	no	1	R	R
	(g) 75 mm dia	no	1	R	R
	(h) 63 mm dia	no	1	R	R
	(i) 50 mm dia	no	1	R	R
3.3.1.2.5	Tees				
	(a) 200 mm dia	no	1	R	R
	(b) 200 x 160 mm dia	no	1	R	R
	(c) 200 x 110 mm dia	no	1	R	R
	(d) 160 mm dia	no.	1	R	R
	(e) 160 x 110 mm dia	no	1	R	R
	(f) 160 x 90 mm dia	no	1	R	R
	(g) 140 mm dia	no	1	R	R
	(h) 125 mm dia	no	1	R	R
	(i) 110 mm dia	no	1	R	R
	(j) 110 x 90 mm dia	no	1	R	R
	(k) 110 x 75 mm dia	no	1	R	R
	(l) 110 x 63 mm dia	no	1	R	R
	(m) 90 mm dia	no	1	R	R
	(n) 90 x 63 mm dia	no	1	R	R
	(o) 75 m dia	no	1	R	R
	(p) 63 mm dai	no	1	R	R
	(q) 50 mm dia	no	1	R	R
				R	R
3.3.1.2.6	Scour Tee (100 DN flanged outlet drilled SABS 1123 Table 1600/3)				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 110 mm dia	no	1	R	R
	(d) 90 mm dia	no	1	R	R
3.3.1.2.7	Reducers (socketed both ends)				
	(a) 200 x 160 mm dia	no	1	R	R
	(b) 160 x 110 mm dia	no	1	R	R
	(c) 110 x 90 mm dia	no	1	R	R
	(d) 90 x 63 mm dia	no	1	R	R
3.3.1.2.8	Reducers (spigot and socket)				
	(a) 200 x 110 mm dia	no	1	R	R
	(b) 200 x 90 mm dia	no	1	R	R
	(c) 160 x 140 mm dia	no	1	R	R
	(d) 160 x 125 mm dia	no	1	R	R
	(e) 160 x 90 mm dia	no	1	R	R
	(f) 140 x 110 mm dia	no	1	R	R
	(g) 140 x 125 mm dia	no	1	R	R
	(h) 125 x 110 mm dia	no	1	R	R
	(i) 110 x 75 mm dia	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(j) 110 x 63 mm dia	no	1	R	R
	(k) 110 x 50 mm dia	no	1	R	R
	(l) 90 x 75 mm dia	no	1	R	R
	(m) 90 x 63 mm dia	no	1	R	R
	(n) 90 x 50 mm dia	no	1	R	R
	(o) 75 x 63 mm dia	no	1	R	R
	(p) 75 x 50 mm dia	no	1	R	R
	(q) 63 x 50 mm dia	no	1	R	R
3.1.2.9	End caps				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 110 mm dia	no	1	R	R
	(d) 90 mm dia	no	1	R	R
	(e) 75 mm dia	no	1	R	R
	(f) 63 mm dia	no	1	R	R
	(g) 50 mm dia	no	1	R	R
3.3.1.2.10	Repair coupling				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 110 mm dia	no	1	R	R
	(d) 90 mm dia	no	1	R	R
	(e) 63 mm dia	no	1	R	R
3.3.1.2.11	Flange Adaptor (drilled SABS 1123 Table 1600/3)				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 140 mm dia	no	1	R	R
	(d) 125 mm dia	no	1	R	R
	(e) 110 mm dia	no	1	R	R
	(f) 90 mm dia	no	1	R	R
	(g) 75 mm dia	no	1	R	R
	(h) 63 mm dia	no	1	R	R
	(i) 50 mm dia	no	1	R	R
3.3.1.2.12	Saddle Clamp (tap drilled 252 BSP)				
	(a) 200 mm dia	no	1	R	R
	(b) 160 mm dia	no	1	R	R
	(c) 110 mm dia	no	1	R	R
	(d) 90 mm dia	no	1	R	R
	(e) 75 mm dia	no	1	R	R
	(f) 63 mm dia	no	1	R	R
3.3.1.2.13	Cast Iron Gate Valves (SABS 664 Class 16) Spigot ended for uPVC pipework in the following nominal diameters:				
	(a) 200 mm	no	1	R	R
	(b) 160 mm	no	1	R	R
	(c) 110 mm	no	1	R	R
	(d) 90 mm	no	1	R	R
	(e) 63 mm	no	1	R	R
3.3.2	**MGI PIPES AND FITTINGS**				
3.3.2.1	Supply, lay, bed and test the following MGI pipes (conforming to SABS 62-1989) in 6,7 m lengths, each pipe fitted at one end with a parallel socket for jointing, in the following diameters:				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2	Extra-over item 3.3.2.1 for the supply, laying and bedding of galvanized specials for fixing onto MGI pipes. Fittings to be suitable for coupling to MGI pipes and to be in accordance with SABS 509-1975 as amended 1989.				
3.3.2.2.1	Threaded boss flanges drilled SABS 1123 Table 1600/4 in the following sizes:				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
3.3.2.2.2	Malleable iron parallel socket				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 332 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.3	Conical Socket Unions				
	(a) 80 DN	no	1	R	R
	(b) 65 DN	no	1	R	R
	(c) 50 DN	no	1	R	R
	(d) 40 DN	no	1	R	R
	(e) 32 DN	no	1	R	R
	(f) 25 DN	no	1	R	R
	(g) 20 DN	no	1	R	R
	(h) 15 DN	no	1	R	R
3.3.2.2.4	Barrel Nipple				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.5	Tee				
	(a) 150 DN	no	1	R	R
	(b) 150 x 100 DN	no	1	R	R
	(c) 150 x 80 DN	no	1	R	R
	(d) 150 z 50 DN	no	1	R	R
	(e) 100 DN	no	1	R	R
	(f) 100 x 80 DN	no	1	R	R
	(g) 100 x 50 DN	no	1	R	R
	(h) 100 x 40 DN	no	1	R	R
	(i) 80 DN	no	1	R	R
	(j) 80 x 65 DN	no	1	R	R
	(k) 80 x 50 DN	no	1	R	R
	(l) 80 x 40 DN	no	1	R	R
	(m) 80 x 32 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(n) 80 x 25 DN	no	1	R	R
	(o) 65 DN	no	1	R	R
	(p) 65 x 50 DN	no	1	R	R
	(q) 65 x 40 DN	no	1	R	R
	(r) 65 x 32 DN	no	1	R	R
	(s) 65 x 25 DN	no	1	R	R
	(t) 50 DN	no	1	R	R
	(u) 50 x 40 DN	no	1	R	R
	(v) 50 x 32 DN	no	1	R	R
	(w) 50 x 25 DN	no	1	R	R
	(x) 50 x 20 DN	no	1	R	R
	(y) 50 x 15 DN	no	1	R	R
	(z) 40 DN	no	1	R	R
	(aa) 40 x 32 DN	no	1	R	R
	(ab) 40 x 25 DN	no	1	R	R
	(ac) 40 x 20 DN	no	1	R	R
	(ad) 40 x 15 DN	no	1	R	R
	(ae) 32 DN	no	1	R	R
	(af) 32 x 25 DN	no	1	R	R
	(ag) 32 x 20 DN	no	1	R	R
	(ah) 32 x 15 DN	no	1	R	R
	(ai) 25 DN	no	1	R	R
	(aj) 25 x 20 DN	no	1	R	R
	(ak) 25 x 15 DN	no	1	R	R
	(al) 20 DN	no	1	R	R
	(am) 20 x 15 DN	no	1	R	R
	(an) 15 DN	no	1	R	R
3.3.2.2.6	Cross				
	(a) 100 DN	no	1	R	R
	(b) 80 DN	no	1	R	R
	(c) 65 DN	no	1	R	R
	(d) 50 DN	no	1	R	R
	(e) 40 DN	no	1	R	R
	(f) 32 DN	no	1	R	R
	(g) 25 DN	no	1	R	R
	(h) 20 DN	no	1	R	R
	(i) 15 DN	no	1	R	R
3.3.2.2.7	Reducing Bush				
	(a) 150 x 100 DN	no	1	R	R
	(b) 150 x 80 DN	no	1	R	R
	(c) 100 x 80 DN	no	1	R	R
	(d) 100 x 65 DN	no	1	R	R
	(e) 100 x 50 DN	no	1	R	R
	(f) 80 x 65 DN	no	1	R	R
	(g) 80 x 50 DN	no	1	R	R
	(h) 65 x 50 DN	no	1	R	R
	(i) 65 x 40 DN	no	1	R	R
	(j) 50 x 40 DN	no	1	R	R
	(k) 50 x 32 DN	no	1	R	R
	(l) 50 x 25 DN	no	1	R	R
	(m) 40 x 32 DN	no	1	R	R
	(n) 40 x 25 DN	no	1	R	R
	(o) 32 x 25 DN	no	1	R	R
	(p) 25 x 20 DN	no	1	R	R
	(q) 25 x 15 DN	no	1	R	R
	(r) 20 x 15 DN	no	1	R	R
3.3.2.2.8	Reducing Socket				
	(a) 150 x 100 DN	no	1	R	R
	(b) 150 x 50 DN	no	1	R	R
	(c) 100 x 80 DN	no	1	R	R
	(d) 100 x 50 DN	no	1	R	R
	(e) 80 x 65 DN	no	1	R	R
	(f) 80 x 50 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(g) 65 x 50 DN	no	1	R	R
	(h) 50 x 40 DN	no	1	R	R
	(i) 50 x 32 DN	no	1	R	R
	(j) 50 x 25 DN	no	1	R	R
	(k) 40 x 32 DN	no	1	R	R
	(l) 40 x 25 DN	no	1	R	R
	(m) 32 x 25 DN	no	1	R	R
	(n) 25 x 20 DN	no	1	R	R
	(o) 25 x 15 DN	no	1	R	R
	(p) 20 x 15 DN	no	1	R	R
			1		
3.3.2.2.9	Reducing Elbows				
	(a) 32 x 25 DN	no	1	R	R
	(b) 25 x 15 DN	no	1	R	R
	(c) 20 x 15 DN	no	1	R	R
3.3.2.2.10	Elbows M/F				
	(a) 100 DN	no	1	R	R
	(b) 80 DN	no	1	R	R
	(c) 65 DN	no	1	R	R
	(d) 50 DN	no	1	R	R
	(e) 40 DN	no	1	R	R
	(f) 32 DN	no	1	R	R
	(g) 25 DN	no	1	R	R
	(h) 20 DN	no	1	R	R
	(i) 15 DN	no	1	R	R
3.3.2.2.11	Elbows (female)				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.12	Bends (90°) M/F				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.13	Bends (90°) female				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
			1		
3.3.2.2.14	Bends (45°) M/F				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(c) 80 DN	no	1	R	R
	(d) 64 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.15	Plugs				
	(a) 150 DN	no	1	R	R
	(b) 100 DN	no	1	R	R
	(c) 80 DN	no	1	R	R
	(d) 65 DN	no	1	R	R
	(e) 50 DN	no	1	R	R
	(f) 40 DN	no	1	R	R
	(g) 32 DN	no	1	R	R
	(h) 25 DN	no	1	R	R
	(i) 20 DN	no	1	R	R
	(j) 15 DN	no	1	R	R
3.3.2.2.16	End caps				
	(a) 80 DN	no	1	R	R
	(b) 65 DN	no	1	R	R
	(c) 50 DN	no	1	R	R
	(d) 40 DN	no	1	R	R
	(e) 32 DN	no	1	R	R
	(f) 25 DN	no	1	R	R
	(g) 20 DN	no	1	R	R
	(h) 15 DN	no	1	R	R
3.3.3	**HDPe PIES AND FITTINGS**				
3.3.3.1	Supply, lay, bed and test the following HDPe type IV pipes (conforming to SABS 533 - Part 2: 1982 amended 1994), in the following diameters and class.				
	(a) 75 DN Class 16	m	1	R	R
	(b) 74 DN Class 12	m	1	R	R
	(c) 75 DN Class 10	m	1	R	R
	(d) 63 DN Class 16	m	1	R	R
	(e) 63 DN Class 12	m	1	R	R
	(f) 63 DN Class 10	m	1	R	R
	(g) 50 DN Class 16	m	1	R	R
	(h) 50 DN Class 12	m	1	R	R
	(i) 50 DN Class 10	m	1	R	R
	(j) 40 DN Class 16	m	1	R	R
	(k) 40 DN Class 12	m	1	R	R
	(l) 40 DN Class 10	m	1	R	R
	(m) 32 DN Class 16	m	1	R	R
	(n) 32 DN Class 12	m	1	R	R
	(o) 32 DN Class 10	m	1	R	R
	(p) 25 DN Class 16	m	1	R	R
	(q) 25 DN Class 12	m	1	R	R
	(r) 25 DN Class 10	m	1	R	R
	(s) 20 DN Class 16	m	1	R	R
	(t) 20 DN Class 12	m	1	R	R
	(u) 20 DN Class 10	m	1	R	R
3.3.3.2	Extra-over item 3.3.3.1 for supply, laying and bedding of compression fittings for use with HDPe Type IV pipes.				
3.3.3.2.1	Coupling				
	(a) 75 DN	no	1	R	R
	(b) 63 DN	no	1	R	R
	(c) 50 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(d) 40 DN	no	1	R	R
	(e) 32 DN	no	1	R	R
	(f) 25 DN	no	1	R	R
	(g) 20 DN	no	1	R	R
3.3.3.2.2	Male Adaptor (BSP threaded)				
	(a) 75 DN x 65 BSP	no	1	R	R
	(b) 75 DN x 50 BSP	no	1	R	R
	(c) 63 DN x 50 BSP	no	1	R	R
	(d) 63 DN x 40 BSP	no	1	R	R
	(e) 50 DN x 50 BSP	no	1	R	R
	(f) 50 DN x 40 BSP	no	1	R	R
	(g) 40 DN x 50 BSP	no	1	R	R
	(h) 40 DN x 50 BSP	no	1	R	R
	(i) 40 DN x 32 BSP	no	1	R	R
	(j) 32 DN x 32 BSP	no	1	R	R
	(k) 32 DN x 25 BSP	no	1	R	R
	(l) 25 DN x 25 BSP	no	1	R	R
	(m) 25 DN x 20 BSP	no	1	R	R
	(n) 20 DN x 25 BSP	no	1	R	R
	(o) 20 DN x 20 BSP	no	1	R	R
	(p) 20 DN x 15 BSP	no	1	R	R
3.3.32.3	Female Adaptor (BSP threaded)				
	(a) 75 DN x 50 BSP				
	(b) 63 DN x 50 BSP				
	(c) 50 DN x 50 BSP	no	1	R	R
	(d) 40 DN x 32 BSP	no	1	R	R
	(e) 40 DN x 25 BSP	no	1	R	R
	(f) 32 DN x 25 BSP	no	1	R	R
	(g) 25 DN x 25 BSP	no	1	R	R
	(h) 25 DN x 20 BSP	no	1	R	R
	(i) 20 DN x 20 BSP	no	1	R	R
	(j) 20 DN x 15 BSP	no	1	R	R
3.3.3.2.4	Equal tee				
	(a) 75 DN	no	1	R	R
	(b) 63 DN	no	1	R	R
	(c) 50 DN	no	1	R	R
	(d) 40 DN	no	1	R	R
	(e) 32 DN	no	1	R	R
	(f) 25 DN	no	1	R	R
	(g) 20 DN	no	1	R	R
3.3.3.2.5	Reducing tee				
	(a) 75 x 63 DN	no	1	R	R
	(b) 63 x 50 DN	no	1	R	R
	(c) 50 x 40 DN	no	1	R	R
	(d) 40 x 32 DN	no	1	R	R
	(e) 32 x 25 DN	no	1	R	R
	(f) 25 x 20 DN	no	1	R	R
3.3.2.6	Tee with female thread				
	(a) 75 DN x 65 BSP	no	1	R	R
	(b) 75 DN x 50 BSP	no	1	R	R
	(c) 63 DN x 50 BSP	no	1	R	R
	(d) 50 DN x 50 BSP	no	1	R	R
	(e) 50 DN x 50 BSP	no	1	R	R
	(f) 40 DN x 50 BSP	no	1	R	R
	(g) 40 DN x 40 BSP	no	1	R	R
	(h) 40 DN x 32 BSP	no	1	R	R
	(i) 40 DN x 25 BSP	no	1	R	R
	(j) 32 DN x 32 BSP	no	1	R	R
	(k) 32 DN x 25 BSP	no	1	R	R
	(l) 25 DN x 32 BSP	no	1	R	R
	(m) 25 DN x 25 BSP	no		R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(n) 25 DN x 20 BSP	no	1	R	R
	(o) 25 DN x 15 BSP	no	1	R	R
	(p) 20 DN x 20 BSP	no	1	R	R
	(q) 20 DN x 15 BSP	no	1	R	R
3.3.3.2.7	Male elbow				
	(a) 63 DN x 50 BSP	no	1	R	R
	(b) 50 DN x 40 BSP	no	1	R	R
	(c) 40 DN x 32 BSP	no	1	R	R
	(d) 32 DN x 25 BSP	no	1	R	R
	(e) 25 DN x 20 BSP	no	1	R	R
	(f) 20 DN x 20 BSP	no	1	R	R
	(g) 20 DN x 15 BSP	no	1	R	R
3.3.3.2.8	Female elbow				
	(a) 75 DN x 75 BSP	no	1	R	R
	(b) 74 DN x 65 BSP	no	1	R	R
	(c) 63 DN x 50 BSP	no	1	R	R
	(d) 50 DN x 50 BSP	no	1	R	R
	(e) 50 DN x 40 BSP	no	1	R	R
	(f) 40 DN x 50 BSP	no	1	R	R
	(g) 40 DN x 40 BSP	no	1	R	R
	(h) 40 DN x 32 BSP	no	1	R	R
	(i) 32 DN x 25 BSP	no	1	R	R
	(j) 32 DN x 20 BSP	no	1	R	R
	(k) 25 DN x 25 BSP	no	1	R	R
	(l) 25 DN x 20 BSP	no	1	R	R
	(m) 20 DN x 20 BSP	no	1	R	R
	(n) 20 DN x 205 BSP	no	1	R	R
3.3.3.2.9	Elbow (90°)				
	(a) 75 DN	no	1	R	R
	(b) 63 DN	no	1	R	R
	(c) 50 DN	no	1	R	R
	(d) 40 DN	no	1	R	R
	(e) 32 DN	no	1	R	R
	(f) 25 DN	no	1	R	R
	(g) 20 DN	no	1	R	R
3.3.3.2.200	Reducers				
	(a) 75 x 63 DN	no	1	R	R
	(b) 75 x 50 DN	no	1	R	R
	(c) 63 x 50 DN	no	1	R	R
	(d) 63 x 50 DN	no	1	R	R
	(e) 63 x 40 DN	no	1	R	R
	(f) 50 x 40 DN	no	1	R	R
	(g) 50 x 32 DN	no	1	R	R
	(h) 50 x 25 DN	no	1	R	R
	(i) 40 x 32 DN	no	1	R	R
	(j) 40 x 25 DN	no	1	R	R
	(k) 32 x 25 DN	no	1	R	R
	(l) 32 x 20 DN	no	1	R	R
	(m) 25 x 20 DN	no	1	R	R
3.3.3.2.11	Polypropylene Saddle				
	(a) 75 DN x 25 BSP	no	1	R	R
	(b) 75 DN x 25 BSP	no	1	R	R
	(c) 75 DN x 15 BSP	no	1	R	R
	(d) 63 DN x 25 BSP	no	1	R	R
	(e) 63 DN x 25 BSP	no	1	R	R
	(f) 63 DN x 15 BSP	no	1	R	R
	(g) 50 DN x 25 BSP	no	1	R	R
	(h) 50 DN x 25 BSP	no	1	R	R
	(i) 50 DN x 25 BSP	no	1	R	R
	(j) 40 DN x 20 BSP	no	1	R	R
	(k) 40 DN x 15 BSP	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(l) 32 DN x 20 BSP	no	1	R	R
	(m) 32 DN x 15 BSP	no	1	R	R
	(n) 25 DN x 15 BSP	no	1	R	R
	(o) 20 DN x 15 BSP	no	1	R	R
3.4	**VALVES**				
3.4.1	Gate valves Gate valves, waterworks pattern in compliance with SABS 664, flanged, drilled to SABS 1123 table 1600/3, with resilient, rubberised metal gate, cap top, plan thrust collar, non-rising spindle, clockwise closing.				
	(a) 200 DN	no	1	R	R
	(b) 150 DN	no	1	R	R
	(c) 100 DN	no	1	R	R
	(d) 80 DN	no	1	R	R
	(e) 65 DN	no	1	R	R
	(f) 50 DN	no	1	R	R
3.5	**ANCHOR/THRUST BLOCKS AND PEDESTALS**				
3.5.1	Concrete thrust block, , in the following sizes:				
	(a) Concrete volume < 0,4 m^3	no	1	R	R
	(b) Concrete volume 0,4 to 0,59 m^3	no	1	R	R
	(c) Concrete volume 0,6 to 0,79 m^3	no	1	R	R
	(d) Concrete volume 0,8 to 0,99 m^3	no	1	R	R
	(e) Concrete volume 1,0 to 1,19 m^3	no	1	R	R
	(f) Concrete volume 1,2 to 1,39 m^3	no	1	R	R
	(g) Concrete volume 1,4 to 1,6 m^3	no	1	R	R
3.5.2	Pipeline marker	no	1	R	R
3.6	**SPECIAL WRAPPING** Wrapping of buried steel pipelines and connections with petrolatum mastic and impregnated tape in an over-the-trench operation, for the following pipe diameters:				
	(a) 200 DN	m	1	R	R
	(b) 150 DN	m	1	R	R
	(c) 100 DN	m	1	R	R
	(d) 80 DN	m	1	R	R
	(e) 65 DN	m	1	R	R
	(f) 50 DN	m	1	R	R
3.7	**MARK-UP RATES**				
3.7.2	(a) Percentage mark-up on rates listed on term contracts.	%	R	%	R
	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used.	%	R	%	R
3.8	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
3.9	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
3.10	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
TOTAL SCHEDULE 3 CARRIED FORWARD TO SUMMARY					

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
				R	
Note: BID price must include value added tax.					

SCHEDULE 4: HANDPUMPS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.	Note: Supply & delivery of the equipment required for handpump installation				
4.1	Complete installation and commissioning	m	1	R	R
	(a) Helical Roter Positives Displacement + Vertical Hand Operated Type (various borehole depths).	m	1	R	R
	(b) Positive Displacement Hand operated piston	m	1	R	R
	Type (various borehole depths)	m	1	R	R
4.2	(a) Concrete pedestal for Helical positive Displacement vertical hand operated type including holding down bolts complete as per specification.	no	1	R	R
	(b) Concrete pedestal for Positive Displacement hand operated piston type including holding down bolts complete	no	1	R	R
4.3	Removal of existing Handpump	no	1	R	R
4.4	Mark-up rates				
	(a) Percentage mark-up on rates listed on term contracts	%	R	%	R
	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used.	%	R	%	R
4.5	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
4.6	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
4.7	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	TOTAL SCHEDULE 4 CARRIED FORWARD TO SUMMARY			**R**	

Note: BID price must include value added tax.

SCHEDULE 5: ELEVATED TANKS

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5.1	**Sectional Pressed Steel Elevated Tanks**				
5.1.1	Earthworks				
	(a) Excavate in all materials for concrete bases	m^3	1	R	R
	(b) Extra-over for items 6.1.1(a) for intermediate material	m^3	1	R	R
	(c) Extra-over for item 6.1.1(a) for hard rock	m^3	1	R	R
5.1.2	Concrete				
	(a) Bedding layer in 10 Mpa/19 mm concrete, 75 mm thick	m^2	1	R	R
	(b) Supply, mix and place Class 25/20 concrete for column bases	m^3	1	R	R
5.1.3	REINFORCEMENT				
5.1.3.1	Mild steel bars				
	(a) Diameter 25 mm: Basic price	kg	1	R	R
	(b) Extra over 6.1.3.1 (a) (Provisional quantities for bars of diameter)				
	(i) 8 mm	kg	1	R	R
	(ii) 10 mm	kg	1	R	R
	(iii) 12 mm	kg	1	R	R
5.1.3.2	High tensile steel bars				
	(a) Diameter 25 mm: Basic price	kg	1	R	R
	(b) Extra over 6.1.3.2 (a) (Provisional quantities for bars of diameter)				
	(i) 10 mm	kg	1	R	R
	(ii) 12 mm	kg	1	R	R
	(iii) 16 mm	kg	1	R	R
5.1.4	Formwork				
5.1.4.1	Rough formwork	m^2	1	R	R
5.1.4.2	Smooth formwork	m^2	1	R	R
5.1.4.3	Chamfer 30 x 30 mm	m	1	R	R
5.1.4.4	Uniformed surface finishes				
	(a) Woodfloated finish	m^2	1	R	R
	(b) Steelfloated finish	m^2	1	R	R
5.1.5	Sectional steel tank				
	Design, supply, fabrication, delivery to site and erection of the following sectional pressed steel tank with cover, access hatches, ventilator and pipework, all as specified in particular specification PE including surface dressing, surface preparation and hot dip galvanising, sterilising and water tightness test in the following sizes:				
	(a) 50 m^3	no	1	R	R
	(b) 100 m^3	no	1	R	R
	(c) 150 m^3	no	1	R	R
	(d) 200 m^3	no	1	R	R
	(e) 250 m^3	no	1	R	R
	(f) 300 m^3	no	1	R	R
5.1.6	Design, supply, fabricate, deliver to site and erection of				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	the following structural steel stands for the sizes of pressed steel tanks indicated and heights as specified. Structural steel stands with associated access ladder, surface dressing, surface preparation, shop priming and 2 layers of site painting including holding down bolts:				
	(a) For 50 m3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1	R	R
	(iii) 20 m heights	no	1	R	R
	(b) For 100 m^3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1	R	R
	(iii) 20 m heights	no	1	R	R
	(c) For 150 m^3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1	R	R
	(iii) 20 m heights	no	1	R	R
	(d) For 200 m^3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1	R	R
	(iii) 20 m heights	no	1	R	R
	(e) For 250 m^3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1	R	R
	(iii) 20 m heights	no	1	R	R
	(f) For 300 m^3 tank volume on the following stand heights:				
	(i) 10 m heights	no	1	R	R
	(ii) 15 m heights	no	1		
	(iii) 20 m heights	no	1		
5.2	Interlock paver - Heavy duty (80mm)	no	1	R	R
5.3	Mark-up rates				
	(a) Percentage mark-up on rates listed on term contracts	%	R	%	R
	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used	%	R	%	R
5.4	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	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) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	TOTAL SCHEDULE 5 CARRIED FORWARD TO SUMMARY			**R**	

Note: BID price must include value added tax.

SCHEDULE 6: PVC STORAGE TANK INSTALLATIONS

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.	**PVC STORAGE TANK INSTALLATIONS**				
6.1	**SITE CLEARANCE**				
6.1.1	Clear and grub site	m^2	100	R	R
6.1.2	Remove and grub large trees and stumps of girth:				
	(a) Over 1 m and up to and including 2 m	no	1	R	R
	(b) Over 2 m and up to and including 3 m	no	1	R	R
6.1.3	Reclear surfaces (only on instructions from the Engineer)	m^2	1	R	R
6.1.4	Dismantle and remove pipelines with internal diameter up to 150 mm	m	1	R	R
6.1.5	Demolish and remove concrete structures:				
	(a) Unreinforced	m^3	1	R	R
	(b) Reinforced	m^3	1	R	R
6.1.6	Transport materials and debris to unspecified sites and dumps	m^3/km	1	R	R
6.2	**EARTHWORKS (SMALL WORKS)**				
6.2.1	Restricted excavation			R	R
	(a) Excavate for restricted foundations, footings, slabs and trenches in all materials and use for backfill or dispose	m^3	1	R	R
	(b) Extra-over item 20.2.1a for:				
	(i) Intermediate excavation	m^3	1	R	R
	(ii) Hard rock excavation	m^3	1	R	R
6.2.2	Overhaul				
	(a) Limited overhaul	m^3	1	R	R
	(b) Long overhaul	m^3/km	1	R	R
6.2.3	Importing of materials from borrow pits	m^3	1	R	R
6.2.4	Topsoiling	m^2	1	R	R
6.3	**CONCRETE (ORDINARY BUILDINGS)**				
6.3.1	Formwork				
6.3.1.1	(a) Rough				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
	(b) Normal				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
	(c) Special smooth, rubbed				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
6.3.1.2	Narrow widths				
	(a) Up to 300 mm	m	1	R	R
	(b) Exceeding 300 mm up to and including 600 mm	m	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.3.2	Reinforcement				
	(a) Mild steel bars	t	1		
	(b) High tensile steel bars	t	1		
	(c) Welded mesh				
	(i) ref. 193	m^2	1	R	R
	(ii) ref. 245	m^2	1	R	R
	(iii) ref. 395	m^2	1	R	R
6.3.3	Concrete				
6.3.3.1	Prescribed mix 1:3:6 (38)	m^3	1	R	R
6.3.3.2	Strength mix (general works)				
	(a) Class 15/19	m^3	1	R	R
	(b) Class 20/19	m^3	1	R	R
	(c) Class 25/19	m^3	1	R	R
	(d) Class 30/19	m^3	1	R	R
6.3.3.3	Strength mix Class 25/19, including formwork, floated surface finish and mesh reinforcement and mild steel anchors in 150 mm thick concrete slab for:				
	(a) One tank (2900 x 3000)	no	1	R	R
	(b) two tank (2900 x 5500)	no	1	R	R
	(c) three tank (2900 x 8000)	no	1	R	R
	(d) four tank (2900 x 10500)	no	1	R	R
6.3.3.4	Blinding layer in class 15/19 concrete and 50 mm thick	m^2	1	R	R
6.3.3.5	Unformed concrete surface finishes				
	(a) Wood-floated finish	m^2	1	R	R
	(b) Steel-floated finish	m^2	1	R	R
6.3.3.5	Brickwork (stretcherbond) Foundation walling with clay bricks type NFX to SABS 227-1986 in:				
	(a) 230 mm walls	m^2	1	R	R
	(b) 345 mm walls	m^2	1	R	R
6.3.6	Extra-over item 20.3.5 for building in of miscellaneous walling materials:				
6.3.6.1	Brickforce in the following widths:				
	(a) 150 mm	m	1	R	R
	(b) 225 mm	m	1	R	R
6.4	Water tank (ground level installation)				
	10 000 ℓ polyethylene water tank (2980 mm high x 2 200 mm diameter) detailed supplied, installed and anchored	no	1	R	R
6.5	**PIPES AND FITTINGS (ground level installation)** Supply, install and test the pipework and fittings installation arrangements:				
	(a) One tank	set	1	R	R
	(b) Two tank	set	1	R	R
	(c) Three tank	set	1	R	R
	(d) Four tank	set	1	R	R
6.5	**WATER TANK (elevated installation)**				
	10 000 ℓ polyethylene water tank (2980 mm high x 2200 mm diameter), supplied, erected and anchored.	no	1	R	R
6.6	**STEEL TANK STAND** Supply and erect elevated tank stand in accordance with plan nos.:		1		

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(a) Painted	set	1	R	R
	(b) Hot dip galvanised	set	1	R	R
6.7	**PIPES AND FITTINGS (elevated tank installation)**				
6.7.1	Supply, install and test the pipework and fittings for the single tank installation	set	1	R	R
6.7.2	Supply, install and test the pipework and fittings for the multiple tank installation:				
	(a) Two tank arrangement	set	1	R	R
	(b) Three tank arrangement	set	1	R	R
6.8	**MARK-UP RATES**				
6.8.1	(a) Percentage mark-up on rates listed on term contracts	%	R	%	R
6.8.2	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used.	%	R	%	R
6.9	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
6.10	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
6.11	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	TOTAL SCHEDULE 7 CARRIED FORWARD TO SUMMARY			**R**	

Note: BID price must include value added tax.

SCHEDULE 7: POSITIVE DISPLACEMENT BOREHOLE PUMPS, COLUMN AND ANCILLIARY PIPEWORK INSTALLATION

Note: Supply and delivery of components required for borehole installations:

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7.1	**Remove existing pump and pipe work**				
7.1.1	Removal of columns diameter, 25 mm - 100 mm up to 120 m	m	1	R	R
7.2	**Installation of existing pump and pipework (excl. probe pipe) including the supply and applying of the STAG compound.**				
7.2.1	Installation of columns diameter, 25 mm to 100 mm up to 120 m	m	1	R	R
7.3	**Probe pipes**				
7.3.1	Supply 25 mm class 10 HDPF pipe	m	1	R	R
7.3.2	Rate charged per meter for installation of 25 mm, class 10 HDPF	m	1	R	R
7.3.3	Rate charged per meter for installation of two 25 mm pipes with heavy duty cable ties 7,5 mm (both)	m	1	R	R
7.4	**Supply and installation of ancillary pipework including non-return valve, flanged water meter, gate valves, pressure gauge and pipework.**				
7.4.1	Complete 50 mm diameter installation	Set	1	R	R
7.4.2	Complete 65 mm diameter installation	Set	1	R	R
7.4.3	Complete 80 mm diameter installation	Set	1	R	R
7.4.4	Complete 100 mm diameter installation	Set	1	R	R
7.5	Name plates: Supply and installation of name plates according to SABS	No.	1	R	R
7.6	**MARK-UP RATES**				
7.6.1	Percentage mark-up on rates listed on term contracts	%	R	%	
7.6.2	Percentage mark-up on items approved by the client or his representative with attached invoices for material used.	%	R	%	
7.7	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
7.8	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
7.9	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
Total Schedule 7 carried forward to Summary				**R**	
Note: BID price must include value added tax.					

SCHEDULE 8: PUMPHOUSE INSTALLATION FOR BOREHOLES

Note: Supply and delivery of components required for borehole installations: Term contract rates are applicable.

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
8.	**PUMPHOUSE INSTALALTION FOR BOREHOLES**				
8.1	**SITE CLEARANCE**				
8.1.1	Clear and grub site	m^2	1	R	R
8.1.2	Remove and grub large trees and stumps of girth:				
	(a) Over 1 m and up to and including 2 m	no	1	R	R
	(b) Over 2 m and up to and including 3 m	no	1	R	R
8.1.3	Reclear surfaces (only on instructions from the Engineer)	m^2	1	R	R
8.1.4	Take down existing fences				
	(a) Stockproof fence	m	1	R	R
	(b) Security fence	m	1	R	R
8.1.5	Dismantle and remove pipelines with internal diameter up to 150 mm	m	1	R	R
8.1.6	Demolish and remove concrete structures:				
	(a) Unreinforced	m^3	1	R	R
	(b) Reinforced	m^3	1	R	R
8.1.7	Transport materials and debris to unspecified sites and dump	m^3/km	1	R	R
8.2	**EARTHWORKS (SMALL WORKS)**				
8.2.1	Restricted excavation				
	(a) Excavate for restricted foundations, footings and trenches in all materials and use for backfill or dispose.	m^3	1	R	R
	(b) Extra-over item 18.2.1a for:				
	(i) intermediate excavation	m^3	1	R	R
	(ii) hard rock excavation	m^3	1	R	R
8..2.2	Overhaul				
	(a) Limited overhaul	m^3/km	1	R	R
	(b) Long overhaul	m^3/km	1	R	R
8.2.3	Importing of materials from borrow pits	m^3	1	R	R
8.2.4	Topsoiling	m^2	1	R	R
8.3	**CONCRETE (ORDINARY BUILDINGS)**				
8.3.1	Formwork				
8.3.1.1	(a) Rough				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
	(b) Normal				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
	(c) Special smooth, rubbed				
	(i) Horizontal	m^2	1	R	R
	(ii) Vertical	m^2	1	R	R
8.3.1.2	Narrow widths				
	(a) Up to 300 mm	m	1	R	R
	(b) Exceeding 300 mm up to and including 600 mm	m	1	R	R
8.3.2	Reinforcement				

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	(a) Mild steel bars	t	1	R	R
	(b) High tensile steel bars	t	1	R	R
	(c) Welded mesh				
	(i) ref. 193	m^2	1	R	R
	(ii) ref. 245	m^2	1	R	R
	(iii) ref. 395	m^2	1	R	R
8.3.3	Concrete				
8.3.3.1	Prescribed mix 1:3:6 (38)	m^3	1	R	R
8.3.3.2	Strength mix (general works)				
	(a) Class 15/19	m^3	1	R	R
	(b) Class 20/19	m^3	1	R	R
	(c) Class 25/19	m^3	1	R	R
	(d) Class 30/19	m^3	1	R	R
8.3.3.3	Strength mix Class 25/19 to pumphouse floor, pump and engine foundations,				
	(a) Concrete floor 3000 x 3000 x 150 mm	no	1	R	R
	(b) Diesel engine foundation block (including formwork and anchor bolts)				
	(i) Size 2300 x 800 x 600 mm	no	1	R	R
	(ii) (Up to 5 kW max.)	no	1	R	R
	(iii) (From 6 kW to 25 kW)	no	1	R	R
	(c) Electric motor foundation block (including formwork and anchor bolts)				
	(i) Size 600 x 600 x 600 mm (up to 7 kW max.) (anchor bolts dia. M12 x 200 mm long)	no	1	R	R
	(ii) Size 800 x 800 x 600 mm (from 8 kW to 22 kW (5 anchor bolts dia M16 x 215 mm long)	no	1	R	R
8.3.3.4	Blinding layer in class 15/19 concrete and 50 mm thick	m^2	1	R	R
8.3.3.5	Unformed concrete surface finishes				
	(a) Wood-floated finish	m2	1	R	R
	(b) Steel-floated finish	m2	1	R	R
	(c) Power-floated finish	m2	1	R	R
8.3.3.6	Concrete collar				
	(i) 150mm above floor	sum	1	R	R
8.4	**BRICKWORK (strecherbond)**				
8.4.1	Foundation walling with clay bricks type NFX to SABS 227-1986 in:				
	(a) 230 mm walls	m^2	1	R	R
	(b) 345 mm walls	m^2	1	R	R
8.4.2	Walling with clay stock bricks type NFP to SABS 227-1986 in:				
	(a) 115 mm walls	m^2	1	R	R
	(b) 230 mm walls	m^2	1	R	R
	(c) 345 mm walls	m^2	1	R	R
8.4.3	Walling with clay face bricks to SABS 227-1986 in:				
	(a) Type FBA				
	(i) 115 mm walls	m^2	1	R	R
	(ii) 230 mm walls	m^2	1	R	R
	(b) Type FBX				
	(i) 115 mm walls	m^2	1	R	R
	(ii) 230 mm walls	m^2	1	R	R
	(c) Type FBS				
	(i) 115 mm walls	m^2	1	R	R
	(ii) 230 mm walls	m^2	1	R	R
8.4.4	Extra-over items 18.4.1, 18.4.2 and 18.4.3 for building in of miscellaneous walling materials				
8.4.41	Brickforce in the following widths				
	(a) 75 mm	m	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	(b) 150 mm	m	1	R	R
	(c) 225 mm	m	1	R	R
8.4.4.2	Wire ties				
	(a) Butterfly type wire tie	no	1	R	R
	(b) Modified PWD type wire tie	no	1	R	R
8.4.4.3	Mild steel (non-coiled) round bars				
	(a) 6 mm dia	m	1	R	R
	(b) 8 mm dia	m	1	R	R
8.4.4.4	Precast concrete lintels				
	(a) 110 mm wide	m	1	R	R
	(b) 225 x 50 mm cross section	m	1	R	R
	(c) 225 x 75 mm cross section	m	1	R	R
8.4.4.5	Damp proof sheeting to SABS 952-1985				
	(a) 375 micron polyolefin water proof sheeting under floor slabs and other positions instructed by the Engineer	m2	1	R	R
	(b) 375 micron polyolefin water proof sheeting in walls and window cills:				
	(i) 110 m wide	m	1	R	R
	(ii) 225 mm wide	m	1	R	R
	(iii) 375 mm wide	m	1	R	R
8.4.4.6	Soft board				
	(a) Plain				
	(i) 10 mm thick	m^2	1	R	R
	(ii) 13 mm thick	m^2	1	R	R
	(b) Bitumen impregnated				
	(i) 10 mm thick	m^2	1	R	R
8.4.4.7	Galvanised hoop iron	m	1	R	R
8.4.4.8	Galvanised wire				
	(a) 4 mm dia in 50 kg rolls	no	1	R	R
	(b) 3,15 mm dia in 50 kg rolls	no	1	R	R
8.4.4.9	Galvanised heavy duty door				
	(i) 120mm X 210mm				
8.4.4.10	Galvanised Louvers				
8.4.5	Extra-over items 18.4.1, 18.4.2 and 18.4.3 for forming of wall joints				
	(a) 10 mm square raked joint, measured per square metre of walling	m^2	1	R	R
	(b) 10 mm square raked and tooled joint, measured per square metre of walling	m^2	1	R	R
8.5	**MODULAR PUMPHOUSE**				
8.5.1	Remove old pumphouse and store temporarily for re-installation	no	1	R	R
8.5.2	Install removal pump house	no	1	R	R
8.5.3	Supply and install complete new modular pumphouse	no	1	R	R
8.5.4	Supply 50 mm padlock wit set of 3 keys	set	1	R	R
8.5.5	Supply and install precision made frame for pump and engine complete with a anchor bolt (500 mm long with 100 mm hook, diameter M20)				
	(a) Small diesel engine - frame size 500 x 2100 x 350	set	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	mm				
	(b) Medium engines - frame size 600 x 2100 x 350 mm	set	1	R	R
	(c) Large engines - frame size 1000 x 2100 x 650 mm	set	1	R	R
8.6	**TAPSTANDS**				
	(a) Stand pipes - single type	no	1	R	R
	(b) Stand pipes - double type	no	1	R	R
8.7	**NAME PLATES**				
	Supply and installation of name plates	set	1	R	R
8.8	(a) Percentage mark-up on rates listed on term contracts	%	R	%	R
	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used	%	R	%	R
8.9	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
8.10	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
8.11	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	TOTAL SCHEDULE 8 CARRIED TO SUMMARY				**R**

Note: BID price must include value added tax.

SCHEDULE 9: SUBMERSIBLE PUMPS

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
9.	**SUBMERSIBLE PUMPS**				
9.1	Supply and delivery of stainless steel centrifugal submersible borehole pumps and motors complete for the following duty points: Manufacturer: _____				
9.1.1	(a) Head = 70 m Flow = 0,2-1 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 70 m Flow = 0,2-1 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.1.2	(a) Head = 110 m Flow = 0,2-1,3 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 110 m Flow = 0,2-1,3 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 0,2-1,3 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.1.3	(a) Head = 60 m Flow = 1-2,2 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 1-2,2 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
9.1.4	(a) Head = 110 m Flow = 1-2,2 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 110 m Flow = 1-2,2 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 1-2,2 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.1.5	(a) Head = 50 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
9.1.6	(a) Head = 80 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 80 m Flow = 1,6-3,6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.1.7	(a) Head = 110 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 110 m Flow = 1,6-3,6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 1,0-3,6 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.1.8	(a) Head = 60 m Flow = 2,5-6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 2,5-6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.1.9	(a) Head = 90 m Flow = 2,5-6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 90 m Flow = 2,5-6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 90 m Flow = 2,5-6 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.1.10	(a) Head = 60 m Flow = 5-10 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 5-10 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.1.11	(a) Head = 90 m Flow = 5-10 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 90 m Flow = 5-10 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 90 m Flow = 5-10 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.2	Supply, delivery and installation of stainless steel centrifugal submersible borehole pumps and motors complete for the following duty points: Manufacturer: _____			R	R
9.2.1	(a) Head = 70 m Flow = 0,2-1 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 70 m Flow = 0,2-1 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.2.2	(a) Head = 110 m Flow = 0,2-1,3 m^3/h for 30 m pump	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	installation (Model: _____)				
	(b) Head = 110 m Flow = 0,2-1,3 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 0,2-1,3 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.2.3	(a) Head = 60 m Flow = 1-2,2 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 1-2,2 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.2.4	(a) Head = 110 m Flow = 1-2,2 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 110 m Flow = 1-2,2 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 1-2,2 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.2.5	(a) Head = 50 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
9.2.6	(a) Head = 80 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 80 m Flow = 1,6-3,6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.2.7	(a) Head = 110 m Flow = 1,6-3,6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 110 m Flow = 1,6-3,6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 110 m Flow = 1,0-3,6 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.2.8	(a) Head = 60 m Flow = 2,5-6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 2,5-6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.2.9	(a) Head = 90 m Flow = 2,5-6 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 90 m Flow = 2,5-6 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
	(c) Head = 90 m Flow = 2,5-6 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.2.10	(a) Head = 60 m Flow = 5-10 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 60 m Flow = 5-10 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R
9.2.11	(a) Head = 90 m Flow = 5-10 m^3/h for 30 m pump installation (Model: _____)	no	1	R	R
	(b) Head = 90 m Flow = 5-10 m^3/h for 50 m pump installation (Model: _____)	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	(c) Head = 90 m Flow = 5-10 m^3/h for 80 m pump installation (Model: _____)	no	1	R	R
9.3	(a) Percentage mark-up on rates listed on term contracts	%	R	%	R
	(b) Percentage mark-up on items approved by the client or his representative with attached invoices for material used for heads greater than 110m and depth greater than 80m	%	R	%	R
9.4	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
9.5	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
9.6	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	SUBTOTAL SCHEDULE 9 CARRIED FORWARD			**R**	

Note: BID price must include value added tax.

SCHEDULE 10 : ELECTRIC MOTORS

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.1	Megger testing of electric motors between phases and between phase and frame (earth) & report findings to Department (per motor)	no	1	R	R
10.2	Disconnection and removal of electric motors and placing in store of Department or delivery to position required by Department for:				
10.2.1	Motors of 1.1 and 2.4 kW (per motor)	no	1	R	R
10.2.2	Motors of 3 and 4 kW (per motor)	no	1	R	R
10.2.3	Motors of 5,5 and 7,5 kW (per motor)	no	1	R	R
10.2.4	Motors of 11 and 15 kW (per motor)	no	1	R	R
10.2.5	Motors of 18,5 and 22 kW (per motor)	no	1	R	R
10.2.6	Motors of 30kW (per motor)	no	1	R	R
10.3	Installation and connection of **existing** motors for pumps, including shaft alignment of motor for V-belts or pump coupling for:				
10.3.1	Motors of 1.1 and 2.4 kW TEFC, foot mounted				
10.3.2	Motors of 3 and 4 kW TEFC, foot mounted				
10.3.3	Motors of 5,5 and 7,5 kW TEFC, foot mounted	no	1	R	R
10.3.4	Motors of 11 and 15 kW TEFC, foot mounted	no	1	R	R
10.3.5	Motors of 18,5 and 22 kW TEFC, foot mounted	no	1	R	R
10.3.6	Motors of 5,5 and 7,5 kW TEFC, flange mounted	no	1	R	R
10.3.7	Motors of 11 and 15 kW TEFC, flange mounted	no	1	R	R
10.3.8	Motors of 18,5 and 22 kW TEFC, flange mounted	no	1	R	R
10.3.9	Motors of 30kW TEFC, flange mounted	no	1	R	R
10.4	Supply, installation and connection of **new** motors for pumps, including shaft alignment of motor for V-belts or pump coupling for:				
10.4.1	1.1 kW, 380/220 V, TEFC, foot mounted				
10.4.2	2.4 kW, 380/220 V, TEFC, foot mounted				
10.4.3	3 kW, 380/220 V, TEFC, foot mounted				
10.4.4	4 kW, 380/220 V, TEFC, foot mounted				
10.4.5	5,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.6	7,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.7	11 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.8	15 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.9	18,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.10	22 kW, 380/220 V, TEFC, foot mounted	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.4.11	30 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.4.12	1.1 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.13	2.4 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.14	3 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.15	4 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.16	5,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.17	7,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.18	11 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.19	15 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.20	18,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.21	22 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.4.22	30 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5	Disconnection, removal and transport to re-winders, rewinding of existing 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:				
10.5.1	1.1 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.2	2.4 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.3	3 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.4	4 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.5	5,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.6	7,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.7	11 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.8	15 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.9	18,5 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.10	22 kW, 380/220 V, TEFC, foot mounted	no	1	R	R
10.5.11	5,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.12	7,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.13	11 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.14	15 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.15	18,5 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.16	22 kW, 380/220 V, TEFC, flange mounted	no	1	R	R
10.5.17	30 kW, 380/220 V, TEFC, flange mounted				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.6	General Callout Rates				
10.6.1	(a) Normal hours	hour	1	R	R
10.6.2	(b) After hours	hour	1	R	R
10.7	**Make-up rates**				
10.7.1	(a) Percentage mark-up on rates listed on term contracts	%	R	%	
10.7.2	(b) 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
10.8	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
10.9	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
10.10 PSA15	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
TOTAL SCHEDULE 11 CARRIED FORWARD TO SUMMARY					R

Note: BID price must include value added tax.

SCHEDULE 11 : SMALL ELECTRICAL PANELS

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.1	**Testing of earthing installation for the electrical panel**				
11.1.1	Test earthing of distribution panel back to main earth point (per panel)	no	1	R	R
11.1.2	Testing of earth connections at light fittings, power point, motors and instrumentation (per circuit)	no	1	R	R
11.2	**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)**				
11.2.1	2,5 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.2	4 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.3	6 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.4	10 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.5	16 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.6	25 mm^2 bare copper or insulated earth wire	m	1	R	R
11.2.7	2,5 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.8	4 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.9	6 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.10	10 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.11	16 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.12	25 mm^2 earth wire end, lugged and connected	no	1	R	R
11.2.13	1,8 m copper clad steel core earth rod installed in ground, complete with clamp and connections (per earth assembly)	no	1	R	R
11.2.14	5 x 25 m copper earth strap installed on surface of structure or cable ladders, including fixings	m	1	R	R
11.3	**Supply and installation of 600/1 000 V, grade PVC PVC SWA PVC cable in trench or in ground**. Fixings or excavations as well as cable ends are measured elsewhere				
11.3.1	1,5 mm^2 3 or 4 core armoured	m	1	R	R
	2,5 mm^2 3 or 4 core armoured	m	1	R	R
	4 mm^2 4 core armoured	m	1	R	R
	6 mm^2 3 core armoured	m	1	R	R
	10 mm^2 4 core armoured	m	1	R	R
	16 mm^2 4 core armoured	m	1	R	R
	25 mm^2 3 core armoured	m	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	35 mm^2 4 core armoured	m	1	R	R
11.4	**Supply and installation of 600/1 000 V, grade PVC PVC SWA PVC cable ends complete with lugs, connections to motor terminals, stub bars, small terminals, etc. (include for labels and testing)**				
11.4.1	1,5 mm^2 3 or 4 - core armoured	m	1	R	R
11.4.2	2,5 mm^2 3 or 4 - core armoured	m	1	R	R
11.4.3	1,5 mm^2 7 - core armoured	m	1	R	R
11.4.4	4 mm^2 4 - core armoured	m	1	R	R
11.4.5	6 mm^2 3 - core armoured	m	1	R	R
11.4.6	10 mm^2 4 - core armoured	m	1	R	R
11.4.7	16 mm^2 4 - core armoured	m	1	R	R
11.4.8	25 mm^2 3 - core armoured	m	1	R	R
11.4.9	35 mm^2 4 - core armoured	m	1	R	R
11.5	**Cable Trenches** Excavation, laying 150 mm bedding, backfilling in 150 mm layers, and stabilising to original of cable trench (600 mm wide x 1 m deep):				
11.5.1	Hard rock	m^3	1	R	R
11.5.2	Soft rock	m^3	1	R	R
11.5.3	Soil	m^3	1	R	R
11.6	**General maintenance of electrical equipment as per Section 3 of the maintenance specification:**				
11.6.1	Clean inside and outside of each panel (per panel)	no	1	R	R
11.6.2	Tighten all connections in panel (per panel)	no	1	R	R
11.6.3	Tighten connections in lock stop button box (per box)	no	1	R	R
11.6.4	Tighten connections in remote stop-start station box (per box)	no	1	R	R
11.6.5	Tighten connections in motor connection box, including thermal sensor wiring terminals (per box)	no	1	R	R
11.6.6	Tighten connections at instrument terminals (per instrument)	no	1	R	R
11.6.7	Repair ends of damaged conductors due to overheating at circuit breakers, contactors, overloads or motor terminals, including installation of ferrules, lugs, heatshrink materials or insulated sleeving:				
	(a) Conductor size up to 16 mm^2, per terminal	no	1	R	R
	(b) Conductor sizes from 25 mm^2 to 50 mm^2 per terminal	no	1	R	R
11.6.8	Testing of single phase or three phase earth leakage unit	no	1	R	R
11.6.9	Testing of under/over-voltage relay or phase monitor				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	relay per unit	no	1	R	R
11.6.10	Checking of all voltmeters and voltmeter switches for correct operation (per panel)	no	1	R	R
11.6.11	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
11.6.12	Checking of all indicator lamps on panel (per panel)	no	1	R	R
11.6.13	**Replacement of indicator lamps as follows:**				
	(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
11.6.14	Checking of all instrumentation fuses on a site (per site)	no	1	R	R
11.6.15	**Replacement of blown fuses as follows:**				
	(a) HRC up to 10A	no	1	R	R
	(b) HRC above 10A and up to 32A	no	1	R	R
11.6.16	Checking of all lightning arrestors on a site (per site)	no	1	R	R
11.6.17	**Replacing of lightning arrestors as follows:**				
	(a) Power surge arrestors - MOV type - 40 kA fault rating	no	1	R	R
	(b) Power surge arrestors - MOV type - 65 kA fault rating	no	1	R	R
	(c) Power surge arrestors - MOV type - 100 kA fault rating	no	1	R	R
	(d) Instrument signal surge arrestor - MOV type - 10 kA fault rating	no	1	R	R
	(e) Instrument signal surge arrestor - MOV type - 5 kA fault rating	no	1	R	R
11.7	**Megger testing of 600/1 000 V cables** with both ends of cables disconnected for the following sizes of cables:				
	(a) Cables with 3 to 7 cores up to 2,5 mm^2, per cable	no	1	R	R
	(b) Cables with 3 to 4 cores from 4 mm^2 to 25 mm^2, per cable	no	1	R	R
	(c) Cables with 3 - 4 cores from 35 mm^2 to 50 mm^2, per cable	no	1	R	R
11.8	Supply and installation of PVC warning tape in top 300 mm of trench backfill	no	1	R	R
11.9	Supply and fitting of cable labels on ends of cable with strap-on type label with up to 10 digits on label (per label)	no	1	R	R
11.10	**Testing and checking of motors**, all sizes, and comparing current readings with current rating of motor				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	and logging of data as follows per motor:	no	1	R	R
11.10.1	Megger between phases and phases to earth and log data (per motor)	no	1	R	R
11.11	**Maintenance of panels**, executing the following various tasks per unit of equipment:				
11.11.1	Inspecting of 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 motor 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
11.11.2	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	1	R	R
11.11.3	Checking that overloads are of correct rating and that setting i correct for the rating of the motor protected with overload. Also check for malfunctioning of overload and nuisance tripping as ell as overheating of overloads. Check that overload is not set for "Auto" reset (per panel)	no	1	R	R
11.11.4	Checking and setting of star-delta starter for proper changeover of star-to-delta (per timer)	no	1	R	R
11.12	**Equipment** Supply, installation, connection, testing and commis-sioning of the following equipment for distribution boards or motor controls:				
11.12.1	100 A TP on-load isolator	no	1	R	R
11.12.2	100 - 250 A TP on-load isolator	no	1	R	R
11.12.3	10 - 10 A SP mcb (5 kA)	no	1	R	R
11.12.4	15 - 100 A TP mcb (5 kA)	no	1	R	R
11.12.5	125 - 250 A TP mcb (10 kA) (with replaceable trip unit)	no	1	R	R
11.12.6	**Replacing set of 3 contacts** in the following sizes of contractors:				
	(a) 4 kW AC-3 rating contactor	set	1	R	R
	(b) 5,5 kW AC-3 rating contactor	set	1	R	R
	(c) 7,5 kW AC-3 rating contactor	set	1	R	R
	(d) 11 kW AC-3 rating contactor	set	1	R	R
	(e) 15 kW AC-3 rating contactor	set	1	R	R
	(f) 18,5 kW AC-3 rating contactor	set	1	R	R
	(g) 22 kW AC-3 rating contactor	set	1	R	R
	(h) 30 kW AC-3 rating contactor	set	1	R	R
11.12.7	**Replacing coil** in the following sizes of contactors:				
	(a) 4 kW AC-3 rating contactor	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) 5,5 kW AC-3 rating contactor	no	1	R	R
	(c) 7,5 kW AC-3 rating contactor	no	1	R	R
	(d) 11 kW AC-3 rating contactor	no	1	R	R
	(e) 15 kW AC-3 rating contactor	no	1	R	R
	(f) 18,5 kW AC-3 rating contactor	no	1	R	R
	(g) 22 kW AC-3 rating contactor	no	1	R	R
11.12.8	**Replacing of complete contactor** for the following sizes of contactors, inclusive of removal of old unit and all re-connections:				
	(a) 2.4 kW AC-3 rating contactor	no	1	R	R
	(b) 3 kW AC-3 rating contactor	no	1	R	R
	(c) 4 kW AC-3 rating contactor	no	1	R	R
	(d) 5,5 kW AC-3 rating contactor	no	1	R	R
	(e) 7,5 kW AC-3 rating contactor	no	1	R	R
	(f) 11 kW AC-3 rating contactor	no	1	R	R
	(g) 15 kW AC-3 rating contactor	no	1	R	R
	(h) 18,5 kW AC-3 rating contactor	no	1	R	R
	(i) 22 kW AC-3 rating contactor	no	1	R	R
	(j) 30 kW AC-3 rating contactor	no	1	R	R
11.12.9	**Replacing of adjustable overloads** on contactors for the following sizes:				
	(a) 8 - 18 A	set	1	R	R
	(b) 17 - 40 A	set	1	R	R
	(c) 38 - 63 A	set	1	R	R
11.12.10	**Replace star-delta timer** for starter contactors as follows:				
	(a) Electronic type	no	1	R	R
	(b) Magnetic type	no	1	R	R
	(c) Vacuum type	no	1	R	R
11.12.11	Changeover switch				
	(i) 30A	no	1	R	R
	(ii) 40A	no	1	R	R
	(iii) 70A	no	1	R	R
	(iv) 80A	no	1	R	R
	(v) 100A	no	1	R	R
11.13	**As-built drawings** Drawing up and delivery of five sets of "As Built" drawings of panel to the Department for the following:				
11.13.1	12-way power distribution board (per board)	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.13.2	24-way power distribution board (per board)	no	1	R	R
11.13.3	Motor supply panel with main incoming panel and up to 2 starters (per panel)	no	1	R	R
11.13.4	Motor control centre with main incoming panel and up to 4 starters (per MCC)	no	1	R	R
11.14	**General call out rates**	hour	1	R	R
11.14.1	Normal hours	hour	1	R	R
11.14.2	After hours	hour	1	R	R
11.15	Mark-up rates				
11.15.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
11.15.2	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
11.16	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
11.17	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
11.18	LDV				
	(a) 2x4WD	km	1	R	R
	(b) 4x4WD	km	1	R	R
	TOTAL SCHEDULE 12 CARRIED FORWARD TO SUMMARY			**R**	

Note: BID price must include value added tax.

SCHEDULE 12: DIESEL ENGINES: LISTER LV1

NOTE: SUPPLY AND DELIVERY OF DIESEL ENGINES AND ACCESSORIES:

ITEM NO.	DESCRIPTION		UNIT	QTY	RATE	AMOUNT
12.1	**SERVICE**					
		PART NUMBER (TERM CONTRACT)				
12.1.1	Fuel Filter	201-13117	Part	1	R	
12.1.2	Oil Filter	N/A	Part	1	R	
12.1.3	Air Filter	601-31350	Part	1	R	
12.1.4	Labour		Hour		R	
12.1.5	Lubrication		Sum		R	
12.1.6	W/Shop Cons		Sum		R	
	SUBTOTAL			**R**		
12.2	**MAJOR SERVICE**					
12.2.1	Gasket Set	657-28576	Part	1	R	
12.2.2	Main Bearing Seal	601-35670	Part	1	R	
12.2.3	Timing Cover Seal	601-39550	Part	1	R	
12.2.4	Nozzle	601-37020	Part	1	R	
12.2.5	Pump Element	660-14180	Part	1	R	
12.2.6	Delivery Valve	660-14270	Part	1	R	
12.2.7	Delivery Valve Washer		Part	1	R	
12.2.8	Oil Pump Kit	601-50170	Part	1	R	
12.2.9	Oil Filter		Part	1	R	
12.2.10	Air Filter	601-31350	Part	1	R	
12.2.11	Fuel Filter	201-13117	Part	1	R	
	WORKSHOP LABOUR:					
12.2.12	Repair Pump/Injector		Sum	1	R	
12.2.13	Strip & Assemble		Sum	1	R	
12.2.14	Dyno Test		Hour	1	R	
12.2.15	Respray Engine		Sum	1	R	
	CONSUMABLES:					
	Workshop Material					
12.2.16	(Cloths etc.)		Sum	1	R	
12.2.17	Engine Oil		Litre	1	R	
12.2.18	Paint & Thinners		Sum	1	R	
	SUBTOTAL			**R**		
12.3.1	Piston & Ring Set	601-51145	Part	1	R	
12.3.2	Mains	601-30060/601-30061	Part	2	R	
12.3.3	Big Ends	601-50420	Part	1	R	
12.3.4	Thrust Washer	201-12380	Part	1	R	
12.3.5	Cam Bearing	601-21670	Part	2	R	
12.3.6	Small Ends	601-30150	Part	1	R	
12.3.7	Gasket Set	657-28576	Part	1	R	
12.3.8	Main Bearing Seal	601-35670	Part	1	R	
12.3.9	Timing Cover Seal	601-39550	Part	1	R	
12.3.10	Nozzle	601-37020	Part	1	R	
12.3.11	Pump Element	660-14180	Part	1	R	
12.3.12	Delivery Valve	660-14270	Part	1	R	
12.3.13	Delivery Valve Washer		Part	1	R	
12.3.14	Oil Pump Kit	601-50170	Part	1	R	
12.3.15	Oil Filter		Part	1	R	
12.3.16	Air Filter	601-31350	Part	1	R	
12.3.17	Fuel Filter	201-13117	Part	1	R	
12.3.18	Inlet Valve	601-30361	Part	1	R	
12.3.19	Exhaust Valve	601-30372	Part	1	R	
12.3.20	Valve Springs	601-30221	Part	2	R	
12.3.21	Valve Guides	601-30402/601-30321	Part	2	R	
	ENGINEERING WORKS:					

ITEM NO.	DESCRIPTION		UNIT	QTY	RATE	AMOUNT
12.3.22	Grind Crankshaft		Sum	1	R	
12.3.23	Polish Crankshaft		Sum	1	R	
12.3.24	Rebore/hone Block		Sum	1	R	
12.3.25	Face Valves		Sum	1	R	
12.3.26	Face Seats		Sum	1	R	
12.3.27	Fit Valve Guides		Sum	1	R	
12.3.28	Resize Conrods		Sum	1	R	
12.3.29	Fit & Match Small Ends		Sum	1	R	
12.3.30	Fit Cam Bushes		Sum	1	R	
12.3.31	Grind Valves		Sum	1	R	
12.3.32	Repair Pump/Injector		Sum	1	R	
	WORKSHOP LABOUR:					
12.3.33	Strip & Assemble		Sum	1	R	
12.3.34	Dyno-Test		Hour	1	R	
12.3.35	Respray Engine		Sum	1	R	
	CONSUMABLES:					
	Workshop Material					
12.3.36	(Cloths etc.)		Sum	1	R	
12.3.37	Engine oil		Litre	1	R	
12.3.38	Paint & thinners		Sum	1	R	
	SUBTOTAL				**R**	
	CLUTCHES (Overhaul clutch)					
	Materials Used					
12.3.39	Shoes	125-1003	Part	2	R	
12.3.40	Springs	125-1201 (1000RPM)	Part	2	R	
12.3.41	Workshop Labour		Hour	1	R	
12.3.42	New clutch		Part	1	R	
	SUBTOTAL				R	
12.4	**MARK-UP RATES**					
12.4.1	Percentage mark-up on rates listed on term contracts		%	R		
12.4.2	Percentage mark-up on items approved by the client or his representative with attached invoices for material used		%	R		
12.5	Tip trucks					
	(a) 6 m^3		h	1		
	(b) 10 m^3		h	1		
12.6	Flat bed trucks					
	(a) 5t		km	1		
	(b) 7t		km	1		
12.7	LDV					
PSA15	(a) 2x4WD		km	1		
	(b) 4x4WD		km			
TOTAL SCHEDULE 12 CARRIED FORWARD TO SUMMARY				R		

Note: BID price must include value added tax.

SCHEDULE 13: DIESEL ENGINES: LISTER TR1

NOTE: SUPPLY AND DELIVERY OF DIESEL ENGINES AND ACCESSORIES: TERM CONTRACT RATES ARE APPLICABLE

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
13.1	**SERVICE**					
13.1.1	Fuel Filter	751-18100	Part	1	R	
13.1.2	Oil Filter	201-55370	Part	1	R	
13.1.3	Air Filter	366-06227	Part	1	R	
13.1.4	Labour		Hour		R	
13.1.5	Lubrication		Sum		R	
13.1.6	W/Shop Cons		Sum		R	
	SUBTOTAL			**R**		
13.2	**MAJOR SERVICE**					
13.2.1	Gasket Set	657-32681	Part	1	R	
13.2.2	Main Bearing Seal	201-41940	Part	1	R	
13.2.3	Timing Cover Seal	601-39550	Part	1	R	
13.2.4	Nozzle	201-47092	Part	1	R	
13.2.5	Pump Element	660-14260	Part	1	R	
13.2.6	Delivery Valve	660-14270	Part	1	R	
13.2.7	Delivery Valve Washer		Part	1	R	
13.2.8	Oil Pump Kit	570-32670	Part	1	R	
13.2.9	Oil Filter	201-5537 0	Part	1	R	
13.2.10	Air Filter	366-06227	Part	1	R	
13.2.11	Fuel Filter	751-18100	Part	1	R	
	WORKSHOP LABOUR:					
13.2.12	Repair Pump/Injector		Sum	1	R	
13.2.13	Strip & Assemble		Sum	1	R	
13.2.14	Dyno Test		Hour	1	R	
13.2.15	Respray Engine		Sum	1	R	
	CONSUMABLES:					
	Workshop Material					
13.2.16	(Cloths etc.)		Sum	1	R	
13.2.17	Engine Oil		Litre	1	R	
13.2.18	Paint & Thinner		Sum	1	R	
	SUBTOTAL			**R**		
13.3	**OVERHEAUL ENGINE**					
13.3.1	Piston & Ring Set	570-12840	Part	1		
13.3.2	Mains	570-30010/570-30011	Part	2		
13.3.3	Big Ends	570-31370	Part	1		
13.3.4	Thrust Washer	570-31360	Part	1		
13.3.5	Cam Bearing	201-30250/201-30670	Part	2		
13.3.6	Small Ends	201-441950	Part	1		
13.3.7	Gasket Set	657-32681	Part	1		
13.3.8	Main Bearing Seal	201-41940	Part	1		
13.3.9	Timing Cover Seal	601-39550	Part	1		
13.3.10	Nozzle	201-47092	Part	1		
13.3.11	Pump Element	660-14260	Part	1		
13.3.12	Deliver Valve	660-14270	Part	1		
13.3.13	Delivery Valve Washer		Part	1		
13.3.14	Oil Pump Kit	570-32670	Part	1		
13.3.15	Oil Filter	201-55370	Part	1		
13.3.16	Air Filter	366-06227	Part	1		
13.3.17	Fuel Filter	751-18100	Part	1		
13.3.18	Inlet Valve	201-30040	Part	1		
13.3.19	Exhaust Valve	201-30051	Part	1		
13.3.20	Valve Springs	201-300080	Part	2		
13.3.21	Valve Guides	201-30181/201-30171	Part	2		

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
	ENGINEERING WORKS:					
13.3.22	Grind Crankshaft		Sum	1		
13.3.23	Polish Crankshaft		Sum	1		
13.3.24	Rebore/hone block		Sum	1		
13.3.25	Face Valves	Each	Sum	1		
13.3.26	Face Seats	Each	Sum	1		
13.3.27	Fit Valve Guides	Each	Sum	1		
13.3.28	Resize Conrods	Each	Sum	1		
13.3.29	Fit & Match Small Ends	Each	Sum	1		
13.3.30	Fit Cam Bushes	Each	Sum	1		
13.3.31	Grind Valves	Each	Sum	1		
13.3.32	Repair Pump/Injector	Each	Sum	1		
	WORKSHOP LABOUR:					
13.3.33	Strip & Assemble		Sum	1		
13.3.34	Dyno-Test		Hour	1		
13.3.35	Respray Engine		Sum	1		
	CONSUMABLES:					
	Workshop Material					
13.3.36	(Cloths etc.)		Sum	1		
13.3.37	Engine Oil		Litre	1		
13.3.38	Paint & Thinners		Sum	1		
	CLUTCHES:					
	Overhaul clutch					
	Material used					
13.3.39	Shoes	125-1003	Part	2		
	SUBTOTAL	**CARRIED FORWARD**			**R**	
		BROUGHT FORWARD			R	
13.3.40	Springs	125-1201 (1000RPM)	Part	2		
13.3.41	Workshop Labour		Hour	1		
13.3.42	New clutch		Part	1		
	SUBTOTAL				R	
13.4	MARKUP RATES					
13.4.1	Percentage mark-up on rates listed on term contracts	%	R	R		
13.4.2	Percentage mark-up on items approved by the client or his representative with attached invoices for material used	%	R	R		
13.5 (a) 5t (b) 7t 13.6 PSA`4 (a) 2 x 4WD (b) 4 x 4WD	Flat bed truck	 km km km km	 1 1 1 1	 R R R R		
	Total Schedule 14 carried forward to Summary		R			
TOTAL SCHEDULE 13 CARRIED FORWARD TO SUMMARY				R		

Note: BID price must include value added tax.

SCHEDULE 14: DIESEL ENGINES: LISTER TR2

NOTE: SUPPLY AND DELIVERY OF DIESEL ENGINES AND ACCESSORIES: TERM CONTRACT RATES ARE APPLICABLE

14.1 DIESEL ENGINE LISTER TS2: SERVICE

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
14.1	SERVICE					
14.1.1	Fuel Filter	751-18100	Part	1	R	
14.1.2	Oil Filter	201-55370	Part	1	R	
14.1.3	Air Filter	366-06227	Part	1	R	
14.1.4	Labour		Hour		R	
14.1.5	Lubrication		Sum		R	
14.1.6	W/Shop Cons		Sum		R	
	SUBTOTAL			**R**		
SCHEDULE NO.	**DESCRIPTION**	**PART NUMBER (TERM CONTRACT)**	**UNIT**	**QTY**	**RATE**	
	PARTS:	**BROUGHT FORWARD**		**R**		
14.2	**MAJOR SERVICE**					
14.2.1	Gasket Set	567-29511	Part	1	R	
14.2.2	Main Bearing Seal	201-41920	Part	1	R	
14.2.3	Timing Cover Seal	601-39550	Part	1	R	
14.2.4	Nozzle	201-47092	Part	2	R	
14.2.5	Pump Element	660-14260	Part	2	R	
14.2.6	Delivery Valve	660-14270	Part	2	R	
14.2.7	Delivery Valve Washer		Part	2	R	
14.2.8	Oil Pump Kit	570-30680	Part	1	R	
14.2.9	Oil Filter	201-55370	Part	1	R	
14.2.10	Air Filter	366-06227	Part	1	R	
14.2.11	Fuel Filter	751-18100	Part	1	R	
	WORKSHOP LABOUR:					
14.2.12	Repair Pump/Injector		Sum	1	R	
14.2.13	Strip & Assemble		Sum	1	R	
14.2.14	Dyno Test		Hour	1	R	
14.2.15	Respray Engine		Sum	1	R	
	CONSUMABLES:					
14.2.16	Workshop Material					
14.2.17	(Cloths etc.)		Sum	1	R	
14.2.18	Engine Oil		Litre	1	R	
14.2.19	Paint & Thinners		Sum	1	R	
	SUBTOTAL			**R**		
SCHEDULE NO.	**DESCRIPTION**	**PART NUMBER (TERM CONTRACT)**	**UNIT**	**QTY**	**RATE PER PART**	
	PARTS:	**BROUGHT FORWARD**		**R**		
14.3	**ENGINE OVERHAUL**					
14.3.1	Piston & Ring Set	570-12840	Part	1	R	
14.3.2	Mains	570-20010/570-30011/570-2990	Part	1	R	
14.3.3	Big Ends	570-31370	Part	1	R	
14.3.4	Thrust Washer	570-30360	Part	1	R	
14.3.5	Cam Bearing	201-30250/201-50670/202-12070	Part	1	R	
14.3.6	Small Ends	201-44950	Part	1	R	
14.3.7	Gasket Set	657-29511	Part	1	R	
14.3.8	Main Bearing Seal	201-41940	Part	1	R	
14.3.9	Timing Cover Seal	601-39550	Part	1	R	
14.3.10	Nozzle	201-47092	Part	1	R	
14.3.11	Pump Element	660-14260	Part	1	R	
14.3.12	Delivery Valve	660-14270	Part	1	R	
14.3.13	Delivery Valve Washer		Part	1	R	
14.3.14	Oil Pump Kit	570-30680	Part	1	R	

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
14.3.15	Oil Filter	201-55370	Part	1	R	
14.3.16	Air Filter	366-06227	Part	1	R	
14.3.17	Fuel Filter	751-18100	Part	1	R	
14.3.18	Inlet Valve	751-18100	Part	1	R	
14.3.19	Exhaust Valve	201-30070	Part	1	R	
14.3.20	Valve Springs	201-30080	Part	1	R	
14.3.21	Valve Guides	201-30181/201-30171	Part	1	R	
	ENGINEERING WORKS:					
14.3.22	Grind Crankshaft		Sum	1	R	
14.3.23	Polish Crankshaft		Sum	1	R	
14.3.24	Rebore/hone block	Per cylinder	Sum	1	R	
14.3.25	Face Valves	Each	Sum	1	R	
14.3.26	Face Seats	Each	Sum	1	R	
14.3.27	Fit Valve Guides	Each	Sum	1	R	
14.3.28	Resize Conrods	Each	Sum	1	R	
14.3.29	Fit & Match Small Ends	Each	Sum	1	R	
14.3.30	Fit Cam Bushes	Each	Sum	1	R	
14.3.31	Grind Valves	Each	Sum	1	R	
14.3.32	Repair Pump/Injector	Each	Sum	1	R	
	WORKSHOP LABOUR:					
14.3.33	Strip & Assemble		Sum	1	R	
14.3.34	Dyno-Test		Hour	1	R	
14.3.35	Respray Engine		Sum	1	R	
	CONSUMABLES:					
	Workshop Material					
14.3.36	(Cloths etc.)		Sum	1	R	
14.3.37	Engine Oil		Litre	1	R	
14.3.38	Paint & Thinners		Sum	1	R	
	SUBTOTAL CARRIED FORWARD			R		
	CLUTCHES:	**BROUGHT FORWARD**		**R**		
	Overhaul Clutch					
	Material used					
14.3.39	Shoes	125-1090	Part	2	R	
14.3.40	Springs	125-1201 (1000RPM)	Part	2	R	
14.3.41	Workshop labour		Hour	1	R	
14.3.42	New clutch		Part	1	R	
	SUBTOTAL			**R**		
14.4	MARK-UP RATES					
14.4.1	Percentage mark-up on rates listed on term contracts		%	R	R	
14.4.2	Percentage mark-up on items approved by the client or his representative with attached invoices for material used		%	R	R	
14.5	Flat bed trucks					
	(a) 5t		km	1	R	
	(b) 7t		km	1	R	
14.6	LDV					
PSA15	(a) 2x4WD		km	1	R	
	(b) 4x4WD		km	1	R	
TOTAL SCHEDULE 14 CARRIED FORWARD TO SUMMARY				R		
Note: BID price must include value added tax.						

SCHEDULE 15: DIESEL ENGINES: LISTER TR3

NOTE: SUPPLY AND DELIVERY OF DIESEL ENGINES AND ACCESSORIES: TERM CONTRACT RATES ARE APPLICABLE

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
15.1	**SERVICE**					
15.1.1	Fuel Filter	751-18100	Part	1	R	
15.1.2	Oil Filter	201-55370	Part	1	R	
15.1.3	Air Filter	366-07188	Part	1	R	
15.1.4	Labour		Hour		R	
15.1.5	Lubrication		Sum		R	
15.1.6	W/Shop Cons		Sum		R	
	SUBTOTAL			**R**		
15.2	**MAJOR SERVICE**					
15.2.1	Gasket Set	657-29531	Part	1	R	
15.2.2	Main Bearing Seal	201-41940	Part	1	R	
15.2.3	Timing Cover Seal	601-39550	Part	1	R	
15.2.4	Nozzle	201-47092	Part	1	R	
15.2.5	Pump Element	660-14260	Part	1	R	
15.2.6	Delivery Valve	660-14270	Part	1	R	
15.2.7	Deliver Valve Washer		Part	1	R	
15.2.8	Oil Pump Kit	570-30680	Part	1	R	
15.2.9	Oil Filter	201-55370	Part	1	R	
15.2.10	Air Filter	366-07188	Part	1	R	
15.2.11	Fuel Filter	751-18100	Part	1	R	
15.2.12	Inlet Valve	201-30040	Part	1	R	
15.2.13	Exhaust Valve	201-30051	Part	1	R	
15.2.14	Valve Spring	201-30080	Part	1	R	
15.2.15	Valve Guides	201-30181/201-30171	Part	1	R	
	WORKSHOP LABOUR:			1		
15.2.16	Repair Pump/Injector		Sum	1	R	
15.2.17	Strip & Assemble		Sum	1	R	
15.2.18	Dyno Test (After setting)		Hour	1	R	
15.2.19	Respray Engine		Sum	1	R	
	CONSUMABLES:			1		
	Workshop Material			1		
15.2.20	(Cloths etc.)		Sum	1	R	
15.2.21	Engine Oil		Litre	1	R	
15.2.22	Paint & Thinners		Sum	1	R	
	SUBTOTAL			1		
				1		
15.3	**OVERHAUL**			1		
				1		
15.3.1	Piston & Ring Set	570-12840	Part	1	R	
15.3.2	Mains	570-12990/570-30010/570-30011	Part	1	R	
15.3.3	Big Ends	570-31370	Part	1	R	
15.3.4	Thrust Washer	570-31360	Part	1	R	
15.3.5	Cam Bearing	201-30250/201-3067/202-12030	Part	1	R	
15.3.6	Small Ends	201-44950	Part	1	R	
15.3.7	Gasket Set	657-29531	Part	1	R	
15.3.8	Main Bearing Seal	201-41940	Part	1	R	
15.3.9	Timing Cover Seal	601-39550	Part	1	R	
15.3.10	Nozzle	201-47092	Part	1	R	
15.3.11	Pump Element	660-14260	Part	1	R	
15.3.12	Delivery Valve	660-14270	Part	1	R	
15.3.13	Delivery Valve Washer		Part	1	R	
15.3.14	Oil Pump Kit	570-30680	Part	1	R	
15.3.15	Oil Filter	201-55370	Part	1	R	

ITEM NO.	DESCRIPTION	PART NUMBER (TERM CONTRACT)	UNIT	QTY	RATE	AMOUNT
15.3.16	Air Filter	366-07188	Part	1	R	
15.3.17	Fuel Filter	751-18100	Part	1	R	
15.3.18	Inlet Valve	201-30040	Part	1	R	
15.3.19	Exhaust Valve	201-30051	Part	1	R	
15.3.20	Valve Springs	201-30080	Part	1	R	
15.3.21	Valve Guides	201-30181/201-30171	Part	1	R	
	ENGINEERING WORKS:			1		
15.3.22	Grind Crankshaft		Sum	1	R	
15.3.23	Polish Crankshaft		Sum	1	R	
15.3.24	Rebore/hone block	Per cylinder	Sum	1	R	
15.3.25	Face Valves	Each	Sum	1	R	
15.3.26	Face Seats	Each	Sum	1	R	
15.3.27	Fit Valve Guides	Each	Sum	1	R	
15.3.28	Resize Conrods	Each	Sum	1	R	
15.3.29	Fit & Match Small Ends	Each	Sum	1	R	
15.3.30	Fit Cam Bushes	Each	Sum	1	R	
15.3.31	Grind Valves	Each	Sum	1	R	
15.3.32	Repair Pump/Injector	Each	Sum	1	R	
	WORKSHOP LABOUR:			1		
15.3.33	Strip & Assemble		Sum	1	R	
15.3.34	Dyno-Test		Hour	1	R	
15.3.35	Respray Engine		Sum	1	R	
	CONSUMABLES:			1		
	Workshop Material			1		
15.3.36	(Cloths etc.)		Sum	1	R	
15.3.37	Engine Oil		Litre	1	R	
15.3.38	Paint & Thinners		Sum	1	R	
	CLUTCHES:			1		
	Overhaul clutch			1		
	Material used			1		
15.3.39	Shoes	125-1090	Part	1	R	
	SUBTOTAL CARRIED FORWARD			R		
15.3.40	Springs	125-1201 (1000RPM)	Part	1		R
15.3.41	Workshop labour		Hour	1		R
15.3.42	New clutch		Part	1		R
	SUBTOTAL			**R**		
15.4	MARK-UPS					
15.4.1	Percentage mark-up on rates listed on term contracts		%	R		R
15.4.2	Percentage mark-up on items approved by the client or his representative with attached invoices for material used		%	R		R
15.5	Flat bed trucks					
	(a) 5t		km	1		R
	(b) 7t		km	1		R
15.6	LDV					
PSA15	(a) 2x4WD		km	1		R
	(b) 4x4WD		km	1		R
TOTAL SCHEDULE 15 CARRIED FORWARD TO SUMMARY				R		

Note: BID price must include value added tax.

SUB-SCHEDULE 1: PALISADE FENCING

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	SUPPLY,DELIVERY AND INSTALLATION OF SECURITY FENCING AND THE SUPPLY OF ALL MATERIALS				
1.1	For work to be executed by nominated sub-contractor (Specialised)	Sum	1	R300 000	R300 000
1.1.1	Overheads, charge and profit on item 1.1.	%	R150 000	%	R
1.2	SITE CLEARING Clear and grub the fence line, 2m wide strip	km	1	R	R
	PRECAST CONCRETE PALISADE FENCING WITH GATE (he required concrete compressive strength in all prefabricated prestressed elements shall be a minimum of 40 Mpa at 28 days, determined in accordance with SABS method 863. All steel used for reinforcements in prefabricated elements shall be high yield steel with a minimum characteristic strength of 410 Mpa, and shall be free of rust, loose scale, flux, grease or oil substances and shall in general comply with SABS 920 and BS 4482. **Stated Name of supplier:** _____				
	(a) Palisade posts	No	1	R	R
	(b) Palisade beams	No	1	R	R
	(c) Palisade palos	No	1	R	R
	(d) 12 Dia x 120 mm bolts and nuts	No	1	R	R
	(e) Supply and install 2.4m high sliding security gate of 8000mm to match the fence	No	1	R	R
	(f) Razor wire on top of palisade fencing	m	1	R	R
	(g) Supply and install 2.4m high sliding security gate of 8000mm to match the fence	no	1	R	R
1.3	Percentage mark-up on items (with attached invoices approved by the Employer or his representative for material, (other than those set out in this list) used in execution of work ordered by the Employer.	%	R	%	R
1.4	Concrete Prescribed mix 1.3.6 (38)	m^3	1	R	R
1.5 1.5.1	Earthworks (small works) Restricted excavation (a) Excavate for restricted foundation, footlings and trenches in all materials and used for backfill or dispose	m^3	1	R	R
1.6	DAYWORKS LABOUR (a) Contractor's Representative	hr	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	(b) Foreman, leader-hand	hr	1	R	R
	(c) Semi-skilled labourer	hr	1	R	R
	(d) Labourer	hr	1	R	R
1.7	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
1.8	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
1.9	LDV				
	(a) 2 x 4 WD	km	1	R	R
	(b) 4 x 4 WD	km	1	R	R
TOTAL PALISADE FENCING CARRIED FORWARD TO SUMMARY (AGRICULTURE)				**R**	
Note: BID price must include value added tax					

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	SUPPLY,DELIVERY AND INSTALLATION OF SECURITY FENCING AND THE SUPPLY OF ALL MATERIALS				
1.1	For work to be executed by nominated sub-contractor (Specialised)	Sum	1	R300 000	R300 000
1.1.1	Overheads, charge and profit on item 1.1.	%	R150 000	%	R
1.2	SITE CLEARING Clear and grub the fence line, 2m wide strip	km	1	R	R
	STEEL PALISADE FENCING WITH GATE (ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SANS SPECIFICATIONS. TRUCTURAL STEEL SHALL BE GRADE 300W UNLESS OTHERWISE INDICATED OR SPECIFIED. COLD FORMED SECTIONS SHALL BE MADE FROM COMMERCIAL QUALITY STEEL UNLESS OTHERWISE SPECIFIED. MATERIAL: LOW CARBON STEEL, STAINLESS STEEL. SURFACE TREATMENT: GALVANIZED, POWDER COATED. COMMON COLOR: BLACK, GREEN, BLUE, RED. FENCE PANEL LENGTH (POST CENTER): 2.75 M. MAXIMUM PALE SPACING: 155 MM FOR CORRUGATED PALES; 135 MM FOR ANGLE PALES. CORRUGATED PALE TYPE: W SECTION PALE, D SECTION PALE. FENCE GATE: SINGLE LEAF GATE OR DOUBLE LEAVES GATE. ACCESSORIES: FISHPLATES, POST CLAMPS, POST BRACKET, BOLTS AND NUTS.) **Stated Name of supplier:** _____				
	(a) Palisade posts	No	1	R	R
	(b) Palisade beams	No	1	R	R
	(c) Palisade palos	No	1	R	R

ITEM NO	DESCRIPTION	UNIT	QUANT.	RATE	AMOUNT
	(d) 12 Dia x 120 mm bolts and nuts	No	1	R	R
	(e) Supply and install 2.4m high sliding security gate of 8000mm to match the fence	No	1	R	R
	(f) Razor wire on top of palisade fencing	m	1	R	R
	(g) Supply and install 2.4m high sliding security gate of 4000mm to match the fence	no	1	R	R
1.3	Percentage mark-up on items (with attached invoices approved by the Employer or his representative for material, (other than those set out in this list) used in execution of work ordered by the Employer.	%	R	%	R
1.4	Concrete Prescribed mix 1.3.6 (38)	m^3	1	R	R
1.5 1.5.1	Earthworks (small works) Restricted excavation (a) Excavate for restricted foundation, footlings and trenches in all materials and used for backfill or dispose	m^3	1	R	R
1.6	DAYWORKS LABOUR				
	(a) Contractor's Representative	hr	1	R	R
	(b) Foreman, leader-hand	hr	1	R	R
	(c) Semi-skilled labourer	hr	1	R	R
	(d) Labourer	hr	1	R	R
1.7	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
1.8	Flat bed trucks				
	(a) 5t	km	1	R	R
	(b) 7t	km	1	R	R
1.8.1	Supply and install a 2.4m high security Clear vu or simillar fencing with the following specification or simillar on Steep Slope 76.2mm x 12.7mm mesh aperture Wire diameter of 3mm horizontal and 4mm Vertical 4 Stiffening wire bend Galvanised coating after welding 600mm deep hole with 25Mpa Concrete	m	1	R	R
1.8.2	Supply and install 2.4m high sliding security gate of 8000mm to match the fence	no	1	R	R
1.8.3.	Supply and install 2.4m high sliding security gate of 4000mm to match the fence	no	1	R	R
1.9	LDV				
	(a) 2 x 4 WD	km	1	R	R
	(b) 4 x 4 WD	km	1	R	R
TOTAL PALISADE FENCING CARRIED FORWARD TO SUMMARY				**R**	
Note: BID price must include value added tax					

SECTION 5

SUMMARY OF PRICE SCHEDULES
(TO BE CARRIED FORWARD TO FORM OF BID)

Schedule 3	:	Small diameter Clearwater supply pipelines	R_____
Schedule 4	:	Hand-pumps	R_____
Schedule 5	:	Elevated tanks	R_____
Schedule 6	:	PVC storage tank installations	R_____
Schedule 7	:	Positive displacement borehole pumps, Column and ancillary pipework installation	R_____
Schedule 8	:	Pump-house installation for boreholes	R_____
Schedule 9	:	Submersible pumps	R_____
Schedule 10	:	Electric motors	R_____
Schedule 11	:	Small electrical panels	R_____
SUBTOTAL PRICE SCHEDULES 3-11			**R**_____
Schedule 12	:	Diesel engines: Lister LV1	R_____
Schedule 13	:	Diesel engines: Lister TR1	R_____
Schedule 14	:	Diesel engines: Lister TR2	R_____
Schedule 15	:	Diesel engines: Lister TR3	R_____
Schedule 16	:	Diesel engines: Lister TR4	R_____
TOTAL (PRICE SCHEDULE 3-19) CARRIED FORWARD TO FORM OF BID			**R**_____
Schedule 1	:	General (Rate only)	R_____
Schedule 2	:	Dayworks (Rate only)	R_____
TOTAL RATE SCHEDULE 1 AND 2 (NOT CARRIED FORWARD TO FORM OF BID			**R**_____

CONTRACTOR: _____ **SIGNATURE:** _____

SUB-SCHEDULE :	1	PALISADE FENCING	R

CONTRACTOR: _____ SIGNATURE: _____

SECTION 6:

PRICE SCHEDULES

INDEX OF PRICE SCHEDULES

PART 6

SCHEDULE 1 : GENERAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1.1	**SUMS STATED PROVISIONALLY BY THE ENGINEER** 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
1.2	**PRIME COSTS ITEMS**				
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_____
	TOTAL SCHEDULE 1 CARRIED FORWARD TO SUMMARY			**R**	

Note: BID price must include value added tax. _____

SCHEDULE 2 : SMALL & MEDIUM SIZE ELECTRICAL PANELS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.1	**Testing of earthing installation for the electrical panel :**				
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
3.2	**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)**				
3.2.1	2,5mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.2	4mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.3	6mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.4	10mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.5	16mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.6	25mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.7	35mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.8	50mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.9	70mm^2 bare copper or insulated earth wire	m	1	R	R
3.2.10	2,5mm^2 earth wire end lugged and connected	no	1	R	R
3.2.11	4mm^2 earth wire end lugged and connected	no	1	R	R
3.2.12	6mm^2 earth wire end lugged and connected	no	1	R	R
3.2.11	10mm^2 earth wire end lugged and connected	no	1	R	R
3.2.13	16mm^2 earth wire end lugged and connected	no	1	R	R
3.2.14	25mm^2 earth wire end lugged and connected	no	1	R	R
3.2.15	35mm^2 earth wire end lugged and connected	no	1	R	R
3.2.16	50mm^2 earth wire end lugged and connected	no	1	R	R
3.2.17	70mm^2 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
3.3	**Supply and installation of 600/1 000 V. grade PVC PVC SWA PVC cable in trench or in ground.** Fixings or excavations as well as cable ends are measured elsewhere				
3.3.1	1,5 mm^2 3 or 4 core armoured	m	1	R	R
3.3.2	2,5 mm^2 3 or 4 -core armoured.	m	1	R	R
3.3.3	1,5mm^2 7-core armoured	m	1	R	R
3.3.4	4 mm^2 4 core armoured	m	1	R	R
3.3.5	6 mm^2 4 -core armoured.	m	1	R	R
3.3.6	10 mm^2 4 core armoured	m	1	R	R
3.3.7	16 mm^2 4 core armoured	m	1	R	R
3.3.8	25 mm^2 4 -core armoured.	m	1	R	R
3.3.9	35 mm^2 4 core armoured	m	1	R	R
3.3.10	50 mm^2 4 core armoured	m	1	R	R
3.3.11	70 mm^2 4 core armoured	m	1	R	R
3.3.12	95 mm^2 4 core armoured	m	1	R	R
3.3.13	120 mm^2 4 core armoured	m	1	R	R
3.3.14	150 mm^2 4 core armoured	m	1	R	R
3.3.15	185 mm^2 4 core armoured	m	1	R	R
3.4	**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)**				
3.4.1	1,5 mm^2 3 or 4 core armoured	no	1	R	R
3.4.2	2,5 mm^2 3 or 4 -core armoured.	no	1	R	R
3.4.3	1,5mm^2 7-core armoured	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.4.4	4 mm^2 4 core armoured	no	1	R	R
3.4.5	6 mm^2 3 -core armoured.	no	1	R	R
3.4.6	10 mm^2 4 core armoured	no	1	R	R
3.4.7	16 mm^2 4 core armoured	no	1	R	R
3.4.8	25 mm^2 3 -core armoured.	no	1	R	R
3.4.9	35 mm^2 4 core armoured	no	1	R	R
3.4.10	50 mm^2 4 core armoured	no	1	R	R
3.4.11	70 mm^2 4 core armoured	no	1	R	R
3.4.12	95 mm^2 4 core armoured	no	1	R	R
3.4.13	120 mm^2 4 core armoured	no	1	R	R
3.4.14	150 mm^2 4 core armoured	no	1	R	R
3.4.15	185 mm^2 4 core armoured	no	1	R	R
3.5	**Cable Trenches** 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^3	1	R	R
3.5.2	Soft rock	m^3	1	R	R
3.5.3	Soil	m^3	1	R	R
3.6	**General maintenance of electrical equipment as per Section 3 of the maintenance specification**				
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^2, per terminal	no	1	R	R
	(b) Conductor sizes from 25 mm^2 to 50 mm2, 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	Replacement of indicator lamps as follows:				
	(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	Replacement of blown fuses as follows:				
	(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	Replacing of lightning arrestors as follows:				
	(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	**Megger testing of 600/ 1000 V cables** with both ends of cables disconnected for the following sizes of cable :				
	(a) Cables with 3 to 7 cores up to 2,5mm^2 per cable	no	1	R	R
	(b) Cable with 3 or 4 cores from 4mm^2 to 25mm^2	no	1	R	R
	(c) Cable with 3 or 4 cores from 35mm^2 to 50mm^2	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.8	Supply and installation of PVC warning tape in top 300 mm of trench backfill 300 mm of trench backfill	m	1	R	R
3.9	**Supply and fitting of cable labels** on ends of cable with strap-on type label with up to 10 digits on label (per label0	no	1	R	R
3.10	**Testing and checking of motors** 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	**Maintenance of panels** 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	**Installation of Circuit breakers** 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

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.12.4	500 A TP mcb (15 kA)	no	1	R	R
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
3.13	**Installation of Electronic Overload Relays** 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 **no CT's**	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
3.14	**Installation of Contactors and Components** Supply, installation, connection, testing and commissioning of the following equipment for distribution boards or motor controls.				
3.14.1	**Complete New Contactor for:**				
	(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

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(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
3.14.2	**Replacing contactor contacts per set of three for the following sizes:**				
	(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

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(o) 185kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
	(o) 220kW AC-3 rating contactor (Similar or equal to Siemens)	set	1	R	R
3.14.3	**Replacing contactor coil in the following sizes of contactors:**				
	(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
3.15	**Installation of Standard Adjustable Overloads**				
	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
3.16	**Replacing star-delta timer for star-delta starters as follows: (per unit)**				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(a) Electronic type	no	1	R	R
	(b) Magnetic type	no	1	R	R
	(c) Vacuum type	no	1	R	R
3.17	**Motor Control Centres (complete assemblies)**				
	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, excluding main circuit breaker. (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, excluding main circuit breaker. (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, excluding main circuit breaker. (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 standard overload 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 electronic overload 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 electronic overload 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 electronic overload 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 electronic overload for motors from 90kW up to 132 Kw (excluding motor mcb, contactors & electronic	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	overload relay)				
3.17.10	Star-delta starter panel with electronic overload for motors from 150kW up to 220 Kw				
	(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 Invectors from 220V up to 400V	no	1	R	R
3.17.13	Voltage Regulator 75kVA	no	1	R	R
3.18	**Drawing up and delivery of "As Built"drawings of boards to the Department for the following :**				
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		
3.19	**Mark-up rates**				
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
3.20	**Tip Trucks**				
	(a) 6 m^3	H	1	R	R
	(b) 10 m^3	H	1	R	R
3.21	**Flat bed trucks**				
	(a) 5t	Km	1	R	R
	(b) 7t	Km	1	R	R
3.22	**LDV**				
PSA 15	(a) 2 x 4WD	Km	1	R	R
	(b) 4 x 4WD	Km	1	R	R
	Subtotal			R	R
	TOTAL OF SCHEDULE 2 CARRIED FORWARD TO SUMMARY			**R**	**R**

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 **existing** 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
4.4	Supply, installation, connection, testing and commissioning of new				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	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
4.6	**Mark-up rates**				
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
4.70	**Tip Trucks**			R	
	(a) 6 m^3	H	1	R	R
	(b) 10 m^3	H	1	R	R
4.71	**Flat bed trucks**				
	(a) 5t	Km	1	R	R
	(b) 7t	Km	1	R	R
4.72	**LDV**				
PSA15	(a) 2 x 4WD	Km	1	R	R
	(b) 4 x 4WD	Km	1	R	R

TOTAL OF SCHEDULE 3 CARRIED FORWARD TO SUMMARY

SCHEDULE 4 : BALL VALVES

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5.	**BALL VALVES** Ball valve with split body; straight through pigable bore, ball supported by a double-offset bearing arrangement, with resilient seal. Note: 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	Servicing and repair of existing valves in the following diameters; 25 bar rating:				
5.1.1	Remove valve				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.2	Transport from site				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.3	Dismantle				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.4	Blast				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.5	Clean				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.6	Inspect				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.7	Submit inspection report				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.8	Lap				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.9	Re-blast				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.10	Epoxy coat (min thickness 300 micron)				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.11	Reassemble				
	a) 150 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) 200 DN	no	1	R	R
5.1.12	Pressure test				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.13	Submit pressure test certificate				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.14	Install				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.1.15	Commission				
	a) 150 DN	no	1	R	R
	b) 200 DN	no	1	R	R
5.2	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
	b) 200 DN PN 25 ref. no. …….. Name of Manufacturer: ……	no	1	R	R
5.3	**Mark-up rates**				
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^3	h	1	R	R
	(b) 10 m^3	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
TOTAL OF SCHEDULE 4 CARRIED FORWARD TO SUMMARY					

SCHEDULE 5 : BUTTERFLY VALVES (WAFER TYPE)

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.	**BUTTERFLY VALVES** (Wafer Type)				
	Handlever or geared operator, with or without actuator.				
	Note:				
	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	Servicing and repair of existing valves in the following diameters and pressure ratings:				
6.1.1	Remove valve				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.2	Dismantle				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.3	Blast				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.4	Clean				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.5	Inspect				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.6	Submit inspection report				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.7	Lap				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.8	Re-blast				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.9	Epoxy coat (min thickness 300 micron)				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.10	Reassemble				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(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
6.1.11	Pressure test				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.12	Submit pressure test certificate				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.13	Install				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
6.1.14	Commission				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(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
6.2	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: ……				
6.3	**<u>Mark-up rates</u>**				
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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			**R**	**R**
	TOTAL SCHEDULE 5 CARRIED FORWARD TO SUMMARY			**R**	**R**

SCHEDULE 6 : BUTTERFLY VALVES (DOUBLE FLANGED)

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7.	**BUTTERFLY VALVES** (Double Flanged) Gear operated, with or without actuator. Note: 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	Servicing and repair of existing valves in the following diameters and pressure ratings:				
7.1.1	Remove valve				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.2	Dismantle				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.3	Blast				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.4	Clean				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.5	Inspect				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.6	Submit inspection report				
	a) 100 DN				

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
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.7	Lap				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(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
7.1.8	Re-blast				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.9	Epoxy coat (min thickness 300 micron)				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.10	Reassemble				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.11	Pressure test				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.12	Submit pressure test certificate				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.13	Install				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				

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
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
7.1.14	Commission				
	a) 100 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	b) 150 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	c) 200 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	d) 250 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	e) 300 DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	(iii) PN 40	no	1	R	R
	f) 350 DN				
	(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:				
	a) 100 DN				

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	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 Valve Manufacturer:				
	b) 150 DN				
	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 Valve Manufacturer:				
	…….				
	c) 200 DN				
	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 Valve Manufacturer:				
	…….				
	d) 250 DN				
	ii) PN 25 ref. no. …….	no	1	R	R
	iii) PN 40 ref. no. …….	no	1	R	R
	Name of Valve Manufacturer:				
	e) 300 DN				
	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 Valve Manufacturer:				
	…….				
	f) 350 DN				
	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 Valve Manufacturer:				
	…….				
7.3	**Mark-up rates**				
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 that those set out in this list) used in execution of work ordered by the Employer	%	R	%	R
7.4	Tip trucks				
	(a) 6 m^3	h	1	R	R

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) 10 m^3	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
	Carried Forward			R	R

TOTAL OF SCHEDULE 6 CARRIED FORWARD TO SUMMARY

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.				
	Note: 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	Servicing and repair of valves in the following diameters and pressure ratings:				
8.1.1	Remove valve				
	a) **80 DN**				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) **100 DN**				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.2	Transport from site				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.3	Dismantle				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.4	Blast				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.5	Clean				
	a) 80 DN				
	(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
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.6	Inspect				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.7	Submit inspection report				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
				R	
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(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
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.8	Lap				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) **150 DN**				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.9	Re-blast				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8.1.10	Epoxy coat (min thickness 300 micron)				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.11	Reassemble				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.12	Pressure test				
	a) 80 DN				
	(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
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.13	Submit pressure test certificate				
	a) **80 DN**				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.14	Transport to site				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(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
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.15	Install				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.1.16	Commission				
	a) 80 DN				
	(i) PN 10	no		R	R
	(ii) PN 16	no		R	R
	(iii) PN 25	no		R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
8.2	Supply, install and commission the following gate valves fitted with wedge gates. Valves to comply				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	with SABS 664, waterworks applications with cap top, plain thrust collar, non-rising spindle, clock-wise 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	**<u>Specialist Dayworks (compulsory)</u>**				
8.3.1	Dayworks labour by specialist valve subcontractor.	hr	1	R	R
8.4	**<u>Mark-up rates</u>**				
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^3	h	1	R	R
	(b) 10 m^3	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
	Carried Forward			R	R

TOTAL SCHEDULE 7 CARRIED FORWARD TO SUMMARY	R

SCHEDULE 8 : RESILIENT SEAL GATE VALVES AND SUPPLY OF ALL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9.	**WATERWORKS GATE VALVES** Valves fitted with wedge gates. Valves in compliance with SABS 664, waterworks applications with plain thrust collar, non-rising spindle and flanged ends. Note: 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	Servicing and repair of valves in the following diameters and pressure ratings:				
9.1.1	Remove valve				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.2	Dismantle				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.3	Blast				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.4	Clean				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.5	Inspect				
	a) 80 DN				
	(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
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.6	Submit inspection report				
	a) 80 DN			R	R
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.7	La p				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.8	Re-blast				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.9	Epoxy coat (min thickness 300 micron)				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.10	Reassemble				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.11	Pressure test				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.12	Submit pressure test certificate				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.13	Install				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	No	1	R	R
	(iii) PN 25	No	1	R	R
	c) 150 DN				
	(i) PN 10	No	1	R	R
	(ii) PN 16	No	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.1.14	Commission				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				

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
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.2	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, clock-wise closing and having flanged ends:				
	a) 80 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	b) 100 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	c) 150 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
	d) 200 DN				
	(i) PN 10	no	1	R	R
	(ii) PN 16	no	1	R	R
	(iii) PN 25	no	1	R	R
9.3	**Mark-up rates**				
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^3	h	1	R	R
	(b) 10 m^3	h	1	R	R
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

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) 4 x 4WD	km	1	R	R
TOTAL OF SCHEDULE 8 CARRIED FORWARD TO SUMMARY					

SCHEDULE 9 : WAFER PATTERN CHECK VALVES AND THE SUPPLY OF ALL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.	**WAFER PATTERN CHECK VALVES** Compact, single door, wafer pattern check valves. Note: 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	Servicing and repair of valves in the following diameters and pressure rating PN25				
10.1.1	Remove valve				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.2	Dismantle				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.3	Blast				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.4	Clean				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.5	Inspect				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.6	Submit inspection report				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.7	Epoxy coat (min thickness 300 micron)				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.8	Reassemble				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.9	Pressure test				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.10	Submit pressure test certificate				
	a) 100 DN	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.11	Install				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.1.12	Commission				
	a) 100 DN	no	1	R	R
	b) 150 DN	no	1	R	R
	c) 200DN	no	1	R	R
10.2	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 single stainless steel disc with torsion spring and inserted seat with sealing O-ring. Valve suitable for installation between the specified flange pressure ratings.				
	a) 100 DN				
	(i) PN 25 ref. no. ……	no	1	R	R
	(ii) PN 40 ref. no. ……	no	1	R	R
	Name of Manufacturer: ……				
	b) 150 DN				
	(i) PN 25 ref. no. ……	no	1	R	R
	(ii) PN 40 ref. no. ……	no	1	R	R
	Name of Manufacturer: ……				
	c) 200 DN				
	(i) PN 25 ref. no. ……	no	1	R	R
	(ii) PN 40 ref. no. ……	no	1	R	R
	Name of Manufacturer: ……				
10.3	**Mark-up rates**				
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
10.4	Tip trucks				
	(a) 6 m^3	h	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(b) 10 m^3	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
	SUBTOTAL			R	R
	TOTAL SCHEDULE 9 CARRIED FORWARD TO SUMMARY			R	

SCHEDULE 10 : HYDRAULIC FLOW CONTROL VALVES AND THE SUPPLY OF ALL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.	**HYDRAULIC FLOW CONTROL VALVES** 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. Note: 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	Servicing and repair of valves in the following diameters and pressure rating:				
11.1.1	Remove valve				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.2	Dismantle				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.3	Blast				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.4	Clean				
	a) 100DN				
	(i) PN 16	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.5	Inspect all wearing parts including pilot valve				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.6	Submit inspection report				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.7	Replace body seats				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.8	Epoxy coat (min thickness 300 micron)				
	a) 100DN				
	(i) PN 16	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.9	Reassemble				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.10	Pressure test and reset operation limits				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.11	Submit pressure test certificate and confirm correct setting of operation limits				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.1.12	Install				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
11.1.13	Commission				
	a) 100DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	b) 150DN				
	(i) PN 16	no	1	R	R
	(ii) PN 25	no	1	R	R
	c) 200DN				
	(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) 100 DN				
	(i) PN 16 ref. no. …..……..	no	1	R	R
	(ii) PN 25 ref. no. …..……..	no	1	R	R
	Name of Manufacturer: ……				
	b) 150 DN				
	(i) PN 16 ref. no. …..……..	no	1	R	R
	(ii) PN 25 ref. no. …..……..	no	1	R	R
	Name of Manufacturer: ……				
	c) 200 DN				
	(i) PN 16 ref. no. …..……..	no	1	R	R
	(ii) PN 25 ref. no. …..……..	no	1	R	R
	Name of Manufacturer: …… Name of Manufacturer:				
	Subtotal Carried Forward			R	
11.3	**Mark-up rates**				
11.3.1	Percentage mark-up on rates listed on term				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Contracts	%	R	%	R
11.3.2	Percentage mark-up on items (with attached in-voices) approved by the Employer or his represen-tative 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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			R	R
	TOTAL SCHEDULE 10 CARRIED FORWARD TO SUMMARY			R	

SCHEDULE 11 : SURGE ANTICIPATING CONTROL VALVE

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12.	**HYDRAULICALLY OPERATED SURGE ANTICIPATING CONTROL VALVE** 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. Note: 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	Servicing and repair of valves in the following dia-meters and pressure rating:				
12.1.1	Remove valve				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.2	Dismantle				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.3	Blast				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.4	Clean				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.5	Inspect all wearing parts including pilot valve				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.6	Submit inspection report				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.7	Replace body seats				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.8	Epoxy coat (min thickness 300 micron)				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.9	Reassemble				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.10	Pressure test and reset operation limits				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12.1.11	Submit pressure test certificate and confirm correct setting of operation limits				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.12	Install				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.1.13	Commission				
	a) 150DN PN 25	no	1	R	R
	b) 200DN PN 25	no	1	R	R
12.2	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) 150 DN				
	(i) PN 16 ref. no. …..……..	no	1	R	R
	(ii) PN 25 ref. no. …..……..	no	1	R	R
	Name of Manufacturer: ……				
	b) 200 DN				
	(i) PN 16 ref. no. …..……..	no	1	R	R
	(ii) PN 25 ref. no. …..……..	no	1	R	R
	Name of Manufacturer: ……				
12.3	**Mark-up rates**				
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 that those set out in this list) used in execution of work ordered by the Employer	%	R	%	R
12.4	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			**R**	**R**
	TOTAL SCHEDULE 11 CARRIED FORWARD TO SUMMARY			**R**	**R**

SCHEDULE 12 : PUMP (CENTRIFUGAL, AXIAL FLOW, VERTICAL OR HORIZONTAL SPLITS, MULTI STAGE)

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
13.	**PUMP** Centrifugal, axial flow, horizontal split case, dual stage, flow rate 100 l/s, motor rating 185 kW. Note: 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	Servicing and repair of one pump:				
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
13.2	**Mark-up rates**				
13.2.1	Percentage mark-up on rates listed on term contracts	%	R	%	R
13.2.2	Percentage mark-up on items (with attached in-voices) approved by the Employer or his represen-tative 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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			R	
	TOTAL SCHEDULE 12 CARRIED FORWARD TO SUMMARY			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.	**SCREENS** Trash racks (repairs) Note: 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	
15.1	Repairs to screens Note: differentiation made between screened areas.				
15.1.1	Remove screen				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.2	Dismantle				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.3	Remove algae growth and clean				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.4	Inspect and deliver report				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.5	Supply material and repair				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.6	Corrosion protection by hot-dip galvanizing				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.7	Assemble and transport to site				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.8	Install and test				
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.1.9	Submit test reports				

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	a) up to 2,5m²	no	1	R	R
	b) exceeding 2,5m² up to 5m²	no	1	R	R
	c) exceeding 5m² up to 16m²	no	1	R	R
15.3	**Mark-up rates**				
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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			**R**	**R**
	TOTAL SCHEDULE 13 CARRIED FORWARD TO SUMMARY			**R**	**R**

SCHEDULE 14 : DOSING (CHEMICAL) AND THE SUPPLY OF ALL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE RATE	AMOUNT
16.	**DOSING (CHEMICAL)** Chemical dosing equipment as installed in water treatment works. Note: 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	Repairs to chemical dosing equipment				
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
16.2	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
16.3	**Mark-up rates**				
16.3.1	Percentage mark-up on rates listed on term contracts	%	R	%	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			**R**	**R**
	TOTAL SCHEDULE 14 CARRIED FORWARD TO SUMMARY			**R**	

SCHEDULE 15 : CHLORINATION SYSTEM AND THE SUPPLY OF ALL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
17.	**CHLORINATION EQUIPMENT**				
	Note: 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	Service and repair of chlorine gas dosing equipment				
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:				
	a) vacuum regulator	set	1	R	R

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	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	**Mark-up rates**				
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^3	h	1	R	R
	(b) 10 m^3	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
	SUBTOTAL			**R**	**R**
	TOTAL SCHEDULE 15 CARRIED FORWARD TO SUMMARY			**R**	

SCHEDULE 16 : DAYWORKS

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
18.1	**DAYWORKS LABOUR**				
	(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
18.2	**PLANTHIRE: WORK RATES ON SITE**				
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^3 bucket size	h	1	R	R
18.2.8	Wheel tractor scrapers 15,0 - 16 m^3	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^3	h	1	R	R
18.2.12	Tip trucks				
	(a) 6 m^3	h	1	R	R
	(b) 10 m^3	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^3/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^3 (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
18.3	**LABOUR BASED TOOLS**				
	(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
	TOTAL SCHEDULE 16 CARRIED FORWARD TO SUMMARY			**R**	**R**

SUMMARY OF SCHEDULES

SCHEDULE 2	:	SMALL AND MEDIUM SIZE ELECTRICAL PANELS	R_____
SCHEDULE 3	:	ELECTRIC MOTORS	R_____
SUBTOTAL		**SCHEDULES 2- 3,**	**R**_____
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_____
SUBTOTAL SCHEDULES 4-15,			**R**_____
SUBTOTAL SCHEDULES 2-15 CARRIED FORWARD TO "FORM OF BID"			**R**_____
SCHEDULE 1	:	GENERAL (COMPULSORY)	R_____
SCHEDULE 16	:	DAYWORKS(COMPULSORY)	R_____
SUBTOTAL SCHEDULES 1, 16			**R**_____
TOTAL SCHEDULES 1-16			**R**_____

CONTRACTOR: _____ SIGNATURE: _____

COMPANY NAME: _____ DATE: _____

SBD 7.5