



TENDER COVER PAGE

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF JOHANNESBURG WATER

BID NUMBER: JW14425

CLOSING DATE: 07 APRIL 2025

CLOSING TIME: 10:30 AM

DESCRIPTION: BUSHKOPPIE WASTEWATER TREATMENT WORKS: INFRASTRUCTURE RENEWAL PLAN

CIDB REQUIREMENTS: TENDERERS SHALL HAVE A CONTRACTOR CIDB GRADING OF 9ME.

BRIEFING SESSION	COMPLUSORY
BRIEFING DETAILS	DATE AND TIME: 06 MARCH 2025 AT 13:00 ADDRESS: BUSHKOPPIE WASTEWATER TREATMENT WORKS STOCKWELL AVENUE, SOWETO (PARKING LOT OF THE MAIN ADMIN BUILDING) CO-ORDINATES: 26°18'40"S, 27°56'6"E (-26.311111, 27.935000). TENDERS RECEIVED FROM BIDDERS THAT DID NOT ATTEND THE COMPULSORY BRIEFING SESSION WILL BE DISQUALIFIED
TENDER SUBMISSION DETAILS	BID DOCUMENTS MUST BE DEPOSITED IN THE TENDER BOX SITUATED AT GROUND FLOOR IN JOHANNESBURG WATER ADDRESS: TURBINE HALL, 65 NTEMI PILISO STREET, NEWTOWN, JOHANNESBURG, 2001 PLEASE ALLOW SUFFICIENT TIME TO ACCESS JOHANNESBURG WATER OFFICES IN TURBINE HALL AND DEPOSIT YOUR TENDER DOCUMENT IN THE JOHANNESBURG WATER TENDER BOX SITUATED AT RECEPTION BEFORE TENDER CLOSING TIME. TIMES: THE BUILDING WILL OPEN 7 DAYS A WEEK FROM 06:00 UNTIL 18:00

BIDDER INFORMATION				
NAME OF BIDDER				
NUMBER OF BID SUBMITTED				
PHYSICAL ADDRESS				
TELEPHONE NUMBER				
CELLPHONE NUMBER				
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
TAX COMPLIANCE STATUS	TCS PIN		MAAA No	
OTHER STATUS	COIDA Registration No		CRS(CIDB)No	

EMPLOYER INFORMATION			
DEPARTMENT	Supply Chain Management	DEPARTMENT	CAPEX
CONTACT PERSON	Gcina Ndela	CONTACT PERSON	Peter Louw
TELEPHONE NUMBER	011 688 1796	TELEPHONE NUMBER	011 688 1676
E-MAIL ADDRESS	gcina.ndela@jwater.co.za	E-MAIL ADDRESS	peter.louw@jwater.co.za

Employer:		Contractor:	
Witness:		Witness:	



TENDER COVER PAGE
PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

- 1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
- 1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED– (NOT TO BE RE-TYPED) OR ONLINE**
- 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

- 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.
- 2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.
- 2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.
- 2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

- 3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO
- 3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?
☐ YES ☐ NO
- 3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?
☐ YES ☐ NO
- 3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?
☐ YES ☐ NO
- 3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?
☐ YES ☐ NO

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

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

Employer:		Contractor:	
Witness:		Witness:	



TENDER COVER PAGE

NOTE: DOCUMENTS DOWNLOADED FROM THE ETENDER PORTAL IS AT NO COST BUT MUST COMPLY WITH SUBMISSION REQUIREMENTS.

WITHOUT LIMITATION, JOHANNESBURG WATER TAKES NO RESPONSIBILITY FOR ANY DELAYS IN ANY COURIER OR POSTAL SYSTEM OR ANY LOGISTICAL DELAYS WITHIN THE PREMISES OF JOHANNESBURG WATER. JOHANNESBURG WATER LIKewise TAKES NO RESPONSIBILITY FOR OFFERS DELIVERED TO A LOCATION OTHER THAN THE TENDER BOX AS PER THE TENDER SUBMISSION DETAILS STATED IN THE TENDER. PROOF OF POSTING OR OF COURIER DELIVERY WILL NOT BE TAKEN BY JOHANNESBURG WATER AS PROOF OF DELIVERY. TENDER SUBMISSION DOCUMENTS MUST BE IN THE BOX BEFORE TENDER CLOSURE.

The current Johannesburg Water Supply Chain policy is applicable which is available on the JW website www.johannesburgwater.co.za

THE TENDERER IS ENCOURAGED TO SIGN THE TENDER SUBMISSION REGISTER WHEN SUBMITTING THEIR TENDERS.

**PLEASE ENSURE YOU SUBMIT 1 x ORIGINAL TENDER HARD DOCUMENT
(1X Original Tender document and 1X Electronic copy in memory stick/USB)**

Any documents required that are not submitted in the tender box at the deadline will be considered late.

The tenderer accepts that Johannesburg Water will not take responsibility for the misplacement or premature opening of the tender if the outer package is not sealed and marked as stated.

NB: NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

NAME OF CONTACT PERSON:

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

Employer:		Contractor:	
Witness:		Witness:	



TENDER NOTICE AND INVITATION TO TENDER



T1.1 TENDER NOTICE AND INVITATION TO TENDER

Johannesburg Water (SOC) Ltd invites the tenderer for the following:

**CONTRACT NO: JW14425 BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN**

The tender document will be available in the form of a download from the Johannesburg Water website (www.johannesburgwater.co.za/supply_chain/tenders) starting from 26 February 2025.

The Employer is **Johannesburg Water (SOC) Ltd**

All tenders and supporting documents must be sealed and be placed in the Tender box on the ground floor of Johannesburg Water by no later than 10:30 am on 07 April 2025.

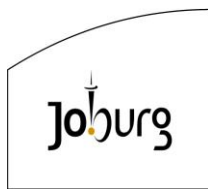
Address is as follows:

**TURBINE HALL,
65 NTEMI PILISO STREET,
NEWTOWN,
JOHANNESBURG,
2001**

The Employer is not obliged to accept the lowest or any tender and reserve the right to appoint:

- a) in whole or in part.
- b) to more than one tenderer.
- c) to the highest points scoring bidder.
- d) to the lowest acceptable tender or highest acceptable tender in terms of the point scoring system.
- e) to a bidder not scoring the highest points (based on objective grounds in terms of section 2 (1) (f) of the PPPFA) (where applicable).
- f) not to consider any bid with justifiable reasons.

A valid and binding contract with the successful tender/s will be concluded once the Employer has awarded the contract. The Employer will issue an appointment letter to the successful tenderer.



Johannesburg Water SOC Ltd



CONTRACT NO: JW14425

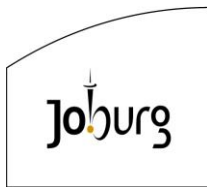
BUSHKOPPIE WASTEWATER TREATMENT WORKS INFRASTRUCTURE RENEWAL PLAN

VOLUME 1 TENDER AND CONTRACT

Prepared by
PMU
PO Box 61542
Marshalltown
2107

V1.0
August 2024

Employer:		Contractor:	
Witness:		Witness:	



Contract No JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



Volume 1 Tender and Contract
Section T1 Tender and Contract

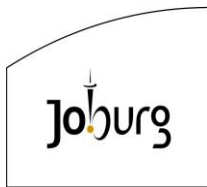
The Tenderer is to indicate in the “Submitted (Yes/No)” column in the below table that they have completed the required section of the tender document. Completion of this checklist will assist the Tenderer in ensuring that they have attended to all the required items for submission with this tender. Additionally, it is an absolute requirement that tenderers comply with National Treasury’s CSD registration as well as SARS tax compliance requirements for contract award – refer T2.2.2. The below will form part of the tender document, the tenderers are therefore encouraged to submit the returnable and or documentation with their tender offer to avoid elimination especially with regards to what is stated in the Required for Tender Evaluation column or not obtaining points for Specific Goals. Tenderers are encouraged to ensure that their Tax status remains Tax Compliant on CSD throughout the process to avoid delaying the process or being eliminated at award stage. For infrastructure related projects. Tenderer must have a CIDB Active Status at the requested CIDB requirement at evaluation stage to avoid disqualification.

All documentation listed in the Checklist below shall form part of the Contract.

Table 1

Ref	Description of Returnable/s or Documentation that will form Part of Contract and must therefore to be Completed and / or Submitted by the Tenderer	Required for Tender Evaluation	Required for Tender Award	Required After Tender Award	Submitted (Yes/No)
	Tender Cover:				
	Name of Tender	•			
	Contact Person	•			
	Telephone Number	•			
	Central Supplier Database Registration	•	•		
	CIDB Registration Number	•			
	COIDA Registration Number			•	
	Tax SARS PIN No.	•	•		
	MAAA No. for Tax Compliant Status		•		
	Mandatory Documents at Particular Stage:				
	CIDB grading of 9ME. Active Status at the required CIDB grading or higher at the time of Evaluation.	•			
	Mandatory Tender Briefing Meeting	•			
	Complete and sign the Form of Offer	•			
	Administrative Documentation:				
	MBD 1 - Invitation to Bid - Completed and signed	•	•		
T2.2.4	MBD 4 - Declaration of interest - Completed and signed	•	•		
	MBD 5 - Declaration for procurement above R10 Million (all applicable taxes included) Completed and signed.	•	•		
	MBD 6.1 - Preference Points Schedule – Specific Goals and Price Points - Completed and signed.	•			

Employer:		Contractor:	
Witness:		Witness:	



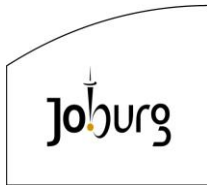
**Contract No JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN**



**Volume 1 Tender and Contract
Section T1 Tender and Contract**

Ref	Description of Returnable/s or Documentation that will form Part of Contract and must therefore to be Completed and / or Submitted by the Tenderer	Required for Tender Evaluation	Required for Tender Award	Required After Tender Award	Submitted (Yes/No)
T2.1	Signed Certificate of Authority to Sign	•			
	Acknowledgement of Project Tender Drawings	•	•		
	Acknowledgement of SHE Specification & Annexures	•	•		
T2.2.4	MBD 8 - Bidder's past supply chain management practices – Completed and signed.	•	•		
T2.2.4	MBD 9 - Certificate of Independent Bid Determination – Completed and signed.	•	•		
	Municipal Rates and Taxes for the Company - Current municipal rates for the company not older than 90 days (if leasing/renting, submitted proof such as lease agreement where premises are rented), OR Confirmation that suitable arrangements are in place for arrear municipal obligations with your local municipality OR Current municipal rates which is not older than 90 days or valid lease agreement with affidavit from owner of property in cases stated in Proof of Good Standing with Regards to Municipal Accounts document in the Tender.	•	•		
	Municipal Rates and Taxes - Current municipal rates for the directors of the entity not older than 90 days (if leasing/renting, submitted proof such of lease agreement where premises are rented), OR Confirmation that suitable arrangements are in place for arrear municipal obligations with your local municipality OR Current municipal rates which is not older than 90 days or valid lease agreement with affidavit from owner of property in cases stated in Proof of Good Standing with Regards to Municipal Accounts document in the Tender.	•	•		
	3-year financial statements (audited where applicable)	•	•		
	Any qualifications. If "Yes", reference to	•			

Employer:		Contractor:	
Witness:		Witness:	



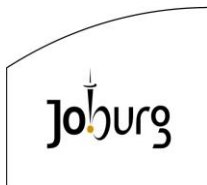
Contract No JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



Volume 1 Tender and Contract
Section T1 Tender and Contract

Ref	Description of Returnable/s or Documentation that will form Part of Contract and must therefore to be Completed and / or Submitted by the Tenderer	Required for Tender Evaluation	Required for Tender Award	Required After Tender Award	Submitted (Yes/No)
	such qualification/s must be indicated on a cover letter. Please be aware that qualification on the tender document may result in your tender being eliminated as the qualification may impede on the ability to evaluate like with like.				
4.	Functionality Documentation:				
	Documentary Evidence Criteria 1 – (Contactable Reference Letters)	•			
	Documentary Evidence Criteria 2 – (Contactable Reference Letters)	•			
	Documentary Evidence Criteria 3 – (Contactable Reference Letters)	•			
	Documentary Evidence Criteria 4 – (CV)	•			
	Documentary Evidence Criteria 5 – (CV)	•			
	Documentary Evidence Criteria 6 – (CV)	•			
	Documentary Evidence Criteria 7 – (Page/pages of specific Method)	•			
5.	Specific Goals:				
	Business located within the boundaries of COJ Municipality	•			
	Business owned by 51% or more-Women	•			
7.	Pricing Schedule:				
	Bill of Quantities/ Schedule of Quantities. completed in accordance with the award strategy	•			
	Alterations authenticated – Refer to Conditions of Tender	•			
8.	Terms and Conditions:				
	General Conditions of Contract	•			
	Special Conditions	•			
	Tender Data	•			
9.	Other Documents				
	Form of Acceptance (do not complete will only be completed after award)			•	
	Third Party Liability Insurance			•	
	Insurance of Works			•	
	Common Law Liability Insurance			•	
	Insurance of Construction Plant and Equipment			•	
	Valid Registration with Compensation for Occupation Injuries and Diseases Act			•	
	Performance Guarantee			•	

Employer:		Contractor:	
Witness:		Witness:	



Contract No JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



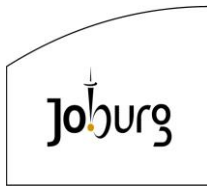
Volume 1 Tender and Contract
Section T1 Tender and Contract

Ref	Description of Returnable/s or Documentation that will form Part of Contract and must therefore to be Completed and / or Submitted by the Tenderer	Required for Tender Evaluation	Required for Tender Award	Required After Tender Award	Submitted (Yes/No)
	Bank Details Form			.	

Tenderers will be notified of such or any missing and incomplete documents and will be offered a period of 3 days to complete or submit those pages i.e., Municipal Bidding Documents (MBD) and other documents that require completion and signatures that do not have a bearing on functionality, price and preference points for specific goals. Tenders that are received contrary to the above requirements will be disqualified after three (3) days period has lapsed. If locality is a specific goal in MBD6.1 – the requested documentation may not be used to allocate points for specific goals.

Signature: _____ Date: _____

Employer:		Contractor:	
Witness:		Witness:	



Contract: JW14425
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Johannesburg Water (SOC) Ltd



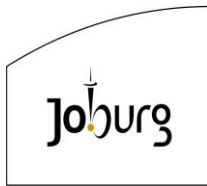
CONTRACT NO. JW14425

**BUSHKOPPIE WASTEWATER TREATMENT
WORKS
INFRASTRUCTURE RENEWAL PLAN**

VOLUME 1

TENDERING PROCEDURES

Employer:		Contractor:	
Witness:		Witness:	



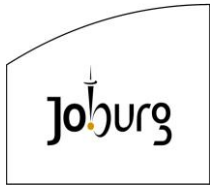
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Employer:		Contractor:	
Witness:		Witness:	



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T1.2 TENDER DATA

T1.2.1 Conditions of Tender

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

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

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

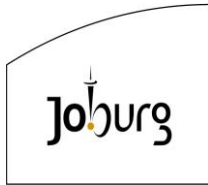
T1.2.2 Tender Data

The clause numbers in the Tender Data refer to the corresponding clause numbers in the Conditions of Tender.

The additional Conditions of Tender are:

Clause number	Tender Data
C.1.1	The Employer is, Johannesburg Water (SOC) Limited
C.1.2	<p>The tender documents issued by the Employer comprise:</p> <p>Volume 1</p> <p>Tender Part 1: Tendering Procedures T1.1 Tender Notice and Invitation to Tender T1.2 Tender Data</p> <p>Tender Part 2: Returnable Documents T2.1 List of Returnable Documents T2.2 List of other Returnable Documents T2.3 List of Returnable Schedules, including the Enterprise Declaration Affidavit which may be bound in a separate volume.</p> <p>Contract Part 1: Agreement and Contract Data C1.1 Form of Offer and Acceptance C1.2 Contract Data C1.3 Forms of Securities</p> <p>Contract Part 2: Pricing Data C2.1 Pricing Instructions C2.2 Bill of Quantities/Schedule of Rates</p> <p>Volume 2A Contract Part 3: Scope of Work</p>

Employer:		Contractor:	
Witness:		Witness:	

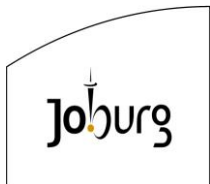


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Clause number	Tender Data
	<p>C3.1 Scope of Work C3.2 Particular Specifications</p> <p>Contract Part 4: Site Information C4 Site Information</p> <p>Volume 2B Generic Specifications</p> <p>Volume 3 Occupational Health, Safety and Environmental Specification and Environmental Management Plan</p> <p>Volume 4 Tender Drawings</p>
C.1.4	<p>The Employer's representative is: The Employer's representative is: Contact Person: Mr Peter Louw Telephone: 011 688 1676 E-mail address: peter.louw@jwater.co.za</p> <p>The SCM representative is Contact Person: Nthabiseng More Telephone: 011 688 1512 E-mail address: nthabiseng.more@jwater.co.za</p>
C.2.1	<p>Eligibility criteria and requirements</p> <p>CIDB registration and grading:</p> <p>1) Only tenderers who are registered with the CIDB and were capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for an 9ME class of work are eligible to submit tenders. Tenders must have an Active status at the required CIDB grading at time of tender evaluation for the bidder to meet the eligibility criteria and requirement.</p> <p>2) Joint ventures are eligible to submit tenders provided that:</p> <ul style="list-style-type: none">i) Every member of the joint venture is registered with the CIDB; andii) The combined contractor grading designation calculated in accordance with the CIDB Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for an 9ME class of construction work. <p>Failure to meet to Eligibility criteria and requirements will result in disqualification.</p>

Employer:		Contractor:	
Witness:		Witness:	

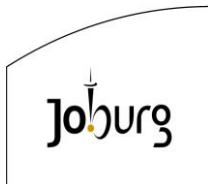


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Clause number	Tender Data
C.2.7	Tenderers should forward their contact details to the contact persons as stated on the Tender Cover Page and Invitation to Tender so that they will be sent any communication pertaining to this tender.
C.2.8	Replace the contents of the clause with the following: "Request clarification of the tender documents, if necessary, by notifying the Employer's Officials indicated on the Tender Notice and Invitation to Tender in writing at least seven (7) working days before the closing time stated in the foregoing notice.
C.2.9	Add the following to the clause: "Accept that the submission of a Tender shall be construed as an acknowledgement by the Tenderer that they are satisfied with the insurance cover, the Employer will affect under the contract."
C.2.10.5	Add the following to the clause: "If no offer is made for an item, a line must be drawn through the space in pen. All prices and details must be legible / readable to ensure the tender will be considered for adjudication."

Employer:		Contractor:	
Witness:		Witness:	

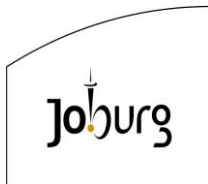


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Clause number	Tender Data
C.2.11	<p>The evaluation on price alteration will be conducted as follows:</p> <p>Where the tender award strategy is to evaluate and award per item or category, the following must apply:</p> <ul style="list-style-type: none"> • If there is an alteration in the rate but no alteration on the total for the item or category, the bidder will not be disqualified. • If there is an alteration on the total for the item/s without authentication, bidders will only be disqualified for alteration per item or category. <p>Where the tender award strategy is to evaluate and award total bid offer, the following must apply:</p> <ul style="list-style-type: none"> • If there is an alteration on the rate, total for the line item, sub-total/ sum brought/carried forward for the section but no alteration on the total bid offer, the bidder will not be disqualified. • If there is an alteration on the total bid offer on "Form of Offer" then the amount in words must be considered or vice-versa. • If there is an unauthenticated alteration on the total bid offer and the amount in words is not authenticated, the bidders will be disqualified for the entire tender. <p>Where the tender pricing schedule or bill of quantities is requesting rates/price from bidder/s without providing a total, the following will apply:</p> <ul style="list-style-type: none"> • (i) If there is an unauthenticated alteration on the unit rate/price the bidder must be disqualified. <p>Please note: Corrections may not be made using correction fluid, correction tape or the like.</p>
C.2.12.1	<p>Replace Contents</p> <p>Alternative offers will not be permitted.</p>
C.2.12.2	<p>Failure to complete and sign the form of offer in full will result in the elimination of the tender.</p>
C.2.13.3	<p>Each tender offer shall be submitted as an original. Tenderers are also requested to submit a soft copy in a USB (Tenderers who do not submit a soft copy will not be disqualified)</p>
C.3.9	<p>Replace Existing Clause</p> <p>Arithmetic Errors</p> <p>Construction related tenders</p> <p>JW undertakes to check the highest scoring bid for arithmetical errors and correcting them as follows:</p> <p>JW shall check for arithmetic errors using the following sequence:</p> <ol style="list-style-type: none"> Check the amount in words against the amount in figures on the <i>Form of Offer</i>, Check the Form of Offer against the Summary Schedule Total,

Employer:		Contractor:	
Witness:		Witness:	

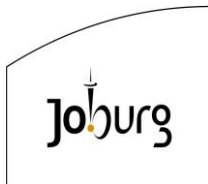


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Clause number	Tender Data
	<p>(iii) Check the Section Sub-Totals per section against the Summary Total for summation errors,</p> <p>(iv) Check the Section Sub-Totals in the Summary Schedule against Section Sub-Totals in the Bill of Quantities.</p> <p>(v) Check the Section Sub-Totals against the Item Totals for summation errors.</p> <p>(vi) Check the Item Totals against the product of the Item Rate and the Quantity Provided.</p> <p>If a bill of quantities or price schedule applies JW will request the bidder to correct the arithmetic errors as follows:</p> <p>(i) In respect of the Form of Offer, where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern. The Tenderer must be requested to adjust the amount in figures to correspond with the amount in words.</p> <p>JW will notify the Tenderer of all errors or omissions that are identified in the tender offer and either request the Tenderer to confirm the offer as tendered or JW will accept the corrected total of prices. Where the Tenderer elects to confirm the tender offer as tendered, correct the errors as follows:</p> <p>(i) 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.</p> <p>(ii) 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 requested to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.</p> <p>Clarification session(s) shall be held with Tenderer where there are pricing discrepancies, errors are highlighted and identified corrections are explained.</p> <p>Tenderer is afforded an opportunity to provide clarification, accept or reject identified corrections in writing.</p> <p>(i) In the event that the Tenderer accepts identified corrections, JW will proceed with evaluation.</p> <p>(ii) In the event that the Tenderer rejects the identified correction(s), JW must review the Tenderer's motivation and risks associated with the proposed change.</p> <p>This is not an opportunity for Tenderers to change the bid offer. A bidder that does not agree to the above will be disqualified.</p>

Employer:		Contractor:	
Witness:		Witness:	

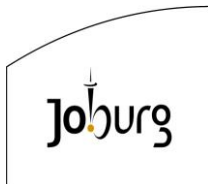


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Clause number	Tender Data
	<p>Risk related to the Arithmetic Corrections shall be assessed. Where risks are identified, Tenderers shall provide JW with any other material or information that has a bearing on the tender offer, the Tenderer's commercial position (including joint venture agreements), quotations preferencing arrangements or samples of materials considered necessary by JW for the purpose of a full and fair risk assessment.</p> <p>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 JW request or fails to attend any meeting in which it has been formally invited to clarify any issue, the tender offer will be regarded as non-responsive.</p>
C.2.13.5	<p>The Employer's address for delivery of tender offers and identification details to be shown on the Tenderer's offer package are:</p> <p>Location of tender box: Ground Floor Entrance</p> <p>Physical address: Johannesburg Water (SOC) Ltd Turbine Hall 65 Ntemi Piliso Street Newtown Johannesburg 2001</p> <p>Identification details: Tender reference number, Title of Tender and the closing date and time of the tender, <i>as well as the Tenderer's name, their Authorised Representative's name, postal address and telephonic contact numbers.</i></p>
C.2.13.6 & C.3.5	A two-envelope procedure will not be followed.
C.2.15.1	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
C.2.16	The tender offer validity period is 90 days.
C.2.16.1	<p>Add the following to the clause:</p> <p>"If the tender validity expires on a Saturday, Sunday or public holiday, the Tender Offer shall remain valid and open for acceptance until the closure of business on the following working day."</p>
C.2.19	The Tenderer must provide access during working hours to his premises for inspections on request.
C.2.23	The Tenderer is required to submit with his tender:

Employer:		Contractor:	
Witness:		Witness:	

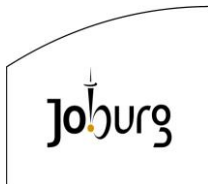


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Clause number	Tender Data
	<ol style="list-style-type: none">1) Valid SARS Compliance status Pin for Tenders issued by the South African Revenue Services.2) Proof of CSD registration i.e. MA xxxxxxxx number3) A Certificate of Contractor Registration issued by the CIDB.4) Where the tendered amount inclusive of VAT exceeds R 10 million:<ol style="list-style-type: none">i. Audited annual financial statement for 3 years, or for the period since establishment if established during the last 3 years, if required by law to prepare annual financial statements for auditing.ii. If the bidder is not required by law to prepare financial statements, then the bidder is required to submit their unaudited financial statements prepared by an independent accounting professional.5) Proof that the Tenderer and directors of the Tenderer are not in arrears for more than 90 days with municipal rates and taxes and municipal service charges, The latest municipal account is to be attached, or a signed copy of the valid lease agreement if the Tenderer or director of the Tenderer is currently leasing premises and not responsible for paying municipal accounts.<ol style="list-style-type: none">i. Should the municipal statement that was submitted with the tender document before tender closing date and time be in arrears for more than 90 days at time of award, the tenderer will be requested to submit the latest municipal statement which shows that the Tenderer is not in arrears for more than 90 days. If the statement at that time is in arrears for more than 90 days, the Tenderer must submit before the stipulated deadline, the written proof of an approved arrangement with the municipality.ii. The proof may be a copy of the agreement or an updated municipal statement which reflects the arrangement.iii. Should this tender be considered for award of the contract, based on proof of submission and should proof of such submission be found to be invalid, erroneous or inaccurate, the tenderer will no longer be considered for the award of the contract.iv. Statement must not be older than 90 days from the closing date of this tender. Attach latest municipal account statement behind this page.v. In cases where the director of the tenderer resides with their spouse, parent, partner or sibling the owner of the property that confirm where the director of the tenderer resides must submit an affidavit stating such and explaining the relationship. This would happen in the case where the submitted municipal statement or lease agreement is not in the name of the director of the tenderer. Point (i) will be applicable.vi. In cases where the business address of the tenderer is also the official residence of the director of the tenderer, the director of the tenderer must submit an affidavit stating such. Proof that the municipal statement is not in arrears for more than 90 days or a valid lease agreement must be submitted. Point (i) will be applicable.

Employer:		Contractor:	
Witness:		Witness:	

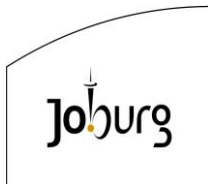


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Clause number	Tender Data
	<p>6) Particulars of any contracts awarded to the tenderer by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract.</p> <p>7) A statement indicating whether any portion of the goods or services are expected to be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality or municipal entity is expected to be transferred out of the Republic.</p> <p>8) Where a Tenderer satisfies CIDB contractor grading designation requirements through joint venture formation, such Tenderers must submit the Certificates of Contractor Registration in respect of each partner.</p>
C.2.24	<p>Add the following new clause:</p> <p>Canvassing and obtaining of additional information by Tenderers</p> <p>Accept that:</p> <ol style="list-style-type: none"> No Tenderer shall make any attempt either directly or indirectly to canvass any of the Employers officials or the Employer's agent in respect of his tender, after the opening of the tenders but prior to the Employer arriving at a decision thereon. No Tenderer shall make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.
C.2.25	<p>Add the following new clause:</p> <p>Prohibitions on awards to persons in service of the state</p> <p>Accept that the Employer is prohibited to award a tender to a person -</p> <ol style="list-style-type: none"> Who is in the service of the state; or If that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or A person who is an advisor or consultant contracted with the municipality or municipal entity. <p>"In the service of the state" means to be -</p> <ol style="list-style-type: none"> a member of:- <ul style="list-style-type: none"> any municipal council; any provincial legislature; or the National Assembly or the National Council of Provinces; the board of directors of any municipal entity; an official of any municipality or municipal entity; an employee of any national or provincial department; 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."

Employer:		Contractor:	
Witness:		Witness:	

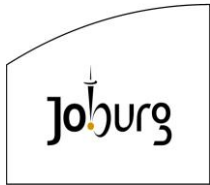


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Clause number	Tender Data
	To give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in Section T2.1 must be completed.
C.2.26	<p>Add the following new clause:</p> <p>Awards to close family members of persons in the service of the state</p> <p>“Accept that the notes to the Employer’s annual financial statements must disclose particulars of any award of more than R 2 000 to a person who is a spouse, child or parent of a person in the service of the state (defined in clause C.2.25), or has been in the service of the state in the previous twelve months, including:</p> <ul style="list-style-type: none"> a) The name of that person; b) The capacity in which that person is in the service of the state; and c) The amount of the award. <p>To give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 – Returnable Documents must be completed in full and signed.</p>
C.2.27	<p>Add the following new clause:</p> <p>Tax Compliance</p> <p>In the case of a Joint Venture/Consortium the tax Compliance status Pin must be submitted for each member of the Joint Venture/Consortium.”</p>
C.2.28	<p>Add the following new clause:</p> <ul style="list-style-type: none"> • Tenderers will be notified of such missing and incomplete documents and will be offered a period of three (3) days to complete or submit those pages i.e., Municipal Bidding Documents (MBD), Authority to sign and other documents that require completion and signatures that do not have a bearing on functionality, specific goals and price. • Tenders that are received contrary to the above requirements will be disqualified after three (3) days period has lapsed. • In cases where locality is a specific goal and the Tenderer did not submit the required documentation, the Tenderer upon submitting the municipal statement, lease agreement or letter from ward councilor confirming business address as per above, may not be eligible for points under specific goals if such documentation was not submitted with the tender document.
C.3.2	<p>Replace the contents of the clause with the following:</p> <p>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 (7) Working days before the tender closing time stated in the Tender Data. If, as a result a</p>

Employer:		Contractor:	
Witness:		Witness:	

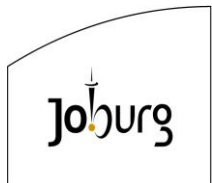


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Clause number	Tender Data
	tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.
C.3.4.2	Tenders will be opened in public soon after closing time and recording of received documents but not later than 11:00 at the tender office located at Turbine Hall, 65 Ntemi Piliso, Newtown, 2001, Ground Floor. Tenderers' names and total prices, where practical will be read out.
C.3.11	Replace Contents with Returnable Schedule MBD 6.1 for evaluation criteria

Employer:		Contractor:	
Witness:		Witness:	

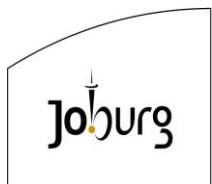


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Clause number	Tender Data		
C.1.1	<u>Mandatory Requirements</u>		
	Description		Complied
			Yes No
	1	CIDB grading of 9ME. Active Status at the required CIDB grading or higher at the time of Evaluation.	
	2	Compulsory briefing meeting	
	3	Completed and signed Form of Offer	
Tenderers who FAIL to meet the mandatory criteria or requirements of tender will result in disqualification.			

Employer:		Contractor:	
Witness:		Witness:	

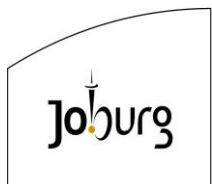


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Clause number	Tender Data				
	<u>Administrative Requirements</u>				
	Description			Complied	
	Reference	Description	Requirement	Yes	No
	Certificate of Authority	Certificate of Authority or Board Resolution granting authority to sign.	Completed and signed certificate of authority to sign or signed board resolution		
	MBD 1	Invitation to Bid Form	Complete and submit complete and signed MBD 1 Form.		
	CSD	Central Supplier Database Registration	Provide proof of CSD registration.		
	MBD 4	Declaration of Interest	Complete and submit complete and signed MBD 4 Form.		
	MBD 5	Declaration of Procurement Above R10m (All Applicable Taxes Included)	Complete and submit signed MBD 5 Form.		
	T2.3.2	Acknowledgement of Project Tender Drawings	Complete and submit signed T2.3.2 Form.		
	T2.3.1	Acknowledgement of SHE Specification & Annexures	Complete and submit signed T2.3.1 Form.		

Employer:		Contractor:	
Witness:		Witness:	

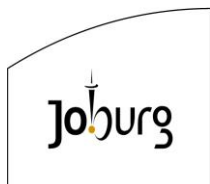


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Clause number	Tender Data				
	MBD 6.1	Preference Points Claim in Terms of The Preferential Procurement Regulations 2022	Complete and submit complete and signed MBD 6.1 Form.		
	MBD 8	Declaration of Bidder's Past Supply Chain Management Practices	Complete and submit complete and signed MBD 8 Form.		
	MBD 9.	Certificate of Independent Bid Determination	Complete and submit complete and signed MBD 9 Form.		
	Annexure – Proof of Specific Goals - Ref: 4.4	Valid BBBEE Certificate or certified copy thereof or a valid sworn affidavit	Submit applicable documentation with the tender submission		
	Annexure T2.2.4	Municipal statement of account for Director/s (not older than three (03) months from the closing date of tender or a valid lease agreement at time of tender closure).	Submit applicable documentation with the tender submission		
	Annexure T2.2.4	Municipal statement of account for Company (not older than three (03) months from the closing date of tender or a valid lease agreement at time of tender closure).	Submit applicable documentation with the tender submission		
	Annexure	Joint Venture Consortium or equivalent Agreement signed by all parties.	Submit applicable documentation with the tender submission		

Employer:		Contractor:	
Witness:		Witness:	

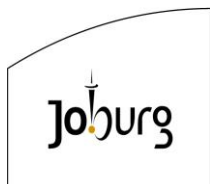


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Clause number	Tender Data																
	<u>Functionality Requirements</u>																
	The quality criteria minimum and maximum points in respect of each of criteria shall be as follows:																
	<table><tr><th>CRITERIA NO #</th><th>CRITERIA</th><th>EVIDENCE</th><th>SUB-CRITERIA/CLAUSE</th><th>MAX SCORE</th><th>SCORE</th></tr><tr><td rowspan="3">1.</td><td rowspan="3">Tenderer's experience with respect to specific aspects of the project / comparable projects. Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 20Mℓ/d (each), with a construction value of at least R80m (ex VAT) each.</td><td rowspan="3">Record of completed projects as per format given on section T2.1.6 accompanied with completion certificate / final approval certificate and supported with contactable references. Tenderer to provide reference letters and completion certificates as per the format provided in section T2.1.7, on the Client's letterhead, with all the required information. Note: The attached contactable reference letter must be completed by the referee/previous client of the tenderer and included in the tender submission. Alternatively, the Clients letterhead may be used provided it complies with the functionality requirements. A separate form must be completed for each reference as a requirement in the evaluation criteria. The information provided will be verified and if</td><td>Tenderer has not Completed any Projects/No submission of supporting documents.</td><td rowspan="3">10</td><td>0</td></tr><tr><td>Tenderer has Completed a minimum of 2 (two) Projects.</td><td>7</td></tr><tr><td>Tenderer has Completed more than 2 Projects.</td><td>10</td></tr></table>	CRITERIA NO #	CRITERIA	EVIDENCE	SUB-CRITERIA/CLAUSE	MAX SCORE	SCORE	1.	Tenderer's experience with respect to specific aspects of the project / comparable projects. Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 20Mℓ/d (each), with a construction value of at least R80m (ex VAT) each.	Record of completed projects as per format given on section T2.1.6 accompanied with completion certificate / final approval certificate and supported with contactable references. Tenderer to provide reference letters and completion certificates as per the format provided in section T2.1.7, on the Client's letterhead, with all the required information. Note: The attached contactable reference letter must be completed by the referee/previous client of the tenderer and included in the tender submission. Alternatively, the Clients letterhead may be used provided it complies with the functionality requirements. A separate form must be completed for each reference as a requirement in the evaluation criteria. The information provided will be verified and if	Tenderer has not Completed any Projects/No submission of supporting documents.	10	0	Tenderer has Completed a minimum of 2 (two) Projects.	7	Tenderer has Completed more than 2 Projects.	10
CRITERIA NO #	CRITERIA	EVIDENCE	SUB-CRITERIA/CLAUSE	MAX SCORE	SCORE												
1.	Tenderer's experience with respect to specific aspects of the project / comparable projects. Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 20Mℓ/d (each), with a construction value of at least R80m (ex VAT) each.	Record of completed projects as per format given on section T2.1.6 accompanied with completion certificate / final approval certificate and supported with contactable references. Tenderer to provide reference letters and completion certificates as per the format provided in section T2.1.7, on the Client's letterhead, with all the required information. Note: The attached contactable reference letter must be completed by the referee/previous client of the tenderer and included in the tender submission. Alternatively, the Clients letterhead may be used provided it complies with the functionality requirements. A separate form must be completed for each reference as a requirement in the evaluation criteria. The information provided will be verified and if	Tenderer has not Completed any Projects/No submission of supporting documents.	10	0												
			Tenderer has Completed a minimum of 2 (two) Projects.		7												
			Tenderer has Completed more than 2 Projects.		10												

Employer:		Contractor:	
Witness:		Witness:	

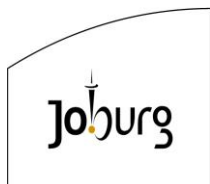


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Clause number	Tender Data				
			found to be false or misrepresented, punitive measures will be instituted against the respective party including blacklisting in participating in any future government tenders.		
	2.	Tenders experience with respect to specific aspects of the project / comparable projects Experience on two or more Electrical projects for waste or potable water treatment projects with capacity of at least 10Mℓ/d (each), with a construction value of at least R20m (ex VAT) each.	Record of completed projects as per format given on section T2.1.6 accompanied with completion certificate / final approval certificate and supported with contactable references. Tenderer to provide reference letters and completion certificates as per the format provided in section T2.1.7, on the Client's letterhead, with all the required information. Note: The attached contactable reference letter must be completed by the referee/previous client of the tenderer and included in the tender submission. Alternatively, the Clients letterhead may be used provided it complies with the functionality requirements. A separate form	Tenderer has not Completed any Projects/No submission of supporting documents.	0
				Tenderer has Completed a minimum of 2 (two) Projects	7
				Tenderer has Completed more than 2 Projects.	10
				10	

Employer:		Contractor:	
Witness:		Witness:	

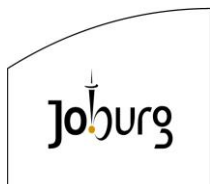


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			must be completed for each reference as a requirement in the evaluation criteria. The information provided will be verified and if found to be false or misrepresented, punitive measures will be instituted against the respective party including blacklisting in participating in any future government tenders.		
3.	Tenderer must provide Site Specific Method Statement Which Addresses the following: - Sequencing of the Works as described in the Scope of Work - Approach statement and Introduction which illustrates understanding of the scope - Quality Control Plan including all necessary standards to be used,	Detailed explanation of evidence to be submitted. Number of pages to be submitted Tenderer is required to address the following: Sequencing of the Works (Maximum of 4 pages) – Tenderer must demonstrate an understanding of how the Works will be executed, in terms of the sequence of construction activities, commissioning of individual/groups of structures, and handover of process units to JW.	Method Statement is generic and not aligned to the project/Non submission of method statement	10	0
			Tenderer has adequately addressed all the minimum requirements highlighted in annexure 5 PS 3.4, as well as the Sequencing of the Works, and the proposed construction method statement is feasible given the constraints on the Works.		7
			Tenderer has exceeded all the minimum requirements highlighted in annexure 5 PS 3.4 and the proposed construction		10

Employer:		Contractor:	
Witness:		Witness:	

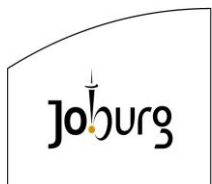


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Clause number	Tender Data					
		resources available and procedures to ensure quality Specific construction method statements as required in annexure 5 PS 3.4 (Part 3 Scope of Work).	Quality Control Plan (Maximum of 4 pages) – Include all necessary standards to be used, resources available and procedures to ensure quality. The following major components must be addressed: - Demolition/removal of existing equipment, including Health and Safety considerations, - Concrete and rebar work, - Mechanical equipment manufacture and testing, - Mechanical equipment installation and testing, - Electrical equipment manufacture and testing, - Electrical / C&I equipment installation and testing, - Commissioning	method statement is feasible given the constraints on the Works.		
	4.	Experience of Contracts Manager:	Tenderer to provide CV of Contract Manager in the format provided on T.2.1.9	0 – 1 Projects completed	15	0

Employer:		Contractor:	
Witness:		Witness:	

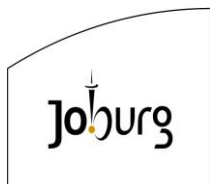


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Clause number	Tender Data				
		Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 20Mℓ/d (each), with a construction value of R80m ex VAT (each).	Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should contain information required for functionality. Note: Certified Copies of qualifications and valid registrations are to accompany the CVs.	2 – 3 Projects completed	12
		Only Contract Managers with minimum qualifications of BSc, BEng or B.Tech in Engineering (Civil/Mechanical)		More than 3 Projects completed	15
		REGISTRATION PrEng / Pr Tech (Eng) / PrCPM			
5.	Experience of Site Agent:	Tenderer to provide CV of Site Agent in the format provided on T.2.1.9	0 – 1 Projects completed	15	0
	Experience on two or more				

Employer:		Contractor:	
Witness:		Witness:	

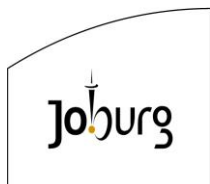


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Clause number	Tender Data				
		<p>Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 10Mℓ/d (each), with a construction value of R50m ex VAT (each).</p> <p>National Diploma or BSc or BEng Engineering (Civil / Mechanical)</p> <p>REGISTRATION</p> <p>Registered as a Candidate Professional in the Built Environment (ECSA or SACPCMP), or more</p>	<p>Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should contain information required for functionality.</p> <p>Note: Certified Copies of qualifications and valid registrations are to accompany the CVs.</p>	2 – 3 Projects completed	12
				More than 3 Projects completed	15
	6.	Mechanical Engineering Senior Foreman:	Tenderer to provide CV of Senior Foreman in the format provided on T.2.1.9	0 – 2 Projects completed	0

Employer:		Contractor:	
Witness:		Witness:	

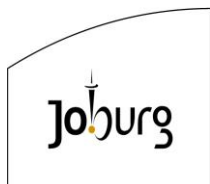


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Clause number	Tender Data				
		Experience on three or more Electro-Mechanical projects for waste or potable water treatment projects with a capacity of at least 10Mℓ/d (each).	Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should contain information required for functionality. Note: Certified Copies of qualifications are to accompany the CVs.	3 – 4 Projects completed	6
				More than 4 Projects completed	10
	7.	Civil Engineering Senior Foreman (Main Contractor or Sub-Contractor) Experience on three or more Civil / Electro-Mechanical projects for waste or potable water treatment projects with	Tenderer to provide CV of Senior Foreman in the format provided on T.2.1.9 Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should	0 – 2 Projects completed	0
				3 – 4 Projects completed	6
				More than 4 Projects completed	10

Employer:		Contractor:	
Witness:		Witness:	

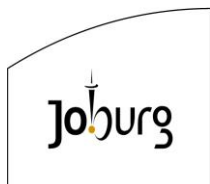


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		a capacity of at least 10Mℓ/d (each).	contain information required for functionality.		
		National Diploma or BSc or BEng Engineering (Civil), or higher	Note: Certified Copies of qualifications are to accompany the CVs.		
8.	Electrical and C&I Engineering Senior Foreman (Main Contractor or Sub-Contractor):	Experience on three or more Electro-Mechanical projects for waste or potable water treatment projects with a capacity of at least 10Mℓ/d (each).	Tenderer to provide CV of Senior Foreman in the format provided on T.2.1.9 Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should contain information required for functionality. Note: Certified Copies of qualifications are to accompany the CVs.	0 – 2 Projects completed	0
				3 – 4 Projects completed	6
				More than 4 Projects completed	10
				10	

Employer:		Contractor:	
Witness:		Witness:	

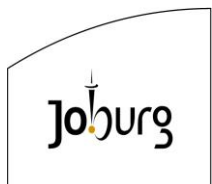


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Clause number	Tender Data					
	9.	Experience of Safety Officer: Experience on three or more related projects (Water / Wastewater Treatment, Bulk Pipelines, Motor Control Centres, Mechanical installations in an Industrial Environment) with a minimum value of R20m ex. VAT (each) (post-graduation) will be considered. Only Safety Officers with minimum qualifications of National Diploma (Safety Management), National Diploma (Environmental Health/Environmental Science/ Environmental Management), SAMTRAC / SHEOMTRAC / SHEMTRAC / MESHTRAC / NEBOSH OR ANY OTHER SAFETY COURSE.	Tenderer to provide CV of Safety Officer in the format provided on T.2.1.9 Note: Tenderers are required to make use of CV template provided on T2.1.9 however, Tenderers may provide their own CVs but information provided should contain information required for functionality. Note: Certified Copies of qualifications and valid registrations are to accompany the CVs.	0 – 2 Projects completed	10	0
				3 – 4 Projects completed		7
				More than 4 Projects completed		10

Employer:		Contractor:	
Witness:		Witness:	

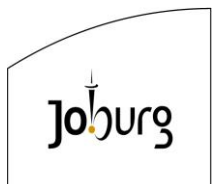


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Clause number	Tender Data				
		REGISTRATION Professionally Registered with SACPCMP in the Construction Health and Safety Sector will be considered			
	MINIMUM QUALIFYING SCORE				70
	TOTAL				100
	<p>Each evaluation criteria will be assessed in terms of the indicators specified. The scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for quality.</p> <p>Tenderers who fail to achieve a minimum overall score of 70 points, will not be considered further.</p> <p>Quality shall be scored in accordance with the following schedules:</p> <p>Experience of Key Personnel</p> <p>The scoring of the Experience of Key Personnel will be as follows:</p>				

Employer:		Contractor:	
Witness:		Witness:	

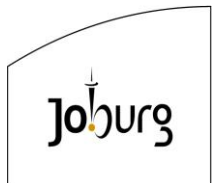


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Clause number	Tender Data		
	CVs of all key personnel to be furnished or T2.1.9 can be completed. Qualifications and Experience of Key Construction Personnel.		
		Qualification of team members	Experience of team members
	(Score = 0)	Non-submission of supporting documents or minimum requirements not met.	Non-submission of supporting documents or minimum requirements not met.
	(score as specified)	Key staff met the minimum required qualifications and candidate/professional registrations.	Key staff met the minimum required experience
	(score as specified)	Key staff has exceeded the minimum required qualifications.	Key staff has exceeded the minimum required experience.
<p>NOTE 1: Where applicable, foreign qualifications MUST be accompanied by a SAQA verification certificate. Failure to submit SAQA verification certificate will lead to that qualification not being considered for allocation of points for that criterion.</p> <p>NOTE 2: When an uncertified copy of professional registration is submitted and the requirement was to submit a certified copy, JW will verify the validity of the registration on the issuing bodies or institution’s website. If the verification is confirmed on the website, the bidder meets the criteria. This will only be applicable for the recommended bidders.</p> <p>NOTE 3: The time of registration of Contract Manager, Site Manager and Safety Officer will not impact post qualification number of projects.</p> <p>NOTE 4: The information provided by bidders will be verified and if found to be false, punitive measures will be affected.</p>			

Employer:		Contractor:	
Witness:		Witness:	

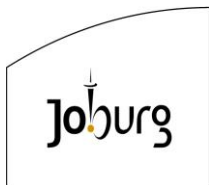


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Clause number	Tender Data
	ECSA: Engineering Council of South Africa SACPCMP: South African Council for the Project and Construction Management Professions SAMTRAC: Safety Management Training Course NEBOSH: National Examination Board in Occupational Safety and Health SHEOMTRAC: Safety Health Environmental Occupational Management Training Course SHEMTRAC: Safety Health Environmental Management Training Course MESHTRAC: Management Environmental Safety Health Training Course

Employer:		Contractor:	
Witness:		Witness:	

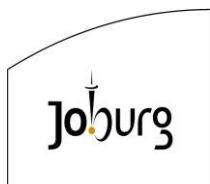


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Clause Number	Tender Data												
	<p>4. STAGE FOR PRICE AND PREFERENCE POINTS EVALUATION:</p> <p>4.1. Pricing</p> <p>The following aspects will be considered in the financial offer:</p> <ol style="list-style-type: none">Costing for all items as described in the Pricing Schedule and applicable Strategies Review of financial offer and discrepancies between total and calculations.Identify any parameters that may have a bearing on the financial offer, e.g., contract period, price escalations or adjustments required and life cycle costs.The 90/10 preference point system will be applicable in this tender. Whereby 90 points will be allocated to price and 10 points will be allocated to the set specific goals per category as outlined on the pricing schedule. The bidder scoring the highest in terms of price and specific goal will be recommended for that specific category. <p>4.2. Award and Allocation Strategy:</p> <table><tr><td>AWARD STRATEGY</td><td>The tender will be awarded to the highest scoring bidder in terms of price and Specific Goals</td></tr><tr><td>ALLOCATION STRATEGY</td><td>The tender will be allocated to the highest scoring bidder in terms of price and Specific Goals</td></tr></table> <p>4.3. The maximum preference points for this bid are allocated as follows:</p> <table><tr><th></th><th>POINTS</th></tr><tr><td>PRICE</td><td>90</td></tr><tr><td>SPECIFIC GOALS</td><td>10</td></tr><tr><td>Total points for Price and SPECIFIC GOALS</td><td>100</td></tr></table>	AWARD STRATEGY	The tender will be awarded to the highest scoring bidder in terms of price and Specific Goals	ALLOCATION STRATEGY	The tender will be allocated to the highest scoring bidder in terms of price and Specific Goals		POINTS	PRICE	90	SPECIFIC GOALS	10	Total points for Price and SPECIFIC GOALS	100
AWARD STRATEGY	The tender will be awarded to the highest scoring bidder in terms of price and Specific Goals												
ALLOCATION STRATEGY	The tender will be allocated to the highest scoring bidder in terms of price and Specific Goals												
	POINTS												
PRICE	90												
SPECIFIC GOALS	10												
Total points for Price and SPECIFIC GOALS	100												

Employer:		Contractor:	
Witness:		Witness:	

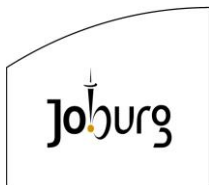


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Clause Number	Tender Data
	<p>SPECIFIC GOALS</p> <p>In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations 2022, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender.</p> <p>Specific goals may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability.</p> <p>Race:</p> <ul style="list-style-type: none"> I. Ownership by black people II. Black Designated Group: <ul style="list-style-type: none"> Ownership by black people that are unemployed Ownership by black people who are youth Ownership by black people living in rural or underdeveloped areas or townships Ownership by black people with disabilities Ownership by black people who are military veterans Cooperative owned by black people <p>Gender:</p> <ul style="list-style-type: none"> III. Persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of gender are women. Ownership by persons that are classified as female or women according to the Department of Home Affairs of South African. <p>Disability:</p> <ul style="list-style-type: none"> IV. Persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of disability are disabled persons. <p>Reconstruction and Development Programme (RDP) objectives as published in Government Gazette No. 16085 dated 23 November 1994 i.e.,</p> <p>Local Manufacture:</p> <ul style="list-style-type: none"> I. Promotion of procurement of locally manufactured goods in South Africa to promote job creation in light of the high unemployment rate in South Africa which has a greater impact previously disadvantaged individuals and black youth.

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Witness:		Witness:	

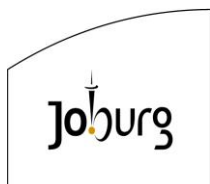


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Clause Number	Tender Data
	<p>Locality:</p> <ol style="list-style-type: none"> I. Promotion of procurement from local business in the geographical areas that JW operate in. This is also directed at creating employment in the areas JW operate in. The BSC may allocate points as follows: <ul style="list-style-type: none"> • Promotion of enterprises located in the Gauteng Province • Promotion of enterprises located in a specific region within COJ (the 7 regions. A to G) • Promotion of enterprises located in the City of Johannesburg municipality • Promotion of enterprises located rural or underdeveloped areas or townships. <p>QSE</p> <ol style="list-style-type: none"> I. Promotion of procurement from QSE's that are black owned. <p>EME:</p> <ol style="list-style-type: none"> I. Promotion of procurement from EME's that are black own. <p>SUB-CONTRACTING:</p> <p>Promotion of a company previously owned by a Historically Disadvantaged Individuals (HDI).</p> <p>Consider sub-contract only in cases where there are no company which can meet any of the specific goals. Check if the portion of the work cannot be subcontracted in terms of specific goals.</p> <p>One goal may be chosen, or a combination of goals may be decided upon including a sub-goal i.e., owned by black people that are disabled etc.,</p> <p>JOINT VENTURE, CONSORTIUM OR EQUIVALENT:</p> <p>For Joint Venture Agreements, Consortiums or equivalent, the agreement must show percentages of ownership and work to be completed by each party. This agreement must form part of the tender submission.</p> <p>To determine the Joint Venture, Consortium or equivalent score for specific goals, JW will look at the consolidated BBBEE certificate to determine the points for specific goals that will be awarded to the tenderer. If a consolidated BBBEE certificate is not submitted, the parties to the joint venture, consortium or equivalent must submit their individual BBBEE certificates issued by a SANAS accredited verification agency or the documents listed below on 4.6 and the joint venture, consortium or equivalent agreement in order for JW to determine the proportional points for specific goals.</p> <p>Documentation to be provided:</p> <ul style="list-style-type: none"> • JV, Consortium, or equivalent agreement

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Witness:		Witness:	

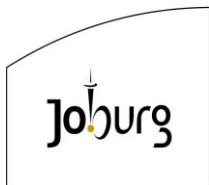


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	<ul style="list-style-type: none"> Consolidated BBBEE certificate issued by an SANAS accredited verification agency. Certificate must be valid <p>Table 1:</p> <table> <tr> <th>The specific goals allocated points in terms of this tender</th><th>Number of points allocated (90/10 system)</th></tr> <tr> <td>Business owned by 51% or more-Women</td><td>6</td></tr> <tr> <td>Business located within the boundaries of COJ Municipality</td><td>4</td></tr> <tr> <td>Total</td><td>10</td></tr> </table> <p>4.4. The following verification documents must be submitted with the tender document:</p> <table> <tr> <th>SPECIFIC GOALS – ANY ONE OR A COMBINATION OF ANY</th><th>MEANS OF VERIFICATION THAT MAY BE SELECTED OR A COMBINATION THEREOF</th></tr> <tr> <td>Business owned by 51% or more-Women-</td><td> Valid BBBEE Certificate issued by SANAS accredited verification agency or DTI/CIPC BBBEE Certificate for Exempted Micro Enterprises or Affidavit sworn under oath, OR •CIPC registration document showing percentage of ownership and share certificate where applicable <ul style="list-style-type: none"> CSD </td></tr> <tr> <td>Business located within the boundaries of COJ Municipality</td><td> Proof of municipal account / valid lease agreement, letter from the Ward Council confirming the business address <ul style="list-style-type: none"> CSD </td></tr> </table> <p>Note: The joint venture, consortium, or equivalent agreement in order for JW to determine the proportional points for specific goals</p>	The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system)	Business owned by 51% or more-Women	6	Business located within the boundaries of COJ Municipality	4	Total	10	SPECIFIC GOALS – ANY ONE OR A COMBINATION OF ANY	MEANS OF VERIFICATION THAT MAY BE SELECTED OR A COMBINATION THEREOF	Business owned by 51% or more-Women-	Valid BBBEE Certificate issued by SANAS accredited verification agency or DTI/CIPC BBBEE Certificate for Exempted Micro Enterprises or Affidavit sworn under oath, OR •CIPC registration document showing percentage of ownership and share certificate where applicable <ul style="list-style-type: none"> CSD 	Business located within the boundaries of COJ Municipality	Proof of municipal account / valid lease agreement, letter from the Ward Council confirming the business address <ul style="list-style-type: none"> CSD
The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system)														
Business owned by 51% or more-Women	6														
Business located within the boundaries of COJ Municipality	4														
Total	10														
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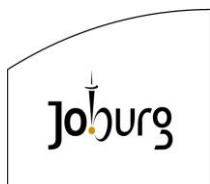


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	Example, If there are two parties in a Joint Venture with a 50:50 ownership of the Joint Venture and one party is located within the boundaries of COJ and one is located in Tshwane, if one of the goals is locality and has total points of 4, the JV will only be entitled the proportional points of 2.																																																																			
	4.5. The following are the requirements for the Sworn Affidavit it terms of the BBBEE Sector Codes of Good Practise:																																																																			
	<table><tr><th>Affidavit Prescribed Formats</th><th>Category</th><th>Financial Threshold</th></tr><tr><td colspan="3">Generic Enterprises</td></tr><tr><td></td><td>BO QSE</td><td>Between R10m and R50m</td></tr><tr><td></td><td>BO EME</td><td>Less than R10m</td></tr><tr><td colspan="3">Sector Specific Enterprises</td></tr><tr><td></td><td>BO QSE</td><td>Between R10m and R50m</td></tr><tr><td></td><td>BO EME</td><td>Less than R10m</td></tr><tr><td colspan="3">Construction Sector Code</td></tr><tr><td></td><td>EME Contractor</td><td>Less than R3m</td></tr><tr><td></td><td>BO EME BEP</td><td>Less than R1.8m</td></tr><tr><td colspan="3">Financial Sector Code</td></tr><tr><td></td><td>BO QSE</td><td>Between R10m and R50m</td></tr><tr><td></td><td>BO EME</td><td>Less than R10m</td></tr><tr><td colspan="3">Information Communication Technology Sector Code (ICT)</td></tr><tr><td></td><td>BO QSE</td><td>Between R10m and R50m</td></tr><tr><td></td><td>BO EME</td><td>Less than R10m</td></tr><tr><td colspan="3">Marketing, Advertising & Communication Sector Code (MAC)</td></tr><tr><td>> Public Relations</td><td>BO QSE</td><td>Between R5m and R10m</td></tr><tr><td>> Marketing, Advertising & Communications</td><td>BO EME</td><td>Less than R5m</td></tr><tr><td colspan="3">Property Sector Code</td></tr><tr><td rowspan="2">> Service-based</td><td>BO QSE</td><td>Between R5m and R10m</td></tr><tr><td>EME</td><td>Less than R5m</td></tr></table>			Affidavit Prescribed Formats	Category	Financial Threshold	Generic Enterprises				BO QSE	Between R10m and R50m		BO EME	Less than R10m	Sector Specific Enterprises				BO QSE	Between R10m and R50m		BO EME	Less than R10m	Construction Sector Code				EME Contractor	Less than R3m		BO EME BEP	Less than R1.8m	Financial Sector Code				BO QSE	Between R10m and R50m		BO EME	Less than R10m	Information Communication Technology Sector Code (ICT)				BO QSE	Between R10m and R50m		BO EME	Less than R10m	Marketing, Advertising & Communication Sector Code (MAC)			> Public Relations	BO QSE	Between R5m and R10m	> Marketing, Advertising & Communications	BO EME	Less than R5m	Property Sector Code			> Service-based	BO QSE	Between R5m and R10m	EME	Less than R5m
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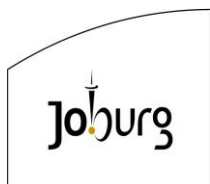


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	> Agency-based	BO QSE	Between R2.5m and R35m
	> Asset-based	EME	Less than R2.5m
		BO QSE	Between R80m and R400m
	Tourism Sector Code		
		BO QSE	Between R5m and R45m
		BO EME	Less than R5m
	Specialised Enterprises		
		BO QSE	Between R10m and R50m
		BO EME	Less than R10m
	<p>4.6. Requirements for a valid BBBEE Certificate</p> <p>a) Copy of a certified valid BBBEE certificate (Only Valid BBBEE certificate must be accredited by SANAS) or valid Sworn Affidavit issued by the DTIC or the CIPC or in a similar format complying with commissioner of oath Act.</p> <p>b) Bidders who do NOT qualify as EME's and QSE's as outlined in 4.5, must submit B-BBEE verification certificates that are issued by an Agency accredited by SANAS.</p> <p>c) Bidders who fail to submit a certified copy of their valid B-BBEE certificate or valid sworn affidavit or valid DTI / CIPC B-BBEE certificate will score zero points for specific goals.</p> <p>Valid Sworn Affidavits or certified copies of B-BBEE Certificate must comply with the requirements outlined in the Justices of the Peace and Commissioners of Oaths Act, no 16 of 1963 and its Regulations promulgated in Government Notice GNR 1258 of 21 July 1972 Justices of the Peace and Commissioners of Oaths Act, No. 16 of 1963. i.e.</p> <p>(i) The deponent shall sign the declaration in the presence of the commissioner of oaths (COA).</p> <p>(ii) Below the deponent's signature the COA shall certify that the deponent has acknowledged that he knows and understands the contents of the declaration and the COA shall state the manner, place, and date of taking the declaration.</p> <p>(iii) The COA shall sign the declaration and print his full name and business address below his signature; and state his designation and the area for which he holds his appointment, or the office held by him if he holds his appointment ex officio.</p> <p>(iv) Copy of certified copies will not be accepted.</p> <p>N.B. A tenderer failing to submit proof of specific goals claimed as per 4.4 will not be disqualified but will be allocated zero points for specific goals and will be allocated points for pricing.</p>		

Employer:		Contractor:	
Witness:		Witness:	

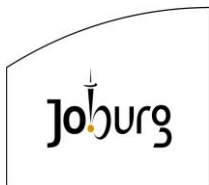


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Clause Number	Tender Data
	<p>ADJUDICATION USING A POINT SYSTEM</p> <ul style="list-style-type: none"> (a) The bidder obtaining the highest number of total points will be awarded the contract. (b) Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts;. (c) Points scored must be rounded off to the nearest 2 decimal places. (d) In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of points for specific goals. (e) However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for specific goals, the successful bid must be the one scoring the highest score for functionality. (f) Should two or more bids be equal in all respects, the award shall be decided by the drawing of lots. <p>POINTS AWARDED FOR PRICE</p> <p>THE 90/10 PREFERENCE POINT SYSTEMS</p> <p>A maximum of 90 points is allocated for price on the following basis:</p> <p>90/10</p> $P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$ <p>Where</p> <p>Ps = Points scored for comparative price of bid under consideration</p> <p>Pt = Comparative price of bid under consideration</p> <p>Pmin = Comparative price of lowest acceptable bid</p>
	<p>Add to the existing clause:</p> <p>Tender offers will only be accepted if:</p> <ul style="list-style-type: none"> a) the tenderer submits a valid SARS tax Compliance status Pin for tenders issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations; b) Proof of CSD registration ie MA xxxxx number; c) the tenderer submits a letter of intent from an approved insurer undertaking to provide the Performance Guarantee to the format included in Part T2.2.22 of this procurement document d) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; e) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

Employer:		Contractor:	
Witness:		Witness:	



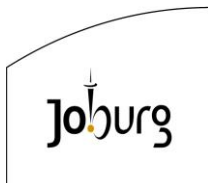
Contract: JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
Volume 1 Tender and Contract
Section T1 Tendering Procedures



Clause Number	Tender Data
	<p>f) the tenderer has not:</p> <ul style="list-style-type: none">i) abused the Employer's Supply Chain Management System; orii) failed to perform on any previous contract and has been given a written notice to this effect; <p>g) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract;</p> <p>h) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer;</p> <p>i) the Employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely; and</p> <p>j) the tenderer:</p> <ul style="list-style-type: none">i) has sufficiently substantiated his experience in this type work;ii) has the required and experienced key personnel; andiii) Owns the primary equipment to effectively and efficiently execute the work.
C.3.17	The number of paper copies of the signed contract to be provided by the Employer is one.
	There are no additional conditions of tender.

--- END OF PART ---

Employer:		Contractor:	
Witness:		Witness:	



Johannesburg Water (SOC) Ltd



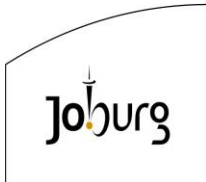
CONTRACT NO. JW14425

**BUSHKOPPIE WASTEWATER TREATMENT
WORKS
INFRASTRUCTURE RENEWAL PLAN**

VOLUME 1

**RETURNABLE DOCUMENTS
AND
SCHEDULES**

Employer:		Contractor:	
Witness:		Witness:	



T2.1 LIST OF RETURNABLE DOCUMENTS

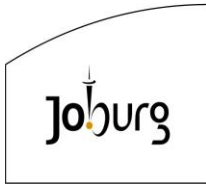
The tenderer must complete the following returnable documents:

<u>Document</u>	<u>Page</u>
1. Returnable Schedules required for tender evaluation purposes	
T2.1.1 Record of addenda to tender documents	RD.5
T2.1.2 Certificate of Authority	RD. 6
T2.1.3 Compulsory Enterprise Questionnaire	RD.11
T2.1.4 Preferential Procurement	RD 13
MBD 6.1 Preference points claim form in terms of the preferential procurement regulations	RD.13
MBD 4 Declaration of any potential conflict of interest	RD.20
MBD 8 Declaration of bidder's past Supply Chain management practices	RD.22
MBD 5 Declaration for Procurement above R10 Million (VAT Included)	RD.24
MBD 9 Certificate of independent bid determination	RD.26
T2.1.5 Proposed qualifications	RD.29
T2.1.6 Schedule of the Tenderer's experience	RD.30
T2.1.7 Contactable reference template	RD.31
T2.1.8 Schedule of key personnel	RD.44
T2.1.9 Curriculum vitae of key personnel	RD.46
T2.1.10 Site Specific Method Statement	RD.64

T2.2 LIST OF OTHER RETURNABLE DOCUMENTS

<u>Document</u>	<u>Page</u>
2. Other documents required only for tender evaluation purposes	
T2.2.1 Certificate of Contractor Registration issued by the Construction Industry Development Board	RD.70
T2.2.2 SARS Tax Compliance Status Pin and Proof of CSD registration i.e. MA xxxxxxxxxx number	RD.71

Employer:		Contractor:	
Witness:		Witness:	



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



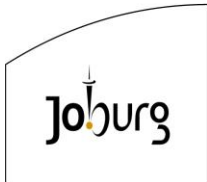
Volume 1 Tender and Contract
Section T2 Returnable Documents

T2.3 LIST OF RETURNABLE SCHEDULES

<u>Document</u>	<u>Page</u>
4. Other documents that will be incorporated into the contract	
T2.3.1 JW 6.4 Returnable Annexure A – SHE Acknowledgment Form	RD.72
T2.3.2 JW 6.5 Returnable Annexure B: Acknowledgement of Tender Drawings	RD.73

NOTE: The Tenderer is required to complete each and every schedule listed above to the best of his ability as the evaluation of tenders and the eventual contract will be based on the information provided by the tenderer.

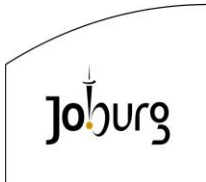
Employer:		Contractor:	
Witness:		Witness:	



T2.1 LIST OF RETURNABLE DOCUMENTS

<u>Document</u>	<u>Page</u>
1. Returnable Schedules required only for tender evaluation purposes	
T2.1.1 Record of addenda to tender documents	RD.5
T2.1.2 Certificate of authority	RD.6
T2.1.3 Compulsory Enterprise Questionnaire	RD.11
T2.1.4 Preferential Procurement	RD.13
T2.1.5 Proposed qualifications	RD.29
T2.1.6 Schedule of the Tenderer's experience	RD.30
T2.1.7 Contactable reference template	RD.31
T2.1.8 Schedule of key personnel	RD.44
T2.1.9 Curriculum vitae of key personnel	RD.46
T2.1.10 Site Specific Method Statement	RD.64

Employer:		Contractor:	
Witness:		Witness:	



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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T2.1.1 Record of Addenda to Tender Documents

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

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Attach additional pages if more space is required.

Signed

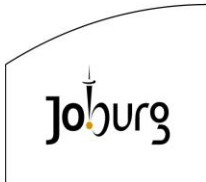
Date

Name

Position

Tenderer

Employer:		Contractor:	
Witness:		Witness:	



Contract JW14425
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Volume 1 Tender and Contract
Section T2 Returnable Documents

T2.1.2 Certificate of Authority

Indicate the status of the Tenderer by ticking the appropriate box hereunder. The Tenderer must complete the certificate set out below for the relevant category.

(I) COMPANY	(II) CLOSE CORPO- RATION	(III) PARTNERSHIP	(IV) JOINT VENTURE	(V) SOLE PROPRIE- TOR

i. Certificate For Company

I,, chairperson of the Board of Directors of, hereby confirm that by resolution of the Board (copy attached) taken on, Mr/Ms, acting in the capacity of, was authorized to sign all documents in connection with the tender for Contract No. JW14425 and any contract resulting from it on behalf of the company.

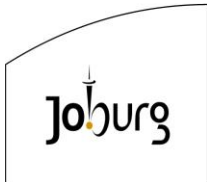
Chairman:

As Witnesses: 1.....

2.....

Date:

Employer:		Contractor:	
Witness:		Witness:	



Volume 1 Tender and Contract
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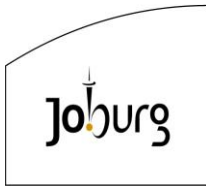
ii. **Certificate For Close Corporation**

We, the undersigned, being the key members in the business trading as
..... hereby authorize Mr/Ms , acting in the capacity of
....., to sign all documents in connection with the
tender and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note : This certificate is to be completed and signed by all of the key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

Employer:		Contractor:	
Witness:		Witness:	



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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iii. Certificate For Partnership

We, the undersigned, being the key partners in the business trading as,

....., hereby authorize Mr/Ms,

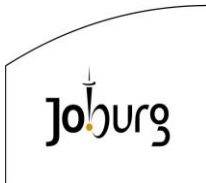
acting in the capacity of, to sign all documents in connection

with the tender and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note : This certificate is to be completed and signed by all of the key partners upon whom rests the direction of the affairs of the Partnership as a whole.

Employer:		Contractor:	
Witness:		Witness:	



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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iv. **Certificate For Joint Venture**

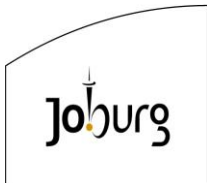
This Returnable Schedule is to be completed by joint ventures.

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

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

Note : This certificate is to be completed and signed by all of the key partners upon whom rests the direction of the affairs of the Joint Venture as a whole.

Employer:		Contractor:	
Witness:		Witness:	



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v. **Certificate *For Sole Proprietor***

I,, hereby confirm that I am the sole owner of the Business
trading as

Signature of Sole owner:

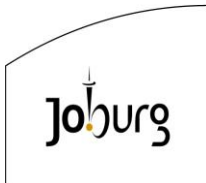
As Witnesses:

1.....

2.

Date:

Employer:		Contractor:	
Witness:		Witness:	



**Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN**



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T2.1.3 Compulsory Enterprise Questionnaire

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

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number

.

Close corporation number

Proof of CSD registration ie MA xxxxxxxxx number.

SARS Tax Compliance status Pin number

Section 6: Record in the service of the state

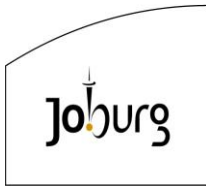
Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- | | |
|--|---|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*insert separate page if necessary



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Section 7: Record of spouses, children and parents in the service of the state

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent of a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months been in the service of any of the following:

- | | |
|--|---|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

Name of spouse, child or parent	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*insert separate page if necessary

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

- authorizes the Employer to verify the tax compliance status from the South African Revenue Services that my / our tax matters are in order;
- confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
- confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

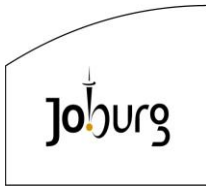
Signed

Date

Name

Position

Enterprise name



T2.1.4 Preferential Procurement

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

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

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

1. GENERAL CONDITIONS

- 1.1 The following preference point systems are applicable to invitations to tender:
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).
- 1.2 The applicable preference point system for this tender is the 90/10 preference point system.
- 1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:
- a) Price; and
 - b) Specific Goals.

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	90
SPECIFIC GOALS	10
Total points for Price and SPECIFIC GOALS	100

- 1.4 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.
- 1.5 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1 POINTS AWARDED FOR PRICE

3.1.1 THE 90/10 PREFERENCE POINT SYSTEMS

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

90/10

$$Ps = 90 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

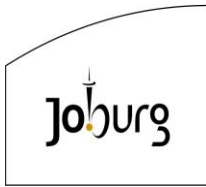


Table 1: Specific goals for the tender and points claimed are indicated per the table below.

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system)	Number of points claimed (90/10 system) (To be completed by the tenderer)
Business owned by 51% or more-Women	6	
Businesses located within the boundaries of COJ municipality	4	
Total	10	

5. DECLARATION WITH REGARD TO COMPANY/FIRM

5.1 Name of company/firm.....

5.2 Company registration number:

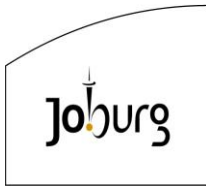
5.3 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

5.4 I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any



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of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

- (a) disqualify the person from the tendering process;
- (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
- (e) forward the matter for criminal prosecution, if deemed necessary.

SIGNATURE(S) OF TENDERER

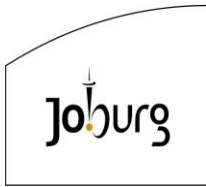
SURNAME AND NAME:

DATE:

ADDRESS:

.....

.....



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5.5 SUB-CONTRACTING

5.5.1 Will any portion of the contract be sub-contracted?

(**Tick applicable box**)

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

5.5.2 If yes, indicate:

- i) What percentage of the contract will be subcontracted _____ (minimum of 11%)
ii) The name of the sub-contractor(s):

.....
.....
.....
.....

- iii) The black shareholders of the sub-contractor(s):

.....
.....
.....
.....

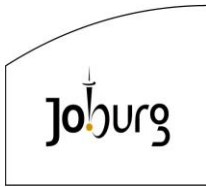
- iv) Whether the sub-contractor(s) is an EME or QSE

(**Tick applicable box**)

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

- v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations, 2022:

Designated Group: An EME or QSE which is at last 51% owned by:	EME √	QSE √
Black people		
Black people who are youth		
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		



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5.6 DECLARATION WITH REGARD TO COMPANY/FIRM

5.6.1 Name of company/firm:

5.6.2 VAT number registration number:

5.6.3 Company registration number:

5.7 TYPE OF COMPANY/ FIRM

☐ Partnership/Joint Venture / Consortium

☐ One person business/sole propriety

☐ Close corporation

☐ Company

☐ (Pty) Limited

[TICK APPLICABLE BOX]

5.8 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....
.....
.....
.....

5.9 COMPANY CLASSIFICATION

☐ Manufacturer

☐ Supplier

☐ Professional service provider

☐ Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

5.10 MUNICIPAL INFORMATION

Municipality where business is situated:

Registered Account Number:

Stand Number:

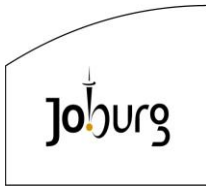
5.11 Total number of years the company/firm has been in business:

5.12 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 Specific Goals in MBD 6.1 qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

v) The information furnished is true and correct;

vi) In the event of a contract being awarded as a result of points claimed as shown in MBD 6.1, the contractor is required to furnish documentary proof as requested in the Tender Data to the satisfaction of the purchaser that the claims are correct;

vii) If the specific goals points have been claimed or obtained on a fraudulent



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basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

- (a) Disqualify the person from the bidding process;
- (b) Recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
- (c) Cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) Recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
- (e) Forward the matter for criminal prosecution.

WITNESSES

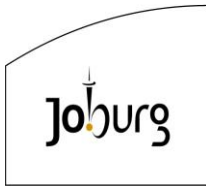
- 1.
- 2.

.....
SIGNATURE(S) OF BIDDERS(S)

DATE:

ADDRESS

.....
.....



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MBD 4

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state¹.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.
3. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

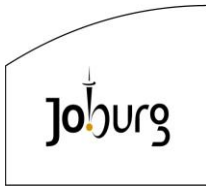
- 3.1 Full Name of bidder or his or her representative:.....
- 3.2 Identity Number.....
- 3.3 Position occupied in the Company (director, trustee, shareholder²):.....
- 3.4 Company Registration Number:
- 3.5 Tax Reference Number:.....
- 3.6 VAT Registration Number:
- 3.7 The names of all directors / 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.

¹MSCM Regulations: "in the service of the state" means to be –

- (a) a member of –
 - (i) any municipal council;
 - (ii) any provincial legislature; or
 - (iii) the national Assembly or the national Council of provinces;
- (b) a member of the board of directors of any municipal entity;
- (c) an official of any municipality or municipal entity;
- (d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
- (e) a member of the accounting authority of any national or provincial public entity; or
- (f) an employee of Parliament or a provincial legislature.

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

- 3.9 Have you been in the service of the state for the past twelve months?YES / NO
 - 3.9.1 If yes, furnish particulars.....
- 3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid? YES / NO
 - 3.10.1 If yes, furnish particulars.....



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3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? YES / NO

3.11.1 If yes, furnish particulars.....
.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? YES / NO

3.12.1 If yes, furnish particulars.....
.....

3.13 Are any spouse, child or parent of the company's directors trustees, managers, principle shareholders or stakeholders in service of the state? YES / NO

3.13.1 If yes, furnish particulars.....
.....

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract. YES / NO

3.14.1 If yes, furnish particulars:.....
.....

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

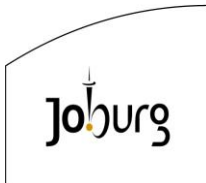
Full Name	Identity Number	State Employee Number

.....
Signature

.....
Date

.....
Capacity

.....
Name of Bidder



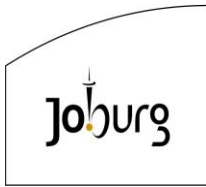
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MBD 8

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 The bid of any bidder may be disregarded if that bidder, or any of its directors have-
 - a. abused the institution's supply chain management system;
 - b. committed fraud or any other improper conduct in relation to such system; or
 - c. failed to perform on any previous contract.
- 2 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 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 National Treasury after the <i>audi alteram partem</i> rule was applied).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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)? To access this Register, enter the National Treasury's website, www.treasury.gov.za, click on the icon "Register for Tender Defaulters" or submit your written request for a hard copy of the Register to facsimile number (012) 3265445.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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 outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If so, furnish particulars:		



CERTIFICATION

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

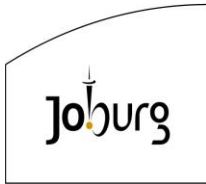
**I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION
MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE
FALSE.**

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

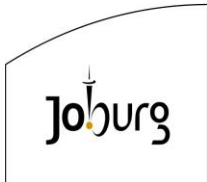


MBD 5

DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (VAT INCLUDED)

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

- 1 Are you by law required to prepare annual financial statements for auditing? **YES / NO**
 - 1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.....
.....
.....
- 2 If the bidder is not required by law to prepare annual financial statements for auditing, they shall be required to furnish their Annual Financial Statements -
 - i. for the past three years , or
 - ii. since their establishment if established during the past three years
 - 2.1 Do you have any outstanding undisputed commitments for municipal services towards a municipality or any other service provider in respect of which payment is overdue for more than 30 days?
YES / NO
 - 2.2 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days.
 - 2.3 If yes, provide particulars.....
.....
.....
- 3 Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? **YES / NO**
 - 3.1 If yes, furnish particulars.....
.....
.....
- 4 Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? **YES / NO**
 - 4.1 If yes, furnish particulars.....
.....
...



CERTIFICATION

I, THE UNDERSIGNED (NAME)

.....

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

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

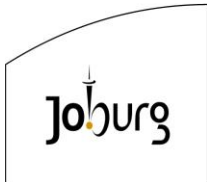
FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder



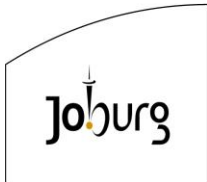
MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all bids¹ invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging)². Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. take all reasonable steps to prevent such abuse;
 - b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
4. This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
5. In order to give effect to the above, the attached Certificate of Bid Determination (MBD9) 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.



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MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description) in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity) do hereby make the following statements that I certify to be true and complete in every respect:

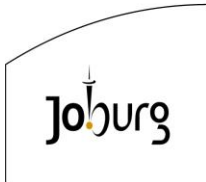
I certify, on behalf of

_____ that:

(Name of Bidder)

1. I have read, and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation;
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;

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.



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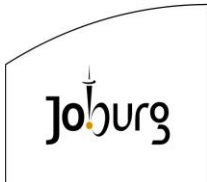
- (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No. 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No. 12 of 2004 or any other applicable legislation.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder



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T2.1.5 Proposed Amendments and Qualifications

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

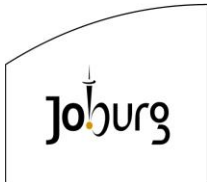
The Tenderer's attention is drawn to clause C.3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the employer's handling of material qualifications.

Page	Clause or item	Proposal

Signed _____ Date _____

Name _____ Position _____

Tenderer _____



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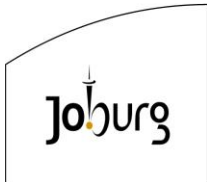
T2.1.6 Schedule of the Tenderer's Experience

EMPLOYER: CONTACT PERSON AND TELEPHONE NUMBER	EMPLOYER'S AGENT OR REPRESENTATIVE: CONTACT PERSON AND TELEPHONE NUMBER	NATURE OF WORK	VALUE OF WORK (inclusive of VAT)	DATE COMPLETED OR EXPECTED TO BE COMPLETED

Signed _____ Date _____

Name _____ Position _____

<i>Tenderer</i>	
-----------------	--



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T 2.1.7 CONTACTABLE REFERENCE

To Johannesburg Water (SOC) Ltd

I, the undersigned being duly authorized to do so, hereby furnish a reference to Johannesburg Water relative to the **JW 14425 for the Bushkoppie Wastewater Treatment**

Works Infrastructure Renewal Plan.

Name of Tenderer:

Description of Goods / Services provided in terms of scope and or

.....
.....
.....
.....

Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

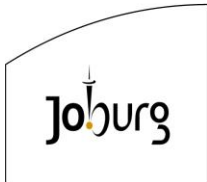
Signature: **Date**

Telephone/Mobile:

Email:

Completed on behalf (Name of Client)

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Name of Tenderer:

Description of Goods / Services provided in terms of scope and or

.....
.....
.....
.....

Contract Value

Infrastructure Size/Project Capacity

Name of authorised person:

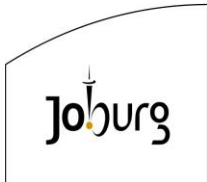
Signature: **Date**

Telephone/Mobile:

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Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

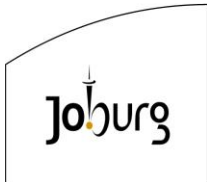
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Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

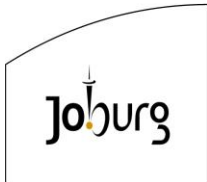
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Telephone/Mobile:

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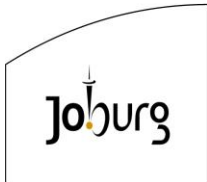
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.....

Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

Signature: **Date**

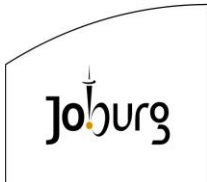
Telephone/Mobile:

Email:

Completed on behalf (Name of Client)

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T 2.1.7 CONTACTABLE REFERENCE



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Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

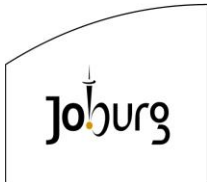
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T 2.1.7 CONTACTABLE REFERENCE

To Johannesburg Water (SOC) Ltd

I, the undersigned being duly authorized to do so, hereby furnish a reference to Johannesburg Water relative to the **JW 14425 for the Bushkoppie Wastewater Treatment**

Works Infrastructure Renewal Plan.

Name of Tenderer:

Description of Goods / Services provided in terms of scope and or

.....
.....
.....
.....

Contract Value

Infrastructure Size/Project Capacity.....

Name of authorised person:

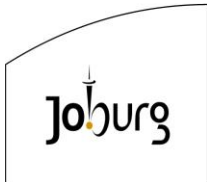
Signature: **Date**

Telephone/Mobile:

Email:

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Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



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Section T2 Returnable Documents

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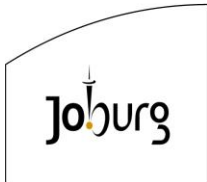
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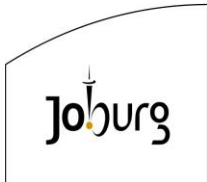
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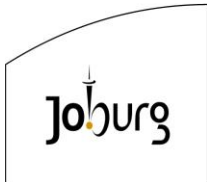
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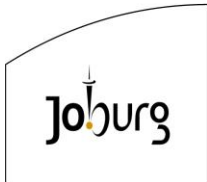
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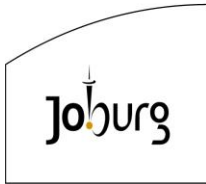
Signature: **Date**

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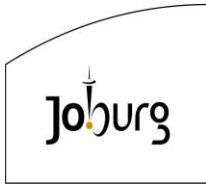


T2.1.8 Key Personnel

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

The Tenderer shall list below the personnel which they intend to utilize on the Works, including key personnel which may have to be brought in from outside if not available locally.

CATEGORY OF EMPLOYEE	NUMBER OF PERSONS					
	KEY PERSONNEL, PART OF THE TENDERER'S ORGANISATION		KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY		UNSKILLED PERSONNEL TO BE RECRUITED FROM LOCAL COMMUNITY	
	HDI	NON-HDI	HDI	NON-HDI	HDI	NON-HDI
Contracts Manager						
Site Agent						
Mechanical Engineering Foreman						
Civil Engineering Foreman						
Electrical and C&I Engineering Foreman						
Safety Officer						
Quality Control Personnel						
Technicians, Surveyors, etc.						
Artisans and other Skilled workers						



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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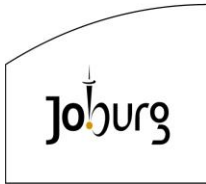
Volume 1 Tender and Contract
Section T2 Returnable Documents

Plant Operators						
Unskilled Workers						
Others:						

SIGNATURE:.....

DATE:

(of person authorized to sign on behalf of the Tenderer)



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN



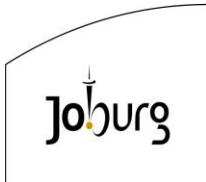
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Section T2 Returnable Documents

Project Name and Locality	
Project Dates and Value	
Project Position (e.g. Project Manager, Engineer, etc.)	
Description of Scope and Duties	

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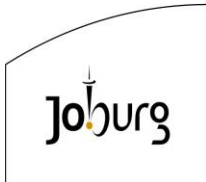
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I,....., hereby declare that I am aware of the inclusion of my Curriculum Vita in the proposed project team and make myself available for this project.

Signature :

Date :



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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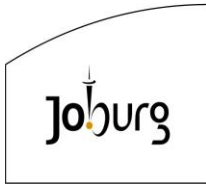
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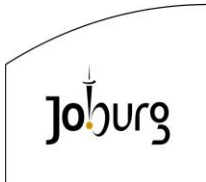
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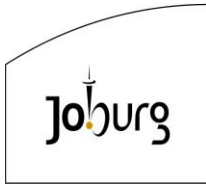
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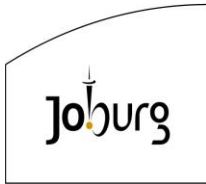
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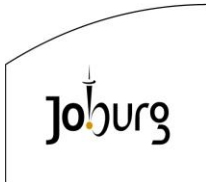
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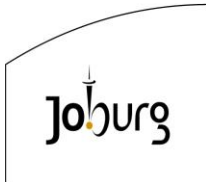
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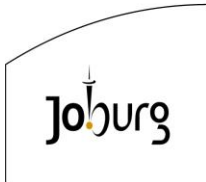
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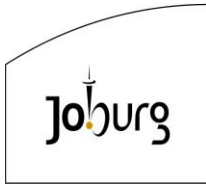
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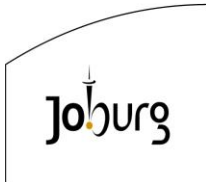
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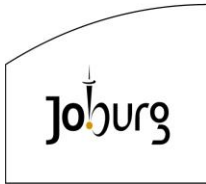
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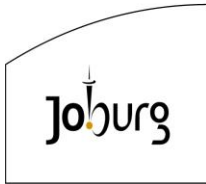


Contract JW14425
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Volume 1 Tender and Contract
Section T2 Returnable Documents

1.3	Existing Wash Water Pump Station (Including Sand Filters)
1.4	Existing Substations
1.5	General (other items)

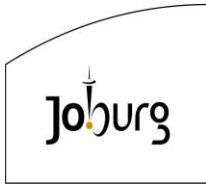


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Volume 1 Tender and Contract
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3	Health and Safety (with respect to working at heights and confined spaces and addresses the major components listed below)
3.1	Head of Works Module 1
3.2	Primary Sedimentation Tanks and Pump Stations
3.3	Existing Wash Water Pump Station (Including Sand Filters & Tanks)

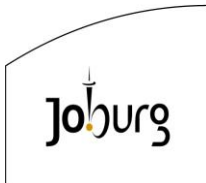


**Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN**



**Volume 1 Tender and Contract
Section T2 Returnable Documents**

3.4	Existing Substations
3.5	General (other items)
4	<p>Project Programme/Schedule (On <i>MS Projects or any other Gantt Chart</i>, as an Annexure) outlining a critical path, durations of tasks/activities aligned to the scope of works, linkages of tasks, aligned to the contractual timelines, and including all contractual dates. The following major components and their sub-tasks must be shown (Refer to annexure 7 PS 1.3 for details of scope);</p> <ul style="list-style-type: none"> • Head of Works Module 1; • Primary Sedimentation Tanks and Pump Stations; • Existing Wash Water Pump Station (Including Sand Filters & Tanks), and • Existing Substations



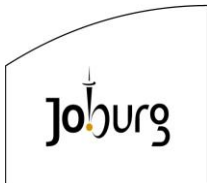
T2.2.1 Contractor's Certificate of Registration With CIDB

NB: The Tenderer shall attach hereto the Contractor's Certificate of Registration with CIDB OR provide the CIDB registration number that JW can use to verify CIDB requirements for this tender. Failure to submit the certificate or CIDB registration number with the tender document will lead to the conclusion that the Tenderer is not registered with the CIDB and therefore not eligible to tender.

Tenderers who have made application to CIDB for registration and are capable of being so registered prior to the evaluation of submissions must attach a notification from CIDB that their application is being considered.

CIDB status to be active at the required CIDB grading at time of evaluation to avoid disqualification.

SIGNATURE: DATE:
(of person authorized to sign on behalf of the Tenderer)



Contract JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
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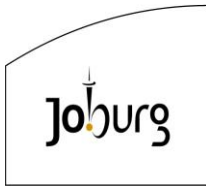
Volume 1 Tender and Contract
Section T2 Returnable Documents

T2.2.2 SARS Tax Compliance Status Pin and Proof of CSD registration

The Tenderer must attach hereto a copy SARS Tax Compliance Status Pin and Proof of CSD registration i.e. MA xxxxxxxxxxx number.

SIGNATURE: DATE:

(of person authorized to sign on behalf of the Tenderer)



T2.3.1 JW 6.4 Returnable Annexure A: Acknowledgement of SHE Specification & Annexures

DECLARATION BY CONTRACTOR

I, the undersigned, and representing the tenderer as indicated hereby acknowledge that I have obtained copies of the following listed documentation and confirm that I fully understand the contents thereof and confirm compliance thereto in the event of being successful:

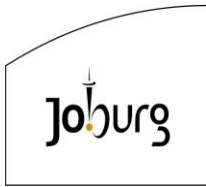
- OHS Specification (Volume 2)
- Annexure 1: Baseline Risk Assessment
- Annexure 2: Medical Screening Policy
- Annexure 3: Sign off form
- Annexure 4: Environmental Management Plan

We furthermore commit to:

- Comply with all applicable SHE related legal and other requirements.
- Inform all staff of their role in managing environmental impacts and safety hazards on site.

Signed at on this Day of 20.....

Name of tenderer	
Name of Authorized person	
Authorized Signature*	



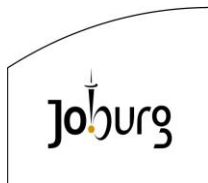
T2.3.2 JW 6.5 Returnable Annexure B: Acknowledgement of Tender Drawings

DECLARATION BY CONTRACTOR

I, the undersigned, and representing the tenderer as indicated hereby acknowledge that I have obtained copies of the following listed documentation and confirm that I fully understand the contents thereof and confirm compliance thereto in the event of being successful:

The drawings that are issued for **TENDER PURPOSES** are those noted on the drawings register attached below:

DRAWING NUMBER	DESCRIPTION	REV
SECTION 01 – SITE LAYOUT		
18056-73-01-100	SITE LAYOUT	T01
18056-73-01-101	SITE LAYOUT – HEAD OF WORKS	T01
18056-73-01-102	SITE LAYOUT – BIOREACTORS	T01
18056-73-01-103	SITE LAYOUT – SECONDARY CLARIFIERS, EFFLUENT PUMP STATION, WASH WATER PUMP STATION, BELT PRESS BUILDING & NEW WASH WATER FILTER STATION	T01
SECTION 02 – ACCESS ROADS		
18056-73-02-100	INTERNAL ROADS - AREAS TO BE RESURFACED	T01
18056-73-02-102	INTERNAL ROADS - HEAVY VEHICLE ACCESS ROUTES	T01
SECTION 03 - HEAD OF WORKS		
18056-73-03-100	HEAD OF WORKS - MODULE 1 & MODULE 2 GENERAL ARRANGEMENT	T01
18056-73-03-101	HEAD OF WORKS - MODULE 1 & MODULE 2 3D VIEW	T01
18056-73-03-102	COARSE SCREENS MODULE 1 LAYOUT & SECTIONS - AS BUILT	T01
18056-73-03-103	VORTEX DEGRITTERS MODULE 1 LAYOUT & SECTIONS - AS BUILT	T01
18056-73-03-104	FINE SCREENS MODULE 1 LAYOUT & SECTIONS - AS BUILT	T01
18056-73-03-105	COARSE SCREENS MODULE 1 LAYOUT & SECTIONS – REFURBISHMENT	T01
18056-73-03-106	VORTEX DEGRITTERS MODULE 1 LAYOUT & SECTIONS – REFURBISHMENT	T01
18056-73-03-107	FINE SCREENS MODULE 1 LAYOUT & SECTIONS - REFURBISHMENT	T01
18056-73-03-108	MODULE 1 COARSE SCREENS WASHER COMPACTOR INSTALLATION PLAN & SECTIONS	T01
18056-73-03-109	MODULE 2 VORTEX DEGRITTER, SKIP BIN & ROTORAY SCREW FEEDER INSTALLATION PLAN & SECTIONS	T01
18056-73-03-110	MECHANICAL TRASH SCREEN GENERAL ARRANGEMENT	T01
18056-73-03-111	MECHANICAL TRASH SCREEN PLAN & SECTIONS	T01
18056-73-03-112	FINE SCREENS AND DEGRITTING AREA ACCESS PLAN	T01

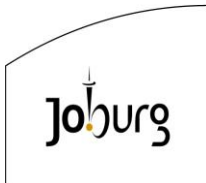


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INFRASTRUCTURE RENEWAL PLAN**



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DRAWING NUMBER	DESCRIPTION	REV
18056-73-03-113	MODULE 1 BLOWER ROOM NEW BLOWER INSTALLATION PLAN & SECTIONS	T01
18056-73-03-114	COMPRESSOR ROOM PLAN, SECTION AND DETAILS - AS BUILT	T01
18056-73-03-115	MACERATING PUMP STATION - AS BUILT	T01
18056-73-03-116	MACERATING PUMP STATION - REFURBISHMENT	T01
18056-73-03-117	COARSE SCREENS MODULE 2 LAYOUT & SECTIONS - AS BUILT	T01
18056-73-03-118	COARSE SCREENS MODULE 2 LAYOUT & SECTIONS - REFURBISHMENT	T01
18056-73-03-119	MODULE 1 BLOWER ROOM - REFURBISHMENT	T01
18056-73-03-120	MODULE 2 BLOWER ROOM, NEW BLOWER BUILDING, 3D VIEWS & ELEVATIONS	T01
18056-73-03-121	MODULE 2 BLOWER ROOM, NEW BLOWER BUILDING, ROOF LAYOUT, SECTION & DETAILS	T01
18056-73-03-122	MODULE 2 BLOWER ROOM, NEW BLOWER BUILDING, TRUSS LAYOUT & DETAILS	T01
SECTION 04 –SECONDARY CLARIFIERS		
18056-73-04-100	GENERAL ARRANGEMENT	T01
18056-73-04-101	CLARIFIER 3D VIEW -AS BUILT	T01
18056-73-04-102	CLARIFIER LAYOUT & SECTION - AS BUILT	T01
18056-73-04-103	CLARIFIER LAYOUT & SECTIONS - REFURBISHMENT	T01
SECTION 05 – BIO REACTOR		
18056-73-05-100	3D VIEW - REFURBISHMENT	T01
18056-73-05-101	PLAN VIEW & FLOOR PLAN - REFURBISHMENT	T01
18056-73-05-102	PLATFORMS AND SECTIONS- REFURBISHMENT	T01
SECTION 06 – FINAL EFFLUENT PUMP STATION		
18056-73-06-100	3D VIEW - REFURBISHMENT	T01
18056-73-06-101	PLAN, LAYOUT & SECTIONS - REFURBISHMENT	T01
18056-73-06-102	ELEVATIONS - REFURBISHMENT	T01
18056-73-06-103	VALVE CHAMBER PLAN, LAYOUT, SECTIONS AND DETAILS	T01
SECTION 07 – WASH WATER PUMP STATIONS		
18056-73-07-100	WASH WATER PUMP STATION PLAN - AS BUILT	T01
18056-73-07-101	WASH WATER PUMP STATION SECTIONS - AS BUILT	T01
18056-73-07-102	WASH WATER PUMP STATION PLAN - REFURBISHMENT	T01
18056-73-07-103	WASH WATER PUMP STATION SECTIONS - REFURBISHMENT	T01
18056-73-07-105	NEW WASH WATER FILTER STATION 3D VIEWS	T01
18056-73-07-106	NEW WASH WATER FILTER STATION ELEVATIONS	T01
18056-73-07-107	NEW WASH WATER FILTER STATION LAYOUTS & DETAILS	T01
18056-73-07-108	NEW WASH WATER FILTER STATION ROOF LAYOUT & DETAILS	T01

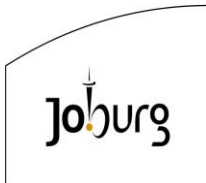


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18056-73-07-109	NEW WASH WATER FILTER STATION SECTIONS & DETAILS	T01
SECTION 08 – SLUDGE HANDLING FACILITY		
18056-73-08-100	BELT PRESS BUILDING LAYOUT - REFURBISHMENT	T01
SECTION 09 – MV ROOMS		
18056-73-09-100	MAIN INTAKE SUBSTATION PLAN ,ELEVATION & SECTIONS - AS BUILT	T01
18056-73-09-101	WAS THICKENER SUBSTATION PLAN ,ELEVATION & SECTIONS - AS BUILT	T01
18056-73-09-102	TYPICAL SUBSTATION - PLAN ,ELEVATION & SECTIONS - AS BUILT	T01
SECTION 10 – EMERGENCY DAM		
18056-73-10-100	EMERGENCY DAM OUTLET 3D VIEW - AS BUILT	T01
18056-73-10-101	EMERGENCY DAM OUTLET PLAN & SECTIONS - AS BUILT	T01
18056-73-10-102	EMERGENCY DAM OUTLET 3D VIEW - REFURBISHMENT	T01
18056-73-10-103	EMERGENCY DAM OUTLET PLAN & SECTIONS - REFURBISHMENT	T01
SECTION 11 – LIME PLANT		
18056-73-11-100	GENERAL ARRANGEMENT	T01
18056-73-11-101	NEW LIME INSTALLATION LAYOUT	T01
18056-73-11-102	LIME CLARIFIER - AS BUILT	T01
18056-73-11-103	LIME CLARIFIER - REFURBISHMENT	T01
SECTION 12 – ELECTRICAL		
18056-73-12-100	SINGLE LINE MV RETICULATION	T01
18056-73-12-101	SINGLE LINE PROPOSED MV RETICULATION	T01
18056-73-12-102	SUBSTATION NO 1 LAYOUT	T01
18056-73-12-103	SUBSTATION NO 2 LAYOUT	T01
18056-73-12-104	SUBSTATION NO 0 LAYOUT	T01
18056-73-12-105	SUBSTATION NO 3 LAYOUT	T01
18056-73-12-106	HOW SUBSTATION LAYOUT	T01
18056-73-12-107	BLOWERS SUBSTATION LAYOUT	T01
18056-73-12-108	HOW TYPICAL 2.2KW SCREENINGS WASHER DOL	T01
18056-73-12-109	HOW TYPICAL 2.2KW SCREENINGS COMPACTOR FORWARD RESERVE	T01
18056-73-12-110	HOW TYPICAL 22KW WW BOOSTER PUMP DOL	T01
18056-73-12-111	HOW TYPICAL 15KW BLOWER DOL	T01
18056-73-12-112	HOW TYPICAL 2.2KW DRAINAGE RETURN PUMP	T01
18056-73-12-113	HOW MODULE 1 TYPICAL 2.2KW GRIT CLASSIFIER WASHER STIRRER DOL	T01
18056-73-12-114	HOW MODULE 1 TYPICAL 2.2KW GRIT CLASSIFIER WASHER SCREW DOL	T01

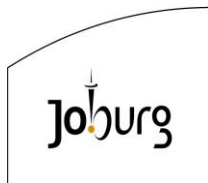


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DRAWING NUMBER	DESCRIPTION	REV
18056-73-12-115	HOW MODULE 1 TYPICAL 2.2KW GRIT DEGRITTERS STATIC SCREW CONVEYOR DOL	T01
18056-73-12-116	HOW TYPICAL 7.5KW MACERATOR DOL	T01
18056-73-12-117	HOW COMPRESSOR MCC SINGLE LINE DIAGRAM	T01
18056-73-12-118	HOW TYPICAL 15KW COMPRESSOR DOL	T01
18056-73-12-119	HOW COMPRESSOR PRESSURE SWITCH SCHEMATIC	T01
18056-73-12-120	HOW SKIP WINCH & TRAVERSING CONVEYOR POSITION DOL	T01
18056-73-12-121	HOW MODULE TWO 2.2KW GRIT TRAVERSING CONVEYOR DOL	T01
18056-73-12-122	HOW MODULE 2 TYPICAL 2.2KW DEGRITTERS STATIC SCREW CONVEYOR DOL	T01
18056-73-12-123	HOW MODULE 2 TYPICAL 2.2KW GRIT CLASSIFIER WASHER STIRRER DOL	T01
18056-73-12-124	HOW MODULE 2 TYPICAL 2.2KW GRIT CLASSIFIER WASHER SCREW DOL	T01
18056-73-12-125	HOW MODULE TWO 2.2KW DEGRITTERS DRAINAGE RETURN PUMP	T01
18056-73-12-126	HOW MODULE 2 TYPICAL 22KW WW BOOSTER PUMP DOL	T01
18056-73-12-127	HOW NEW BLOWER ROOM MCC SINGLE LINE DIAGRAM	T01
18056-73-12-128	HOW NEW BLOWER ROOM TYPICAL 15KW BLOWER DOL	T01
18056-73-12-129	HOW NEW BLOWER ROOM TYPICAL 15KW COMPRESSOR DOL	T01
18056-73-12-130	HOW NEW BLOWER ROOM COMPRESSOR PRESSURE SWITCH SCHEMATIC	T01
18056-73-12-131	INLET WORKS 2.2KW TRASH SCREEN VSD	T01
18056-73-12-132	HOW NEW BLOWER ROOM 1.1KW MCC ROOM FAN	T01
18056-73-12-133	EXISTING WASH WATER PUMP STATION MCC SINGLE LINE DIAGRAM	T01
18056-73-12-134	TYPICAL 30KW WASH WATER TRANSFER PUMP DOL	T01
18056-73-12-135	TYPICAL 15KW FILTER FEED PUMP DOL	T01
18056-73-12-136	TYPICAL 11KW BLOWER DOL	T01
18056-73-12-137	1.1KW MCC ROOM FAN	T01
18056-73-12-138	1.5KW EXTRACTION FAN	T01
18056-73-12-139	1.1KW SUMP PUMP	T01
18056-73-12-140	NEW WASH WATER FILTER STATION MCC SINGLE LINE DIAGRAM	T01
18056-73-12-141	TYPICAL 15KW FILTER FEED PUMP DOL	T01
18056-73-12-142	TYPICAL 11KW AIR BLOWER DOL	T01
18056-73-12-143	1.1KW MCC ROOM FAN	T01
18056-73-12-144	1.1KW SUMP PUMP	T01
18056-73-12-145	TYPICAL 15KW MIXER DOL	T01
18056-73-12-146	TYPICAL 0.55KW CLARIFIER DOL	T01
18056-73-12-147	TYPICAL 1.1KW SCREW CONVEYOR DOL	T01
18056-73-12-148	TYPICAL 2.2KW LIME MIXER DOL	T01
18056-73-12-149	MODULE 2 NEW BLOWER ROOM LIGHTING & SMALL POWER	T01

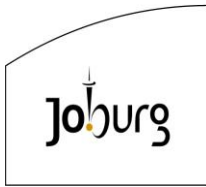


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DRAWING NUMBER	DESCRIPTION	REV
18056-73-12-150	NEW WASH WATER FILTER STATION LIGHTING & SMALL POWER	T01
18056-73-12-151	EXISTING WASH WATER PUMP STATION LIGHTING & SMALL POWER	T01
SECTION 13 – PRIMARY SEDIMENTATION TANKS		
18056-73-13-100	GENERAL ARRANGEMENT	T01
18056-73-13-101	PRIMARY SEDIMENTATION TANK 1-4 3D VIEW – AS BUILT	T01
18056-73-13-102	PRIMARY SEDIMENTATION TANK 1-4 LAYOUT & SECTION – AS BUILT	T01
18056-73-13-103	PRIMARY SEDIMENTATION TANK 1-4 LAYOUT & SECTIONS - REFURBISHMENT	T01
18056-73-13-104	PRIMARY SEDIMENTATION TANK 5 3D VIEW – AS BUILT	T01
18056-73-13-105	PRIMARY SEDIMENTATION TANK 5 LAYOUT & SECTION – AS BUILT	T01
18056-73-13-106	PRIMARY SEDIMENTATION TANK 5 LAYOUT & SECTIONS - REFURBISHMENT	T01
SECTION 14 – FERMENTERS		
18056-73-14-100	GENERAL ARRANGEMENT	T01
18056-73-14-101	FERMENTER 3D VIEW - AS BUILT	T01
18056-73-14-102	FERMENTER LAYOUT & SECTION - AS BUILT	T01
18056-73-14-103	FERMENTER LAYOUT & SECTIONS - REFURBISHMENT	T01
SECTION 15 – MISCELLANEOUS BUILDINGS		
18056-73-15-100	GUARD HOUSE 3D VIEWS	T01
18056-73-15-101	GUARD HOUSE LAYOUTS, ELEVATIONS, SECTIONS & DETAILS	T01
SECTION 16 - ARCHITECTURAL DRAWINGS		
18056-73-16-100	MODULE 2 BLOWER ROOM, NEW BLOWER BUILDING, LAYOUT & 3D VIEWS	T01
18056-73-16-101	MODULE 2 BLOWER ROOM, NEW BLOWER BUILDING, SECTIONS, SCHEDULES & DETAILS	T01
18056-73-16-200	NEW WASH WATER FILTER STATION, LAYOUTS & DETAILS	T01
18056-73-16-201	NEW WASH WATER FILTER STATION ELEVATIONS	T01
18056-73-16-202	NEW WASH WATER FILTER STATION, SECTIONS & DETAILS	T01
18056-73-16-300	GUARD HOUSE, 3D VIEWS, LAYOUTS, ELEVATIONS, SECTIONS & DETAILS	T01
SECTION 17 – CONTROL AND INSTRUMENTATION		
P&IDs		
46100563-WSP-DR-CI-PID00_T0-LEGEND	LEGEND SHEET FOR P&IDS	T01
46100563-WSP-DR-CI-PID01_T0-INFLOW	INFLOW AND DAM-01 P&ID	T01

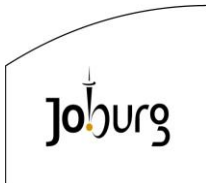


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46100563-WSP-DR-CI-PID02_T0-COARSE SCREENS	UNIT 1 COARSE SCREENS P&ID	T01
UNIT 1 COARSE SCREENS P&ID	Unit 1 Grit Removal P&ID	T01
46100563-WSP-DR-CI-PID04_T0-GRIT REMOVAL-MOD 2	Unit 2 Grit Removal P&ID	T01
46100563-WSP-DR-CI-PID05_T0-FINE SCREENS	Unit 1 Fine Screens P&ID	T01
46100563-WSP-DR-CI-PID06_T0-LIME DOSING	Lime Plant P&ID	T01
46100563-WSP-DR-CI-PID07_T0-WASH WATER PS	Wash Water Pump Station P&ID	T01
46100563-WSP-DR-CI-PID08_T0-EX WASH WATER PS	Final Effluent Wash Water Pump Station P&ID	T01
TYPICAL LOOP DIAGRAMS		
ING0645D-TYP-FCV001	Flow Control Valve FCV001 - Typical Loop Diagram	T01
ING0645D-TYP-CLV001	Open/Close Valve CLV001 - Typical Loop Diagram	T01
ING0645D-TYP-HDV001	Hand Valve HDV001 - Typical Loop Diagram	T01
ING0645D-TYP-FIT001	Magflow Flow Meter - FIT001 - Typical Loop Diagram	T01
ING0645D-TYP-FIT002	Area Velocity Flow Meter - FIT002 - Typical Loop Diagram	T01
ING0645D-TYP-FIT003	Clamp On Flow Meter - FIT003 - Typical Loop Diagram	T01
ING0645D-TYP-FIT004	Flume Flow Meter - FIT004 - Typical Loop Diagram	T01
ING0645D-TYP-LIT001	Ultrasonic Level Transmitter - LIT001 - Typical Loop Diagram	T01
ING0645D-TYP-ICP-SLV001	Solenoid Instrument Control Panel SLV001 - Typical Loop Diagram	T01
TYPICAL WIRING DIAGRAMS		
ING0645D-TYP-D1R0S5-AI	PLC-TYP Remote Panel Analog Input Module Drop 1/Rack 0/Slot 5 - Typical Wiring Diagram	T01
ING0645D-TYP-R0S2A-DI	PLC-TYP Digital Input Module: Sub-Base 1 of 4 Rack 0/Slot 2A Typical Wiring Diagram	T01
ING0645D-TYP-R0S2B-DI	PLC-TYP Digital Input Module: Sub-Base 2 of 4 Rack 0/Slot 2B Typical Wiring Diagram	T01
ING0645D-TYP-R0S2C-DI	PLC-TYP Digital Input Module: Sub-Base 3 of 4 Rack 0/Slot 2C Typical Wiring Diagram	T01
ING0645D-TYP-R0S2D-DI	PLC-TYP Digital Input Module: Sub-Base 4 of 4 Rack 0/Slot 2D Typical Wiring Diagram	T01



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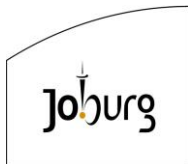


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DRAWING NUMBER	DESCRIPTION	REV
ING0645D-TYP-R0S3A-DO	PLC-TYP Digital Output Module: Sub-Base 1 of 2 Rack 0/Slot 3A (200-215) Typical Wiring Diagram	T01
ING0645D-TYP-R0S3B-DO	PLC-TYP Digital Output Module: Sub-Base 2 of 2 Rack 0/Slot 3B (216-231) Typical Wiring Diagram	T01
ING0645D-TYP-R0S4-AI	PLC-TYP Analog Input Module: Rack 0/Slot 4 Typical Wiring Diagram	T01
ING0645D-TYP-R0S5-AO	PLC-TYP Analog Output Module: Rack 0/Slot 5 Typical Wiring Diagram	T01

Signed at on this Day of 20.....

Name of tenderer	
Name of Authorized person	
Authorized Signature*	



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Johannesburg Water (SOC) Ltd



CONTRACT JW14425

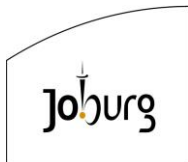
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INFRASTRUCTURE RENEWAL PLAN

VOLUME 1

PART 1: AGREEMENT AND CONTRACT DATA

Employer:		Contractor:	
Witness:		Witness:	



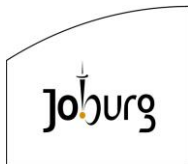
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Summary of Bill of Quantities	C.96

Employer:		Contractor:	
Witness:		Witness:	



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C1.1 FORM OF OFFER (ACCEPTANCE & AGREEMENT)

C1.1.1 Form of Offer

The Contractor is to complete and sign the Form of Offer.

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

JW 14425: Bushkoppie Wastewater Treatment Works Infrastructure Renewal Plan.

The Contractor, 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 Contractor, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Contractor 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 Contractor before the end of the period of validity stated in the Tender Data, whereupon the Contractor becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

Signature(s)

Name(s)

Capacity

For the Contractor

(Name and address of
organisation)

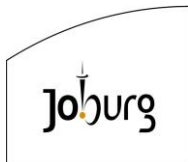
**Name and signature
of witness**

(Name)

(Signature)

Date

Employer:		Contractor:	
Witness:		Witness:	



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C1.1.2 Form of Acceptance

The Employer is to complete and sign the form of acceptance

By signing this part of the Form of Offer and Acceptance, the Employer identified below accepts the Contractor'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 Contractor's Offer shall form an agreement between the Employer and the Contractor 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 Volume 1:

- Part 1 Agreement and Contract Data, (which includes this Agreement)
- Part 2 Pricing Data
- Part 3 Scope of Work
- Part 4 Site Information

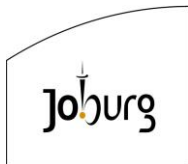
and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Contractor 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 Contractor shall within twenty-eight **(28) days** 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 Contact 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 of 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 Contractor receives one fully completed copy of this document, including the Schedule of Deviations (if any). Unless the Contractor (now the Contractor) within five days after 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 binding contract between the parties.

Employer:		Contractor:	
Witness:		Witness:	



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Name(s) _____

Capacity _____

For the Employer **Johannesburg Water SOC (Ltd), Turbine Hall, 65 Ntemi Piliso Street, Newtown.**

(Name and address of organisation)

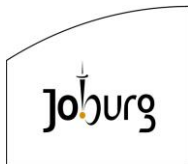
Name and signature of witness

(Name)

(Signature)

Date _____

Employer:		Contractor:	
Witness:		Witness:	



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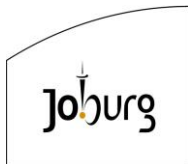
C1.1.3 Schedule of Deviations

Notes:

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

1	Subject	
	Details	
2	Subject	
	Details	
3	Subject	
	Details	
4	Subject	
	Details	
5	Subject	
	Details	
6	Subject	
	Details	
7	Subject	
	Details	
8	Subject	
	Details	

Employer:		Contractor:	
Witness:		Witness:	



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

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

For the Contractor:

Signature(s)

Name(s)

Capacity

For the Contractor

(Name and address of
organisation)

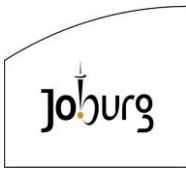
**Name and signature
of witness**

(Name)

(Signature)

Date

Employer:		Contractor:	
Witness:		Witness:	



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For the Employer:

Signature(s)

Name(s)

Capacity

For the Employer

(Name and address of
organisation)

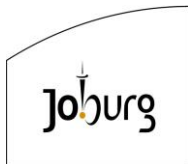
**Name and signature
of witness**

(Name)

(Signature)

Date

Employer:		Contractor:	
Witness:		Witness:	



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C1.2 CONTRACT DATA

C1.2.1 Part 1: Data Provided by the Employer

CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works Third Edition (2015), published by the South African Institution of Civil Engineering, is applicable to this Contract.

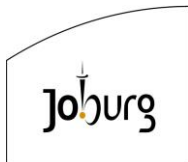
Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Telephone number: 011-805 5947)

C1.2.1.1 Contract Specific Data

The following contract specific data are applicable to this Contract:

GCC Clause	Information												
1.1.1.13	The Defects Liability Period is 52 weeks from the date of issue of the Certificate of Practical Completion. There shall be two separate Defects Liability Periods as per provisions of Clause 1.1.1.14 below.												
1.1.1.14	<p>The time for achieving Practical Completion is 36 months (including the non-working days and the special non-working days) , as follows:</p> <p>Section 1 – at the end of Month number 18 (including the non-working days and the special non-working days).</p> <p>Section 2 – at the end of Month number 36 (including the non-working days and the special non-working days).</p>												
1. 1.1.15	The name of the Employer is Mr Peter Louw of Johannesburg Water (SOC) Limited.												
1.1.1.16	The name of the Employer’s Agent is Zitholele Consulting represented by Jan Swart, who is Registered as a PrEng with the Engineering Council of South Africa .												
1.1.1.26	The Pricing Strategy is a Bill of Quantities.												
1.2.1.2	<p>The address of the Employer is:</p> <table><tr><td>Physical</td><td>Postal</td><td>Tel: 011 688 1603</td></tr><tr><td>Turbine Hall</td><td>P.O. Box</td><td>Fax: 011 688 1521</td></tr><tr><td></td><td>61542</td><td></td></tr><tr><td>65 Ntemi Piliso Street</td><td>Marshalltown</td><td>Email: peterlouw@jwater.co.za</td></tr></table>	Physical	Postal	Tel: 011 688 1603	Turbine Hall	P.O. Box	Fax: 011 688 1521		61542		65 Ntemi Piliso Street	Marshalltown	Email: peterlouw@jwater.co.za
Physical	Postal	Tel: 011 688 1603											
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	61542												
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Employer:		Contractor:	
Witness:		Witness:	

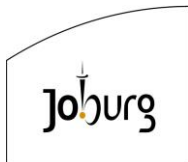


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GCC Clause	Information
	Newtown 2107
1.2.1.2	<p>The address of the Employer's Agent is:</p> <p>Building 1, Maxwell Postal Tel: 011 207 2060 Office Park, Magwa Crescent, P.O. Box 6002 Email: jans@zitholele.co.za Waterfall City Halfway Midrand 1685 House 1685</p>
3.2.3	<p>Specific Approval – The Employer's Agent is required to obtain the Employer's approval for the following:</p> <ul style="list-style-type: none"> • Approval of Variation Orders • Approval to exceed the Contract Sum • Approval of Subcontracting Plan
4.4.2	<p>Add the following after this clause:</p> <p>Apart from subcontractors identified by the Contractor for the execution of certain sections of the Works, subcontractors shall also include SMME's (Small Medium and Micro Enterprises), who are identified from the Local Community for the execution of certain sections of the Works identified by the Contractor.</p> <p>The appointment of subcontractors and the allocation of work to subcontractors shall, in addition to the provisions of the General Conditions of Contract, comply with, but not be limited to, the provisions of C1.2.1.2.14 (see below).</p> <p>A minimum value of 20% (twenty percent) of the Contract Price shall be subcontracted to SMME's.</p>
4.10.1	<p>The Contractor shall employ labour from Local Communities (otherwise known as Local Labour), in accordance with the Tender Data, Scope of Work, Site Information, and Specifications. All Local Labour shall be recruited through the Community Liaison Officer (CLO) and/or Labour Desk Officer (LDO). The Contractor remains</p>

Employer:		Contractor:	
Witness:		Witness:	

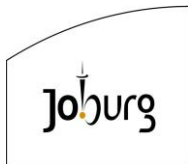


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GCC Clause	Information
	fully responsible for all Local Labour that are employed for the execution of the Works, as if they were the Contractor's own labour.
4.11.1	<p>Add the following to this clause:</p> <p>Competent Employees shall include, amongst others, the following Key Personnel:</p> <ul style="list-style-type: none"> • Contracts Manager • Site Manager / Site Agent • Civil Engineering Senior Foreman • Mechanical Engineering Senior Foreman • Electrical and C&I Engineering Senior Foreman • Safety Officer <p>The minimum requirements in terms of qualifications and experience of these Key Personnel are listed in C1.2.1.2.15 (see below).</p>
5.3.1	<p>The documentation required before Commencement with Works execution are:</p> <ul style="list-style-type: none"> • Approved Health and Safety File (Clause 4.3) • Approval of the Environmental File (Clause 4.3) • Initial programme & cashflow projections (Clause 5.6) • Guarantee from Bank or Insurance Company (Clause 6.2) • Insurance of the Works, Plant, etc. (Clause 8.6), including but not limited to: <ul style="list-style-type: none"> ○ SASRIA Policy ○ Liability Insurance ○ Insurance of Construction Machinery and Plant ○ Insurance of Motor Vehicle Liability , etc. • Compliance Certificate in respect of COID • Signed Notification to the Department of Labour • Construction Permit (where applicable) • Organogram of resources
5.3.2	The time to submit the documentation required before Commencement of the Works is 28 days.
5.3.3	Time to instruct commencement of the Works

Employer:		Contractor:	
Witness:		Witness:	

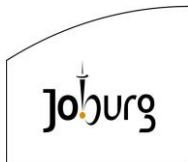


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GCC Clause	Information
	Delete Clause 5.3.3 and replace with the following: The Contractor shall commence with carrying out the Works upon written instruction from the Employer's Agent to commence with the Works.
5.4.1	Access to the Site shall be granted through written instruction from the Employer's Agent. In general, the Contractor shall be granted access to Section One, and on successful commissioning and Completion of Section One, access shall be granted to Section Two. The Employer reserves the right to limit access to any part of the Site and/or Works, at its sole discretion.
5.6.1	The Programme must take into account the Employer's requirements regarding the Sequencing of the Works, as described in the Scope of Works (Section PS 5.4), and Clause 1.1.1.14.
5.8.1	Working days shall be Monday to Friday, between 07h00 to 17h00.
5.8.1	The non-working days are Saturdays and Sundays. The special non-working days are all Public Holidays in terms of the Public Holidays Act (as amended), and the annual "Builder's Break " as defined by SAFCEC on an annual basis.
5.13.1	The penalty for failing to complete the Works (or a Section of the Works) is the greater of: An amount equal to the daily Time Related P&G rate (as calculated from the Time Related P&G section in the Bill of Quantities), or R50,000.00 per day, whichever is greater.
5.14.1	The time for achieving Practical Completion is 18 months for Section 1, and 18 months (i.e. at month 36) for Section 2, in accordance with Clause 1.1.1.14. The requirements for achieving Practical Completion are as detailed in either the Scope of Work for each Section, the Commissioning Procedures, or Particular Specifications.
5.14.2	The Works shall be programmed to be completed in Sections, such that a Certificate of Practical Completion can be issued for each Section.

Employer:		Contractor:	
Witness:		Witness:	

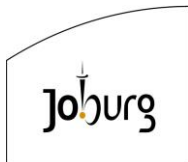


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GCC Clause	Information
5.14.5.1	The performance guarantee shall be returned after completion of the whole of the Works (i.e. after both Sections have been completed).
5.14.5.3	Retention shall be reduced to half, per Section that has been completed. The value of retention to be released shall be calculated on a pro-rata basis according to the value of work that has been certified by the Employer's Agent for each Section.
5.14.5.5	Insurance of the Works shall cease after completion of the whole of the Works (i.e. after both Sections have been completed).
5.14.7	Different dates of Practical Completion for each of the 2 (two) Sections will apply.
5.16.3	The latent defect period is Five (5) years for Civil Engineering and Building Works; and Three (3) years for Electrical and Mechanical Engineering works; and shall apply after completion of the whole of the Works (i.e. after both Sections have been completed)..
6.2.1	<p>The time to deliver the Form of Guarantee is within 28 days from the Commencement Date. The security to be provided by the Contractor shall be in the form of a Performance Guarantee and will comply with the requirements of Clause 6.2.3.</p> <p>The Performance Guarantee shall be irrevocable, and in the form of an On-Demand Performance Guarantee, to be issued exactly in the form of the proforma document, provided in favour of the Employer by a Bank or Recognised Financial Institution; or Cash in lieu of bond will apply.</p> <p>The value of the Performance Guarantee shall be ten (10) % of the Contract Sum, which sum excludes VAT.</p>
6.8.2	<p>Contract Price Adjustment is applicable for this contract.</p> <p>The following formula will be applicable.</p> $(1-x) \left[\frac{aLt}{Lo} + \frac{bPt}{Po} + \frac{cMt}{Mo} + \frac{dFt}{Fo} - 1 \right]$ <p>In which the symbols have the following meaning as per GCC 2015:</p> <p>"x" is the proportion of "Ac" which is not subject to adjustment.</p>

Employer:		Contractor:	
Witness:		Witness:	

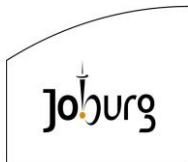


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GCC Clause	Information
	<p>"a", "b", "c" and "d" are the coefficients contained in the Contract Data, which are deemed, irrespective of the actual constituents of the work, to represent the proportionate value of labour, contractors' equipment, material (other than "special materials" specified in the Contract Data) and fuel respectively.</p> <p>"L" is the "Labour Index" "P" is the "Plant Index" "M" is the "Materials Index" "F" is the "Fuel Index"</p> <p>The suffix "o" denotes the base indices applicable to the base month as stated in the Contract Data. The suffix "t" denotes the current indices applicable to the month in which the last day of the period falls to which the relevant monthly statement relates.</p> <p>If any index relevant to any particular certificate is not known at the time when the certificate is prepared, the Engineer shall estimate the value of such index. Any correction which may be necessary when the correct indices become known, shall be made by the Engineer in subsequent payment certificates.</p> <p>The value of the payment certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule, with the following values:</p> <p>The value of "x" is 0,10</p> <p>The values of the coefficients are: a = 0,32 Labour b = 0,25 Contractor's equipment c = 0,33 Material d = 0,10 Fuel</p> <p>The province where the Site is located is Gauteng and the urban area where the project is implemented is Johannesburg.</p>

Employer:		Contractor:	
Witness:		Witness:	

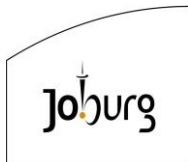


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GCC Clause	Information
	<p>The base month is the month prior to the month in which the tender closes.</p> <p>The Consumer Price Indices for Labour (L), Plant (P), Material (M) and Fuel (F) are as published by Statistics South Africa for the applicable time periods.</p>
6.8.3	Price adjustments for variations in the costs of special materials are NOT allowed.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%.
6.10.3	The percentage retention on the amounts due to the Contractor is 10%.
6.10.3	The limit of retention money is 5% of the Contract Price.
6.10.4	<p>Delivery, dissatisfaction with and payment of payment certificates</p> <p>Delete Clause 6.10.4 and replace with the following:</p> <p>Payment shall be made upon:</p> <ul style="list-style-type: none"> • The Contractor providing a payment certificate with all required supporting documents to the Employer's Agent on dates to be communicated to the Contractor upon award. • The payment certificate being submitted with an original tax invoice. • A statement being submitted on the last day of the month. <p>Payment will be made within 30 days of receipt of the Contractor's statement.</p> <p>Payment shall be subject to the Contractor submitting an Original Tax Invoice compliant with SARS requirements for a Valid Tax Invoice to the Employer for the amount due. Any dissatisfaction in respect of such payment certificate shall be dealt with in terms of Clause 10.2.</p>
6.10.5	<p>Payment of Retention Money</p> <p>Add to Clause 6.10.5 the following:</p> <p>Payment will be subject to Johannesburg Water processes as outlined in clause 6.10.4 as amended.</p>
6.10.6.2	Delete Clause 6.10.6.2.
6.11	Delete Clause 6.11.

Employer:		Contractor:	
Witness:		Witness:	

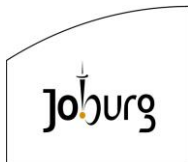


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GCC Clause	Information
7.8.2	Cost of making good of defects Amend Clause 7.8.2.1 as follows: In the first line, correct the spelling of 'therefore'.
8.1.1	Add to the end of Clause 8.1.1 the following text: "Although the extent of the Works and the Site are located within the boundaries of the Bushkoppie Wastewater Treatment Works (BWwTW), and the Employer may (or may not) provide security for the Treatment Works (BWwTW) as a whole, the Contractor shall remain solely responsible for the protection of the Works and the Site".
8.1.5	Add to the end of Clause 8.1.5 the following text: "Although the Employer has made certain provisions for protection of the Works and the Site in the Pricing Data, the Contractor shall ensure that any and all additional requirements for the protection of the Works and the Site are adequately catered for in his rates and/or prices".
8.4.1.1	Add to the end of Clause 8.4.1.1 the following text: "hereby indemnifies the Employer against any liability in respect of damage or physical loss of property of any person or injury or death of any person due to non-compliance with the Occupational Health and Safety Act (Act 85 of 1993).
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is an amount equal to 10% of the Contract Price.
8.6.1.2	Delete clause 8.6.1.2 and replace with the following: Following the introduction of legislation affecting the articles of the South African Special Risks Insurance Association (SASRIA) , insurance cover for loss or damage to the Works caused by any event defined as a risk in terms of the insurance offered by SASRIA, will be provided under a certificate issued by SASRIA.
8.6.1.3	The limit of indemnity for liability insurance is R20,000,000 (Twenty million Rand) for any single claim – the number of claims to be unlimited during the Construction and Defects Liability Periods
8.6.1.5	In addition to the insurances required in terms of General Conditions of Contract Clauses 8.6.1.1 to 8.6.1.4 the following insurance is also required:

Employer:		Contractor:	
Witness:		Witness:	

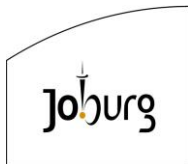


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GCC Clause	Information
	<p>a. The Contractor shall insure all Construction Machinery and Plant (including tools, offices and other temporary structures and content) and other items, other than those intended for incorporation into the works, owned, leased or hired and brought on to the Site against all risks of physical loss or damage for the period that such Plant shall be on the Site to the full value thereof. In respect of Machinery and Plant brought on to the Site by or on behalf of Sub-Contractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause if it has ensured that such Sub-Contractors have similarly insured such Plant and Machinery. Such insurance shall be effected with an Insurer and in terms approved by the Employer (which approval shall not be unreasonably withheld) and the Contractor shall, when required, submit to the Employer's Insurance Brokers, via the Employer's Agent, the policy or policies of insurance and receipts for payment of the current premiums.</p> <p>b. The Contractor and the Sub-contractors shall effect and maintain at their cost, insurance under the provision of the Compensation for Occupational Injuries and Diseases Act (COID), 1993 (Act No. 130 of 1993)</p> <p>c. The Contractor and the Sub-Contractors shall effect and maintain at their own cost, motor vehicle liability insurance with at least indemnification for "balance of third party" risks, including passenger liability with a limit of indemnity of not less than R2,5 million.</p> <p>d. Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.</p> <p>e. Any other Insurance cover that may be deemed necessary by the Contractor to ensure full and successful completion of the Works.</p>
8.6	Add the following clause to 8.6

Employer:		Contractor:	
Witness:		Witness:	

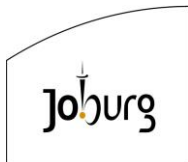


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GCC Clause	Information
	<p>In addition to any statutory obligations, or other requirements contained in the Conditions of Contract or in the Insurance Policy and Documents the Contractor shall report in writing to the Employer's Agent every accident within 48 hours of its occurrence, whether such accident is in respect of damage to persons or property. The report shall contain full details of the accident. The Employer's Agent shall have the right to make all and any enquiries either on the Site or elsewhere as to the cause and results of any such accident and the Contractor shall give the Employer's Agent full access and facilities for carrying out such enquiries.</p> <p>The Employer's Agent shall be given full and immediate access to all communication, reports, findings, assessments, etc. between the Contractor and its Insurance Broker (or Insurance Provider), particularly as it relates to the processing and outcomes of any and all claims. The Contractor shall further allow and authorise the Employer's Agent to communicate with its Insurance Broker (or Insurance Provider) to obtain any and all such information as the Employer's Agent deems necessary.</p>
10.4.2	Dispute resolution shall be by Amicable Settlement, failing which, disputes shall be resolved by way of ad-hoc Adjudication.
10.5.3	The number of Adjudication Board Members to be appointed is one (1).
10.7.1	The determination of disputes shall be by arbitration.

Employer:		Contractor:	
Witness:		Witness:	



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C1.2.1.2 Additions

The additional Conditions of Contract are:

C1.2.1.2.1 Penalties

In addition to GCC clause 5.13, during the Contract Period should the Contractor:

a) Fail to report

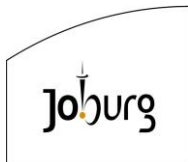
- The Employer shall levy a penalty on Contractor, should the latter fail to provide reporting as required in the specification highlighted in the Scope of Work in PS 5.9, PS 5.11, PS 5.12, PS 5.13, and PS 6.15, with regard to content and frequency, whilst as per the Pricing Data section no payment for work completed shall be processed.
- The penalty value shall be R5,000.00 per report per day; and
- If the Contractor fails to complete the aforementioned more than three incidents and should the Employer or his duly authorised representative find that the Contractor is hindering his (the Employer's) deliverables to JW Senior Management, he shall reserve the right to:
 - i. perform the Works internally or through another Contractor; and
 - ii. deduct additional costs incurred by the Employer from monies owed to the Contractor or from the Contractor's Guarantee. Additional costs incurred by the Employer shall include all claims from Contract affected parties, claims such as but not be limited to claims from customers, any costs associated with the loss of water, and all costs associated with the procurement of an alternative Contractor.
 - iii. terminate the Contract.

No liability in terms of this clause shall be attached to the Contractor if he can prove to the satisfaction of the Employer that the nature of the failure is due to fire, war, riot, strikes, act of God, lockout, accident or other unforeseen occurrences or circumstances beyond the Contractor's control, provided, however, that in all cases the Contractor has notified the Employer in writing within 24 hours of it first coming to his notice, that delivery shall be delayed or become impossible for the above-mentioned reasons.

b) Fail to pay any labourer or SMME

- The Employer shall levy a penalty on the Contractor, should the latter fail to provide payment to the any labourer or SMME as required in the specification highlighted in the Scope of Work and/or specified in the appointment agreements with the Contractor and the labourer or SMME.
- The penalty value shall be R 50,000.00 per incident per occasion; and
- If the Contractor fails to complete the aforementioned more than three incidents and should the Employer or his duly authorised representative find that the Contractor is hindering his (the Employer's) deliverables to JW Senior Management, he shall reserve the right to:

Employer:		Contractor:	
Witness:		Witness:	



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- i. perform the Works internally or through another Contractor; and
- ii. deduct additional costs incurred by the Employer from monies owed to the Contractor or from the Contractor's Guarantee. Additional costs incurred by the Employer shall include all claims from Contract affected parties, claims such as but not be limited to claims from customers, any costs associated with the loss of water, and all costs associated with the procurement of an alternative Contractor.
- iii. terminate the Contract.

No liability in terms of this clause shall be attached to the Contractor if he can prove to the satisfaction of the Employer that the nature of the failure is due to fire, war, riot, strikes, act of God, lockout, accident or other unforeseen occurrences or circumstances beyond the Contractor's control, provided, however, that in all cases the Contractor has notified the Employer in writing within 24 hours of it first coming to his notice, that delivery shall be delayed or become impossible for the above-mentioned reasons.

c) Failure to achieve targets in terms of Contract Participation Goals

If the Contractor fails to achieve the monetary value of the target set by the Employer for contract participation by local SMME Contractors in terms of Procurement and Particular Specifications in Scope of Works clause PS3.3, the Contractor shall be liable to the Employer for a sum calculated in accordance with the Contract Data and the aforementioned Scope of Works as a penalty for such underachievement."

The penalty for failing to achieve the monetary value of the target set by the Employer for contract participation by Targeted Enterprises and local SMME Contractors in terms of Small Contractor Development of Particular Specifications in PS3: Scope of Works, is 50% of the monetary value by which the achieved monetary value falls short of the target monetary value.

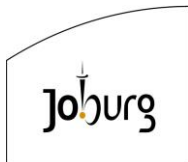
d) Failure to meet the Occupational Health and Safety compliance target

Monthly compliance rating will be calculated for each Contractor as per a formula determined by the Employer focusing on or incorporating outcomes of assurance (e.g. monthly audit), operational (e.g. behavioral based safety inspection) assessments and other requirements, as necessary.

The Employer will impose a penalty value of R10,000.00 per audit report where a Contractor scores below 85%.

The Employer will impose a penalty value of R5,000.00 per occasion where the Contractor scores above 85% but below 93% for two successive months.

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Witness:		Witness:	



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e) Failure to meet the Environmental compliance target

Monthly compliance rating will be calculated for each Contractor as per a formula determined by the Employer focusing on or incorporating outcomes of assurance (e.g. monthly audit), operational assessments and other requirements, as necessary.

The Employer will impose a penalty value of R10,000.00 per audit report where a Contractor scores below 85%.

The Employer will impose a penalty value of R5,000.00 per occasion where the Contractor scores above 85% but below 93% for two successive months.

f) Penalties irreversible

The Contractor shall note that all penalties once imposed shall be non-recoverable or non-reversible, even if the default is remedied. Penalties will be recovered either through the monthly Payment Certificate (i.e. in the month in which the default has occurred) or through a credit note issued by the Contractor (in the month in which the default has occurred).

C1.2.1.2.2 Source of instructions

The Contractor shall neither seek nor accept instructions from any authority external to the Employer's Agent in connection with the performance of his services under this Contract. The Contractor shall refrain from any action which may adversely affect the Employer and shall fulfill his commitments with fullest regard for the interest of the Employer. The Contractor may only accept and comply with instructions from the Employer's Health and Safety Representative or the Employer's Environmental Representative with regards to matters regarding Health & Safety or Environmental Management respectively, but with further approval from the Employer's Agent.

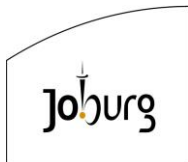
C1.2.1.2.3 Officials not to benefit

The Contractor warrants that no official of the Employer has been or shall be admitted by the Contractor to any direct or indirect benefit arising from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of the Contract.

C1.2.1.2.4 Prevention of corruption

The Employer shall be entitled to cancel the Contract and to recover from the Contractor the amount of any loss resulting from such cancellation, if the Contractor has offered or given any person any gift or consideration of any kind as an inducement or reward for doing or intending to do any action in relation to the obtaining or the execution of the Contract or any other contract with the Employer or for showing or intending to show favor or disfavor to any person in relation to the Contract or any other contract with the Employer. If similar acts have been done by any persons employed by the Contractor or acting on his behalf whether with or without the knowledge of the Contractor in relation to this or any other Contract with the Employer the same consequences shall apply.

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C1.2.1.2.5 Confidential nature of documents

All maps, drawings, photographs, mosaics, plans, reports, recommendations, estimates, documents and all other data compiled by or received by the Contractor under the Contract shall be the property of the Employer, shall be treated as confidential and shall be delivered only to the Employer's Agent or his duly authorized representative on completion of the Works; their contents shall not be made known by the Contractor to any person other than the personnel of the Contractor performing services under this Contract without the prior written consent of the Employer.

C1.2.1.2.6 Returns of labour, SMME, plant, equipment and material

The Contractor shall provide a return in detail in the form and at such intervals as the Employer's Agent or his duly authorized representative may prescribe showing the supervisory staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such information respecting construction plant, equipment and material as the Employer's Agent or his duly authorized representative may require. Reporting as per JW6.1. The supporting documents required for SMMEs include but are not limited to the following:

- Valid CIPC registration (i.e. CK, COR)
- SA ID copies of owners
- Active CIDB membership: minimum grading 1CE
- Valid CSD compliance status
- Valid EME affidavit
- COIDA certificate
- Company Profile including similar experience and skilled personnel CVs
- Health and Safety Plan
- Proof of Payments

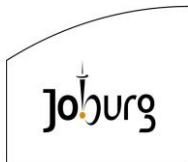
The supporting documents required for local labourers include but are not limited to the following

- Certified Copies of IDs
- Individual contracts
- Monthly Individual proof of payment
- Monthly Individual timesheets
- Training returns
- UIF forms (proof of registration from Labour)

C1.2.1.2.7 Materials and workmanship

All materials and workmanship shall be of the respective kinds described in the Contract and in accordance with the Employer's Agent's instructions and shall be subjected from time to time to such tests as the Employer's Agent may direct at the place of manufacture or fabrication, or on the Site or at all or any of such places. The Contractor shall provide

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such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any materials used and shall supply samples of materials before incorporation in the Works for testing as may be selected and required by the Employer's Agent. All testing equipment and instruments provided by the Contractor shall be used only by the Employer's Agent or by the Contractor in accordance with the instructions of the Employer's Agent.

- a) No material not conforming with the Specifications in the Contract shall be used for the Works without prior written approval of the Employer and instruction of the Employer's Agent, provided always that if the use of such material results or may result in increasing the Contract Price, the procedure in GCC clause 6.3 (Variations) shall apply.

C1.2.1.2.8 Examination of the work before covering up

No work shall be covered up or put out of view without the approval of the Employer's Agent or his duly authorized representative and the Contractor shall afford full opportunity for the Employer's Agent or his duly authorized representative to examine and measure any work which is about to be covered up or put out of view and to examine foundations before permanent work is placed thereon. The Contractor shall give due notice to the Employer's Agent whenever any such work or foundations is or are ready or about to be ready for examination. The Employer's Agent or his duly authorized representative shall without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundations.

C1.2.1.2.9 Employer's Agent's power to order removal of improper work and materials

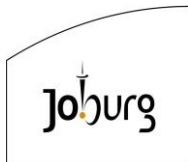
The Employer's Agent or his duly authorized representative shall during the progress of the Works have power to order in writing from time to time, and the Contractor shall execute at his cost and expense, the following operations:

- a) removal from the Site within such time or times as may be specified in the order of any materials which in the opinion of the Employer's Agent are not in accordance with the Contract.
- b) substitution of proper and suitable materials; and
- c) removal and proper re-execution (notwithstanding any previous test thereof or interim payment therefore) of any work which in respect of materials or workmanship is not in the opinion of the Employer's Agent or his duly authorized representative in accordance with the Contract.

C1.2.1.2.10 Default of Contractor in carrying out Employer's Agent's or his duly authorized representative's Instructions

In case of default on the part of the Contractor in carrying out an instruction of the Employer's Agent or his duly authorized representative, the Employer shall be entitled to employ and pay other persons to carry out the same, and all expenses consequent thereon or incidental thereto shall be borne by the Contractor and shall be recoverable

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from him by the Employer and may be deducted by the Employer from any monies due or which may become due to the Contractor.

C1.2.1.2.11 Date falling on public holiday or weekend

Where under the terms of the Contract any act is to be done or any period is to expire upon a certain day and that day or that period fall on a day of rest or recognized public holiday or weekend, the Contract shall have effect as if the act were to be done or the period to expire upon the working day following such day.

C1.2.1.2.12 Ambiguities and inconsistencies

The Employer or the Contractor shall notify the other as soon as either becomes aware of an ambiguity or inconsistency in or between the documents, which are part of this Contract. Governed by the spirit and intention of the Contract, the Employer shall give a binding instruction resolving the ambiguity or inconsistency.

C1.2.1.2.13 False claims by the Contractor

- a. Failure, by the Contractor, to demonstrate or present any feature declared during the procurement stage shall constitute grounds for Contract termination or the market related equivalent price discount, if no market related value is available, the Employer shall give a final ruling on the amount. This shall be at the discretion of the Employer based on the implication of such omission. Should the Contractor refuse to accept the Employer's price, the Contract shall be terminated.
- b. Any false claims by the Contractor or his staff (with or without his knowledge), based on Works to be performed or completed per site stage shall constitute grounds for Contract termination and result in blacklisting on the Employer's database.

The Contractor shall note that any of the above shall constitute non-performance on the part of the Contractor, further resulting in him forfeiting his full Contract Guarantee.

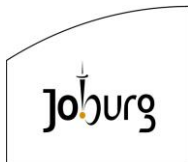
C1.2.1.2.14 Special Conditions

The successful Tenderer must subcontract a minimum of 20% (twenty percent) of the value of this Contract to SMME's or entity(s) described below. The value of the Contract for the purposes of this calculation shall be equal to the Contract Price (excluding VAT) as described in the General Conditions of Contract.

The subcontractor/s or SMME's chosen for this purpose must be registered on National Treasury's Central Supplier Database (CSD) and must be from one of the following designated groups:

- An EME or QSE which is at least 51% owned by black people;
- An EME or QSE which is at least 51% owned by black people who are youth;
- An EME or QSE which is at least 51% owned by black women;
- An EME or QSE which is at least 51% owned by black people with disabilities;
- An EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;

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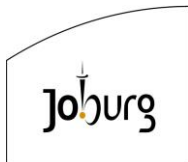


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- A cooperative which is at least 51% owned by black people;
 - An EME or QSE which is at least 51% owned by black people who are military veterans;
 - an EME or QSE .
1. Subcontractors must be chosen from National Treasury's Central Supplier Database which can be accessed on National Treasury's website.
 2. The Contractor shall identify work packages that will be allocated to Subcontractors, so that the minimum requirement can be met during the implementation of the project, as follows:
 - The Contractor shall develop a Subcontracting Plan that sets out the details of the proposed Subcontracting arrangements including, but not limited to, competitive bidding process to be used for the appointment of SMME's, scope of work to be allocated, criteria for the selection of Subcontractor(s), Subcontractor agreements, cost of the work to be Subcontracted, etc.
 - The Subcontracting Plan shall be developed in consultation with the Employer (or his representative), the Ward Councillor and / or Community Liaison Officer, who shall assist the Contractor in identifying SMME's and other skills that may be available in local and surrounding communities.
 - The Subcontracting Plan shall be issued to the Employer's Agent for approval, prior to the engagement of any Subcontractor(s) by the Contractor. The activities, time periods, linkages, etc. associated with the development and approval of the Subcontracting Plan shall be included in the Project Programme, which Programme is subject to the approval of the Employer's Agent. A period of four weeks will be required for the Employer's Agent to consult with the Employer, prior to approval of the Subcontracting Plan.
 - The Contractor shall ensure that rates that are tendered (during Tender Stage) for work items that are likely to be Subcontracted, are market related rates. Provision is made in the Bill of Quantities (BoQ) for the Contractor to add a mark-up for the sourcing, handling, and management of Subcontractors, SMME's, and the like, for the duration of the Contract.
 - On or during appointment of Subcontractors, should Subcontractors prove that rates, that have been tendered by the Contractor for BoQ work items that are being subcontracted, are not market related, the Contractor will be liable to cover the cost of the difference, i.e. the difference in rate tendered by the Contractor versus the rate that is being requested by the Subcontractor. This difference in cost will be for the Contractor's account, and no Variation Orders for additional costs will be entertained by the Employer. The Contractor bears the full and complete risk for the rates that have been tendered by the Contractor during Tender Stage.
 - In the event that a rate supplied by the Contractor for a specific BoQ work item is not sufficient to cover Subcontractor costs/rates for that specific item, the Contractor shall provide a detailed rate breakdown for that specific BoQ item (and each and every subsequent BoQ work item where the rate is not sufficient to cover Subcontractor cost); and shall indicate costs (amongst others) for labour, material, handling, mark-ups, etc. to prove that the rate that was submitted during tender stage was in fact market related; and in balance with other rates that were submitted for work items that will not be

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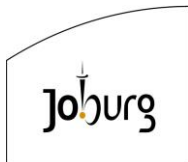


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- undertaken by Subcontractors.
- Should any delays be experienced during the period of the Contract due to the appointment of subcontractors by the Contractor, work stoppages by subcontractors, industrial action by subcontractors, etc. such delays shall be assigned to the Contractor, and no claims for Extension of Time will be entertained by the Employer.
 - The Contractor will be liable to pay a penalty if the Subcontracting target (as specified) has not been met by the end of the Contract. The Employer will deduct this penalty amount through the Payment Certificate process. The Employer will monitor progress by the Contractor towards achieving the target, and shall have full discretion as to when the penalty will be applied (i.e. the month in which the penalty amount will be deducted). In calculating the total amount that has been (will be) paid to SMME's, all amounts that have actually been reimbursed to SMME's will be taken into account including P&G's, amounts for actual work done, etc.
 - The penalty amount described above shall be equal to 50% (fifty percent) of the difference between the target Subcontract amount (i.e. 20% of the Contract Price) and the actual amount that has been spent on Subcontractors/SMME's by the end of the Contract.
3. A Subcontracting agreement between the Main Contractor and the Subcontractor shall be submitted to JW upon appointment of any Subcontractor, and must include the following minimum information:
- Name of Subcontractor and BBBEE status
 - Subcontractor *domicilium* and registered address of business, as well as status of compliance with all applicable legal requirements.
 - Area and location of project
 - Scope of Work issued to the Subcontractor
 - Value of the Work issued including P&G's (this information must be submitted in a format that is readily auditable).
 - Assistance provided/to be provided to the Subcontractor by the Contractor, e.g. acquisition of materials, machinery, tools, etc.
 - A Skills Transfer Plan which will indicate, amongst others, the proposed skills that will be transferred to the Subcontractor, individuals that will be identified for skills transfer, the amount that will be spent by the Contractor on skills transfer, evidence that will be produced by the Contractor (such as training certificates, training registers, etc.), etc.
 - A specific provision that enables the Contractor to pay the Subcontractor's suppliers, labour (skilled, local, etc.) or any other service provider of the Subcontractor, should the Subcontractor fail to do so. This provision shall include (but not be limited to) the following conditions/proviso's:
 - Invoices that are due for payment from suppliers and the like must be invoices that have been approved for payment, and be based on work or services that have actually been completed or delivered. Payments that are due to labour will be based on approved timesheets.
 - The Contractor is to ensure that any invoice presented for payment is indeed an approved invoice, and that the necessary work or services have been

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delivered or completed. The approved invoice shall be settled (paid) by the Contractor (on behalf of the Subcontractor) by the due date for payment.

- The Contractor will be entitled to deduct payments made to any third party, on behalf of the Subcontractor, from subsequent payments that may become due to the Subcontractor.
- The Contractor will be entitled to bill the Subcontractor a mark-up on the payments made on behalf of the sub-contractor. The mark-up shall not be more than 10% (ten percent) of the amount actually paid (i.e. the amount (excluding VAT) reflected on the invoice that has been settled). The mark-up amount shall be deducted from subsequent payments that may become due to the Subcontractor.
- Proof of any such payments made on behalf of the Subcontractor shall be issued to the Employer's Agent, on request, with all necessary supporting information that the Employer's Agent may request
- Payments made on behalf of the Subcontractor are not subject to the Contractor first being paid by the Employer. Therefore, the Contractor shall pay approved invoices, on behalf of the Subcontractor, irrespective of whether the Contractor has first been paid by the Employer. The Contractor will be entitled to levy interest on all payments that have been made in this regard, in accordance with the necessary interest payment provisions contained in the General and Special Conditions of Contract.

4. The successful Contractor shall submit monthly SMME/Subcontractor reports to the Employer's Agent as follows:

- Status of progress against the Subcontracting Plan (described above), to the approval of the Employer's Agent
- Subcontractor *domicilium* and registered address of business, as well as ongoing status of compliance with all applicable legal requirements.
- Name of Subcontractor and BBBEE status
- Area and location of project
- Scope of work issued to the Subcontractor
- Value of the work issued (this information must be submitted in a format that is readily auditable)
- Monthly payments made to the subcontractor (this information must be submitted in a format that is readily auditable)
- Assistance provided to the Subcontractor e.g. advance payments, acquisition of materials, machinery, tools, etc.
- Performance of the Subcontractor, with evidence to support this performance assessment.

5. Upon completion of the project, the Contractor is required to provide a final report to JW on skills transferred to / acquired by the Subcontractor(s) engaged on the Project, description and value of work performed, as well as their overall performance. This report must be issued to JW to enable a Certificate of Completion to be issued.

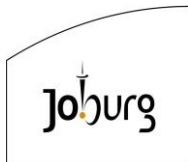
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6. The Contractor shall also indicate whether the experience gained by the Subcontractor is sufficient to assist the Subcontractor to improve their CIDB grading, with full details of supporting information.

C1.2.1.2.15 Competent Employees

Competent Employees	Qualifications	Experience
Contracts Manager	Minimum Qualifications of Contracts Manager: BSc or BEng or B.Tech in Engineering (Civil/Mechanical) plus professional registration.	Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 20Mℓ/d (each), with a construction value of R80m ex VAT (each).
Site Manager / Site Agent	Minimum Qualifications of Site Manager: National Diploma or BSc or BEng Engineering (Civil/Mechanical) AND <ul style="list-style-type: none"> Registered as a Candidate Professional in the Built Environment (ECSA or SACPCMP), or more. 	Experience on two or more Electro-Mechanical projects for waste or potable water treatment projects with capacity of at least 10Mℓ/d (each), with a construction value of R50m ex VAT (each).
Mechanical Engineering Senior Foreman	Minimum Qualifications of Senior Foreman: National Diploma or BSc or BEng Engineering (Mechanical), or higher	Experience on three or more Electro-Mechanical projects for waste or potable water treatment projects with a capacity of at least 10Mℓ/d (each).
Civil Engineering Senior Foreman	Minimum Qualifications of Senior Foreman: National Diploma or BSc or BEng Engineering (Civil), or higher	Experience on three or more Civil/ Electro-Mechanical projects for waste or potable water treatment projects with a capacity of at least 10Mℓ/d (each).
Electrical/C&I Engineering Senior Foreman	Minimum Qualifications of Senior Foreman: National Diploma or BSc or BEng Engineering (Electrical or C&I), or higher	Experience on three or more Electro-Mechanical projects for waste or potable water treatment projects with a capacity of at least 10Mℓ/d (each).
Safety Officer	Minimum Qualifications of Safety Officer National Diploma (Safety	Minimum 5 years in any related projects (post-graduation) will be considered.

Employer:		Contractor:	
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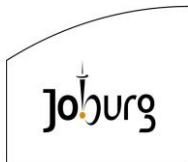


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	<p>Management) / National Diploma (Environmental Health / Environmental Science / Environmental Management) / SAMTRAC / SHEOMTRAC / SHEMTRAC / MESHTRAC / NEBOSH / Safety Officers Course (NQF 5) or more,</p> <p>AND</p> <ul style="list-style-type: none">• Proof of professional registration application.	
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Johannesburg Water (SOC) Ltd



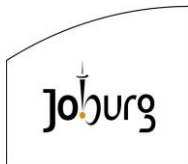
CONTRACT NO. JW14425

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VOLUME 1

PART 1.3: FORMS AND SECURITIES

Employer:		Contractor:	
Witness:		Witness:	



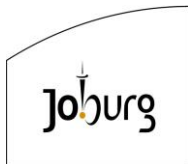
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C1.3 FORMS AND SECURITIES

FORMS FOR COMPLETION BY THE CONTRACTOR

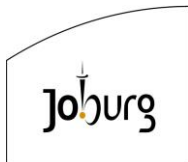
THE FOLLOWING FORMS ARE TO BE COMPLETED BY THE CONTRACTOR AFTER THE TENDER HAS BEEN AWARDED TO THE SUCCESSFUL TENDERER

- a) Form of Guarantee
- b) Blasting Indemnity
- c) Agreement in terms of the Occupational Health and Safety Act
- d) Occupational Health And Safety Indemnity Undertaking

The forms will be completed by the Contractor who will be instructed to do so in the Form of Acceptance. The completed forms will become part of the Contract.

The Form of Guarantee is a pro forma document. The Contractor will provide an original document, from a financial institution, with the same text within the time stated in the Contract Data. Only a Bank or approved Insurance Company or Guarantee Corporation is acceptable as Guarantor.

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C1.3.1 Form of Guarantee

TO BE PRINTED ON THE OFFICIAL LETTERHEAD OF THE GUARANTOR.

FORM OF ON DEMAND GUARANTEE IN RESPECT OF PERFORMANCE

GUARANTEE REFERENCE NUMBER: [*]**

FORM OF ON DEMAND PERFORMANCE GUARANTEE

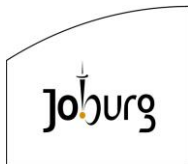
Whereas [insert the full name of the *Employer*], registration number: [insert registration number], of [insert full physical address] (the "*Employer*") has awarded a contract for [insert a detailed description of the contract], under contract number: [insert details] (the "*Contract*"), to [insert full names of the *Contractor*], registration number [insert details], of [insert full physical address] (the "*Contractor*").

And whereas the Contract requires the *Contractor* to provide to the *Employer* an on-demand performance guarantee for the due and proper performance by the *Contractor* of its obligations in terms of the Contract.

Now therefore: [insert full names of the *Guarantor*], registration number [Insert details], of [insert the full physical address] (the "*Guarantor*"), duly represented by the undersigned: [insert the full names of the signatory], and [insert the full names of the signatory], acting herein in their respective capacities as: [insert full title] and [insert full title] respectively, of the *Guarantor*, and being duly authorized to sign this on demand performance guarantee (this "*Guarantee*") and to incur obligations in relation thereto, in the name, and on behalf, of the *Guarantor* under, and in terms of, a Resolution of the Board of Directors or other written authority of the *Guarantor*, hereby irrevocably and unconditionally guarantees and undertakes that:

1. The *Guarantor* shall pay to the *Employer* on demand any sum or sums not exceeding the following aggregate amount: R [insert the amount] (the "*Guaranteed Amount*") on presentation of a written demand signed by the *Employer* (the "*Demand*"), supported by a written statement signed by the *Employer* certifying that the *Contractor*, in the opinion of the *Employer* as at the date of issue of such Demand, is in breach of its obligations under the Contract or that a defect had occurred following the performance by the *Contractor* of its obligations under the Contract, and without being required to prove or set out the nature of any such breach or defect.
2. Neither the failure of the *Employer* to enforce strict or substantial compliance by the *Contractor* with its obligations under the Contract nor any act, conduct or omission by the *Employer* prejudicial to the interests of the *Guarantor* will discharge the *Guarantor* from liability under this Guarantee.

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Witness:		Witness:	



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3. This Guarantee:

3.1 automatically comes into full force and effect on the date of signature hereof by the Guarantor.

3.2 automatically expires, whether or not returned to the Guarantor at the earlier of:

3.2.1 [the *defects date*; or]

3.2.2 90 (ninety) calendar days after the date of termination of the Contract, as notified in writing to the Guarantor by the *Employer*; or

3.2.3 **[insert time]** (Central African Time), at the abovementioned address of the Guarantor on **[insert date]**,

(the “**Expiry Date**”);

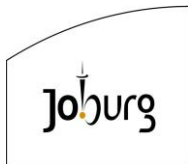
3.3 constitutes the primary obligations of the Guarantor and exists independently of the Contract or any amendment, variation or novation thereof; and

3.4 is governed by the laws of the Republic of South Africa and any dispute arising hereunder shall be subject to the jurisdiction of the South African courts. In respect of such proceedings, each of the Parties specifically consents to the non-exclusive jurisdiction of the High Court of South Africa (Gauteng Local Division, Johannesburg).

4. Any Demand must be presented at the aforementioned address of the Guarantor on or before the Expiry Date. After the Expiry Date, this Guarantee shall become null and void, whether returned to the Guarantor for cancellation or not and any Demand received after the Expiry Date shall be ineffective.

5. The *Employer* may require the *Contractor* to extend this this Guarantee or replace it if the guarantee sum has not been paid in full by the date 28 days prior to the Expiry Date. If the guaranteed sum has not been paid in full by the date 28 days prior to the Expiry Date, and the guarantee has not been extended, the Guarantor unconditionally undertakes to pay to the *Employer* any amounts which the *Contractor* has not repaid (subject to the guaranteed sum) upon receipt by the *Employer*, within such 28 day period, of written demand for payment made in accordance with the terms of the advance payment guarantee.

Employer:		Contractor:	
Witness:		Witness:	



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6. Payments made in terms of this Guarantee shall be in cash, free of any set-off, withholding, counterclaim or deduction of any nature whatsoever.
7. This Guarantee is transferable by the *Employer*, and the Guarantor consents to any transfer of this Guarantee by the *Employer* to any of its affiliates or any other person. This Guarantee is restricted to the payment of a sum of money only and limited to an aggregate amount equal to the Guaranteed Amount.
8. The Guarantor warrants that it has the power and has taken all action and obtained all licenses and approvals required for it, to grant and perform its obligations in terms of this Guarantee.
9. The Guarantor acknowledges that the *Employer* may make multiple demands under this Guarantee provided that the aggregate amount paid by the Guarantor in terms of this Guarantee shall not, at any time, exceed the Guaranteed Amount.
10. The Guarantor's obligations under this Guarantee are of a primary, independent nature and are not ancillary, accessory nor of a collateral nature, to the Contract. Any reference in this Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.
11. For the purposes of this Guarantee, the abovementioned address of the Guarantor shall be its *domicilium citandi et executandi* for all purposes in connection with this Guarantee.

SIGNED at _____ on this day of _____ 20____

Witnesses:

1.

For: **[insert name of the Guarantor]**

duly authorized and warranting such authority Full Name:

Capacity:

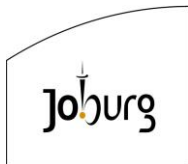
2.

For: **[insert name of Guarantor]**

duly authorized and warranting such authority Full Name:

Capacity:

Employer:		Contractor:	
Witness:		Witness:	



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C1.3.2 Blasting Indemnity

Given by

*Company Registration No.

Address

a *Company incorporated with limited liability according to the company laws of the Republic of South Africa, *Partnership, *Close Corporation, *Public Company (hereinafter called the Contractor), represented herein by

_____ in his
capacity as the Contractor's

_____ duly authorised hereto by a resolution
of the Contractor dated

_____ a certified copy of which resolution is
attached to this Indemnity.

WHEREAS the Contractor has entered into a Contract with the Johannesburg Water (SOC) Ltd (hereinafter called the Employer) for,

_____ and the Company requires this Indemnity from the Contractor

NOW THEREFORE THIS DEED WITNESSETH that the Contractor does hereby indemnify and hold harmless the Company in respect of all loss or damage that may be incurred or sustained by the Employer by reason of or in any way arising out of or caused by blasting operations that may be carried out by the Contractor in connection with the aforementioned Contract and also in respect of all claims that may be made against the Employer in consequence of such blasting operations, by reason of or in any way arising out of any accidents or damage to persons, life or property or any other cause whatsoever, and also in respect of all legal or other expenses that may be incurred by the Employer in examining, resisting or settling any such claims; for the due performance of which the Contractor binds itself according to law.

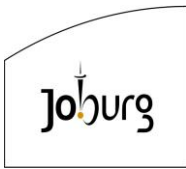
THUS DONE AND SIGNED for and on behalf of the Contractor at
_____ on the

_____ day of _____ 20_____ in the
presence of the subscribing

witnesses.

\

Employer:		Contractor:	
Witness:		Witness:	



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As witnesses

1. _____

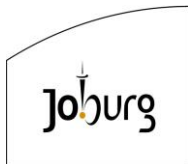
2. _____

Signature

Duly authorised to
sign on behalf of

Address

Employer:		Contractor:	
Witness:		Witness:	



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C1.3.3 Health and Safety Contract Between Employer and Contractor In Terms of Section 37(2) Of The Occupational Health and Safety Act No 85 Of 1993

Written agreement between Johannesburg Water ((Proprietary) Limited (hereinafter referred to as “the Employer) and _____ (hereinafter referred to as “the mandatory”) as envisaged by Section 37(2) of the Occupational Health and Safety Act, No. 85, of 1993 as amended.

I _____
representing

_____ (mandatory) do
hereby acknowledge that

_____ (mandatory) is an employer in its own right and shall be regarded as the employer for purposes of the contract work specified in the body of the principal agreement with duties as prescribed in the Occupational Health and Safety Act, No. 85 of 1993 as amended so as to ensure that all work will be performed or machinery and plant used in accordance with the provisions of the said Act. I furthermore agree to comply with the requirements of the Employer as contained in the Occupational Health and Safety Specification included with the principal agreement and to liaise with the employer should I, for whatever reason, be unable to perform in terms of this agreement.

Signed this _____ day of _____ at _____

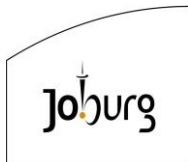
Signature on behalf of mandatory _____

Signature on behalf of Employer _____

Compensation Fund Registration No. of mandatory _____

Good Standing Certificate : ☐ yes ☐ no (tick one box)

Employer:		Contractor:	
Witness:		Witness:	



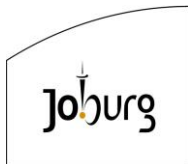
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C1.3.4 Health and Safety Contract: General Information

1. The Occupational Health and Safety Act comprises Sections 1 to 50 and all un-repealed regulations promulgated in terms of the former Machinery and Occupational Safety Act No 6 of 1983 as amended, as well as other regulations which may be promulgated in terms of the OHS Act.
2. 'Mandatory' is defined as including an agent, a contractor or a subcontractor for work, but without derogating from his status in his own right as an employer or user of plant and machinery
3. Section 37 of the Occupational Health and Safety Act potentially punishes employers (principals) for the unlawful acts or omissions of mandataries (contractors) save where a written agreement between the parties has been concluded containing arrangements and procedures to ensure compliance with the said Act by the mandatory.
4. All documents attached or referred to in the above agreement form an integral part of the agreement.
5. To perform in terms of this agreement mandataries must be familiar with the relevant provisions of the Act.
6. Mandataries who utilise the services of their own mandataries (subcontractors) are advised to conclude a similar written agreement.
7. Be advised that this agreement places the onus on the mandatory to contact the Employer in the event of inability to perform as per this agreement. The Employer, however, reserves the right to unilaterally take any steps as may be necessary to enforce this agreement.
8. The contractor shall be responsible for the full and proper implementation of the terms and provisions of the Act and its regulations in the area in which the work is to be undertaken by the Contractor.
9. The Contractor shall be responsible for the well-being, in relation to health and safety, of all persons coming upon or into such area in accordance with that legislation, including the implementation of any directives issued by management of the Employer in this respect.
10. The work to be done is _____
11. The area in which the work is to be conducted is _____
12. The Contractor shall familiarise himself with such area and all risks existing thereon and undertakes to report to the representative of the Employer any hazard or risk to health and safety which arises during the contract work in the area concerned and over which the Contractor may have no control. All necessary and appropriate safety / health equipment shall be issued by the Contractor to all persons working on or coming into the area.

Employer:		Contractor:	
Witness:		Witness:	



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C1.3.4.1 Occupational Health and Safety Indemnity Undertaking

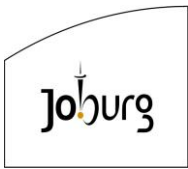
I, the undersigned _____

in my capacity as _____

of the firm _____

1. Hereby undertake to ensure that I/my firm and/or employees and/or subcontractors and/or his employees -
 - 1.1 comply strictly with the provisions of the Occupational Health and Safety Act of 1993 (as amended) and/or the regulations promulgated in terms thereof, with specific reference to section 37(2) of the said act, as well as any relevant legislation, in the course of the performance/execution of any service and/or work in, to or on any of the Employer's buildings, construction sites and/or premises;
 - 1.2 ensure that consultants and/or visitors comply with any instructions and measures relating to occupational health and safety, as prescribed by the Employer; and
 - 1.3 comply strictly with the statutorily prescribed work systems, operational equipment, machinery and occupational health and safety conditions;
2. And as an independent employer and contractor, hereby indemnify, in terms of the above undertakings, the Employer -
 - 2.1 in respect of any costs that I/my firm and/or employees and/or subcontractors and their employees may incur of necessity in compliance with the above undertakings; and
 - 2.2 against any claims that may be instituted against the Employer and/or any liability that the Employer may incur, whether instituted and/or caused by me/my firm's employees, agents, consultants, subcontractors and/or their employees and visitors or the Employer's clients or neighbours in respect of any incidents related to my/my firm's activities and as a result of which the occupational health and safety of the persons involved have been detrimentally affected; and
 - 2.3 against similar claims that I, managers or directors of my firm may have against the Employer and any damages for which I, managers or directors of my firm hold the Employer liable.
3. My firm's compensation commissioner number is _____
and I confirm that my firm and its subcontractors' fees have been paid up and obligations in respect of the compensation commissioner have been complied with and further that I shall furnish proof thereof in writing on request.
- 4.0 I hereby confirm that I have the authority to sign this indemnity undertaking and that the Employer is not obliged to confirm such confirmation.

Employer:		Contractor:	
Witness:		Witness:	



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Signed at _____ This _____ day
of _____

Signature

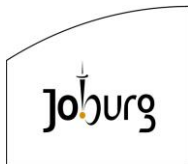
Capacity

As witnesses:

1

2

Employer:		Contractor:	
Witness:		Witness:	



Johannesburg Water (SOC) Ltd



CONTRACT JW14425

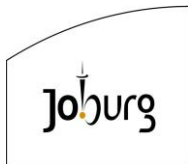
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PART 2: PRICING DATA

Employer:		Contractor:		
Witness:		Witness:		



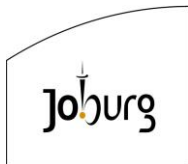
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Witness:		Witness:		



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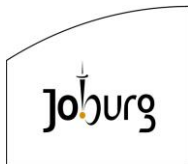
C2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

C2.1.1 General Preamble to the Bill of Quantities

- a) **The Contract is to be constructed by maximising the use of labour (where feasible). In cases where the use of plant is required, the Contractor must motivate and obtain written permission before the work is undertaken with plant. Payment will not be made for unauthorized use of plant to carry out work.**
- b) All items in the Bill of Quantities, except where otherwise specified in Clause 8 of a Standardised Specification or in the Project Specification, shall be measured and shall cover operations as recommended in the standard system of measurement of civil engineering quantities, published under the title "Civil Engineering Quantities", by the South African Institution of Civil Engineering.
- c) The basis and principles of measurement and payment are described in this section (Pricing Instructions) and Clause 8 of each of the Standardised Specifications for Civil Engineering Construction. The applicable SANS 1200 Standardised Specifications are listed in the Scope of Work, Portion 1: Project Specification. Portion 2: comprises the Technical specifications for the works of each discipline in this contract.
- d) Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each Standardised Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardised Specification or the Scope of Work, conflict with the terms of the Bill of Quantities, the requirements of the Standardised Specification or Scope of Work, as applicable, shall prevail.
- e) The clauses in a specification in which further information regarding the Schedule item may be found are listed in the "Payment Refers" column in the Schedule. The reference clauses indicated are not necessarily the only sources of information in respect of listed items. Further information and specifications may be found elsewhere in the Contract Documents. Standardised Specifications are identified by the letter or letters which follow SANS in the SANS 1200 series of specifications, e.g. G for SANS 1200G.
- f) Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
- g) Cable quantities given in the Schedule of Quantities and Cable Schedules have been measured against scaled drawings. It is the contractor's responsibility to measure the exact cable lengths before purchasing / installing cables. All cables will be subject to re-measure by the Employer's Agent once installed. Furthermore, before any material is purchased the contractor must obtain the written permission of the Employer's Agent.
- h) The quantities set out in the Bill of Quantities are the estimated quantities of the Contract Works, but the Contractor shall be required to undertake whatever quantities may be directed by the

Employer:		Contractor:		
Witness:		Witness:		



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Employer's Agent from time to time. The Contract Price for the completed Works shall be computed from the actual quantities of work done, valued at the relevant unit rates and/or prices.

i) The rates and/or prices to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such rates and/or prices shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents, as well as overhead charges and profit. Reasonable charges shall be inserted as these shall be used as a basis for assessment of payment for additional work that may have to be carried out.

j) The units of measurement described in the Bill of Quantities are metric units. Alternatives used are as follows :

mm	=	millimetre	h	=	hour
m	=	metre	kg	=	kilogram
km	=	kilometre	t	=	ton (1000kg)
m ²	=	square metre	No.	=	number
m ² pass	=	square metre pass	sum	=	lump sum
ha	=	hectare	MN	=	meganewton
m ³	=	cubic metre	MN.m	=	meganewton-metre
m ³ km	=	cubic metre-kilometre	PC Sum	=	Prime Cost sum
l	=	litre	Prov Sum	=	Provisional sum
kl	=	kilolitre	%	=	percent
MPa	=	megapascal	kW	=	kilowatt

k) For the purpose of this Bill of Quantities, where applicable, the following words shall have the meanings hereby assigned to them:

Unit : The unit of measurement for each item of work as defined in the SANS Standard Specification for South African National Standards.

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

Rate : The agreed payment per unit of measurement.

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

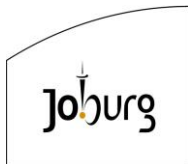
Lump sum : An agreed amount for an item, the extent of which is described in the Bills of Quantities, but the quantity of work of which is not measured in any units.

l) Arithmetical errors in the Bill of Quantities shall be corrected in accordance with Clause C3.9 of the Conditions of Tender. Should there be any discrepancy between rates and/or prices written in the Assessment Schedule and the Bill of Quantities, the latter shall govern.

m) A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price/rate is entered will be considered to be a "nil" price/rate, and deemed to be covered by the other prices in the Schedule.

n) The Bill of Quantities shall be completed by hand in **INK or TYPED**. An electronic version of the BoQ will be made available to all tenderers. Tenderers are permitted to insert rates and prices in the electronic version and submit the completed electronic version of the BoQ as part of their tender pack. Tenderers are to ensure that all line item totals, page totals and summary totals are

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Witness:		Witness:		



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correct, and will remain fully responsible for the priced BoQ that has been submitted. The Employer will accept no responsibility for any errors or omissions in the priced BoQ.

C2.1.2 Special Payment Conditions

This clause shall be read in conjunction with the 'Penalties' clause(s). Where the penalty clause shall always receive precedence over this clause, should it be found that duplicative financial corrective measures exists.

C2.1.2.1 Provided previously

The Contractor shall not re-execute works under this Contract where he has successfully executed works for the Employer under a previous contract(s) that comply with the requirements of this Contract. However, where applicable the Contractor shall:

- a) clearly state this in his qualifications; and
- b) still provide the associated rates and prices in the schedule in the associated line item, but not calculate an associated amount.

The Employer shall at his sole discretion decide to re-execute such works.

C2.1.2.2 Security

The Contractor shall have been deemed to have included all security related costs in the Provisional and General item rates, including allowing for minimum 100% (high risk areas) of the sites requiring security provision for the Employer and Employer's Agent representative(s).

C2.1.2.3 Materials and equipment

The Employer shall not provide any works material and equipment, as this shall be provided by the Contractor and deemed to have been included in his provided activity rates or prices.

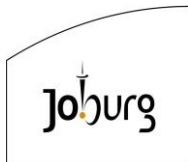
C2.1.2.4 Permits and way-leaves

All associated costs to obtain permits and way-leaves as required for the execution of the works, where such affect other services, shall be deemed to have been included in the scheduled rates for SANS 1200A or SANS 1200AA or SANS 1200AB where pricing provision for such items have been allowed for in the pricing schedules, alternatively it shall be deemed to be included in the various scheduled activity rates or prices provided by the Contractor

C2.1.2.5 Confined space

The Contractor shall note that work activities shall be executed within confined spaces and it shall be deemed that allowance has been made in all activity pricing.

Employer:		Contractor:		
Witness:		Witness:		



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C2.1.2.6 Payment ONLY for works completed

The Contractor shall note that payment shall only be made for Works activities successfully (delivering the end result) executed, complying with the quality requirements and provided to the Employer's Agent or his duly authorised representative.

C2.1.3 Health and Safety

The principal Contractor's health and safety plan has to follow the framework as laid out in the HEALTH AND SAFETY SPECIFICATION AND ENVIRONMENTAL MANAGEMENT PLAN, as a minimum.

No payment shall be applicable where equipment is not provided and services are not rendered in terms of the approved Health and Safety Plan. Additionally, the Contractor shall also be penalised in terms of Clause (30) of the Occupational Health and Safety Act 183 (1993), Construction Regulations (2014).

C2.1.3.1 Compilation of health and safety plan

Unit: Sum

The rate shall include the complete cost for the provision of resources (human and equipment), communication, transportation and travelling, documentation of activities and reporting activities required to compile a Health and Safety Plan as per the Health and Safety Specifications contained in Volume 2, and approval of such plan thereof. Remuneration shall be a lump sum.

C2.1.3.2 Implementation of health and safety plan

Unit: Sum

The rate shall include the complete cost for the provision of resources (human and equipment), communication, transportation and travelling, documentation of activities and reporting activities required to fully comply with the implementation and maintenance of the Health and Safety Plan. Remuneration shall be on a monthly basis for services rendered, by dividing the total sum tendered by the construction duration.

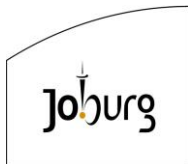
Safety officer

Unit: Sum

The rate shall include the wages and salary that is to be paid to the safety officer/s, whose responsibility it is to ensure that all activities required fully comply with the Health and Safety Plan as per the Health and Safety Specifications contained in the relevant Volume for the duration of the Contract. The rate shall be on a monthly basis for services rendered, by dividing the total sum tendered by the construction duration.

NOTE: The Contractor shall clearly state the number of Health and Safety officers in the provided space in the Bill of Quantities that he has allowed for in his price. Where no number is provided the Employer shall assume that adequate provision, minimum one (1) per site, has been made to implement the provided Health and Safety Plan successfully.

Employer:		Contractor:		
Witness:		Witness:		



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C2.1.4 EMP Implementation and Maintenance

Unit: Sum

The rate shall include the complete cost for the provision of resources (human and equipment), communication, transportation and travelling, documentation of activities and reporting activities required to fully comply with the implementation and maintenance of the EMP contained in the relevant Volume for the duration of the Contract. Remuneration shall be on a monthly basis for services rendered, by dividing the total sum tendered by the construction duration.

No payment shall be applicable where equipment is not provided and services are not rendered in terms of the approved EMP.

C2.1.5 Subcontracting

C2.1.5.1

The Contractor shall ensure that rates that are tendered (during Tender Stage) for work items that are likely to be Subcontracted, are market related rates. Provision is made in the Bill of Quantities (BoQ) for the Contractor to add a mark-up for the sourcing, handling, and management of Subcontractors, SMME's, and the like, for the duration of the Contract.

C2.1.5.2

On or during appointment of Subcontractors, should Subcontractors prove that rates, that have been tendered by the Contractor for BoQ work items that are being subcontracted, are not market related, the Contractor will be liable to cover the cost of the difference, i.e. the difference in rate tendered by the Contractor versus the rate that is being requested by the Subcontractor. This difference in cost will be for the Contractor's account, and no Variation Orders for additional costs will be entertained by the Employer. The Contractor bears the full and complete risk for the rates that have been tendered by the Contractor during Tender Stage.

C2.1.5.3

In the event that a rate supplied by the Contractor for a specific BoQ work item is not sufficient to cover Subcontractor costs/rates for that specific item, the Contractor shall provide a detailed rate breakdown for that specific BoQ item (and each and every subsequent BoQ work item where the rate is not sufficient to cover Subcontractor cost); and shall indicate costs (amongst others) for labour, material, handling, mark-ups, etc. to prove that the rate that was submitted during tender stage was in fact market related; and in balance with other rates that were submitted for work items that will not be undertaken by Subcontractors.

Employer:		Contractor:		
Witness:		Witness:		

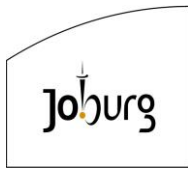
C2.1.5.4

Should any delays be experienced during the period of the Contract due to the appointment of subcontractors by the Contractor, work stoppages by subcontractors, industrial action by subcontractors, etc., such delays shall be assigned to the Contractor, and no claims for Extension of Time will be entertained by the Employer

C2.1.6 Recommended Labour-Intensive Tasks (to be used where necessary, with prior approval of the Employer's Agent)

ACTIVITY	TOOLS	TASK
Bush clearing	Axe, saw, rope	Medium dense bush (4 to 7 bushes per 100 m ²) 350 m ² /md Dense bush (10 to 15 bushes per 100 m ²) 200 m ² /md Very dense bush (20 to 30 bushes per 100 m ²) 100 m ² /md
Grass clearing	Slasher, spade, hoe, fork, rake.	Dense grass 85 m ² /md
Stripping ground cover and grubbing out roots, haul to nearby dump and spread	Pick, shovel, fork, rake	Light vegetation, dig to 50 mm deep 150 m ² /md Medium vegetation, dig to 100 mm deep 75 m ² /md Heavy vegetation, dig to 150 mm deep 40 m ² /md
Grubbing out roots to 250 mm deep	Pick, shovel, fork, rake	Dig in soft ground to remove roots 42 m ² /md
Destumping (removal of stumps large roots)	Pick, shovel, axe	Medium dense bush 60 m ² /md
Removal of bush and tree cuttings	Bush hook, rope, axe, saw	Cut, bundle and load branches, tree trunk pieces, other vegetation 8 m ³ /md
Boulder removal	Crowbar	Daily paid
Excavation (measured in place)		Throwing distance: up to 4 m 4 to 6 m
Loose soil	Shovel	5 to 6 m ³ /md 4.5 to 5 m ³ /md
Sticky soil	Spade, fork, forked hoe	2 to 3 m ³ /md 1.5 to 2 m ³ /md
Firm soil	Pick, shovel, spade, hoe	3 to 4.5 m ³ /md 2.5 to 4 m ³ /md
Hard stony gravel	Pick, shovel, crowbar	1.5 to 2 m ³ /md 1 to 1.5 m ³ /md

Employer:		Contractor:		
Witness:		Witness:		

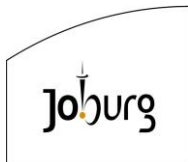


Contract: JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
Volume 1 Tender and Contract
Section C2 Pricing Data



Loading (measured loose) into: Wheelbarrow Trailer Truck		Shovel		Loose soil or gravel: 12 to 15 m ³ /md 7 to 10 m ³ /md 4 to 6 m ³ /md			
Wheel-barrow haul (measured loose; haul and unload only)	Wheelbarrow (Note production increases 30% for good haul route and decreases 30% for poor haul route)	Equivalent haul distance = length + 10(rise + fall)			Production in loose m3/md over average haul route		
		20 m			4.44		
		40			3.16		
		60			2.44		
		80			2.00		
		100			1.70		
		120			1.44		
		140			1.28		
		160			1.15		
		180			1.02		
		200			0.95		
Levelling roadbed (measured loose)	Shovel, spreader 60 m ² /md		60 m ² /md				
Picking loose roadbed (bank m ³)	Pick, shovel, fork		40 m ² /md				
Spreading loose material (loose m ³)	Shovel, spreader, hoe		Soil	12 loose m ³ /md			
			Gravel	10 loose m ³ /md			
Watering, mixing, spreading and levelling	Shovel, spreader, hoe, string-lines, water bowser		Sandy soil	4.5 m ³ /md			
			Gravel	3 m ³ /md			
			(measured tight after compaction)				
Compaction and re- levelling	Roller, string lines, straightedge, shovel, spreader.		Depends upon chosen roller (see below)				
Compaction by pedestrian-controlled double drum vibro-roller	"Stampede" rollers: R75/50 S R90/55 S		Mass kg 980 1 350	Passes 5 4	Layer 100 mm 100 mm	Output 8 m ³ /h 13 m ³ /h (tight)	
Loosen material in trench with pneumatic tools	Compressor, pneumatic tools, team of 4 people		Intermediate	19 m ³ for team			
			Rock	12 m ³ for team			
Screen bedding material	Sieve, shovel		7 m ³ loose /md				
Offload flat-bed truck or trailer	Shovel		15 m ³ loose /md				
Trench backfill, hand compaction	Shovel, spreader, hand- stamper, watering can		Backfill, compact, clean-up and load spoil	4.5 m ³ /md			
Collecting loose stone	Gloves, wheelbarrows		Up to 20 m	2.5 m ³ /md			
			20 to 50 m	2.0 m ³ /md			
Quarrying, prying out cracked rock	Crowbar, gloves, sledgehammer.		Up to 20 m	0.5 to 1 m ³ /md			
Rock crushing	New Dawn Engineering hand-turned rock		0.25 m ³ /md (depends on size of feed- stock and size of product)				

Employer:		Contractor:		
Witness:		Witness:		



Contract: JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
Volume 1 Tender and Contract



Section C2 Pricing Data

	crusher, shovel	
Backfill trench and compact	Shovel, watering can, hand stamper	3.0 m ³ /md
Lay kerbing on level base	Shovel, rubber mallet, string-line, trowel, wheelbarrow	Straight 6.5 to 10.0 m/md Curved 2.0 to 5.0 m/md
Stone pitching: Plain stone pitching	Club hammer, gloves, string-line, shovel, wheelbarrow, stiff broom, pliers, short crowbar	10 to 15 m ² /md, 200 mm thick
Grouted stone pitching		6 to 10 m ² /md, 200 mm thick
Wired and grouted stone pitching		3 to 5 m ² /md, 200 mm thick
Block paving: placing bedding sand, laying blocks, compacting, joint filling, clean up	Shovel, screed rails and beam, rubber mallet, plate compactor, bass broom, wheelbarrow, gloves	16 to 20 m ² /md
Stormwater drainage pipes: trimming, bedding, laying, backfilling, compaction	Shovel, rake, boning rods, hand stamper, watering can, rope and ground anchors	450 mm dia concrete: 1.2 m/md (needs team of 10) 600 mm dia concrete: 1.0 m/md (needs team of 10) 450 mm dia plastic: 3.5 m/md (needs team of 5)
Concrete base slab: batch, mix, transport, pour and finish off	Batching boxes, wheelbarrow, shovel, screed beam, wood float	0.8 m ³ /md (needs team of 5)
Stone masonry walls	Wheelbarrow, shovel, trowel, club hammer, string line, spirit level, batching box.	1.0 m ³ /md
Gabion work	Gloves, string-line, shovel, wheelbarrow, pliers, short crowbar	1.5 m ³ /md

ABBREVIATIONS USED

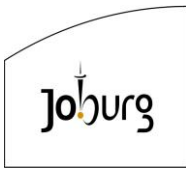
md = man-day

dia = diameter

Source :

Construction Education and Training Authority, Learning Material for Unity Standard 15165: "Use LIC"

Employer:		Contractor:		
Witness:		Witness:		

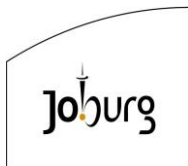


Contract: JW14425
BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
Volume 1 Tender and Contract
Section C2 Pricing Data



C2.2 BILL OF QUANTITIES

Employer:		Contractor:		
Witness:		Witness:		



Johannesburg Water SOC Ltd



**BUSHKOPPIE WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN**

VOLUME 2

PART 4: SITE INFORMATION

Employer:		Contractor:	
Witness:		Witness:	

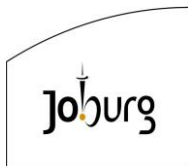
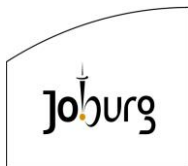


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4. Existing SERVICES, SERVITUDES and wayleaves	S.3
5. Security	S.3
6. Geotechnical investigation.....	S.3
7. Topographical survey	S.3

Employer:		Contractor:	
Witness:		Witness:	



C4: SITE INFORMATION

1. GENERAL

This section describes the site at the time of tender to enable the Contractor to price their tender, decide upon their method of working, as well as their programming and risks.

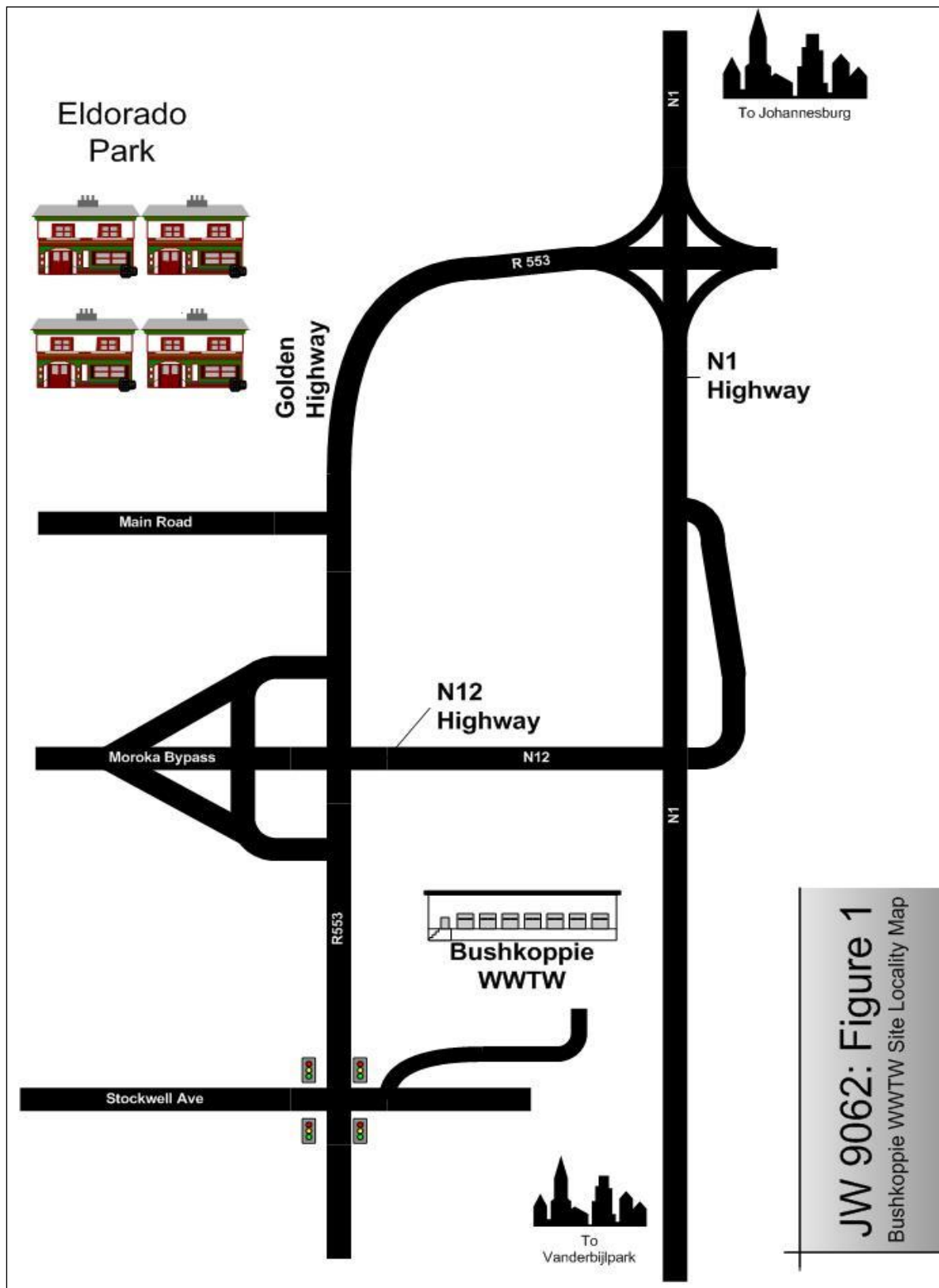
2. SITE LOCATION

The Bushkoppie Wastewater Treatment Works is located South of the N12 and West of the N1 Freeways, between Eldorado Park and Soweto.

The following site conditions shall be taken into consideration in the design and selection of equipment:

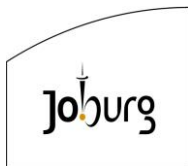
Altitude above sea level.....1625 m
Peak temperature.....40°C
Average maximum temperature.....35°C
Minimum temperature.....-5°C
Relative humidity.....71% at 13°C
Lightning.....Severe
Corrosion.....Severe
Atmosphere.....Dusty

Employer:		Contractor:	
Witness:		Witness:	



JW 9062: Figure 1
Bushkoppie WWTW Site Locality Map

Employer:		Contractor:	
Witness:		Witness:	



3. ACCESS TO SITE AND RESTRICTIONS

Treatment Works is located south of the N12 and west of the N1 Freeways, between Eldorado Park and Soweto, approximately 1 kilometre to the southeast of the N12 and Golden Highway (R553) intersection.

The Treatment Works is a fully functional Plant and as such its operation must not be jeopardised at any time.

The Contractor may not operate any valves, sluice gates or any other equipment currently in use on the works without written permission from the Works Manager.

4. EXISTING SERVICES, SERVITUDES AND WAYLEAVES

No permits or wayleaves will be required.

5. SECURITY

The Bushkoppie Wastewater Treatment Works is a security area and the Contractor shall ensure that the boundary fencing remains intact at all times. The Contractor shall make all necessary arrangements with the Works Manager to facilitate controlled entry of personnel, plant and material to the Site.

6. GEOTECHNICAL INVESTIGATION

The existing ground and soil conditions are presented in the Geotechnical Report which was undertaken for the site (see attached).

It shall be the Contractor's responsibility to ensure that he acquaints himself with all necessary documentation in order to accurately compile his bid.

7. TOPOGRAPHICAL SURVEY

A detailed topographical survey was prepared for the site and is in the possession of the Employer's Agent. This information can be requested if required, as it shall be the Contractor's responsibility to ensure that he acquaints himself with all necessary documentation in order to accurately compile his bid.

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1.1	SANS 1200A	FIXED CHARGE AND VALUE RELATED ITEMS				
	8.3.1	Contractual Requirements				
1.1.1		Surety or bank guarantee	Sum	1		
1.1.2		Insurance of Works	Sum	1		
1.1.3		Common Law Liability insurance	Sum	1		
1.1.4		Third Party insurance	Sum	1		
1.1.5		Insurance of construction plant and equipment	Sum	1		
1.1.6		Design and Drawings	Sum	1		
1.1.7		Other (Detail)	Sum	1		
		(.....)				
1.1.8		Advance Payment Guarantee or Other Forms of Guarantee that may be required, to the value of R5 million	Sum	1		
		Forward cover				
1.1.9		In respect of the total value of imported content of goods used in the Treatment Works from page RD72 Imported Content Sheet: R				
1.1.10		Allow a Provisional Sum to cover variation in exchange rate prior to obtaining forward cover. Tenderer is to insert an amount = 20% of the above amount from Item 1.1.9	Prov. Sum	1		
1.1.11		Allow a Provisional Sum to cover the cost of forward cover. Tenderer is to insert an amount = 10% of the above amount from Item 1.1.9	Prov. Sum	1		
1.1.12		Allowance as a percentage of the PC value of Items under 1.1.10 and 1.1.11 for Contractor's cost and profit. Tenderer to insert summed rate and state percentage.	%			
	SANS 1200A	Establish Facilities on the Site				
	8.3.2.1	Facilities for the Engineer				
1.1.13	PSAB	(c) Nameboards (2 No) (PSAB 3.1)	Sum	1		
1.1.14	8.3.9	(g) Survey instruments	Sum	1		
1.1.15	PSA 8.3.11	Services for offices	Sum	1		
1.1.16	8.8.7	(h) Construction and setting out of survey beacons	No.	8		
1.1.17	PSAB 8.3.13	(i) Personal Protection Equipment	Sum	1		
	SANS 1200A	Facilities for the Contractor				
1.1.18	8.3.2.2	(a) Offices and storage sheds	Sum	1		
1.1.19		(b) Workshops	Sum	1		
1.1.20		(c) Laboratories	Sum	1		
1.1.21		(d) Living accommodation	Sum	1		
1.1.22		(e) Ablution and latrine facilities	Sum	1		
SUB-TOTAL CARRIED FORWARD						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		<i>brought forward</i>				
1.1.23		(f) Tools and equipment	Sum	1		
1.1.24		(g) Water supplies, electric power & communications	Sum	1		
1.1.25		(h) Dealing with water	Sum	1		
1.1.26		(i) Access	Sum	1		
1.1.27		(j) Plant	Sum	1		
1.1.28	8.3.3	Other fixed charge obligations	Sum	1		
1.1.29	8.3.4	Removal of site establishment	Sum	1		
1.1.30		Compliance with the Occupational Health and Safety Act and Specification	Sum	1		
1.1.31		Compliance with the Environmental Management Plan	Sum	1		
1.1.32		Hazard Identification and Risk Assessment (OHS Spec Clause 4.1)	Sum	1		
1.1.33		Health & Safety Plan (PS 7)	Sum	1		
1.1.34		Construction Safety Officer and other appointments (OHS Spec Clause 4.3)	Sum	1		
1.1.35	PSA 8.3.1	Work Skills Plan and Implementation Report to CETA	Sum	1		
1.1.36		Pre-employment medical examination (Clause 3.1 Annexure 2 of OHS Specification), including annual medicals and certificates, and exit medicals	Sum	1		
1.1.37		Provision of Operating and Maintenance Manuals (Full version and Summary version for daily operator use)	Sum	1		
1.1.38		Quality Control Plan and Compliance	Sum	1		
1.2	SANS 1200A	TIME RELATED ITEMS				
	8.4	Contractual Requirements				
1.2.1	8.4.1	Surety or bank guarantee	Sum	1		
1.2.2		Insurance of works	Sum	1		
1.2.3		Common Law Liability insurance	Sum	1		
1.2.4		Third Party insurance	Sum	1		
1.2.5		Insurance of construction plant and equipment	Sum	1		
1.2.6		Other (Detail)	Sum	1		
	8.4.2	Operate and Maintain Facilities on the Site				
	8.4.2.1	Facilities for Engineer for the Duration of Construction				
1.2.7		(c) Nameboards (2 No.)	Sum	1		
1.2.8	8.3.9	Survey instruments	Sum	1		
1.2.9	8.3.10	Survey assistants and materials	Sum	1		
1.2.10	8.3.11	Services for offices	Sum	1		
1.2.11	8.3.12	Treatment and maintenance of areas surrounding offices	Sum	1		
SUB-TOTAL CARRIED FORWARD						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		<i>brought forward</i>				
	8.4.2.2	Facilities for Contractor for the Duration of Construction				
1.2.12		(a) Offices and storage sheds	Sum	1		
1.2.13		(b) Workshops	Sum	1		
1.2.14		(c) Laboratories	Sum	1		
1.2.15		(d) Living accommodation	Sum	1		
1.2.16		(e) Ablution and latrine facilities	Sum	1		
1.2.17		(f) Tools and equipment	Sum	1		
1.2.18		(g) Water supplies, electric power and communications, dealing with water and access	Sum	1		
1.2.19		(h) Dealing with water	Sum	1		
1.2.20		(i) Access	Sum	1		
1.2.21		(j) Plant	Sum	1		
1.2.23	PSA 8.4.2	(k) Dust suppression	Sum	1		
1.2.22		Other time-related obligations				
		.....	Sum	1		
		.....	Sum	1		
1.2.24	8.4.3	Supervision for duration of construction	Sum	1		
1.2.25		Project Management for the duration of the Contract	Sum	1		
1.2.26		Quality Assurance and Quality Control	Sum	1		
1.2.27		Servicing Visits during Defects Liability Period	No.	4		
1.2.28	8.4.4	Company and head office overhead costs for the duration of the contract	Sum	1		
1.2.29	8.4.5	Other time-related obligations (list)	Sum	1		
					
		Security for the duration of the contract				
1.2.30		Dayshift (12 hours) - 6 no. of armed guards (grade of guard to be determined by Contractor, appropriate for the assignment at hand), including patrol vehicles (if required) for the duration of the contract	Months	36		
1.2.31		Nightshift (12 hours) - 6 no. of armed guards (grade of guard to be determined by Contractor, appropriate for the assignment at hand), including patrol vehicles (if required) for the duration of the contract	Months	36		
1.2.32		Compliance with the Occupational Health and Safety Act and Specification (Including compliance with COVID-19 Regulations)	Sum	1		
1.2.33		Construction Safety Officer and Other Appointments	Sum	1		
1.2.34		Hazard Identification and Risk Assessment (OHS Spec Clause 4.1)	Sum	1		
1.2.35		Compliance with the Environmental Management Plan and Vegetation Management Plan	Sum	1		
1.2.36	PSA 8.3.1	Workplace Skills Plan and Implementation Report to CETA	Sum	1		
1.2.37		Quality Control Plan and Compliance	Sum	1		
SUB-TOTAL CARRIED FORWARD						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		<i>brought forward</i>				
1.3	8.5	SUMS STATED PROVISIONALLY BY ENGINEER				
1.3.1	8.5(b)(1)	Cell phones (1) and Contract (1), including data, for the duration of the contract	Prov. Sum	1	R180 000.00	R180 000.00
1.3.2		Stationery, equipment and software required by Engineer and his staff	Prov. Sum	1	R100 000.00	R100 000.00
	(b) (3)	Provisional sum for control testing to be carried out as required by the Employer's Agent including testing of the structure	Prov. Sum	1	R100 000.00	R100 000.00
1.3.3		Independent testing where ordered by Engineer	Prov. Sum	1	R200 000.00	R200 000.00
1.3.4		Monthly maintenance of IT Equipment	Prov. Sum	1	R270 000.00	R270 000.00
1.3.5		Aerial photographic record of progress (aerial photos to be taken monthly, for the duration of the contract)	Prov. Sum	1	R360 000.00	R360 000.00
1.3.6	PSAB 8.3.14	Community Liaison Officer (CLO) for the duration of the contract	Months	36	R12 000.00	R432 000.00
1.3.7		Environmental Control Officer	Months	36	R10 000.00	R360 000.00
1.3.8		Full time Environmental Liaison Officer	Months	36	R15 000.00	R540 000.00
1.3.9		General Skills Development and Training	Prov. Sum	1	R864 000.00	R864 000.00
1.3.10		Electrical and Instrument Cable Diversions	Prov. Sum	1	R200 000.00	R200 000.00
1.3.11		Signage for Buildings	Prov. Sum	1	R200 000.00	R200 000.00
1.3.12		Approved Asbestos Specialist	Prov. Sum	1	R50 000.00	R50 000.00
1.3.13		Asbestos Removal Contractor	Prov. Sum	1	R100 000.00	R100 000.00
1.3.14		Existing Service Diversions	Prov. Sum	1	R300 000.00	R300 000.00
1.3.15		Emptying of water retaining structures for additional inspections, testing, flooding, etc., as ordered by the Engineer	Prov. Sum	1	R500 000.00	R500 000.00
1.3.16		Electrical and C&I testing equipment	Prov. Sum	1	R500 000.00	R500 000.00
1.3.17		Pedestrian/Vehicle access control system at the northern and southern gates.	Prov. Sum	1	R200 000.00	R200 000.00
1.3.18		GPR survey	Prov. Sum	1	R100 000.00	R100 000.00
1.3.19	PS 17	Tools and Spares	Prov. Sum	1	R100 000.00	R100 000.00
1.3.20		Ventilation fans for pump station	Prov. Sum	1	R50 000.00	R50 000.00
1.3.21		Operation and maintenance training for JW staff	Prov. Sum	1	R100 000.00	R100 000.00
1.3.21	8.5(b)(2)	(e) Contractor's percentage to cover cost of handling for items 1.3.1 and 1.3.20	%	5 806 000		
1.4	PSA 8.7	DAYWORK				
1.4.1	8.7.1	Expenditure on dayworks (i.e. wages paid to workmen and invoiced cost of materials, delivered on site)	Prov. Sum	1	R1 000 000	
	8.7.2	Extra over item above for supervision, overheads and all other costs related to the daywork items under items below for the following:				
1.4.2		Skilled artisans	%	R300 000		
1.4.3		Unskilled labourers	%	R500 000		
1.4.4		Material	%	R200 000		
SUB-TOTAL CARRIED FORWARD						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		<i>brought forward</i>				
	8.7.3	Plant Hire Rates				
		The appropriate types and sizes (T&S) of the plant shall be stated in the space provided:				
1.4.5		Mobile cranes (Type & Size)	hrs.	80		
1.4.6		Front-end loaders (Type & Size)	hrs.	80		
1.4.7		Bulldozers (Type & Size)	hrs.	80		
1.4.8		Graders (Type & Size)	hrs.	40		
1.4.9		Excavators (Type & Size)	hrs.	40		
1.4.10		Tip Trucks (Type & Size)	hrs.	40		
1.4.11		TLB's (Type & Size)	hrs.	40		
1.4.12		Rollers (Type & Size)	hrs.	40		
1.4.13		Water carts (Type & Size)	hrs.	40		
1.4.14		Portable compressor and breakers etc. (Type & Size)	hrs.	80		
1.4.15		Portable pumps and hoses (150mm self priming centrifugal pump coupled to diesel engine mounted on a trailer unit with an integrated 200l fuel tank)	hrs.	200		
		Others give full details				
1.4.16		.....	hrs.	40		
1.4.17		.....	hrs.	40		
1.5	8.8	TEMPORARY WORKS				
1.5.1	8.8.2	Dealing with traffic (or accommodation of traffic)	Sum	1		
	8.8.4	Existing Services				
1.5.2		Location of existing services	Prov. Sum	1	R250 000.00	R250 000.00
1.5.3		Excavate by hand in all materials to expose existing services	m ³	200		
	PSA 8.8.4	Relocation of services				
		Excavation for exposing services in the following depth ranges below ground level:				
		(a) 0.0m up to 2.0m:				
1.5.4		(i) Soft material	m ³	60		
1.5.5		(ii) Intermediate material	m ³	180		
1.5.6		(iii) Hard material	m ³	60		
		(b) Exceeding 2.0m up 4.0m:				
1.5.7		(i) Soft material	m ³	64		
1.5.8		(ii) Intermediate material	m ³	192		
1.5.9		(iii) Hard material	m ³	64		
SUB-TOTAL CARRIED FORWARD						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 1 - PRELIMINARY & GENERAL

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		<i>brought forward</i>				
1.6	PSA 8.10	SUBCONTRACTORS (SMME's)				
1.6.1	PSA 8.10.4	Provisional Sum to cover costs incurred by the Contractor when making payments of behalf of the sub-contractor (ref Contract Data) or to provide ad-hoc services on behalf of the sub-contractor	Prov.Sum	1	R500 000.00	
1.6.2	PSAB 8.3.15	Training of targeted labour and SMME's	Prov. Sum	1	R1 000 000.00	
1.7	PSA 8.9	DELAYS				
1.7.1		Delay due to total work stoppage, for labour unrest, plant shutdowns, etc. The Daily rate must equal the total of the Daily Time Related P&G Cost. Only this Daily rate will be paid in the event of ANY approved delays to the Due Completion Date of the Contract	days	30		
TOTAL FOR SECTION 1 (Carried to Summary)						

Employer:		Contractor:	
Witness:		Witness:	

SECTION 2 - ACCESS ROADS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2	1		ACCESS ROADS				
	A	SANS 1200C	CLEARING AND GRUBBING				
2	1.1	8.2.1	Clearing and grubbing including all rubble	Prov Sum	1	R 25 000.00	R 25 000.00
	B	SAN 1200ME	GENERAL REQUIREMENTS AND PROVISIONS				
		8.3.1	Excavate material within the following depth ranges below ground level exposing of/or searching for services:				
			(a) 0m to 2m:				
2	1.2		(i) Soft material	m ³	10		
2	1.3	8.3.4	(ii) Hard material	m ³	10		
			Backfilling:				
2	1.4		(a) Using the excavated material	m ³	10		
2	1.5		(b) Using imported selected material	m ³	10		
	C		CRACK SEALING (ASPHALT ROADS)				
2	1.6		Crack seal using hot polymer/rubberised bitumen	m	1600		
	D		ROAD REPAIRS				
2	1.7		Mill out to spoil existing surfacing and crushed stone base where road is badly cracked	m ²	1 500		
2	1.8		Construct new base course 150mm thick	m ²	1 500		
2	1.9		Provisional Sum for Modifications to existing	Prov. Sum	1	R 758 300.00	R 758 300.00
		SANS 1200MG	Prime coat:				
2	1.9	8.4.1	(a) Quick drying MSP1 or equivalent @ 0.8l/m ²	m ²	1500		
			Road repairs using :				
			(a) Continuously graded:				
2	1.10		(i) 40mm medium grade	m ²	1500		
			Double seal over the whole site using :				
2	1.11	8.4.3(a)	(a) 20,0 mm and 10,0 mm aggregate (grade 1 aggregate) with 80/100 penetration grade bitumen	m ²	18000		
			Application of fog spray consisting of:				
2	1.12	8.4.5	(b) 30% spray-grade emulsion (cationic)	litre	18000		
	E	SANS 1200G	CONCRETE SLABS				
2	1.13		Remove and dispose broken concrete slabs	m ³	290		
2	1.14	8.4.3	Supply and install new 35MPa concrete slabs including shuttering	m ³	290		
2	1.15		Remove and dispose existing joint sealing and replace with new polyurethane joint sealing	m	5000		
	F	SANS 1200MJ	WALKWAYS AND BLOCK PAVING				
2	1.16		Remove and dispose of all the broken concrete paving along the pedestrian walkways	m ²	5 560		
2	1.17	8.2.2	Supply and install new 60mm concrete interlocking paving blocks along the walkways	m ²	5 560		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
2	1.18		(b) Re-slope the batter to grade and compact to 90% Mod AASTO density & replace any supporting base where necessary	m ²	200		
2	1.19		(e) Take from stockpile and relay interlocking blocks with riversand jointing	m ²	200		
2	1.20		(i) Take up block paving to stockpile	m ²	250		
2	1.21		(ii) Reinstat base to correct levels and compact to 90% Mod AASHTO density & replace any supporting base where necessary	m ²	250		
2	1.22		(g) Supply and apply to all paving areas "Roundup" or other approved environmentally friendly weed killer	m ²	1 900		
	G		MISCELLANEOUS ITEMS				
		SANS 1200C	SITE CLEARANCE				
2	1.23	8.2.3	Remove trees	No.	6		
		SANS 1200MK	CONCRETE KERBING				
2	1.24		(a) Remove and dispose of broken kerbs at registered disposal site	m	50		
2	1.25	8.2.1	(b) Supply and install new kerbs (Figure 3)	m	50		
2	1.26	8.2.1	(c) Supply and install new kerbs (Figure 8b)	m	50		
2	1.27	PSVB 8.1	Supply and install new 1200mm high 6 strand stockproof fencing including galvanised straining posts and standards	m	12		
2	1.28		Remove existing damaged grating and replace with new 40mm high galvanised grating	LS	1		
2	1.29		Allowance for stormwater infrastructure	Prov Sum	1	R 150 000.00	R 150 000.00
		PSVA8.4	Landscaping and grassing				
2	1.30	8.3.11	(a) Clean the whole site of excess grass and shrubs	Prov Sum	1	R 121 000.00	R 121 000.00
			Hazard markers at culverts/structures:				
			(a) W401 or W402:				
2	1.31		(i) 800mm x 200mm	No.	6		
			Retro-reflective road marking paint:				
2	1.32		(d) White lettering and symbols	m ²	200		
2	1.33		Reinstating footway and filling hole next to pavement	Prov Sum	1	R 2 420.00	R 2 420.00
TOTAL FOR SECTION 2 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3	1		WASHWATER BOOSTER PUMPS				
	A	SANS 1200C	SITE CLEARANCE				
3	1.1	8.2.4	Reclearing of surfaces (only on instruction from the Engineer)	m	35		
3	1.2	8.2.5	Removal and relocation of existing fence	m	15		
	B	SANS 1200D	EARTHWORKS				
			Restricted Excavation				
3	1.3	8.3.3(a)	Excavate for footings and plinths and dispose	m ³	95		
		8.3.3 (b)	Extra-over item 3.1.3 for additional excavation required by the engineer after the excavations have been completed				
3	1.4		Intermediate material	m ³	24		
3	1.5		Hard rock material	m ³	5		
	C	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
3	1.6		Sides of all plinths (pump, accumulator, pressure vessel)	m ²	150		
		8.2.5	Narrow width (up to 300mm wide)				
3	1.7		Sides of footings	m ²	30		
		8.3	Reinforcement				
		8.3.1	High Tensile steel bars				
3	1.8	8.1.2.2	25 mm dia. - Basic price	t	1.0		
		8.3.1	Mild steel bars				
3	1.9	8.1.2.2	25 mm dia. : Basic price	t	0.5		
		8.4	Concrete				
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
3	1.10		Underneath footing	m ²	45		
		8.4.3	Strength Concrete 35/20				
3	1.11		Footings for Wash Water Tank	m ³	10		
3	1.12		Plinths for pumps	m ³	15		
		8.4.4 a)	Wood float finish for upper surfaces of:				
3	1.13		Wash Water Tank plinths	m ²	15		
3	1.14		Pump plinths	m ²	15		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
3	1.15	(i)	using non-shrink grout	m ³	0.10		
3	1.16	(ii)	using dry-packed grout	m ³	0.10		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
3	2		COARSE SCREENS MOD 1				
	A		CLEARING AND REMOVAL OF STRUCTURES				
3	2.1	PSU 8.16	Clearing of concrete channel from inlet sluice gate to coarse screens.	m	185		
3	2.2		Demolish old concrete in coarse screen area and dispose of material	Sum	1		
	B	SANS 1200D	EARTHWORKS				
			Restricted Excavation				
3	2.3	8.3.3(a)	Excavate for extension of bunded area at compactors and dispose	m ³	95		
		8.3.3 (b)	Extra-over item 3.2.3 for additional excavation required by the engineer after the excavations have been completed				
3	2.4		Intermediate material	m ³	24		
3	2.5		Hard rock material	m ³	5		
	B	SANS	CONCRETE - STRUCTURAL				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
3	2.6		Sides of bund walls	m ²	150		
		8.2.5	Narrow width (up to 300mm wide)				
3	2.7		Sides of plinths	m	30		
3	2.8		Edge of floor slab	m	30		
	C	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.3	Reinforcement				
		8.3.1	High Tensile steel bars				
3	2.9	8.1.2.2	25 mm dia. - Basic price	t	1.0		
		8.3.1	Mild steel bars				
3	2.10	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.4	Concrete				
3	2.11		Resurfacing of concrete channel from inlet sluice gate to coarse screens	m ²	140		
3	2.12		Saw-cut 120mm deep into existing concrete floor to get straight transition piece	m	20		
3	3.2.13		Break down existing bund wall to floor level	Sum	1		
3	3.2.14		Break 40mm deeper into existing concrete at reinforcing, cut reinforcing coat the reinforcing with zinc rich paint, apply wet to dry epoxy to old concrete surface and use an approved epoxy to repair concrete to final dimensions	m	20		
3	3.2.15		Supply and install Diamond Dowels at 350mm c/c	No	250.00		
3	3.2.16		Supply and install R20 dowels, 400mm long, 200mm deep at 300mm c/c, incl of drilling , epoxy	No	250.00		
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
3	3.2.17		Under floor for extension of bunded area	m ²	45		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.4.3	Strength Concrete 35/20				
3	3.2.18		Floor of bunded area	m ³	10		
3	3.2.19		Walls of bunded area	m ³	15		
		8.4.4 a)	Wood float finish for upper surfaces of:				
3	3.2.20		Top of plinths	m ²	15		
3	3.2.21		Top of floor inside bunded area	m ²	15		
		8.4.4 a)	Steel float finish for upper surfaces of:				
3	3.2.22		Top of bund walls	m ²	15		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
3	3.2.23	(i)	using non-shrink grout	m ³	0.10		
3	3.2.24	(ii)	using dry-packed grout	m ³	0.10		
		PSG 8.5	JOINTS				
		PSG 8.5.2	Filled Joints (including formwork)				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
3	3.2.25		20 mm wide between 150 mm concrete floor and new bund walls	m	220		
		PSG 8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
3	3.2.26		20 mm joints between concrete members	m	220		
			Replacement of existing joint sealer				
3	3.2.27	8.14	Remove and dispose of old joint sealer 20mm wide and 20mm deep	m	220		
3	3.2.28	8.14	Install new backing cord and polyurethane sealer in 20mm deep joint	m	220		
3	3.2.29	8.15	Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	150		
		D	SANS 1200HA				
			SKIP RAILS (MOD 1 & 2)				
3	2.3		Remove existing skip rails	m	180		
3	2.31	8.3.2	Install 76,2 x 76,2 x 14.9kg/m mild steel rails including fastening clips @ 500mm c/c each with 2/12mm dia. Expanding bolts.	m	180		
			Sundry Items				
3	2.32		Stop log to stop flow in main channel to HoW module 1 when refurbishing existing sluice gate	No	1		
3	3		<u>GRIT HANDLING AREA</u>				
		A	CLEARING AND REMOVAL OF STRUCTURES				
3	3.1		Clean vortex degritters and grit handling transfer screws including disposal of waste	Sum	1		
3	3.2		Demolishing of existing concrete structure for conventional grit classifiers	Sum	1		
3	3.3		Demolishing of existing bundwall and dispose of material	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	B	SANS 1200D	EARTHWORKS				
			Restricted Excavation				
3	3.4	8.3.3(a)	Excavate for extension of bunded area for classifier and dispose	m ³	50		
		8.3.3 (b)	Extra-over item 3.3.4 for additional excavation required by the engineer after the excavations have been completed				
3	3.5		Intermediate material	m ³	13		
3	3.6		Hard rock material	m ³	3		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
			Concrete Work				
3	3.7		Saw cut 120mm deep into existing concrete floor to get straight transition piece	m	20		
3	3.8		Break down existing bund wall to floor level	m	20		
3	3.9		Break 40mm deeper into existing concrete at reinforcing, cut reinforcing coat the reinforcing with zinc rich paint, apply wet to dry epoxy to old concrete surface and use an approved epoxy to repair concrete to final dimensions	m	20		
3	3.10		Supply and install Diamond Dowels at 350mm c/c	No	250.00		
3	3.11		Supply and install R20 dowels, 400mm long, 200mm deep at 300mm c/c, incl of drilling, epoxy.	No	250.00		
3	3.12	8.13	Resurfacing of corroded concrete	m ²	250		
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
3	3.13		Under floor for extension of bunded area	m ²	45		
		8.4.3	Strength Concrete 35/20				
3	3.14		Floor of bunded area	m ³	10		
3	3.15		Walls of bunded area	m ³	15		
		8.4.4 a)	Wood float finish for upper surfaces of:				
3	3.16		Top of plinths	m ²	15		
3	3.17		Top of floor inside bunded area	m ²	15		
		8.4.4 a)	Steel float finish for upper surfaces of:				
3	3.18		Top of bund walls	m ²	15		
		PSG 8.7	Grouting				
			Grouting in of equipment supplied and installed by the plant suppliers				
3	3.19	(i)	using non-shrink grout	m ³	0.10		
3	3.20	(ii)	using dry-packed grout	m ³	0.10		
		PSG 8.5	JOINTS				
			Filled Joints (including formwork)				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
3	3.21	8.5.2	20 mm wide between 150 mm concrete floor and new bund walls	m	220		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
3	3.22	8.5.3	20 mm joints between concrete members				
			Replacement of existing joint sealer				
3	3.23	8.14	Remove old Joint Sealer 20mm wide and 20mm deep	m	220		
3	3.24	8.14	Install new backing cord and polyurethane sealer in 20mm deep joint	m	220		
3	3.25	8.15	Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	150		
3	C	SANS 1200HA	SKIP RAILS				
3	3.26		Removal of existing skip rails	m	90		
3	3.27		76, 2 x 76, 2 x 14.9kg/m mild steel rails including fastening clips @ 500mm c/c each with 2/12mm dia. Expanding bolts.	m	90		
3	4		<u>FINE SCREENS AND MACERATOR PUMP STATION</u>				
3	A		CLEARING AND REMOVAL OF STRUCTURES				
3	4.1		Clearing of concrete channels in fine screens removal area and disposal of waste	m	230		
3	4.2		Demolish and removal of existing concrete plinths inside Macerator Pump Station	Sum	1		
3	4.3		Demolishing of old concrete outside Macerator Pump Station and disposal of waste	Sum	1		
3	4.4		Cleaning, preperation and painting of internal plastered brick walls of Pump Station	m ²	46		
3	4.5		Cleaning of internal concrete walls of Pump Station	m ²	117		
	B	SANS 1200G	CONCRETE - STRUCTURAL				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
3	4.6		Sides of all plinths	m ²	150		
		8.2.5	Narrow width (up to 300mm wide)				
3	4.7		Sides of footings	m ²	30		
		8.3	Reinforcement				
		8.3.1	High Tensile steel bars				
3	4.8	8.1.2.2	25 mm dia. - Basic price	t	0.2		
		8.3.1	Mild steel bars				
3	4.9	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.4	Concrete				
3	4.10	PSG 8.13	Resurfacing of concrete in the channels and bunded area	m ²	288		
3	4.11		Supply and install R20 dowels, 400mm long, 200mm deep at 300mm c/c, incl of drilling, epoxy in existing concrete.	No	60		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.4.3	Strength Concrete 35/20				
3	4.12		New plinths for washer compactors	m ³	1		
3	4.13		New pump plinths in Macerator Pump Station	m ³	1		
		8.4.4 a)	Wood float finish for upper surfaces of:				
3	4.14		Top of Compactor plinths	m ²	5		
3	4.15		Top of pump plinths	m ³	5		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
3	4.16	(i)	using non-shrink grout	m ³	0.10		
3	4.17	(ii)	using dry-packed grout	m ³	0.10		
		PSG	Joints				
3	4.18	8.14	Remove old Joint Sealer 20mm wide and 20mm deep	m	220		
3	4.19	8.14	Install new backing cord and polyurethane sealer in 20mm deep joint	m	220		
3	4.20		Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	150		
		C SANS 1200HA	SKIP RAILS				
3	4.21		Removal of existing skip rails	m	90		
3	4.22		76, 2 x 76, 2 x 14.9kg/m mild steel rails including fastening clips @ 500mm c/c each with 2/12mm dia. Expanding bolts.	m	90		
			MISCELANEOUS				
3	4.23		Replace existing door at Macerator Pump Station	No.	1		
3	4.24		Replace existing window at Macerator Pump Station	No.	1		
3	4.25		Empty existing pump room	Sum	1		
3	4.26		Clean wall surfaces and prepare for repaint	Sum	1		
3	4.27		Paint of inside walls of pump station	Sum	1		
3	5		<u>TRASH SCREEN</u>				
		A SANS 1200C	SITE CLEARANCE				
3	5.1	8.2.1	Clear and grub	m ²	1171		
		B SANS 1200D	EARTHWORKS				
			Restricted Excavations				
		8.3.3 a)	Excavate for restricted foundation, footings and trenches in all material and use for backfill or embankment or dispose.				
3	5.2		0m up to 2m	m ³	125		
3	5.3		2m up to 4m	m ³	50		
		8.3.2 (b)	Extra Over Items 3.1.5 to 3.1.8 for excavations in:				
3	5.4	8.3.3 b) 1)	Intermediate material	m ³	35		
3	5.5	8.3.3 b) 2)	Hard rock material	m ³	20		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	B	SANS 1200DM	ACCESS ROAD				
			SUBGRADE				
		8.3.3	Treatment of road bed				
		8.3.3 a)	Road Bed Preparation and compaction of material to:				
3	5.6	8.3.3 a) 2)	Rip and recompact in-situ material to 150mm depth, moisten and compact to minimum of 93% Mod. AASHTO density.	m ³	151		
	C	SANS 1200ME	SUBBASE				
		8.3.3	Construct the subbase course/ shoulder with material from commercial sources or designated borrow pits				
3	5.7		G7 material compacted in 150mm layer to 93% of modified AASHTO maximum density	m ³	151		
	D	SANS 1200MF	BASE				
			Construct base with material from commercial sources or designated borrow areas				
3	5.8	8.3.3 a)	Construct 150mm layer of G5 base compacted to 93% of MOD AASHTO from commercial sources	m ³	151		
		8.3.5	Process base material by the following processes, as relevant, and use in the base:				
3	5.9	8.3.5 d)	Stabilisation	m ³	151		
		8.3.8	Stabilizing agent:				
3	5.1	8.3.8 b)	Portland cement	t	5		
	E	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.1	Rough Formwork				
			Plane Vertical				
3	5.11		Edge of concrete road slab	m ²	115		
		8.2.2	Smooth Formwork				
			Plane Vertical				
3	5.12		Edge of floor of bunded area	m ²	4		
3	5.13		Sides of trash screen platform	m ²	4		
3	5.14		Sides of staircases	m ²	3		
3	5.15		Vertical risers of stairs	m ²	2		
			Plane Horizontal				
	5.16		Soffit of Trash screen platform over channel	m ²	4		
			Plane Sloping				
3	5.17		Soffit of staircase	m ²	4		
		8.3	Reinforcement				
		8.3.1	High Tensile steel bars				
3	5.18	8.1.2.2	25 mm dia. - Basic price	t	4.4		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
3	5.19	8.3.1	Mild steel bars				
		8.1.2.2	25 mm dia. : basic price	t	0.5		
3	5.2	8.3.2	High Tensile Welded Mesh				
			Ref. 888 for road slab	m ²	5		
		8.4	Concrete				
		8.4.3	Strength Concrete 35/20				
3	5.21		Trash screen platform	m ³	5		
3	5.22		Road Slab	m ³	2		
3	5.23		Stairs	m ³	4		
		8.4.4	Unformed Surface Finishes				
		8.4.4 a)	Wood Floated Finish				
3	5.24		Road Slab (One end bullnose)	m ²	1171		
		8.4.4 b)	Steel Floated Finish				
3	5.25		Trash screen platform	m ²	25		
3	5.26		Stairs	m ²	5		
	F	PSG	JOINTS				
		8.5.2	Filled Joints				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
3	5.27		20 mm wide between 200mm concrete members	m	320		
3	5.28		20 mm wide between 300mm concrete members	m	320		
		8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
3	5.29		20 mm x 15 mm joints between concrete members	m	320		
			Sundry Items				
3	5.3		Stop log lifting hook	No	1		
3	6		<u>TRASH SCREEN BYPASS CHANNEL</u>				
	A	SANS 1200C	SITE CLEARANCE				
3	6.1	8.2.1	Clear and grub	m ²	184		
	B	SANS 1200D	EARTHWORKS				
			Restricted Excavations				
		8.3.3 a)	Excavate for restricted foundation, footings and trenches in all material and use for backfill or embankment or dispose.				
3	6.2		0m up to 2m	m ³	125		
3	6.3		2m up to 4m	m ³	125		
		8.3.2 (b)	Extra Over Items 3.1.5 to 3.1.8 for excavations in:				
3	6.4	8.3.3 b) 1)	Intermediate material	m ³	30		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
3	6.5	8.3.3 b) 2)	Hard rock material	m ³	5		
		8.3.4	Imported backfill material from:				
3	6.6		Stockpile or other excavation on site	m ³	30		
3	6.7		Commercial or off-site sources	m ³	5		
	C	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
3	6.8		Internal and external faces of channel walls	m ²	80		
		8.2.5	Narrow width (up to 300mm high)				
3	6.9		Edges of channel floor slab	m ²	5		
3	6.10		Sides of bundwalls	m ²	5		
		8.3	Reinforcement				
		8.3.1	High Tensile Steel Bars				
3	6.11	8.1.2.2	25mm dia - Basic Price	t	1.2		
		8.3.1	Mild steel bars				
3	6.12	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.4	Concrete				
		8.4.2	Blinding layer in Grade 15/20 concrete with 50mm thickness				
3	6.13		Below channel	m ²	105		
		8.4.3	Strength Concrete 35/20				
3	6.14		Channel floor slab	m ³	15		
3	6.15		Channel walls	m ³	15		
		PSG 8.5	Joints				
		8.5.2	Filled Joints				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
3	6.16		20 mm wide between 200mm concrete members				
3	6.17		Channel floor	m	166		
3	6.18		Channel wall	m	12		
		8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
3	6.19		20 mm x 15 mm joints between concrete members	m	178		
		8.5.4	Joints with Waterstops				
3	6.2	8.5.4 (a)	200 mm wide plasticized, flexible PVC Rearguard waterstop with centre	m	166		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 3 - HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	D		MODIFICATION TO EXISTING CHANNEL				
3	6.21		Cutting of opening in existing channel walls for connection of bypass	No	2		
3	6.22		Supply and installation of new precast concrete measuring flume	Prov Sum	1	R 150 000.00	R 150 000.00
	E	SANS 1200HA PSHA	STRUCTURAL STEELWORK (SUNDRY ITEMS)				
3	6.23	8.3.2(b)	Stainless steel 304 handrail assembly complete	m	25		
TOTAL FOR SECTION 3 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 4 - SECONDARY TREATMENT

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4	1		PRIMARY SEDIMENTATION TANKS				
	A	PSU 8.16	CLEARING OF MATERIAL IN STRUCTURE				
4	1.1		Removal and disposal of sludge in hopper	m ³	50		
4	1.2		Clean inside of launders	m ²	1175		
4	1.3		Clean floor from sand and sludge	m ²	4607		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
4	1.4	PSG 8.15	Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	250		
4	1.5		Resurfacing of corroded concrete	m ²	1380		
4	1.6		Provisional Sum for Modifications to existing	Prov. Sum	1	R 633 844.00	R 633 844.00
		PSG 8.5	Joints				
			Replacement of existing joint sealer				
4	1.7		Remove old Joint Sealer 20mm wide and 20mm deep	m	863		
4	1.8		Remove old Joint Sealer 20mm wide and 30mm deep	m	863		
4	1.9		Install new backing cord and polyurethane sealer in 30mm deep joint	m	863		
4	1.10		Install new backing cord and polyurethane sealer in 20mm deep joint	m	863		
4	1.11		Refurbish existing ground water pressure relief valves	No.	120		
		PSG 8.7	Grouting				
4	1.12		Remove existing grout at centre slip ring	No	5		
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
4	1.13	(i)	using non-shrink grout	m ³	0.50		
4	1.14	(ii)	using dry-packed grout	m ³	0.50		
4	1.15		Re-install weir plates with new neoprene sealing material between concrete and plate and installation of new anchor bolts if required and adjusting after installation to obtain the correct level as shown on the drawing	m	257		
			CCTV Inspections				
4	1.16		Allowance for CCTV Inspections of existing Underground Pipelines	Prov. Sum	1	R 100 000.00	R 100 000.00
TOTAL FOR SECTION 4 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 5 - SECONDARY TREATMENT

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5	1		FERMENTERS				
	A	PSU 8.16	CLEARING OF MATERIAL IN STRUCTURE				
5	1.1		Removal and disposal of sludge in hopper	m ³	20		
5	1.2		Clean inside of launders	m ²	324		
5	1.3		Clean floor from sand and sludge	m ²	970		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
5	1.4	PSG 8.15	Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	250		
5	1.5		Resurfacing of corroded concrete	m ²	730		
5	1.6		Provisional Sum for Modifications to existing	Prov. Sum	1	R 311 886.00	R 311 886.00
		PSG 8.5	Joints				
			Replacement of existing joint sealer				
5	1.7		Remove old Joint Sealer 20mm wide and 20mm deep	m	345		
5	1.8		Remove old Joint Sealer 20mm wide and 30mm deep	m	345		
5	1.9		Install new backing cord and polyurethane sealer in 30mm deep joint	m	345		
5	1.10		Install new backing cord and polyurethane sealer in 20mm deep joint	m	345		
5	1.11		Refurbish existing ground water pressure relief valves	No.	48		
		PSG 8.7	Grouting				
5	1.12		Remove existing grout at centre slip ring	No	2		
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
5	1.13	(i)	using non-shrink grout	m ³	0.50		
5	1.14	(ii)	using dry-packed grout	m ³	0.50		
5	1.15		Re-install weir plates with new neoprene sealing material between concrete and plate and installation of new anchor bolts if required and adjusting sfter installation to obtain the correct level as shown on the drawing	m	103		
TOTAL FOR SECTION 5 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 6 - SECONDARY TREATMENT

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6	1		CLARIFIERS				
	A	PSU 8.16	CLEARING OF MATERIAL IN STRUCTURE				
6	1.1		Removal and disposal of sludge in hopper	m ³	155		
6	1.2		Removal and disposal of sludge on Clarifier Floor	m ³	155		
6	1.3		Clean inside of launders	m ²	1378		
6	1.4		Remove existing weir plates at launders	m	1972		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
6	1.5	PSG 8.15	Concrete crack repair, saw cut along crack, clean, apply primer, insert polyurethane sealant	m	150		
6	1.6		Resurfacing of corroded concrete	m ²	2657		
		PSG 8.5	Joints				
			Replacement of existing joint sealer				
6	1.7		Remove old Joint Sealer 20mm wide and 20mm deep	m	1805		
6	1.8		Remove old Joint Sealer 20mm wide and 30mm deep	m	1805		
6	1.9		Install new backing cord and polyurethane sealer in 30mm deep joint	m	1805		
6	1.10		Install new backing cord and polyurethane sealer in 20mm deep joint	m	1805		
6	1.11		Refurbish existing ground water pressure relief valves	No.	360		
		PSG 8.7	Grouting				
6	1.12		Remove existing grout at centre slip ring	No	12		
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
6	1.13	(i)	using non-shrink grout	m ³	0.50		
6	1.14	(ii)	using dry-packed grout	m ³	0.50		
6	1.15		Re-install weir plates with new neoprene sealing material between concrete and plate and installation of new anchor bolts if required and adjusting after installation to obtain the correct level as shown on the drawing	m	1972		
6	1.16		Provisional Sum for Modifications to existing	Prov. Sum	1	R 462 728.00	R 462 728.00
6	2		BIO-REACTORS				
6	2.1		Removal and disposal of sand on floor of tank	Prov. Sum	1	R 1 000 000.00	R 1 000 000.00
		PSG 8.7	Grouting				
6	2.2		Remove old grout after removal of existing mixers (Area of ±0.25m ² per mixer)	No	20		
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
6	2.3	(i)	using non-shrink grout	m ³	0.50		
6	2.4	(ii)	using dry-packed grout	m ³	0.50		
TOTAL FOR SECTION 6 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 7 - WASH WATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7	1		NEW WASH WATER FILTER STATION				
	A	SANS 1200 C	SITE CLEARANCE				
7	1.1	8.2.1	Clear and grub	m ²	205		
	B	SANS 1200 D	EARTHWORKS				
		PSD 8.3.3	Restricted Excavation				
		8.3.3 a)	Excavate for restricted foundation, footings and trenches in all material and use for backfill or embankment or dispose.				
7	1.2		0m up to 2m	m ³	265		
		8.3.3 (a) (ii)	Extra-over Items 5.1.2 to 5.1.3 for additional excavation required by the engineer after the excavations have been completed				
7	1.3		Intermediate material	m ³	80		
7	1.4		Hard rock material	m ³	53		
	C	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
7	1.5		Internal and external faces of sump walls	m ²	115		
7	1.6		Sides of apron slab	m ²	15		
7	1.7		Sides of all plinths (incl. pump, accumulator, pressure vessel and filters)	m ²	15		
		8.2.5	Narrow width (up to 300mm wide)				
7	1.8		Edges of footings	m ²	40		
7	1.9		Edges of floor slab	m ²	10		
7	1.10		Internal sides of drainage trench floor	m ²	10		
7	1.11		Edges of sump floor	m ²	5		
		PSG	Special Formwork				
		8.2.6	Box out holes/form voids				
		8.2.6 (b)	Cubical of volume				
			Over and up to and including				
7	1.12		(ii) 0,01 m ³ - 0,05 m ³	No.	1		
7	1.13		(iii) 0,05 m ³ - 0,15 m ³	No.	1		
		8.2.7	Recesses and chamfers larger than 25x25mm				
	1.14		100 x 100mm chamfers and vertical corners of cable channels	m	45		
			Reinforcement				
		8.3.1	High Tensile steel bars				
7	1.15	8.1.2.2	25 mm dia. - Basic price	t	3		
		8.3.1	Mild steel bars				
7	1.16	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.3.2	High Tensile Welded Mesh				
7	1.17		Ref. 245 for apron slabs	m ²	70		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 7 - WASH WATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
7	1.18		Ref. 617 for floor slabs	m ²	200		
		8.1.3	Concrete				
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
7	1.19		Underneath floor slabs and sumps of pump station	m ²	210		
			Strength Concrete 35/20				
7	1.20		Strip footing (900 mm wide, 300 mm thick)	m ³	20		
7	1.21		Floor slab	m ³	30		
7	1.22		Sump floor slab	m ³	5		
7	1.23		Sump walls	m ³	20		
7	1.24		Plinths	m ³	10		
7	1.25		Apron Slabs	m ³	15		
		8.4.4 a)	Wood float finish for upper surfaces of:				
7	1.26		Floors and apron slabs	m ²	250		
7	1.27		Sump floor	m ²	250		
7	1.28		Pump plinths	m ²	45		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
7	1.29	(i)	using non-shrink grout	m ³	0.5		
7	1.30	(ii)	using dry-packed grout	m ³	0.5		
		PSG 8.5	Joints				
		8.5.2	Filled Joints				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
7	1.31		20 mm wide between 80 mm concrete apron	m	60		
7	1.32		20 mm wide between concrete floor slab and brickwork	m	160		
		8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
7	1.33		20 mm joints between concrete members	m	60		
7	1.34		20 mm joint between brick and concrete	m	160		
			Building Work				
	D	SANS 1200PSLE	Polyethylene Sheeting				
7	1.35	8.2.18	250 micron polyethylene underneath strip footing and floor slab including ANT poison to SANS 618	m ²	210		
	E	SANS 1200PSU	Brickwork				
7	1.36	8.1 (b)	230mm thick, both faces, face brick	m ²	350		
			Air Bricks				
7	1.37		170 mm x 170 mm Standard vermin proof air bricks	No.	6		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 7 - WASH WATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.8	Ironmongery				
		8.8.1	Doors and Windows				
			Steel doors, frames and windows				
7	1.38	8.8.1 (b)	Double transformer door and frame (1830 wide x 2438 mm high)	No.	2		
7	1.39	8.8.1 (b)	Standard single steel door and frame (915 wide x 2438 mm high)	No.	1		
7	1.40	8.8.1 (b)	Roller Door	No.	1		
7	1.41	8.8.1(d)	Windows SS43 with burglar proofing	No.	7		
		8.9	Structural Timber				
		8.9 (h)	Roof trusses complete: Design, supply, erect and certify by supplier. To include all necessary plates, beams, joists, rafters, purlins, battens, bracing and bracing)	Sum	1		
		8.12	Roof Covering				
7	1.42	(c)	Concrete roof tiles to match existing buildings	m ²	300		
7	1.43		225 mm x 10 mm F.C. fascia boards	m	35		
7	1.44		225 mm x 10 mm F.C. barge boards	m	45		
	F	SANS 1200HB	CLADDING AND SHEETING				
		8.2.2	Supply and install cladding and sheeting:				
7	1.45		Roof Sheeting(0.6 mm green chromadek)	m ²	215		
		8.13	Gutters				
7	1.46	8.13 a)	Gutters (size and type)	m	35		
7	1.47	8.13 b)	Rain water down pipes (size and type)	No.	4		
7	2		<u>EXISTING WASHWATER PUMP STATION</u>				
	A	PSU 8.16	CLEARING AND REMOVAL OF STRUCTURES				
7	2.1		Break out part of existing pump plinths (±800x1250x300mm) and dispose of material (if required)	No	5		
7	2.2		Supply and install R20 dowels, 400mm long, 200mm deep at 300mm c/c, incl of drilling , epoxy in existing concrete as per detail	No	60		
7	2.3		Remove existing footings of water tank outside building and disdpose (if required)	sum	1		
7	2.4		Provisional Sum for Modifications to existing	Prov. Sum	1	R 285 059.00	R 285 059.00
	B	SANS 1200 D	EARTHWORKS				
		PSD 8.3.3	Restricted Excavation				
		8.3.3 a)	Exacvate for restricted foundation, footings and trenches in all material and use for backfill or embankment or dispose.				
7	2.5		0m up to 2m	m ³	5		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
7	2.6		Sides of plinths	m ²	50		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 7 - WASH WATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.3	Reinforcement				
		8.3.1	High Tensile steel bars				
7	2.7	8.1.2.2	25 mm dia. - Basic price	t	0.2		
		8.3.1	Mild steel bars				
7	2.8	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.4	Concrete				
		8.4.3	Strength Concrete 35/20				
7	2.9		Plinths	m ³	6		
7	2.10		Footings for wash water tank	m ³	5		
		8.4.4 a)	Wood float finish for upper surfaces of:				
7	2.11		Pump plinths	m ²	1		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
7	2.12	(i)	using non-shrink grout	m ³	0.03		
7	2.13	(ii)	using dry-packed grout	m ³	0.03		
			Building Work				
		8.9	Structural Timber (Repair)				
7	2.14	8.9 (h)	Inspection, reporting and repair of Roof Trusses	Prov Sum	1	R 100 000.00	R 100 000.00
			SUNDRY ITEMS				
7	2.15		Erect a canopy over the newly installed emergency power generator next to the existing building	Sum	1		
			Fencing				
7	2.16		Galvanised and PVC coated security fence including a gate around the new emergency generator to be maintenance free and carry a minimum 10 year anti corrosion guarantee.	m	10		
		8.12	ROOF COVERING				
7	2.17		Inspection, reporting and repair of Roof Sheeting and Trusses	Prov Sum	1	R 500 000.00	R 500 000.00
		SANS 1200HA PSHA	STRUCTURAL STEELWORK (SUNDRY ITEMS)				
7	2.18	8.3.2(b)	Galvanised mild steel handrail assembly complete	m	12		
		PSU 8.8	Ironmongery				
		8.8.1	Doors and Windows				
7	2.19		Remove existing internal access door in the MCC Room and brick-up with similar face bricks	Sum	1		
7	2.20		Remove existing external roller shutter door in the MCC Room and modify brickwork to install double steel door	Sum	1		
7	2.21		Remove existing external window in the MCC Room and brick-up with face bricks	Sum	1		
			Steel doors, frames and windows				
7	2.22	8.8.1 (b)	Install double transformer door and frame (1830 wide x 2438 mm high) in place of roller shutter door	No.	1		
TOTAL FOR SECTION 7 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 8 - EMERGENCY DAM							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8	1		MODIFICATIONS TO OVERFLOW CHANNEL				
	A	SANS 1200D	EARTHWORKS				
		8.3.3	Restricted Excavation				
			Excavate for new flow measuring channel in all materials and use for backfill or dispose				
8	1.1		0 to 2m deep	m ³	5		
		8.3.4	Importing Materials				
8	1.2	8.3.4 a)	Extra-over for importation of materials from commercial sources or from borrow pits	m ³	3		
	B	SANS 1200 G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.1	Rough Formwork				
			Plane Vertical				
8	1.3		Sides of manhole floor	m ²	2		
8	1.4		Sides of channel	m ²	4		
		8.2.2	Smooth Formwork				
			Plane Vertical				
8	1.5		Internal and external sides of channel walls	m ²	17		
8	1.6		Internal and external sides of access manhole	m ²	15		
			Reinforcement				
		8.3.1	High Tensile steel bars				
8	1.7	8.1.2.2	25 mm dia - Basic price	t	0.32		
		8.3.1	Mild steel bars				
8	1.8	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.4	CONCRETE				
8	1.9	8.2.8	Demolish and remove existing concrete in Emergency Dam outlet using diamond cutting	Sum	1		
8	1.10		Saw cut 150mm deep into existing concrete overflow to get a straight transition piece	m	20		
8	1.11		Break down existing concrete channel (150mm thick) where new channel are to be constructed	m ²	20		
8	1.12		Provisional Sum for Modifications to existing infrastructure	Prov. Sum	1	R 14 670.00	R 14 670.00
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
8	1.13		Underneath outlet channel and access manhole	m ²	16		
		8.4.3	Strength Concrete 15/20				
8	1.14		Mass concrete Benching	m ³	3		
		8.4.3	Strength Concrete 35/20				
8	1.15		Outlet channel	m ³	3		
8	1.16		Access manhole	m ³	2		
		8.4.4	Unformed surface finishes				
			Steel float finish for upper surfaces of:				
8	1.17		Top of concrete walls	m ²	3		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 8 - EMERGENCY DAM							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
8	1.18	PSG 8.5	Channel floor	m ²	5		
			JOINTS				
		8.5.2	Filled Joints (including formwork) Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
8	1.19	8.5.3	20 mm wide between 200mm concrete members	m	24		
			Sealed Joints Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
8	1.20		20 mm joints between concrete members	m	24		
	C	SANS 1200HA	STRUCTURAL STEELWORK (SUNDRY ITEMS)				
8	1.21		Steps in access manhole	Sum	1		
8	1.22		SS 304 hand stop for opening of 300x200	No	1		
	D	PSVC	GRP PRODUCTS				
8	1.23		GRP weir plate 6mm thick	Sum	1		
TOTAL FOR SECTION 8 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 9 - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9	1		LIME PLANT				
	A	SANS 1200C	SITE CLEARANCE				
9	1.1	8.2.1	Clear and grub	m ²	327		
9	1.2		Break out part of existing Lime Silo plinths (±300x300x500mm) and dispose of material	No	4		
	B	SANS 1200 D	EARTHWORKS				
		8.3.3	Restricted Excavation				
		8.3.3 a)	Excavate for new Lime Silo bunded area and use for backfill or dispose				
9	1.3		0 to 2m deep	m ³	105		
			Extra-over for				
9	1.4	8.3.3 b) 1)	Intermediate excavation	m ³	80		
9	1.5	8.3.3 b) 2)	Hard rock excavation	m ³	30		
		8.3.4	Importing Materials				
9	1.6	8.3.4 a)	Extra-over for importation of materials from commercial sources or from borrow pits	m ³	3		
	C	SANS 1200DM	ACCESS ROAD				
9	1.7		Demolish Existing Road	Sum	1		
			SUBGRADE				
		8.3.3	Treatment of road bed				
		8.3.3 a)	Road Bed Preparation and compaction of material to:				
9	1.8	8.3.3 a) 2)	Rip and recompact in-situ material to 150mm depth, moisten and compact to minimum of 93% Mod. AASHTO density.	m ³	70		
	D	SANS 1200ME	SUBBASE				
		8.3.3	Construct the subbase course/ shoulder with material from commercial sources or designated borrow pits				
9	1.9		G7 material compacted in 150mm layer to 93% of modified AASHTO maximum density	m ³	70		
		8.3.4	Importing Materials				
9	1.10	8.3.4 a)	Extra-over for importation of materials from commercial sources or from borrow pits	m ³	70		
	E	SANS 1200MF	BASE				
			Construct base with material from commercial sources or designated borrow areas				
9	1.11	8.3.3 a)	Construct 150mm layer of G5 base compacted to 93% of MOD AASHTO from commercial sources	m ³	70		
		8.3.5	Process base material by the following processes, as relevant, and use in the base:				
9	1.12	8.3.5 d)	Stabilisation with 3% Normal Portland Cement	m ³	70		
		8.3.8	Stabilizing agent:				
9	1.13	8.3.8 b)	Portland cement	t	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 9 - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	F	SANS 1200 MJ	PAVING				
9	1.14	8.2.1	300 x 150mm Barrier Kerb (Straight) Fig 3	m	190		
9	1.15	8.2.2	Complete construction of paving using 80mm thick concrete blocks including 25mm river sand	m ²	460		
9	1.16	8.2.3	Cutting units to fit edge restraints	m	80		
	G	SANS 1200 G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
9	1.17		Internal and external faces of bund walls	m ²	181		
9	1.18		Plinths	m ²	30		
9	1.19		Sides of staircases	m ²	5		
9	1.2		Vertical risers of stairs	m ²	5		
9	1.21		Sides of Staircase platform	m ²	2		
9	1.22		Internal and external sump walls	m ²	5		
			Plane Horizontal				
9	1.23		Soffit of staircase platform	m ²	3		
			Plane Sloping				
9	1.24		Soffit of staircase	m ²	6		
		8.2.6	Box out holes/form voids				
		8.2.6 (b)	Cubical of volume				
			Over and up to and including				
9	1.25		(i) 0 m ³ - 0,01 m ³	No.	4		
			Reinforcement				
		8.3.1	High Tensile steel bars				
9	1.26	8.1.2.2	25 mm dia. - Basic price	t	20		
		8.3.1	Mild steel bars				
9	1.27	8.1.2.2	25 mm dia. : basic price	t	0.5		
			High Tensile Welded Mesh				
9	1.28		Ref 395 in 150mm thick slab	m ²	65		
		8.4	CONCRETE				
		8.4.2	Blinding Layer in Grade 15/20 concrete with 75mm thickness				
9	1.29		Underneath bunded area	m ²	70		
		8.4.3	Strength Concrete 15/10				
9	1.3		Screed on top of floor	m ²	65		
9	1.31		Benching sump & floors	m ³	5		
		8.4.3	Strength Concrete 25/20				
9	1.32		Road Slab	m ³	69		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 9 - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			Strength Concrete 35/20				
9	1.33		Bunded area floors	m³	30		
9	1.34		Bunded area walls	m³	20		
9	1.35		Bunded area stairs	m³	3		
9	1.36		Plinths	m³	3		
		8.4.4	Unformed surface finishes				
			Wood float finish for upper surfaces of:				
9	1.37		Road Slab	m²	460		
9	1.38		Top of concrete slabs	m²	70		
9	1.39		Platforms & Stairs	m²	6		
			Steel float finish for upper surfaces of:				
9	1.4		Top of concrete walls	m²	10		
	H	SANS 1200HA PSHA	STRUCTURAL STEELWORK (SUNDRY ITEMS)				
9	1.41	8.3.2(b)	Galvanised mild steel handrail assembly complete	m	55		
	I	PSVC	GRP PRODUCTS				
9	1.42	8.1	Supply and install GRP open grid flooring complete with frame and supports	m²	1		
	J		PROVISIONAL SUMS				
9	1.43		Provisional Sum for Demolition of existing concrete structures	Prov. Sum	1	R 50 000.00	R 50 000.00
9	1.44		Provisional Sum for Concrete Repairs and Epoxy Coating	Prov. Sum	1	R 89 025.00	R 89 025.00
TOTAL FOR SECTION 9 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10	1		NEW BLOWER HOUSE				
	A	SANS 1200C	SITE CLEARANCE				
10	1.1	8.2.1	Clear and grub	m ²	80		
	B	SANS 1200D	EARTHWORKS				
		PSD 8.3.3	Restricted Excavation				
		8.3.3 a)	Excavate for restricted foundations, footings and pipe trenches in all materials and use for backfill or embankment or dispose				
10	1.2		Foundations	m ³	120		
10	1.3		Cable trench	m ³	5		
10	1.4		Pipe trench	m ³	10		
		8.3.3 (a) (ii)	Extra-over Items 8.1.2 to 8.1.4 for additional excavation required by the engineer after the excavations have been completed				
10	1.5		Intermediate material	m ³	25		
10	1.6		Hard rock material	m ³	15		
	C	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
10	1.7		Sides of air receiver and compressor plinth	m ²	5		
10	1.8		Internal sides of cable trench walls	m ²	15		
		8.2.5	Narrow width (up to 300mm wide)				
10	1.9		Edges of apron slab	m ²	20		
10	1.10		Edges of floor slab	m ²	10		
10	1.11		Sides of pipe trench floor	m ²	15		
			Reinforcement				
		8.3.1	High Tensile steel bars				
10	1.12	8.1.2.2	25 mm dia. - Basic price	t	1.1		
		8.3.1	Mild steel bars				
10	1.13	8.1.2.2	25 mm dia. : basic price	t	0.5		
		8.3.2	High Tensile Welded Mesh				
10	1.14		Ref. 245 for apron slabs	m ²	25		
10	1.15		Ref. 617 for floor slabs	m ²	105		
		8.1.3	CONCRETE				
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50 mm thickness				
10	1.16		Underneath floorslab	m ²	40		
			Strength Concrete 25/20				
10	1.17		Strip footing (900 mm wide, 300 mm thick)	m ³	10		
10	1.18		Apron Slabs	m ³	10		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			Strength Concrete 35/20				
10	1.19		Floor slab	m ³	15		
10	1.20		Blower plinths	m ³	2		
10	1.21		Air reciever and compressor plinth	m ³	1		
		8.4.4 a)	Wood float finish for upper surfaces of:				
10	1.22		Top of floors and apron slabs	m ²	30		
10	1.23		Top of plinths	m ²	10		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
10	1.24	(i)	using non-shrink grout	m ³	0.7		
10	1.25	(ii)	using dry-packed grout	m ³	0.7		
		PSG 8.5	Joints				
		8.5.2	Filled Joints				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m3 including bullnose finish to both sides of joint and tear off strip				
10	1.26		20 mm wide between 80 mm concrete apron	m	45		
10	1.27		20 mm wide between concrete and brickwork	m	55		
		8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether based polyurethane sealing compound on visible face of joint including primer and bond breaker				
10	1.28		20 mm joints between concrete members	m	45		
10	1.29		20 mm joint between brick and concrete	m	55		
			BUILDING WORK				
		SANS 1200PSLE	POLYETHYLENE SHEETING				
10	1.30	8.2.18	250 micron polyethylene underneath floor slab including ANT poison to SANS 618	m ²	40		
		SANS 1200PSU	BRICKWORK				
10	1.31	8.1 (b)	230mm thick, both faces, face brick (external & internal walls)	m ²	20		
			Air Bricks				
10	1.32		170 mm x 170 mm Standard vermin proof air bricks	No.	6		
		8.8	Ironmongery				
		8.8.1	Doors and Windows				
			Removal of existing infrastructure	Sum	1		
			Steel doors, frames and windows				
10	1.33	8.8.1 (b)	Double shutter door with louvres and frame (2350 wide x 2513 mm high)	No.	2		
10	1.34	8.8.1 (b)	Industrial louvre (590 wide x 590 mm high)	No.	10		
10	1.35	8.8.1(d)	Windows SS34 with burglar proofing	No.	7		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.9	Structural Timber				
		8.9 (h)	Roof trusses complete: Design, supply, erect and certify by supplier. To include all necessary plates, beams, joists, rafters, purlins, battens, bracing and bracing)	Sum	1		
		8.12	Roof Covering				
10	1.36	(c)	Concrete roof tiles to match existing buildings	m ²	125		
10	1.37		225 mm x 10 mm F.C. fascia boards	m	50		
10	1.38		225 mm x 10 mm F.C. barge boards	m	50		
		SANS 1200HB	CLADDING AND SHEETING				
		8.2.2	Supply and install cladding and sheeting:				
10	1.39		Roof Sheeting(0.6 mm green chromadek)	m ²	215		
		8.13	Gutters				
10	1.40	8.13 a)	Gutters (size and type)	m	48		
10	1.41	8.13 b)	Rain water down pipes (size and type)	No.	4		
10	2		<u>EXISTING BLOWER HOUSE</u>				
	A		CLEARING AND REMOVAL OF STRUCTURES				
10	2.1		Demolish and removal of existing plinths and dispose of material	Sum	1		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
10	2.2		Sides of air receiver and compressor plinth	m ²	5		
			Reinforcement				
		8.3.1	High Tensile steel bars				
10	2.3	8.1.2.2	25 mm dia. - Basic price	t	0.5		
		8.3.1	Mild steel bars				
10	2.4	8.1.2.2	25 mm dia. : basic price	t	0.1		
		8.1.3	Concrete				
			Strength Concrete 35/20				
10	2.5		Blower plinths	m ³	2		
10	2.6		Air reciever and compressor plinth	m ³	1		
		8.4.4 a)	Wood float finish for upper surfaces of:				
10	2.7		Plinths	m ²	10		
		PSG 8.7	Grouting				
		8.7 (c)	Grouting in of equipment supplied and installed by the plant suppliers				
10	2.8	(i)	using non-shrink grout	m ³	0.7		
10	2.9	(ii)	using dry-packed grout	m ³	0.7		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
10	3		NEW GUARD HOUSE (HOW)				
	A	SANS 1200 D	EARTHWORKS				
			Restricted Excavation				
		8.3.3	Excavate for foundations in all materials and use for backfill or embankment or dispose				
10	3.1	PSD 8.3.3 (b)	Strip Footings	m ³	12		
			Extra-over items for excavating in				
10	3.2		Intermediate material	m ³	213		
10	3.3		Hard rock material	m ³	213		
10	3.4		Extra over items 8.3.2 to 8.3.3 for additional excavations required by the Engineer after excavation has been completed	m ³	90		
	B	SANS 1200G	CONCRETE (STRUCTURAL)				
		8.2	Formwork				
		8.2.2	Smooth Formwork				
			Plane Vertical				
10	3.5		Edge of roof slab	m ²	7		
			Plane Horizontal				
10	3.6		Soffit of Roof slab	m ²	18		
		PSG 8.3	Reinforcement				
10	3.7		High tensile steel bars	t	0.21		
10	3.8		Mild steel bars	t	0.06		
			High Tensile Welded Mesh				
10	3.9		Ref. 245 for floor slabs	m ²	8		
10	3.10		Ref. 193 for apron slabs	m ²	5		
		8.1.3	Concrete				
		8.4.2	Blinding Layer in Grade 15/20 concrete with 50mm thickness				
10	3.11		Underneath footing	m ²	12		
			Strength Concrete 25MPa				
10	3.12		Strip footing (600 mm wide, 250 mm thick)	m ³	10		
10	3.13		Floor slab	m ³	10		
10	3.14		Apron Slabs (80mm thick)	m ³	16		
		8.4.4 a)	Wood float finish for upper surfaces of:				
10	3.15		Top of floors and apron slabs	m ²	25		
		8.5	Joints				
		8.5.2	Filled Joints				
			Joint filler consisting of closed cell expanded polyethylene with density not less than 120kg/m ³ including bullnose finish to both sides of joint and tear off strip				
10	3.16		10 mm wide between 100 mm concrete apron	m	2		
10	3.17		20 mm wide between concrete and brickwork	m	30		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
		8.5.3	Sealed Joints				
			Joint sealer (20 x 15 mm) consisting of a two component polyether				
10	3.18		10 mm joint between concrete apron	m	29		
10	3.19		20 mm joint between brick and concrete	m	29		
		PSU	Building Work				
	C	SANS HA	STRUCTURAL STEELWORK - SUNDRY ITEMS				
		8.3.1	Structural Steel				
			Doors and Windows				
			Steel doors, frames and windows				
10	3.20	PSU 8.8.1(b)	1000mm x 2000mm High Single Panel Steel Combination Door & Frame	No.	1		
10	3.21	PSU 8.8.3	1000mm x 2000mm High Single Panel Steel Security Gate.	No.	1		
10	3.22		800mm x 2100mm High standard semi-solid door to be supplied with frame, cabin hook and a level 3 lock set complete with two keys. All fittings, door restraints and hinges solid brass	No.	1		
10	3.23		1020mm x 950mm Windows SSF43 with burglar proofing	No.	3		
10	3.24		410mm x 610mm - M fixed with trim. Including 12mm diameter MS	No.	1		
10	3.25	PSU 8.15(b)	Painting of doors and windows	No.	2		
10	3.26	PSU 8.15(c)	Painting of windows	No.	3		
	D	PSLE	POLYETHYLENE SHEETING				
10	3.27	8.2.18	250 micron polyethylene underneath strip footing and floor slab including ANT poison to SANS 618	m ²	10		
			Brickwork				
10	3.28	PSU 8.1(b)	230mm thick, both faces, face brick Exterior wall	m ²	5		
10	3.29	PSU 8.1(c)	115mm thick, face brick Interior Wall	m ²	5		
	E	SANS 1200AA	GENERAL - FIXTURES				
10	3.30	8.3.3	Installation of Wall Mounted Wahsbasin with Basin Taps	No.	1		
10	3.31		Installation of Front Flush Toilet Suite	No.	1		
		8.3.5	EXISTING SERVICES				
10	3.32		Water supply to guard house	Sum	1		
	F	SANS 1200LD	SEWERS				
		8.2.1	Supply, Lay, Joint and test uPVC Pipes				
10	3.33		110mm Diameter	m	600		
10	3.34		Installation of new sewer system from Guard House	Prov.Sum	1	R 950 000.00	R 950 000.00
			Building Pipes into Brickwork				
		8.4	SUPPLYING AND BUILDING HDPE OR uPVC PIPES AS SPECIFIED INTO BRICKWORK (FOR CABLE SLEEVES OR PIPE SLEEVES)				
10	3.35		50 mm dia. uPVC Tee piece	No.	2		
10	3.36		110 mm dia. uPVC Tee piece	No.	2		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 10 - MINOR STRUCTURES							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			brought forward				
			<u>EXISTING GUARD HOUSE (MAIN ENTRANCE)</u>				
10	3.37		Replacement of covers on security doors	Prov. Sum	1	R 50 000.00	R 50 000.00
10	3.38		Provisional Sum for Modifications to existing	Prov. Sum	1	R 242 067.00	R 242 067.00
TOTAL FOR SECTION 10 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 11 - INTERCONNECTING PIPEWORK							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11	1		WASH WATER PUMP STATION TO HOW				
	A	SANS 1200DB	PIPE TRENCHES				
		8.3.2 a)	Excavate in all materials for trenches, backfill and compact, including disposal of surplus unsuitable material for pipes and cable ducts				
			Up to 300mm diameter for depths over and up to				
11	1.1		0.0 m - 1.0 m	m	170		
11	1.2		1.0 m - 2.0 m	m	208		
		8.3.2 (b)	Extra over items 9.1.1 to 9.1.2 for excavations				
11	1.3	8.3.2 (l)	Intermediate material	m ³	149		
11	1.4	8.3.2 (ii)	Hard rock material	m ³	104		
			Road Crossing				
11	1.5	8.3.3.3	Compaction in road reserve (provisional)	m ³	10		
11	1.6	8.3.6	Reinstate road surface complete with all courses at pipe crossings	m ²	50		
		8.3.5	Existing Services				
		(a)	Services that intersect a pipe trench				
11	1.7		Control cables (irrespective of diameter)	No.	5		
11	1.8		Electrical cables (irrespective of diameter)	No.	5		
11	1.9		Pipeline (irrespective of diameter)	No.	5		
		(b)	Services that adjoin a pipe trench				
11	1.10		Control cables (irrespective of diameter)	m	150		
11	1.11		Electrical cables (irrespective of diameter)	m	150		
11	1.12		Pipeline (irrespective of diameter)	m	150		
	B	SANS 1200LB	BEDDING				
		8.2.2.1	Provision of bedding material from trench or other excavations within the freehaul distance				
11	1.13	(a)	Selected granular material	m ³	170		
11	1.14	(b)	Selected fill blanket	m ³	285		
		8.2.2.3	Provision of bedding material by importation from commercial sources				
11	1.15	(a)	Selected granular material	m ³	170		
11	1.16	(b)	Selected fill blanket	m ³	285		
	C	SANS	MEDIUM PRESSURE PIPELINES				
		8.2.1	Supply, lay and bed pipes complete with coupling:				
11	1.17		160 dia. uPVC pipeline on Class B bedding	m	377		
11	1.18		Tie-into existing 160 PE100PN12.5 HDPE pipeline	Sum	1		
		PSL	PIPE SPECIALS				
11	1.19	8.2.5	Supplying, testing and installation of pipes, fittings and specials brought forward from the Pipe Schedule.	Prov. Sum	1	R 500 000.00	R 500 000.00
11	1.20		Provisional Sum for Modifications to existing pipework	Prov. Sum	1	R 198 467.00	R 198 467.00
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 11 - INTERCONNECTING PIPEWORK							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
11	2		NEW WASH WATER FILTER STATION				
	A	SANS	SITE CLEARANCE				
11	2.1	8.3.1 (a)	Clear vegetation and trees of girth up to 1m	m	30		
	B	SANS 1200DB	PIPE TRENCHES				
		8.3.2 a)	Excavate in all materials for trenches, backfill and compact, including disposal of surplus unsuitable material for pipes and cable ducts				
			Up to 300mm diameter for depths over and up to				
11	2.2		0.0 m - 1.0 m	m	5		
11	2.3		1.0 m - 2.0 m	m	5		
11	2.4		2.0 m - 3.0 m	m	15		
		8.3.2 (b)	Extra over item 9.2.2 to 9.2.4 for excavations				
11	2.5	8.3.2 (l)	Intermediate material	m ³	25		
11	2.6	8.3.2 (ii)	Hard rock material	m ³	15		
	C	SANS	BEDDING				
		8.2.2.1	Provision of bedding material from trench or other excavations within the freehaul distance				
11	2.7	(a)	Selected granular material	m ³	10		
11	2.8	(b)	Selected fill blanket	m ³	15		
		8.2.2.3	Provision of bedding material by importation from commercial sources				
11	2.9	(a)	Selected granular material	m ³	10		
11	2.10	(b)	Selected fill blanket	m ³	15		
	C	SANS 1200L	MEDIUM PRESSURE PIPELINES				
		8.2.1	Supply, lay and bed pipes complete with coupling:				
11	2.11		200 dia. PE100PN10 HDPE pipeline on Class B bedding	m	50		
11	2.12		315 dia. class 12 uPVC pipeline on Class B bedding	m	15		
11	2.13		Tie-into existing 315 uPVC pipeline	sum	1		
	PSL		PIPE SPECIALS				
11	2.14	8.2.5	Supplying, testing and installation of pipes, fittings and specials brought forward from the Pipe Schedule.	Prov. Sum	1	R 175 000.00	R 175 000.00
TOTAL FOR SECTION 11 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 12 - SECURITY UPGRADES

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12	1		MAIN GATE				
			CCTV Surveillance System				
			Complete installation of surveillance systems(20 No. off Thermal Network Bullet Camera with 25mm lens. 384X288 Resolution; DeepinView, Smart Features, Advanced Fire Detection; Field of View: 14.88 x 11.19; H.264/MJPEG/MPEG4, H.264+; Support mirror image; Audio & Alarm I/O; SD card Slot; Poer: POE, 24VAC, 12VDC; IP66 PC, 42" FHD monitor, multiplexer.	Sum	1		
12	1.1			Sum	1		
12	1.2		12 Way flush mounted DB, complete with all switchgear	Sum	1		
12	1.3		Testing and commissioning of complete installation as specified in 12.1.1	Sum	1		
12	1.4		64 - Channel Professional Embedded NVR. HDMI1 output at 4K & VGA1 output @ 2K resolution; HDMI2/VGA2 output resolution @108p; Incoming / Outgoing bandwidth: 320/256 Mbps; Hard disk: 8 SATA interfaces(with expansion bracket), 1 x Two-way audio input	No.	1		
12	1.5		10 TB 3.5" SATA Hard Drive	No.	1		
12	1.6		Maintenance (12-month maintenance contract on all new & existing equipment specified in 12.1.1 and 12.1.2)	Sum	1		
12	1.7		Provisional Sum for Modifications to existing, as well as additional security equipment that may be required	Prov. Sum	1	R 2 000 000.00	R 2 000 000.00
			Access Control				
12	1.8		Provision for the maintenance of existing automated boom gates	Prov. Sum	1	R 25 000.00	R 25 000.00
			Ramp - Existing Guard Hut				
12	1.9		Construct reinforced concrete ramp onto existing guard house for wheel chair access	Sum	1		
12	2		HEAD OF WORKS				
			Guard Monitoring System				
12	2.1		Supply, delivery, installation, testing and commissioning of security guard control and monitoring system complete including all equipment and software subscriptions.	Sum	1		
			Light Fittings				
			Supply and complete electrical installation on structures within Head of Works area				
12	2.2		Area lighting fitting	Prov. Sum	1	R 20 000.00	R 20 000.00
			CCTV Cameras				
12	2.3		Thermal Network Bullet Camera with 25mm lens. 384X288 Resolution; DeepinView, Smart Features, Advanced Fire Detection; Field of View: 14.88 x 11.19; H.264/MJPEG/MPEG4, H.264+; Support mirror image; Audio & Alarm I/O; SD card Slot; Poer: POE, 24VAC, 12VDC; IP66	Sum	1		
			New Access Control				
12	2.4		Supply, installation and testing of boom gate at access control	No.	1		
12	2.5		Erection of reinforced concrete speed hump	Sum	1		
12	2.6		Supply and install sliding gate at the Gate 2 (HoW)	Prov. Sum	1	R 120 000.00	R 120 000.00
12	3		BLOWER BUILDING				
			Light Fittings				
			Supply and complete electrical installation on Blower House building				
12	3.1		Area lighting fittings	Prov. Sum	1	R 10 000.00	R 10 000.00
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 12 - SECURITY UPGRADES

SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
12	3.2		Guard Monitoring System				
			Supply, delivery, installation, testing and commissioning of security guard control and monitoring system complete including all equipment and software subscriptions.	Sum	1	R 40 000.00	R 40 000.00
12	4	PSVB	FENCING				
		8.7	Supply and erection of concrete palisade fence				
12	4.1	8.7(a)	Concrete Palisade fencing complete including 200 x 200 mm concrete ground beam below fence	Prov. Sum	1	R 500 000.00	R 500 000.00
TOTAL FOR SECTION 12 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
13		PSX1	MECHANICAL EQUIPMENT: HEAD OF WORKS				
			PART A: CONDITIONAL ASSESSMENT OF EXISTING MECHANICAL EQUIPMENT				
13	1		Dismantle and remove (to Contractor's workshop off site), Inspect and Conduct conditional assessment of existitng equipment				
13	1.1		Module 1 Coarse screens	No.	2		
13	1.2		Module 1 Fine screens	No.	4		
13	1.3		Module 2 Fine screens	No.	4		
13	1.4		Sluice gates	No.	29		
13	2		Storage of Mechanical Equipment while Engineer assesses the Contractor's conditional assessment report				
			Off site storage of equipment being assessed under Item 11.1				
13	2.1		Module 1 Coarse screens	Months	1		
13	2.2		Module 1 Fine screens	Months	1		
13	2.3		Module 2 Fine screens	Months	1		
13	2.4		Sluice gates	Months	1		
13	3		Refurbishment of existing equipment				
13	3.1		Module 1 Coarse screens	Prov. Sum	1	R 100 000.00	R 100 000.00
13	3.2		Module 1 Fine screens	Prov. Sum	1	R 200 000.00	R 200 000.00
13	3.3		Module 2 Fine screens	Prov. Sum	1	R 200 000.00	R 200 000.00
13	3.4		Sluice Gates	Prov. Sum	1	R 100 000.00	R 100 000.00
13	3.5		Provisional Sum for Modifications to Existing Equipment	Prov. Sum	1.00	R 1 000 000.00	R 1 000 000.00
13	4		Transport existing equipment from the Contractor's workshop back to site				
13	4.1		Module 1 Coarse screens	No.	2		
13	4.2		Module 1 Fine screens	No.	4		
13	4.3		Module 2 Fine screens	No.	4		
13	4.4		Sluice Gates	No.	29		
13	5		Deliver to client storage area of existing equipment not to be refurbished				
13	5.1		Module 1 Coarse screens	No.	2		
13	5.2		Module 1 Fine screens	No.	4		
13	5.3		Module 2 Fine screens	No.	4		
13	5.4		Grit classifier - screw type	No.	2		
13	5.5		Grit classifier - settler type	No.	1		
13	5.6		Grit classifier - paddle type	No.	2		
13	5.7		Macerator pumps and piping	No.	2		
13	5.8		Screenings Compactor	No	3		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			PART B: SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF MECHANICAL EQUIPMENT				
			Design, supply and delivery of the following equipment to Site including storage (where applicable), quality assurance and painting (where specified)				
13	6		Screenings equipment for Module 1 in accordance with the specification				
13	6.1	PSX1.2	Complete mechanically front raked coarse screen with 12mm aperture in accordance with the specification	No.	2		
13	6.2	PSX1.2	Complete mechanically front raked fine screens with 6mm aperture in accordance with the specification	No.	4		
13	6.3	PSX1.2	Complete mechanically front raked coarse screen with 12mm aperture in accordance with the specification	No.	4		
13	6.4	PSX1.1	Complete trash screen in accordance with the specification (Note: The Contractor shall provide a method statement that clearly indicates how the screen will be installed in the channel under full flow conditions)	No.	1		
13	7	PSX1.2	Screenings handling equipment for Module 1 & 2 in accordance with the specification				
13	7.1		Complete 20m screenings hydro-conveyor for the Mod 1 coarse screens including actuated swing gate valve in accordance with the specification	No	1		
13	7.2		Complete 17.5m screenings hydro-conveyor for the Mod 1 fine screens including actuated swing gate valve in accordance with the specification	No	2		
13	7.3		Complete washer compactor (including trough and chute) for the Mod 1 coarse screens in accordance with the specification	No.	2		
13	7.4		Complete washer compactor (including trough and chute) for the Mod 2 coarse screens in accordance with the specification	No.	2		
13	7.5		Complete washer compactor (including trough and chute) for the MOD 1 fine screens in accordance with the specification	No.	2		
13	7.6		Swivel screw conveyor from the washer compactor to the three waste bins at the Mod 1 coarse screen area in accordance with the specification	No.	1		
13	7.7		Swivel screw conveyor from the washer compactor to the three waste bins at the Mod 2 coarse screen area in accordance with the specification	No.	1		
13	7.8		Swivel screw conveyor from the washer compactor to the three waste bins at the Mod 1 fine screen area in accordance with the specification	No.	1		
13	7.9		Complete automated winch system to pull the waste bins at the Mod 1 coarse screens including rails, bin dollies, SS cables, motors and drive units	Sum	1		
13	7.10		Complete automated winch system to pull the waste bins at Mod 1 fine screens including rails, bin dollies, SS cables, motors and drive units	Sum	1		
13	7.11		Complete automated winch system to pull the waste bins at Mod 2 coarse screens including rails, bin dollies, SS cables, motors and drive units	Sum	1		
13	8	PSX1.3	Grit handling equipment for Module 1 & 2 in accordance with the specification				
13	8.1		Eight (8) no. off air blowers for the vortex degritters complete with all pipework (including separation and dedicated lines to Module 1 Head of Works), valves and supports from the existing blower room to each of the four vortex degritter chambers	Sum	1		
13	8.2		Eight (8) no. off air blowers for the vortex degritters complete with all pipework (including separation and dedicated lines to Module 2 Head of Works), valves and supports from the blower room to each of the four vortex degritter chambers	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
13	8.3		Replace the Two (2) no. off air compressors in the existing Compressor Room with all pipework, valves and supports	Sum	1		
13	8.4		Two (2) no. off air compressors and one (1) no. off air receiver complete with all pipework, valves and supports from the new blower room to connect to the existing pipework at the Module 2 Vortex Degritters	Sum	1		
13	8.5		Two new washer classifiers and feed troughs with actuated swing gate valve at Module 1 including piping from each of the four vortex degritters	Sum	1		
13	8.6		Two new washer classifiers and feed troughs with actuated swing gate valve at Module 2 including piping from each of the four vortex degritters	Sum	1		
13	8.7		New swivel screw conveyor to skips at the Module 1 degritter area in accordance with the specification	No.	1		
13	8.8		New swivel screw conveyor to skips at the Module 2 degritter area in accordance with the specification	No.	1		
13	8.9		Complete automated winch system to pull the four no. waste bins at Module 1 grit handling including rails, bin dolleys, SS cables, motors and drive units	Sum	1		
13	8.10		Complete automated winch system to pull the three no. waste bins at Module 2 grit handling including rails, bin dolleys, SS cables, motors and drive units	Sum	1		
13	8.11		Complete wash water network including solenoid valves at each degritter at Module 1	Sum	1		
13	8.12		Complete wash water network including solenoid valves at each degritter at Module 1	Sum	1		
13	9	PSX1.8	Macerator Pump Station				
13	9.1		New pumps complete in accordance with the specification	No.	2		
13	9.2		New 304 Stainless Steel suction and delivery piping for the two Macerator pumps complete in accordance with the specification	Sum	1		
13	9.3		New submersible floor drainage pump complete with 304 Stainless Steel delivery piping in accordance with the specification	Sum	1		
13	10		Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
13	10.1		Plant supplied under Item 13.6.1	No.	2		
13	10.2		Plant supplied under Item 13.6.2	No.	4		
13	10.3		Plant supplied under Item 13.6.3	No.	4		
13	10.4		Plant supplied under Item 13.6.4	Sum	1		
13	10.5		Plant supplied under Item 13.7.1	Sum	1		
13	10.6		Plant supplied under Item 13.7.2	Sum	1		
13	10.7		Plant supplied under Item 13.7.3	Sum	1		
13	10.8		Plant supplied under Item 13.7.4	Sum	1		
13	10.9		Plant supplied under Item 13.7.5	Sum	1		
13	10.10		Plant supplied under Item 13.7.6	Sum	1		
13	10.11		Plant supplied under Item 13.7.7	Sum	1		
13	10.12		Plant supplied under Item 13.7.8	Sum	1		
13	10.13		Plant supplied under Item 13.7.9	Sum	1		
13	10.14		Plant supplied under Item 13.7.10	Sum	1		
13	10.15		Plant supplied under Item 13.7.11	Sum	1		
13	10.16		Plant supplied under Item 13.8.1	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
13	10.17		Plant supplied under Item 13.8.2	Sum	1		
13	10.18		Plant supplied under Item 13.8.3	Sum	1		
13	10.19		Plant supplied under Item 13.8.4	Sum	1		
13	10.20		Plant supplied under Item 13.8.5	Sum	1		
13	10.21		Plant supplied under Item 13.8.6	Sum	1		
13	10.22		Plant supplied under Item 13.8.7	Sum	1		
13	10.23		Plant supplied under Item 13.8.8	Sum	1		
13	10.24		Plant supplied under Item 13.8.9	Sum	1		
13	10.25		Plant supplied under Item 13.8.10	Sum	1		
13	10.26		Plant supplied under Item 13.8.11	Sum	1		
13	10.27		Plant supplied under Item 13.8.12	Sum	1		
13	10.28		Plant supplied under Item 13.9.1 to 13.9.3	Sum	1		
13	10.29		Refurbished plant under item 13.3.1	No	2		
13	10.30		Refurbished plant under item 13.3.2	No	4		
13	10.31		Refurbished plant under item 13.3.3	No	21		
13	11		Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
13	11.1		Plant installed under Item 13.10.1	Sum	1		
13	11.2		Plant installed under Item 13.10.2	Sum	1		
13	11.3		Plant installed under Item 13.10.3	Sum	1		
13	11.4		Plant installed under Item 13.10.4	Sum	1		
13	11.5		Plant installed under Item 13.10.5	Sum	1		
13	11.6		Plant installed under Item 13.10.6	Sum	1		
13	11.7		Plant installed under Item 13.10.7	Sum	1		
13	11.8		Plant installed under Item 13.10.8	Sum	1		
13	11.9		Plant installed under Item 13.10.9	Sum	1		
13	11.10		Plant installed under Item 13.10.10	Sum	1		
13	11.11		Plant installed under Item 13.10.11	Sum	1		
13	11.12		Plant installed under Item 13.10.12	Sum	1		
13	11.13		Plant installed under Item 13.10.13	Sum	1		
13	11.14		Plant installed under Item 13.10.14	Sum	1		
13	11.15		Plant installed under Item 13.10.15	Sum	1		
13	11.16		Plant installed under Item 13.10.16	Sum	1		
13	11.17		Plant installed under Item 13.10.17	Sum	1		
13	11.18		Plant installed under Item 13.10.18	Sum	1		
13	11.19		Plant installed under Item 13.10.19	Sum	1		
13	11.20		Plant installed under Item 13.10.20	Sum	1		
13	11.21		Plant installed under Item 13.10.21	Sum	1		
13	11.22		Plant installed under Item 13.10.22	Sum	1		
13	11.23		Plant installed under Item 13.10.23	Sum	1		
13	11.24		Plant installed under Item 13.10.24	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: HEAD OF WORKS							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
13	11.25		Plant installed under Item 13.10.25	Sum	1		
13	11.26		Plant installed under Item 13.10.26	Sum	1		
13	11.27		Plant installed under Item 13.10.27	Sum	1		
13	11.28		Allowance for spares for Mechanical, Electrical and C&I	Prov.Sum	1	R 788 502.00	R 788 502.00
TOTAL FOR SECTION 13 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 14 - MECHANICAL EQUIPMENT: PST's							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
14		PSX1.4 & 1.5	MECHANICAL EQUIPMENT: PST's & PRIMARY SLUDGE PUMPS				
			PART A: CONDITIONAL ASSESSMENT OF EXISTING MECHANICAL EQUIPMENT				
14	1		Remove (to Contractor's workshop off site), Inspect and Conduct conditional assessment of existing equipment				
14	1.1	PSX1.5	Primary Sedimentation Tank Bridges, including scum and floor scraper mechanism, scum troughs and piping, weir and baffle plates at launder	No.	5		
14	1.2	PSX1.5	Sluice Gate at Division Box	No.	5		
14	1.3	PSX1.5	Primary Sludge Pumps and piping that required to be replaced	No.	10		
14	2		Storage of Mechanical Equipment while Engineer assesses the Contractor's conditional assessment report				
			Off site storage of equipment being assessed under Item 12.1				
14	2.1		Primary Sedimentation Tank Bridges, including scum and floor scraper mechanism, scum troughs and piping	Months	1		
14	2.2		Sluice Gate at Division Box	Months	1		
14	3		Refurbishment of existing equipment				
14	3.1		Primary Sedimentation Tank Bridges, including sand blasting, Hot Dipped Galvanising and Epoxy Coating	No.	5		
14	3.2		Knife Gate valves on scum discharge	No.	5		
14	3.3		Sluice Gate at Division Box	No.	5		
14	3.4		Provisional Sum for Modifications to Existing Equipment	Prov.Sum	1	R 3 525 550.00	R 3 525 550.00
14	4		Transport existing equipment from the Contractor's workshop back to site				
14	4.1		Primary Sedimentation Tank Bridges, including scum and floor scraper mechanism, scum troughs and piping & Scum Knife Gate Valve & Sluice Gate	No.	5		
14	5		Deliver to client storage area of existing equipment not to be refurbished				
14	5.1		Primary Sedimentation Tank Bridges	No.	5		
14	5.2		Primary Sedimentation Tank scum and sludge scraper mechanism	No.	5		
14	5.3		Knife Gate Valve on Scum discharge	No.	5		
14	5.4		Sluice Gate at Division Box	No.	5		
14	5.5		Primary Sludge Pumps and piping that required to be replaced	No.	10		
			PART B: SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF MECHANICAL EQUIPMENT				
			Design, supply and delivery of the following equipment to Site including storage (where applicable), quality assurance and painting (where specified)				
14	6		Mechanical equipment for the Primary Sedimentation Tank Division Box in accordance with the specification				
14	6.1		Sluice Gate at Division Box	No.	5		
14	6.2		Actuator for Sluice Gate	No.	5		
14	7		Mechanical equipment for the Primary Sedimentation Tanks in accordance with the specification				
14	7.1		New Sludge full floor scraper mechanism with support and control system	No.	5		
14	7.2		New scum trough, scum scraper and piping complete	No.	5		
14	7.3		New Primary Sedimentation Tank maintenance platform added to bridges complete	No.	5		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 14 - MECHANICAL EQUIPMENT: PST's							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
14	7.4		New 3CR12 handrailing around Bridge and maintenance platform with 3CR12 kickplate and 3CR12 access ladder, walkway on Bridge with 3CR12 open steel flooring	No.	5		
14	7.5		New 3CR12 Bridge	Prov.Sum	1	R 1 000 000.00	R 1 000 000.00
14	8		Mechanical equipment for the Primary Sludge Pump Stations in accordance with the specification				
14	8.1		New Primary Sludge Pump, including motor, couplings and base frame	Sum	10		
14	8.2		New piping and valves required	Sum	10		
14	9		Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
14	9.1		Plant supplied under Item 14.6.1	No.	5		
14	9.2		Plant supplied under Item 14.6.2	No	5		
14	9.3		Plant supplied under Item 14.7.1	No	5		
14	9.4		Plant supplied under Item 14.7.2	No	5		
14	19.5		Plant supplied under Item 14.7.3	No	5		
14	9.6		Plant supplied under Item 14.7.4	No	5		
14	9.7		Plant supplied under Item 14.7.5	No	5		
14	9.8		Plant supplied under Item 14.8.1	No	10		
14	9.9		Plant supplied under Item 14.8.2	No	10		
14	9.10		Refurbished Plant under Item 14.3.1	No	5		
14	9.11		Refurbished Plant under Item 14.3.2	No	5		
14	9.12		Refurbished Plant under Item 14.3.3	No	5		
14	10		Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
14	10.1		Plant installed under Item 14.9.1 & 14.9.2	No.	5		
14	10.2		Plant installed under Item 14.9.3 to 14.9.6	No	5		
14	10.3		Plant installed under Item 14.9.7	No	5		
14	10.4		Plant installed under Item 14.9.8 & 14.9.9	No	10		
14	10.5		Plant installed under Item 14.9.10	No	5		
14	10.6		Plant installed under Item 14.9.11	No	5		
14	10.7		Plant installed under Item 14.9.12	No	5		
TOTAL FOR SECTION 14 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 15 - MECHANICAL EQUIPMENT: PST's							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
15		PSX1.4 & 1.5	MECHANICAL EQUIPMENT: Fermenters				
			PART A: CONDITIONAL ASSESSMENT OF EXISTING MECHANICAL EQUIPMENT				
15	1		Remove (to Contractor's workshop off site), Inspect and Conduct conditional assessment of existing equipment				
15	1.1	PSX1.5	Fermenter Bridges, including scum and floor scraper mechanism, scum troughs and piping, weir and baffle plates at launder	No.	2		
15	1.2		Fermented Sludge Pump	No.	3		
15	2		Storage of Mechanical Equipment while Engineer assesses the Contractor's conditional assessment report				
			Off site storage of equipment being assessed under Item 12.1				
15	2.1		Fermenter Bridges, including scum and floor scraper mechanism, scum troughs and piping	Months	1		
15	2.2		Fermented Sludge Pump	Months	1		
15	3		Refurbishment of existing equipment				
15	3.1		Fermenter Bridges, including sand blasting, Hot Dipped Galvanising and Epoxy Coating	Prov. Sum	1	R 100 000.00	R 100 000.00
15	3.2		Knife Gate valves on scum discharge	No.	2		
15	3.3		Fermented Sludge Pump	No.	3		
15	3.4		Provisional Sum for Modifications to existing	Prov. Sum	1	R 1 250 000.00	R 1 250 000.00
15	4		Transport existing equipment from the Contractor's workshop back to site				
15	4.1		Fermenter Bridges, including scum and floor scraper mechanism, scum troughs and piping & Scum Knife Gate Valve	No.	2		
15	4.2		Fermented Sludge Pump	No.	3		
15	5		Deliver to client storage area of existing equipment not to be refurbished				
15	5.1		Fermenter Bridges	No.	2		
15	5.2		Fermenter scum and sludge scraper mechanism	No.	2		
15	5.3		Knife Gate Valve on Scum discharge	No.	2		
15	5.4		Sluice Gate at Division Box	No.	2		
15	5.5		Fermented Sludge Pump	No.	3		
			PART B: SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF MECHANICAL EQUIPMENT				
			Design, supply and delivery of the following equipment to Site including storage (where applicable), quality assurance and painting (where specified)				
15	6		Mechanical equipment for the Fermented Sludge Pump Station in accordance with the specification				
15	6.1		Fermented Sludge Pump	No.	1		
15	7		Mechanical equipment for the Fermenters in accordance with the specification				
15	7.1		New Sludge full floor scraper mechanism with support and control system	No.	2		
15	7.2		New scum trough, scum scraper and piping complete	No.	2		
15	7.3		New Fermenter maintenance platform added to bridges complete	No.	2		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 15 - MECHANICAL EQUIPMENT: PST's							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
15	7.4		New 3CR12 handrailing around Bridge and maintenance platform with 3CR12 kickplate and 3CR12 access ladder, walkway on Bridge with 3CR12 open steel flooring	No.	2		
15	7.5		New 3CR12 Bridge	No.	2		
15	8		Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
15	8.1		Plant supplied under Item 14.6.1	No.	2		
15	8.3		Plant supplied under Item 14.7.1	No	2		
15	8.4		Plant supplied under Item 14.7.2	No	2		
15	8.5		Plant supplied under Item 14.7.3	No	2		
15	8.6		Plant supplied under Item 14.7.4	No	2		
15	8.7		Plant supplied under Item 14.7.5	No	2		
15	8.8		Refurbished Plant under Item 14.3.1	No	2		
15	8.9		Refurbished Plant under Item 14.3.2	No	2		
15	8.10		Refurbished Plant under Item 14.3.3	No	3		
15	9		Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
15	9.1		Plant installed under Item 14.8.1 & 14.8.2	No.	2		
15	9.3		Plant installed under Item 14.8.3 to 14.8.6	No	2		
15	9.4		Plant installed under Item 14.8.7	No	2		
15	9.5		Plant installed under Item 14.8.8	No	2		
15	9.6		Plant installed under Item 14.8.9	No	2		
15	9.7		Plant installed under Item 14.8.10	No	3		
TOTAL FOR SECTION 12 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 16 - MECHANICAL EQUIPMENT: SECONDARY TREATMENT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
16		PSX1.4 & 1.5	MECHANICAL EQUIPMENT: SECONDARY TREATMENT				
			PART A: CONDITIONAL ASSESSMENT OF EXISTING MECHANICAL EQUIPMENT				
16	1		Remove (to Contractor's workshop off site), Inspect and Conduct conditional assessment of existing equipment				
16	1.1	PSX1.4	Biological reactor mixers, including motors, gear boxes, shafts and impellers	No.	16		
16	1.2	PSX1.5	Clarifier Bridges, including scum and floor scraper mechanism, scum troughs and piping	No.	12		
16	2		Storage of Mechanical Equipment while Engineer assesses the Contractor's conditional assessment report				
			Off site storage of equipment being assessed under Item 12.1				
16	2.1		Biological reactor mixers, including motors, gear boxes, shafts and impellers	Months	1		
16	2.2		Clarifier Bridges, including scum and floor scraper mechanism, scum troughs and piping	Months	1		
16	3		Refurbishment of existing equipment				
16	3.1		Biological reactor mixer gear boxes	No.	16		
16	3.2		Clarifier Bridges, including sand blasting, Hot Dipped Galvanising and Epoxy Coating	No.	12		
16	3.3		Knife Gate valves on scum discharge	No.	24		
16	3.4		Provisional Sum for Modifications to existing	Prov. Sum	1	R 1 250 000.00	R 1 250 000.00
16	4		Transport existing equipment from the Contractor's workshop back to site				
16	4.1		Biological reactor mixers, including motors, gear boxes, shafts and impellers	No.	16		
16	4.2		Clarifier Bridges, including scum and floor scraper mechanism, scum troughs and piping	No.	12		
16	5		Deliver to client storage area of existing equipment not to be refurbished				
16	5.1		Biological reactor mixers	No.	16		
16	5.2		Clarifier Bridges	No.	12		
16	5.3		Clarifier scum and sludge scraper mechanism	No.	12		
			PART B: SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF MECHANICAL EQUIPMENT				
			Design, supply and delivery of the following equipment to Site including storage (where applicable), quality assurance and painting (where specified)				
16	6		Mechanical equipment for the Biological Reactors in accordance with the specification				
16	6.1		Vertical shaft mounted mixers complete with motor, gearbox, base plate, coupling and holding down bolts	No.	16		
16	6.2		Replace bottom bearings of screw pumps at four existing screw pump stations with sealed bearings	No.	12		
16	7		Mechanical equipment for the Clarifiers in accordance with the specification				
16	7.1		New floor scraper mechanism hanging from the bridge complete	No.	12		
16	7.2		New inner and outer scum troughs, scum scrapers and piping complete	No.	12		
16	7.3		New clarifier maintenance platform added to bridges complete	No.	12		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 16 - MECHANICAL EQUIPMENT: SECONDARY TREATMENT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
16	8		Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
16	8.1		Plant supplied under Item 12.6.1	No.	16		
16	8.2		Plant supplied under Item 12.6.2	No	12		
16	8.3		Plant supplied under Item 12.7.1	No	12		
16	8.4		Plant supplied under Item 12.7.2	No	12		
16	8.5		Plant supplied under Item 12.7.3	No	12		
16	8.6		Refurbished Plant under Item 12.3.1	No	16		
16	8.7		Refurbished Plant under Item 12.3.2	No	12		
16	9		Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
16	9.1		Plant installed under Item 12.8.1	No.	16		
16	9.2		Plant installed under Item 12.8.2	No	12		
16	9.3		Plant installed under Item 12.8.3 to 12.8.5	No	12		
16	9.4		Plant installed under Item 12.8.6	No	16		
16	9.5		Plant installed under Item 12.8.7	No	12		
TOTAL FOR SECTION 16 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: WASHWATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
17			MECHANICAL EQUIPMENT: WASHWATER				
17	1	PSX1.6.1	MECHANICAL EQUIPMENT: EXISTING WASH WATER SYSTEM				
			PART A: REMOVAL OF EXISTING MECHANICAL EQUIPMENT				
			Dismantle and remove of exisitng equipment and deliver to client storage				
17	1.1		Existing two sand filter booster pumps and pipework	Sum	1		
17	1.2		Existing four sand filters and pipework	Sum	1		
17	1.3		Existing three wash water pumps and pipework	Sum	1		
17	1.4		Existing filtered water tank outside the building	Sum	1		
17	1.5		Existing sump pump inside the dry well in the building	Sum	1		
			PART B: SUPPLY, DELIVER, INSTALLATION AND COMMISSIONING				
			Design, supply and delivery of the following equipment to site including storage (where applicable), quality assurance and painting (where specified)				
			Mechanical equipment for the wash water system in accordance with the specification				
17	1.6		New sand filter booster pumps complete in accordance with the specification	No.	2		
17	1.7		Suction and discharge pipework, valves, fittings and pipe supports for sand filter booster pumps	Sum	1		
17	1.8		New sand filters complete, including piping and valves in accordance with the specification	No.	4		
17	1.9		New blowers for sand filters complete, including piping and valves in accordance with the specification	No.	2		
17	1.10		Replace the existing filtered water storage tank at the wash water pump station complete in accordance with SANS 10329:2004 with a tank with capacity of 125,000L	No.	1		
17	1.11		New wash water supply pumps complete in accordance with the specification	No.	3		
17	1.12		Suction and discharge pipework, valves, fittings and pipe supports for wash water supply pumps to HoW	Sum	1		
17	1.13		New submersible pump to replace the existing sump pump inside wash water pump station	No.	1		
17	1.14		240,000L cold pressed galvanised steel tank at the Head of Works complete including Inlet, Overflow and Outlet pipework in accordance with the specification	Sum	1		
17	1.15		Two wash water booster pumps for Head of Works Module 1 including pressure vessel complete in accordance with the specification	Sum	1		
17	1.16		Suction and discharge pipework, valves, fittings and pipe supports for wash water booster pumps (Item 17.1.12)	Sum	1		
17	1.17		Two wash water booster pumps for Head of Works Module 2 including pressure vessel complete in accordance with the specification	Sum	1		
17	1.18		Suction and discharge pipework, valves, fittings and pipe supports for wash water booster pumps (Item 17.1.14)	Sum	1		
			Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
17	1.19		Plant supplied under Item 17.1.6 and 17.1.7	Sum	1		
17	1.20		Plant supplied under Item 17.1.8	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: WASHWATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
17	1.21		Plant supplied under Item 17.1.9	Sum	1		
17	1.22		Plant supplied under Item 17.1.10	Sum	1		
17	1.23		Plant supplied under Item 17.1.11 and 17.1.12	Sum	1		
17	1.24		Plant supplied under Item 17.1.13	Sum	1		
17	1.25		Plant supplied under Item 17.1.14	Sum	1		
17	1.26		Plant supplied under Item 17.1.15 and 17.1.16	Sum	1		
17	1.27		Plant supplied under Item 17.1.17 and 17.1.18	Sum	1		
			Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
17	1.28		Plant installed under Item 17.1.19 to 17.1.21	Sum	1		
17	1.29		Plant installed under Item 17.1.22	Sum	1		
17	1.30		Plant installed under Item 17.1.23	Sum	1		
17	1.31		Plant installed under Item 17.1.24	Sum	1		
17	1.32		Plant installed under Item 17.1.25	Sum	1		
17	1.33		Plant installed under Item 17.1.26	Sum	1		
17	1.34		Plant installed under Item 17.1.27	Sum	1		
17	1.35		Provisional Sum for Modifications to existing infrastructure	Prov. Sum	1	R 500 000.00	R 500 000.00
17	2	PSX1.6.2	<u>MECHANICAL EQUIPMENT: NEW WASH WATER BUILDING</u>				
			PART A: SUPPLY, DELIVER, INSTALLATION AND COMMISSIONING				
			Design, supply and delivery of the following equipment to site including storage (where applicable), quality assurance and painting (where specified)				
			Mechanical equipment for the wash water system in accordance with the specification				
17	2.1		Sand filter booster pumps complete in accordance with the specification	No.	2		
17	2.2		Suction and discharge pipework, valves, fittings and pipe supports for sand filter booster pumps	Sum	1		
17	2.3		Sand filters complete, including piping and valves in accordance with the specification	No.	4		
17	2.4		Blowers for sand filters complete, including piping and valves in accordance with the specification	No.	2		
17	2.5		Dewatering Building Wash Water Supply Pumps	No.	2		
			Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
17	2.6		Plant supplied under Item 17.2.1 and 17.2.2	Sum	1		
17	2.7		Plant supplied under Item 17.2.3	Sum	1		
17	2.8		Plant supplied under Item 17.2.4	Sum	1		
17	2.9		Plant supplied under Item 17.2.5	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 13 - MECHANICAL EQUIPMENT: WASHWATER							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
17	2.10		Plant installed under Item 17.2.6 to 17.2.8	Sum	1		
17	2.11		Plant installed under Item 17.2.9	Sum	1		
TOTAL FOR SECTION 17 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 18 - MECHANICAL EQUIPMENT - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
18		PSX1.7	MECHANICAL EQUIPMENT: LIME PLANT				
			PART A: CONDITIONAL ASSESSMENT OF EXISTING MECHANICAL EQUIPMENT				
18	1		Remove (to Contractor's workshop off site), Inspect and Conduct conditional assessment of existing equipment				
18	1.1		Lime Rotary Vane Feeders	No.	2		
18	1.2		Lime Silo Isolation valves	No.	2		
18	1.3		Mixers at Lime Reactor	No.	7		
18	1.4		Lime Clarifier Bridge, Scum and Floor Scrapers	No.	4		
18	2		Storage of Mechanical Equipment while Engineer assesses the Contractor's conditional assessment report				
			Off site storage of equipment being assessed under Item 18.1				
18	2.1		Lime Rotary Vane Feeders	Months	1		
18	2.2		Lime Silo Isolation valves	Months	1		
18	2.3		Mixers at Lime Reactor	Months	1		
18	2.4		Lime Clarifier Bridge, Scum and Floor Scrapers	Months	1		
18	3		Refurbishment of existing equipment				
18	3.1		Lime Rotary Vane Feeders	No.	2		
18	3.2		Lime Silo Isolation valves	No.	2		
18	3.3		Mixers at Lime Reactor	No.	7		
18	3.4		Lime Clarifier Bridge	Prov. Sum	1	R 200 000.00	R 200 000.00
18	3.5		Provisional Sum for Modifications to existing	Prov. Sum	1	R 500 000.00	R 500 000.00
18	4		Transport existing equipment from the Contractor's workshop back to site				
18	4.1		Lime Rotary Vane Feeders	No.	2		
18	4.2		Lime Silo Isolation valves	No.	2		
18	4.3		Mixers at Lime Reactor	No.	7		
18	4.4		Lime Clarifier Bridge	No.	4		
18	5		Deliver to client storage area of existing equipment not to be refurbished				
18	5.1		Lime Rotary Vane Feeders	No.	2		
18	5.2		Lime Silo Isolation valves	No.	2		
18	5.3		Mixers at Lime Reactor	No.	5		
18	5.4		Lime Clarifier Bridge, Scum and Floor Scrapers	No.	4		
			PART B: RELOCATION OF EXISTING MECHANICAL EQUIPMENT				
18	6		Unbolting and disconnecting of mechanical equipment				
18	6.1		Lime Silo with four supports and four load cells	No.	1		
18	6.2		Emergency shower and eyewash	No.	1		
18	7		Installation of mechanical equipment in new position				
18	7.1		Lime Silo with four supports and four load cells	No.	1		
18	7.2		Lime filter system at top of Silo	No.	1		
18	7.3		Emergency shower and eyewash	No.	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 18 - MECHANICAL EQUIPMENT - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
			PART C: SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING				
			Design, supply and delivery of the following equipment to Site including storage (where applicable), quality assurance and painting (where specified)				
18	8		Mechanical equipment for the lime plant in accordance with the specification				
18	8.1		Flash Mixer at Lime Reactor	No.	1		
18	8.2		Mixers at Lime Reactor	No.	6		
18	8.3		New rotary vane feeders with isolation valves as per existing equipment	No.	2		
18	8.4		New lime screw feeders from Silo to Lime Make-up tanks	No.	2		
18	8.5		Lime make up tanks 10,000L mild steel epoxy coated with lockable cat ladder, reinforced roof, access manhole for maintenance, roof handrailing, inlet, outlet and drain pipes with associated valves and fittings for ultrasonic level instrumentation	No.	2		
18	8.6		Washwater pipework and valves to both lime make-up tanks	Sum	1		
18	8.7		Lime slurry piping from Lime Make-up tanks to Lime Reactor including actuated knife gate valves	Sum	1		
18	8.8		New 500mm dia. knife gate valve with electric actuator and 500mm dia epoxy coated mild steel spool piece	No.	1		
18	8.9		New Lime Clarifier Scum and Floor Scraper complete	No.	4		
18	8.10		New Lime Clarifier maintenance platform added to bridges complete	No.	4		
18	8.11		New 3CR12 handrailing around Bridge and maintenance platform with 3CR12 kickplate and 3CR12 access ladder, walkway on Bridge with 3CR12 open steel flooring	No.	4		
18	8.12		New 3CR12 Lime Clarifier Bridge	No.	4		
18	9		Handling (including double handling if stored), erection, installation, painting (if applicable) and quality assurance of the following plant, including transportation and accommodation for personnel				
18	9.1		Plant supplied under Item 18.8.1	No	1		
18	9.2		Plant supplied under Item 18.8.2	No	6		
18	9.3		Plant supplied under Item 18.8.3	Sum	1		
18	9.4		Plant supplied under Item 18.8.4	Sum	1		
18	9.5		Plant supplied under Item 18.8.5	Sum	1		
18	9.6		Plant supplied under Item 18.8.6	Sum	1		
18	9.7		Plant supplied under Item 18.8.7	Sum	1		
18	9.8		Plant supplied under Item 18.8.8 (including removing of existing steel pipe at the Lime Clarifier Overflow Pumps inside the Olifantsvlei Sludge Transfer Pump Station)	Sum	1		
18	9.9		Plant supplied under Item 18.8.9 to 18.8.11	No.	4		
18	9.10		Plant supplied under Item 18.8.12	No.	4		
18	10		Commissioning, testing and adjusting the following plant as a completely separate operation some time after completion of erection and installation, including transportation and accommodation for personnel				
18	10.1		Plant installed under Item 18.9.1 & 18.9.2	Sum	1		
18	10.2		Plant installed under Item 18.9.3 to 18.9.7	Sum	1		
18	10.3		Plant installed under Item 18.9.8	Sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 18 - MECHANICAL EQUIPMENT - LIME PLANT							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
18	10.4		Plant installed under Item 18.9.9	No.	4		
18	10.5		Plant installed under Item 18.9.10	No.	4		
TOTAL FOR SECTION 18 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19			ELECTRICAL EQUIPMENT <u>Tenderers must note that PSY3, 4 & 5 must be read in conjunction with all payment clauses.</u>				
19	1	PSY 6	11kV SUBSTATIONS <u>Note: The programming / grading of protection relays must achieve the correct relay co-ordination that will ensure the correct discrimination.</u>				
19	1.1		SUBSTATION 0				
	a	PSY 6	11kV RMU panel including 2 x motorised 11kV 630A switch disconnectors & 3 x motorised 11kV 630A vacuum circuit breakers as specifications and drawings.	Sum			
	b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	3		
	c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV switch disconnectors and 11kV vacuum circuit breakers.	No	1		
	d	PSY 17	30V DC 3A, Battery Tripping Unit including 10AH Nickel Cadmium Batteries.	No	1		
	e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1		
	f	PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm				
		PSY 11	2.5mm ² x 3 core (BTU)	m	12		
	g	PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc.				
		PSY 11	2.5mm ² x 3 core (BTU)	No	4		
	h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12		
	i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20		
	j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	2		
	k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2		
	l	PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	30		
	m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1		
	n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	5		
19	1.2		SUBSTATION 1				
	a	PSY 6	11kV RMU panel including 2 x motorised 11kV 630A switch disconnectors & 2 x motorised 11kV 630A vacuum circuit breakers as specifications and drawings.	Sum			
	b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	2		
	c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV switch disconnectors and 11kV vacuum circuit breakers.	No	1		
	d	PSY 17	30V DC 3A, Battery Tripping Unit including 10AH Nickel Cadmium Batteries.	No	1		
	e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1		
	f	PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm galvanised conduit. (conduit and cable terminations measured elsewhere).				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment									
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT		
19	1.3		brought forward						
		g	PSY 11	2.5mm ² x 3 core (BTU)	m	12			
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc						
			PSY 11	2.5mm ² x 3 core (BTU)	No	4			
		h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12			
		i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20			
		j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	2			
		k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2			
			PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20			
		m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1			
		n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	4			
				SUBSTATION 2					
		a	PSY 6	11kV RMU panel including 2 x motorised 11kV 630A switch disconnectors & 2 x motorised 11kV 630A vacuum circuit breakers as specifications and drawings.	Sum				
		b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	2			
		c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV switch disconnectors and 11kV vacuum circuit breakers.	No	1			
		d	PSY 17	30V DC 3A, Battery Tripping Unit including 10AH Nickel Cadmium Batteries.	No	1			
		e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1			
			PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm galvanised conduit. (conduit and cable terminations measured elsewhere).					
			PSY 11	2.5mm ² x 3 core (BTU)	m	12			
			PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc					
			PSY 11	2.5mm ² x 3 core (BTU)	No	4			
		h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12			
		i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20			
		j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	2			
		k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2			
			PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20			
		m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1			
		n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	4			
		SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	1.4		<i>brought forward</i> SUBSTATION 3				
	a	PSY 6	11kV RMU panel including 2 x motorised 11kV 630A switch disconnectors & 2 x motorised 11kV 630A vacuum circuit breakers as specifications and drawings.	Sum			
	b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	2		
	c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV switch disconnectors and 11kV vacuum circuit breakers.	No	1		
	d	PSY 17	30V DC 3A, Battery Tripping Unit including 10AH Nickel Cadmium Batteries.	No	1		
	e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1		
	f	PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm galvanised conduit. (conduit and cable terminations measured elsewhere).				
		PSY 11	2.5mm ² x 3 core (BTU)	m	12		
	g	PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
		PSY 11	2.5mm ² x 3 core (BTU)	No	4		
	h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12		
	i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20		
	j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	2		
	k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2		
	l	PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	20		
	m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1		
	n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	4		
	1.5		HOW SUBSTATION				
	a	PSY 6	11kV RMU panel including 1 x motorised 11kV 630A switch disconnectors & 3 x motorised 11kV 630A vacuum circuit breakers as specifications and drawings.	Sum			
	b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	3		
	c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV switch disconnectors and 11kV vacuum circuit breakers.	No	1		
	d	PSY 17	30V DC 3A, Battery Tripping Unit including 10AH Nickel Cadmium Batteries.	No	1		
	e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1		
	f	PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm galvanised conduit. (conduit and cable terminations measured elsewhere).				
		PSY 11	2.5mm ² x 3 core (BTU)	m	12		
	g	PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
		PSY 11	2.5mm ² x 3 core (BTU)	No	4		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19			<i>brought forward</i>				
	h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12		
	i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	10		
	j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	1		
	k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	1		
	l	PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	30		
	m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1		
	n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	6		
	1.6		BLOWER SUBSTATION				
	a	PSY 6	11kV metal clad switchgear panel including 2 x 11kV 800A incomer vacuum spring actuated circuit breakers, 4 x 11kV 800A feeder vacuum spring actuated circuit breakers, 5 x 11kV 800A vacuum magnetic actuated circuit breakers & 1 x 11kV/110V 200VA class 1 busbar VT panel as specifications and drawings.	Sum	1		
	b	PSY 6	Programming of circuit breaker protection relays during the FAT.	No	11		
	c	PSY 6	Umbilical cord including male socket and control station for the remote operation of the 11kV vacuum circuit breakers.	No	1		
	d	PSY 17	110V DC 10A, Battery Tripping Unit including 60AH Nickel Cadmium Batteries.	No	1		
	e	PSY 7	10A single pole 10kA circuit breaker to be installed into the existing small power DB.	No	1		
	f	PSY 11	PVC/SWA/PVC copper conductor cables pulled through 25mm galvanised conduit. (conduit and cable terminations measured elsewhere).				
		PSY 11	2.5mm ² x 3 core (BTU)	m	12		
	g	PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
		PSY 11	2.5mm ² x 3 core (BTU)	No	4		
	h	PSY 3 & 4	25mm galvanised conduit, surface mounted to brick walling including saddles and aux items.	m	12		
	i	PSY 10	185mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	180		
	j	PSY 10	185mm ² x 3 core, 11kV PILC copper cable joint	No	10		
	k	PSY 10	185mm ² x 3 core, 11kV PILC copper cable internal termination.	No	15		
	l	PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	30		
	m	PSY 10	50mm ² x 3 core, 11kV PILC copper cable joint	No	1		
	n	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	1.7		<i>brought forward</i> EMERGENCY DAM MINI SUBSTATION				
	a	PSY 6	315kVA, 11kV / 400V mini substation including 1 x 630A 11kV CB RMU. The mini sub must include the following: Main 3 ph 400V circuit breaker 4 x 250A 3ph circuit breakers. Instrumentation and switchgear as listed in Johannesburg Water's specification. The mini substation must be in accordance with Johannesburg Water's particular specification E18.	No	1		
	b	PSY 6	Precast concrete plinth including LV & MV cable apertures to correspond with the mini substation's switchgear.	No	1		
	c	PSY 6	Disconnect, removal and transporting of the existing 315kVA mini substation to a destination of the contractor's choice.	sum	1		
19	2		TRASH SCREEN				
19	2.1		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	2.5mm ² x 4 core (HOW New Blower Room MCC - Sluice Gate Actuator)	m	200		
	b	PSY 11	4mm ² x 4 core (HOW New Blower Room MCC - Crawl motor)	m	200		
19	2.2		LV CABLE TERMINATION				
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	2.5mm ² x 4 core (Sluice Gate Actuator)	No	2		
	b	PSY 11	2.5mm ² x 4 core (Crawl motor)	No	2		
19	2.3		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	50		
	b	PSY 16	Backfilling of cable trenches.	m ³	50		
19	2.4		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers.	No	10		
19	2.5		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / railing.				
	a	PSY 15	100mm cable ladder	m	20		
	b	PSY 15	200mm cable ladder	m	20		
	c	PSY 15	100mm 90° bends	No	4		
	d	PSY 15	200mm 90° bends	No	4		
19	2.6		JUNCTION BOXES				
		PSY 11	PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	2.5mm ² x 4 core (Crawl motor)	No	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	2.7		<i>brought forward</i>				
			LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations (Trash screen motor) (Drawing 18056-73-12-131)	No	1		
	b	PSY 19	3CR12 support stands for the above item.	No	1		
19	3		HoW MODULE 1 & HoW GENERATOR				
19	3.1		MV CABLE SUBSTATION 3				
	a	PSY 10	50mm ² x 3 core, 11kV PILC copper cable to table 18 to be installed in cable trench. (trenches and cable terminations measured elsewhere)	m	8		
	b	PSY 10	50mm ² x 3 core, 11kV PILC copper cable internal termination.	No	2		
19	3.2		LV OVERHEAD BUSBARS				
	a	PSY 26	Disconnect and transport the existing vandalised 1000A overhead copper busbar to the Electrical Workshop at Bushkoppie WwTW	sum	1		
			<u>Supply and install</u>				
		PSY 26	Telemecanique Canalis KG2 (800A -1000A, 660V) Copper Busbar Trunking or similar approved.				
	b	PSY 26	Copper busbar trunking including supports	m	14		
	c	PSY 26	Transformer box.	No	1		
	d	PSY 26	Set of flexibles	No	1		
	e	PSY 26	Transformer end feed unit.	No	1		
	f	PSY 26	Elbow	No	5		
	g	PSY 26	Panel end feed unit.	No	3		
19	3.3		MOTOR CONTROL CENTRE				
	a	PSY 8	Disconnect and transport the existing vandalised HOW Module 1 MCC to the Electrical Workshop at Bushkoppie WwTW.	sum	1		
	b	PSY 8	Manufacture, supply and off loading of the HOW Module 1 MCC, including PLC marshalling tier as detailed in the specifications, single line diagram 18056-73-12-153 and associated motor starter drive schematic tender drawings.	sum	1		
19	3.4		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	95mm ² x 4 core	m	33		
	b	PSY 11	120mm ² x 4 core	m	278		
	c	PSY 11	150mm ² x 4 core	m	340		
	d	PSY 11	35mm ² Bare Copper Earth Wire	m	33		
	e	PSY 11	70mm ² Bare Copper Earth Wire	m	618		
19	3.5		LV CABLE TERMINATION				
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	95mm ² x 4 core	No	2		
	b	PSY 11	120mm ² x 4 core	No	16		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	c	PSY 11	150mm ² x 4 core	No	4		
	d	PSY 11	35mm ² Bare Copper Earth Wire	No	2		
	e	PSY 11	70mm ² Bare Copper Earth Wire	No	20		
19	3.6		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	20		
	b	PSY 16	Backfilling of cable trenches.	m ³	20		
19	3.7		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers.	No	10		
19	3.8		CABLE LADDER AND TRAY				
		PSY 15	OL76 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / railing.				
	a	PSY 15	300mm cable ladder	m	20		
	b	PSY 15	400mm cable ladder	m	20		
	c	PSY 15	300mm 90° bends	No	4		
	d	PSY 15	400mm 90° bends	No	4		
19	3.9		INDOOR STANDBY EMERGENCY GENERATOR				
	a	PSY 23	Transport the existing CAT 300kVA emergency generator to the Electrical Workshop at Bushkoppie WwTW.	sum	1		
	b	PSY 23	600kVA 400V standby emergency generator including automatic change over panel, day tank, bulk fuel tank, filling accessories, transfer pumps, sound attenuated exhaust as detailed in the specifications.	sum	1		
	c	PSY 23	Sound attenuated inlet and outlet louvres, and ducting between the radiator and outlet louvre. (louvres will be built into brick walling by others)	sum	1		
	d	PSY 12	Control cabling between the generator's change over panel and the change over switchgear mounted inside Module 1 MCC.	sum	1		
		PSY 23	<u>Notes:</u> Tenderes to note that the size of the generator room & the single line diagram of the change over panel are indicated on drawing 18056-73-12-152				
19	4		HoW MODULE 1 COARSE SCREENS				
19	4.1		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (12 x local motor isolators / stop - start stations)	m	1745		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	m	360		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	m	400		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	m	300		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	m	100		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	1260		
	g	PSY 11	2.5mm ² x 4 core (Actuators)	m	600		
	h	PSY 11	2.5mm ² x 4 core (Motors)	m	1305		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	4.2		<i>brought forward</i> LV CABLE TERMINATION PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (12 x local motor isolators / stop - start stations)	No	24		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	No	24		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	No	10		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	No	6		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	No	6		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	18		
	g	PSY 11	2.5mm ² x 4 core (Actuators)	No	10		
	h	PSY 11	2.5mm ² x 4 core (Motors)	No	36		
19	4.3		JUNCTION BOXES PVC/SWA/PVC Exe 4 way ezee / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	1mm ² x 3 core	No	10		
	b	PSY 11	1mm ² x 7 core	No	10		
	c	PSY 11	1mm ² x 12 core	No	2		
	d	PSY 11	1mm ² x 19 core	No	2		
19	4.4		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	74		
	b	PSY 16	Backfilling of cable trenches.	m ³	74		
19	4.5		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers	No	18		
19	4.6		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	100mm cable ladder	m	200		
	b	PSY 15	200mm cable ladder	m	200		
	c	PSY 15	300mm cable ladder	m	100		
	d	PSY 15	500mm cable ladder	m	50		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
	g	PSY 15	300mm 90° bends	No	8		
	h	PSY 15	500mm 90° bends	No	8		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	4.7		<i>brought forward</i>				
			SKIPS				
		PSY 20	Removal of existing limit / proximity switches, local stop / start stations, local skip control buttons and the replacement of these items.				
	a	PSY 20	IP66, NO & NC, 6A, 230V AC limit switches including spring return roller lever & 3CR12 mounting plates. (Existing: ERSCE E300-00-FM)	No	16		
	b	PSY 20	230V 200/300mA proximity switches (Existing: Telemecanique	No	1		
	c	PSY 5 & 18	IP65 emergency stop - start push button station for the traversing conveyor (To be installed onto the side of existing steel work).	No	1		
	d	PSY 5 & 18	IP65 emergency stop, left & right push button station for the positioning of the traversing conveyor. (To be installed onto the side of existing steel work).	No	1		
	e	PSY 5 & 18	Replacement of the IP65 230V <u>start</u> buttons on the existing local manual skip control panel.	No	6		
19	4.8		ADDITIONAL WIRING, TERMINALS & SWITCHGEAR TO EXISTING MOTOR STARTER DRIVES				
	a	PSY 5	Single pole 6A circuit breaker, cubicle door test / normal push button (PB4), motor isolator relay (R2), local stop relay (R3) including all wiring and terminals to ensure that the 2 x PLC DI locked out and isolated signals are active. Note: The above can be referenced on the typical schematic 18056-73-12-110.	No	5		
19	4.9		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	4.10		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 1.5kW 3 phase motor isolator / stop - start stations.	No	3		
	b	PSY 19	3CR12 support stands for the above item.	No	3		
	c	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	4		
	d	PSY 19	3CR12 support stands for the above item.	No	4		
	e	PSY 19	Local IP65 3kW 3 phase motor isolator / stop - start stations.	No	2		
	f	PSY 19	3CR12 support stands for the above item.	No	2		
19	5		HOW MODULE 1 GRIT HANDLING INCLUDING BLOWERS & COMPRESSORS				
19	5.1		MOTOR CONTROL CENTRE				
	a	PSY 8	Manufacture, supply and off loading of the HOW Compressor MCC, including PLC marshalling tier as detailed in the specifications and drawings 18056-73-12-117, 18056-73-12-118 & 18056-73-12-119.	sum	1		
	b	PSY 8	Disconnect and transport the existing HOW Compressor MCC to the Electrical Workshop at Bushkoppie WwTW.	sum	1		
19	5.2		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (16 x local motor isolators / stop - start stations)	m	1042		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	b	PSY 11	1.5mm ² x 3 core (4 x skips / bins 16 x limit switches)	m	480		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	m	400		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	m	300		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	m	100		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	996		
	h	PSY 11	2.5mm ² x 4 core (Motors)	m	420		
	i		6mm ² x 4 core (Motors)	m	646		
19	5.3		LV CABLE TERMINATION				
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete				
	a	PSY 11	1.5mm ² x 7 core (16 x local motor isolators / stop - start stations)	No	32		
	b	PSY 11	1.5mm ² x 3 core (4 x skips / bins 16 x limit switches)	No	32		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	No	10		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	No	6		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	No	6		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	28		
	g	PSY 11	2.5mm ² x 4 core (Motors)	No	16		
	h	PSY 11	6mm ² x 4 core (Motors)	No	40		
19	5.4		JUNCTION BOXES				
		PSY 11	PVC/SWA/PVC Exe 4 way ezee / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	c	PSY 12	1mm ² x 12 core	No	2		
	d	PSY 12	1mm ² x 19 core	No	2		
19	5.5		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	51		
	b	PSY 16	Backfilling of cable trenches.	m ³	51		
19	5.6		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers	No	18		
19	5.7		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	100mm cable ladder	m	200		
	b	PSY 15	200mm cable ladder	m	200		
	c	PSY 15	300mm cable ladder	m	100		
	d	PSY 15	500mm cable ladder	m	50		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	g	PSY 15	300mm 90° bends	No	8		
	h	PSY 15	500mm 90° bends	No	8		
	5.8		SKIPS				
		PSY 20	Removal of existing limit / proximity switches, local stop / start stations, local skip control buttons and the replacement of these items.				
	a	PSY 20	IP66, NO & NC, 6A, 230V AC limit switches including spring return roller lever & 3CR12 mounting plates. (Existing: ERSCE E300-00-FM)	No	20		
	b	PSY 20	230V 200/300mA proximity switches (Existing: Telemecanique XS1M30MA230)	No	2		
	c	PSY 5 & 18	IP65 emergency stop - start push button station for the traversing conveyor (To be installed onto the side of existing steel work).	No	1		
	d	PSY 5 & 18	IP65 emergency stop, left & right push button station for the positioning of the traversing conveyor. (To be installed onto the side of existing steel work).	No	1		
	e	PSY 5 & 18	Replacement of the IP65 230V <u>start</u> buttons on the existing local manual skip control panel.	No	8		
	f	PSY 5 & 18	Replacement of the IP65 230V <u>stop</u> buttons on the existing local manual skip control panel.	No	4		
19	5.9		LEVEL PROBES				
	a	PSY 5	Level probes as indicated on drawing 18056-73-12-112	sum	1		
19	5.1		ADDITIONAL WIRING, TERMINALS & SWITCHGEAR TO EXISTING MOTOR STARTER DRIVES				
	a	PSY 5	Single pole 6A circuit breaker, cubicle door test / normal push button (PB4), motor isolator relay (R2), local stop relay (R3) including all wiring and terminals to ensure that the 2 x PLC DI locked out and isolated signals are active. Note: The above can be referenced on the typical schematic 18056-73-12-110	No	5		
19	5.11		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	5.12		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	4		
	b	PSY 19	3CR12 support stands for the above item.	No	4		
	c	PSY 19	Local IP65 15kW 3 phase motor isolator / stop - start stations.	No	10		
	d	PSY 19	3CR12 support stands for the above item.	No	10		
19	6		HOW MODULE 1 FINE SCREENS				
19	6.1		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (10 x local motor isolators / stop - start stations)	m	1600		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	m	360		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	m	400		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	m	300		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	m	100		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	1080		
	g	PSY 11	2.5mm ² x 4 core (Actuators)	m	960		
	h	PSY 11	2.5mm ² x 4 core (Motors)	m	1125		
	6.2		LV CABLE TERMINATION PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (10 x local motor isolators / stop - start stations)	No	20		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	No	24		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	No	10		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	No	6		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	No	6		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	18		
19	g	PSY 11	2.5mm ² x 4 core (Actuators)	No	16		
	h	PSY 11	2.5mm ² x 4 core (Motors)	No	36		
	6.3		JUNCTION BOXES PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	1mm ² x 3 core	No	10		
	b	PSY 11	1mm ² x 7 core	No	10		
	c	PSY 11	1mm ² x 12 core	No	2		
	d	PSY 11	1mm ² x 19 core	No	2		
	6.4		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	77		
	b	PSY 16	Backfilling of cable trenches.	m ³	77		
19	6.5		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers.	No	18		
19	6.6		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	100mm cable ladder	m	200		
	b	PSY 15	200mm cable ladder	m	200		
	c	PSY 15	300mm cable ladder	m	100		
	d	PSY 15	500mm cable ladder	m	50		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
	g	PSY 15	300mm 90° bends	No	8		
	h	PSY 15	500mm 90° bends	No	8		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	6.7		<i>brought forward</i>				
			SKIPS				
		PSY 20	Removal of existing limit / proximity switches, local stop / start stations, local skip control buttons and the replacement of these items.				
	a	PSY 20	IP66, NO & NC, 6A, 230V AC limit switches including spring return roller lever & 3CR12 mounting plates. (Existing: ERSCE E300-00-FM)	No	16		
	b	PSY 20	230V 200/300mA proximity switches (Existing: Telemecanique XS1M30MA230)	No	1		
	c	PSY 5 & 18	IP65 emergency stop - start push button station for the traversing conveyor (To be installed onto the side of existing steel work).	No	1		
	d	PSY 5 & 18	IP65 emergency stop, left & right push button station for the positioning of the traversing conveyor. (To be installed onto the side of existing steel work).	No	1		
19		PSY 5 & 18	Replacement of the IP65 230V <u>start</u> buttons on the existing local manual skip control panel.	No	6		
	f	PSY 5 & 18	Replacement of the IP65 230V <u>stop</u> buttons on the existing local manual skip control panel.	No	3		
19	6.8		ADDITIONAL WIRING, TERMINALS & SWITCHGEAR TO EXISTING MOTOR STARTER DRIVES				
		PSY 5	Single pole 6A circuit breaker, cubicle door test / normal push button (PB4), motor isolator relay (R2), local stop relay (R3) including all wiring and terminals to ensure that the 2 x PLC DI locked out and isolated signals are active. Note: The above can be referenced on the typical schematic 18056-73-12-110	No	5		
19	6.9		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	6.10		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 1.5kW 3 phase motor isolator / stop - start stations.	No	5		
	b	PSY 19	3CR12 support stands for the above item.	No			
	c	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	4		
	d	PSY 19	3CR12 support stands for the above item.	No			
19	7		HOW MODULE 2 GRIT HANDLING				
19	7.1		LV CABLE				
			PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (1 x local motor isolator / stop - start station)	m	107		
	b	PSY 11	1.5mm ² x 3 core (3 x skips local emergency stop stations)	m	321		
	c	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	m	1284		
	d	PSY 11	1.5mm ² x 7 core (skips / bins)	m	400		
	e	PSY 11	1.5mm ² x 12 core (skips / bins)	m	300		
	f	PSY 11	1.5mm ² x 19 core (skips / bins)	m	100		
	g	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	900		
	h	PSY 11	2.5mm ² x 4 core (Motors)	No	945		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	7.2		<i>brought forward</i> LV CABLE TERMINATION PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (1 x local motor isolator / stop - start station)	No	2		
	b	PSY 11	1.5mm ² x 3 core (3 x skips local emergency stop stations)	No	6		
	c	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	No	24		
	d	PSY 11	1.5mm ² x 7 core (skips / bins)	No	10		
	e	PSY 11	1.5mm ² x 12 core (skips / bins)	No	6		
	f	PSY 11	1.5mm ² x 19 core (skips / bins)	No	6		
	g	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	18		
	h	PSY 11	2.5mm ² x 4 core (Motors)	No	36		
	7.3		JUNCTION BOXES PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
19	a	PSY 11	1mm ² x 3 core	No	10		
	b	PSY 11	1mm ² x 7 core	No	10		
	c	PSY 11	1mm ² x 12 core	No	2		
	d	PSY 11	1mm ² x 19 core	No	2		
19	7.4		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	51		
	b	PSY 16	Backfilling of cable trenches.	m ³	51		
19	7.5		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers.	No	18		
19	7.6		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories. mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	100mm cable ladder	m	200		
	b	PSY 15	200mm cable ladder	m	200		
	c	PSY 15	300mm cable ladder	m	100		
	d	PSY 15	500mm cable ladder	m	50		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
	g	PSY 15	300mm 90° bends	No	8		
	h	PSY 15	500mm 90° bends	No	8		
19	7.7		SKIPS				
		PSY 20	Installation of limit / proximity switches, local stop / start stations, local IP65 manual skip control panel.				
	a	PSY 20	IP66, NO & NC, 6A, 230V AC limit switches including spring return roller lever. (Existing: ERSCE E300-00-FM)	No	16		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	b	PSY 20	230V 200/300mA proximity switches (Existing: Telemecanique XS1M30MA230)	No	1		
	c	PSY 5 & 18	IP65 emergency stop - start push button station for the traversing conveyor (To be installed onto the side of steel work).	No	1		
	d	PSY 5 & 18	IP65 emergency stop, left & right push button station for the positioning of the traversing conveyor as indicated on drawing 18056-73-12-120. (To be installed onto the side of steel work)	No	1		
	e	PSY 5 & 18	Installation of a local 3CR12 IP65 manual skip control panel as indicated on drawing 18056-73-12-120 (3 x field forward inch buttons & 3 x field reverse inch buttons for skips 1, 2 & 3)	No	1		
	f	PSY 5 & 18	3CR12 support stand for the above item.	No	1		
19	7.8		MOTOR STARTER DRIVES				
	a	PSY 5 & 8	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for 3 x 2.2kW 3 phase DOL Skip Winch motor starter drives, and 1 x 2.2kW 3 phase DOL traversing conveyor <u>position</u> motor starter drive as indicated on drawing 18056-73-09-120 (GBS201, GBD201, GBD202 & GBD203)	No	1		
	b	PSY 5 & 8	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for the 2.2kW 3 phase DOL Grit Classifier motor starter drive as indicated on drawing 18056-73-12-123 (GCM201 & GCM202)	No	2		
	c	PSY 5 & 8	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for the 2.2kW 3 phase DOL Grit Classifier washer motor starter drive as indicated on drawing 18056-73-12-124 (GCW201 & GCW202)	No	2		
	d	PSY 5 & 8	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for the 2.2kW 3 phase DOL Grit Conveyor motor starter drive as indicated on drawing 18056-73-12-122 (GCY201)	No	1		
19	7.9		ADDITIONAL WIRING, TERMINALS & SWITCHGEAR TO EXISTING MOTOR STARTER DRIVES				
	a	PSY 5	Single pole 6A circuit breaker, cubicle door test / normal push button (PB4), motor isolator relay (R2), local stop relay (R3) including all wiring and terminals to ensure that the 2 x PLC DI locked out and isolated signals are active. Note: The above can be referenced on the typical schematic 18056-73-12-110	No	1		
19	7.10		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures for the skip motors.	No	3		
	b	PSY 18	3CR12 support stands for the above item.	No	3		
	c	PSY 18	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	9		
	d	PSY 18	3CR12 support stands for the above item.	No	9		
19	7.11		CIRCUIT BREAKER				
	a	PSY 7	Installation of circuit breakers into the existing HOW Module 2 MCC (for the existing misgund MCC) This item must include cut outs in the existing cubicle door for the circuit breaker toggles, circuit breaker yokes and wiring between the busbars and the circuit breakers. 200A 3 pole 15kA	No	2		
	b	PSY 7	Installation of circuit breakers into the existing HOW Module 2 MCC (for the new blower room MCC) This item must include cut outs in the existing cubicle door for the circuit breaker toggles, circuit breaker yokes and wiring between the busbars and the circuit breakers. 300A 3 pole 15kA	No	2		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	8		HoW MODULE 2 COARSE SCREENS				
19	8.1		LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (12 x local motor isolators / stop - start stations)	m	1745		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	m	360		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	m	400		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	m	300		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	m	100		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	1260		
	g	PSY 11	2.5mm ² x 4 core (Actuators)	m	600		
	h	PSY 11	2.5mm ² x 4 core (Motors)	m	1305		
19	8.2		LV CABLE TERMINATION PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (12 x local motor isolators / stop - start stations)	No	24		
	b	PSY 11	1.5mm ² x 3 core (3 x skips / bins 12 x limit switches)	No	24		
	c	PSY 11	1.5mm ² x 7 core (skips / bins)	No	10		
	d	PSY 11	1.5mm ² x 12 core (skips / bins)	No	6		
	e	PSY 11	1.5mm ² x 19 core (skips / bins)	No	6		
	f	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	18		
	g	PSY 11	2.5mm ² x 4 core (Actuators)	No	10		
	h	PSY 11	2.5mm ² x 4 core (Motors)	No	36		
19	8.3		JUNCTION BOXES PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	1mm ² x 3 core	No	10		
	b	PSY 11	1mm ² x 7 core	No	10		
	c	PSY 11	1mm ² x 12 core	No	2		
	d	PSY 11	1mm ² x 19 core	No	2		
19	8.4		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	74		
	b	PSY 16	Backfilling of cable trenches.	m ³	74		
19	8.5		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers	No	18		
19	8.6		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	a	PSY 15	100mm cable ladder	m	200		
	b	PSY 15	200mm cable ladder	m	200		
	c	PSY 15	300mm cable ladder	m	100		
	d	PSY 15	500mm cable ladder	m	50		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
	g	PSY 15	300mm 90° bends	No	8		
	h	PSY 15	500mm 90° bends	No	8		
19	8.7		SKIPS				
		PSY 20	Removal of existing limit / proximity switches, local stop / start stations, local skip control buttons and the replacement of these items.				
	a	PSY 20	IP66, NO & NC, 6A, 230V AC limit switches including spring return roller lever & 3CR12 mounting plates. (Existing: ERSCE E300-00-FM)	No	16		
	b	PSY 20	230V 200/300mA proximity switches (Existing: Telemecanique XS1M30MA230)	No	1		
	c	PSY 5 & 18	IP65 emergency stop - start push button station for the traversing conveyor (To be installed onto the side of existing steel work).	No	1		
	d	PSY 5 & 18	IP65 emergency stop, left & right push button station for the positioning of the traversing conveyor. (To be installed onto the side of existing steel work).	No	1		
	e	PSY 5 & 18	Replacement of the IP65 230V <u>start</u> buttons on the existing local manual skip control panel.	No	6		
	f	PSY 5 & 18	Replacement of the IP65 230V <u>stop</u> buttons on the existing local manual skip control panel.	No	3		
19	8.8		ADDITIONAL WIRING, TERMINALS & SWITCHGEAR TO EXISTING MOTOR STARTER DRIVES				
	a	PSY 5	Single pole 6A circuit breaker, cubicle door test / normal push button (PB4), motor isolator relay (R2), local stop relay (R3) including all wiring and terminals to ensure that the 2 x PLC DI locked out and isolated signals are active. Note: The above can be referenced on the typical schematic 18056-73-12-110	No	5		
19	8.9		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	8.10		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 1.5kW 3 phase motor isolator / stop - start stations.	No	3		
	b	PSY 19	3CR12 support stands for the above item.	No	3		
	c	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	4		
	d	PSY 19	3CR12 support stands for the above item.	No	4		
	e	PSY 19	Local IP65 3kW 3 phase motor isolator / stop - start stations.	No	2		
	f	PSY 19	3CR12 support stands for the above item.	No	2		
19	9		EXISTING WASH WATER PUMP STATION				
19	9.1		MOTOR CONTROL CENTRE				
	a	PSY 8	Manufacture, supply and off loading of the Wash Water Pump Station MCC, including PLC marshalling tier as detailed in the specifications and drawings 18056-73-12-133, 134, 135, 136, 137, 138 & 139.	sum	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	b	PSY 8	Disconnect and transport the existing Wash Water Pump Station MCC to the Electrical Workshop at Bushkoppie WwTW.	sum	1		
	9.2		OUTDOOR STANDBY EMERGENCY GENERATOR				
19	a	PSY 23	150kVA 400V standby emergency generator including fuel tank, weather proof & sound proof enclosure as detailed in the specifications.	No	1		
	9.3		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	145		
	b	PSY 11	2.5mm ² x 4 core (Actuators)	m	270		
	c	PSY 11	2.5mm ² x 4 core (Motors)	m	37		
	d	PSY 11	6mm ² x 4 core (Motors)	m	84		
	e	PSY 11	10mm ² x 4 core (Welding socket)	m	10		
	f	PSY 11	16mm ² x 4 core (Motors)	m	63		
	g	PSY 11	120mm ² x 4 core (MCC to generator)	m	20		
	h	PSY 11	70mm ² BCEW (MCC to generator)	m	20		
	i	PSY 11	120mm ² x 4 core (MCC to sub 0)	m	120		
	j	PSY 11	70mm ² BCEW (MCC to sub 0)	m	120		
19	9.4		LV CABLE TERMINATION				
			PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	20		
	b	PSY 11	2.5mm ² x 4 core (Actuators)	No	6		
	c	PSY 11	2.5mm ² x 4 core (Motors)	No	12		
	d	PSY 11	6mm ² x 4 core (Motors)	No	16		
	e	PSY 11	10mm ² x 4 core (Welding socket)	No	2		
	f	PSY 11	16mm ² x 4 core (Motors)	No	12		
	g	PSY 11	120mm ² x 4 core (MCC to generator)	No	2		
	h	PSY 11	70mm ² BCEW (MCC to generator)	No	2		
	i	PSY 11	120mm ² x 4 core (MCC to sub 0)	No	2		
	j	PSY 11	70mm ² BCEW (MCC to sub 0)	No	2		
19	9.5		JUNCTION BOXES				
			PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core	No	4		
19	9.6		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	29		
	b	PSY 16	Backfilling of cable trenches.	m ³	29		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	9.7		CABLE ROUTE MARKERS				
	a	PSY 14	Concrete cable route markers	No	6		
19	9.8		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete walls / slabs				
	a	PSY 15	100mm cable ladder	m	90		
	b	PSY 15	200mm cable ladder	m	90		
	c	PSY 15	300mm cable ladder	m	90		
	d	PSY 15	500mm cable ladder	m	90		
	e	PSY 15	100mm 90° bends	No	10		
	f	PSY 15	200mm 90° bends	No	10		
	g	PSY 15	300mm 90° bends	No	10		
	h	PSY 15	500mm 90° bends	No	10		
19	9.9		WIRE MESH CABLE TRAY				
		PSY 15	GS50 Gridspan / wire mesh duplex coating (exterior polyester) 3CR12 cable tray including all accessories mounted to concrete walls / slabs.				
	a	PSY 15	50mm cable tray	m	20		
	b	PSY 15	50mm 90° bends	No	4		
19	9.10		LEVEL PROBES				
	a	PSY 5	Level probes as indicated on drawing 18056-73-12-139	sum	1		
19	9.11		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	9.12		MCC ROOM FAN ISOLATOR				
	a	PSY3,4&5	MCC Room 30A 3 phase pressurising fan surface isolator	No	1		
19	9.13		MCC ROOM PRESSURISING FAN				
		PSY3,4&5	Room dimensions: L = 5550, W = 2500 & H = 2890mm. Dynamic Fan LDA 500mm axial flow fan or similar approved.				
	a	PSY3,4&5	500mm 3 phase outdoor axial flow fan.	No	1		
	b	PSY3,4&5	Outdoor removable filter including galvanised housing / ducting.	No	1		
	c	PSY3,4&5	Outdoor galvanised cowl / 90 degree ducting bend.	No	1		
	d	PSY3,4&5	Indoor galvanised louvre.	No	1		
19	9.14		WELDING SOCKET				
	a	PSY3&4	Surface mounted 63A 5 round pin welding socket including male plug.	No	1		
19	9.15		CIRCUIT BREAKER				
		PSY 7	Installation of a circuit breakers into the existing Substation 0 MCC. This item must include cut outs in the existing cubicle door for the circuit breaker toggles, circuit breaker yokes and wiring between the busbars and the circuit breakers.				
	a	PSY 7	200A 3 pole 20kA	No	1		
19	9.16		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	1		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	b	PSY 19	3CR12 support stands for the above item.	No	1		
	c	PSY 19	Local IP65 11kW 3 phase motor isolator / stop - start stations.	No	2		
	d	PSY 19	3CR12 support stands for the above item.	No	2		
	e	PSY 19	Local IP65 15kW 3 phase motor isolator / stop - start stations.	No	2		
	f	PSY 19	3CR12 support stands for the above item.	No	2		
	g	PSY 19	Local IP65 30kW 3 phase motor isolator / stop - start stations.	No	3		
	h	PSY 19	3CR12 support stands for the above item.	No	3		
19	9.17		FLOAT SWITCHES				
		PSY3&4	Installation of a float switch into existing outdoor galvanised wash water tank.				
	a	PSY3&4	Pear shaped float switch including 10m cable.	No	1		
19	9.18		LUMINAIRES				
	a	PSY 22	Type C1, surface 1.2m 46W IP65 polycarbonate LED (natural white) luminaire. Beka Vapourline VLN LED 46W or similar approved.	No	1		
	b	PSY 22	Type C2, surface 1.2m 46W IP65 polycarbonate LED (natural white) emergency luminaire (1 hour). Beka Vapourline VLN LED 46W (emergency version 1 hour) or similar approved.	No	1		
19	9.19		CONDUIT				
		PSY3,4&5	Galvanised surface conduit installed onto brick walling including adaptors and all accessories.				
	a	PSY3,4&5	20mm including galvanised draw wire.	m	10		
19	9.20		CONDUIT ACCESSORIES				
	a	PSY3,4&5	Round 1 way galvanised conduit boxes including cover plates.	No	4		
	b	PSY3,4&5	Round 3 way galvanised conduit boxes including cover plates.	No	4		
19	9.21		SOCKET OUTLETS				
	a	PSY3,4&5	Surface mounted 16A duo switched socket outlets including 100 x 100 x 50mm boxes.	No	1		
19	9.22		SWITCHES				
	a	PSY3,4&5	Surface mounted 1 lever 1 way 16A switch including 100 x 50 x 50mm box.	No	1		
19	9.23		WIRING				
		PSY3,4&5	PVC insulated copper conductors drawn into PVC conduit.				
	a	PSY3,4&5	1.5mm ²	m	10		
	b	PSY3,4&5	2.5mm ²	m	10		
19	9.24		EARTH WIRING				
		PSY3,4&5	BCEW drawn into galvanised conduit.				
	a	PSY3,4&5	2.5mm ²	m	20		
19	10		MIXERS AT THE BIO REACTORS				
19	10.1		LV CABLE				
			PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere)				
	a	PSY 11	4mm ² x 4 core (motor cable)	m	1200		
	b	PSY 11	6mm ² x 4 core (motor cable)	m	1200		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	c	PSY 11	1.5mm ² x 7 core (stop / start station)	m	2400		
	10.2		LV CABLE TERMINATION				
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	4mm ² x 4 core (motor cable)	No	32		
	b	PSY 11	6mm ² x 4 core (motor cable)	No	32		
	c	PSY 11	1.5mm ² x 7 core (stop / start station)	No	32		
19	10.3		CABLE EXCAVATION				
		PSY3,4&1 6	Expose existing mixer motor cables on the bio reactor bridges, removal of the existing cables and the installation of new weak cement mix once the new cables have been installed. (This will involve breaking of the existing cable trench cement covering and the removal of the cement).				
	a	PSY3,4&1 6	Cement covering for mixer motor cables between Screw Pump Station No 1 and the associated 4 mixer motors.	sum	1		
	b	PSY3,4&1 6	Cement covering for mixer motor cables between Screw Pump Station No 2 and the associated 4 mixer motors.	sum	1		
	c	PSY3,4&1 6	Cement covering for mixer motor cables between Screw Pump Station No 3 and the associated 4 mixer motors.	sum	1		
	d	PSY3,4&1 6	Cement covering for mixer motor cables between Screw Pump Station No 4 and the associated 4 mixer motors.	sum	1		
19	10.4		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	200mm cable ladder	m	720		
	b	PSY 15	200mm 90° bends	m	32		
19	10.5		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 15kW 3 phase motor isolator / stop - start stations.	No	16		
	b	PSY 19	3CR12 support stands for the above item.	No	16		
19	10.6		15kW 3 PHASE DOL MIXER MOTOR STARTER DRIVES				
	a	PSY 5	Removal of existing switchgear and wiring from existing MCC mixer motor starter cubicles, and the installation of new wiring and switchgear as indicated on drawing 18056-73-12-145	No	16		
19	11		SECONDARY CLARIFIERS				
19	11.1		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere)				
	a	PSY 11	2.5mm ² x 4 core (motor cable)	m	1620		
	b	PSY 11	1.5mm ² x 3 core (emergency stop)	m	1620		
19	19.11.2		LV CABLE TERMINATION				
			PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	2.5mm ² x 4 core (motor cable)	No	48		
	b	PSY 11	1.5mm ² x 3 core (emergency stop)	No	48		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	11.3		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	200		
	b	PSY 16	Backfilling of cable trenches.	m ³	200		
19	11.4		CABLE ROUTE MARKERS				
	a	PSY 14	The supply and installation of concrete cable route markers	No	24		
19	11.5		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	200mm cable ladder	m	120		
	b	PSY 15	200mm 90° bends	m	12		
19	11.6		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side of rotating bridge).	No	12		
19	11.7		0.55kW 3 PHASE DOL CLARIFIER MOTOR STARTER DRIVES				
	a	PSY 5	Removal of existing switchgear and wiring from existing MCC clarifier motor starter cubicles, and the installation of new wiring and switchgear as indicated on drawing 18056-73-12-146	No	16		
19	12		LIME PLANT				
19	12.1		LV CABLE				
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (Screw conveyors stop / start stations)	m	100		
	b	PSY 11	1.5mm ² x 7 core (Lime mixers stop / start stations)	m	100		
	c	PSY 11	2.5mm ² x 4 core (Screw conveyor motors)	m	100		
	d	PSY 11	2.5mm ² x 4 core (Lime mixer motors)	m	100		
19	12.2		LV CABLE TERMINATION				
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc				
	a	PSY 11	1.5mm ² x 7 core (Screw conveyors stop / start stations)	No	2		
	b	PSY 11	1.5mm ² x 7 core (Lime mixers stop / start stations)				
	c	PSY 11	2.5mm ² x 4 core (Screw conveyor motors)	No	4		
	d	PSY 11	2.5mm ² x 4 core (Lime mixer motors)	No	4		
19	12.3		JUNCTION BOXES				
			PVC/SWA/PVC Exe 4 way ezee / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).				
	a	PSY 11	1mm ² x 7 core	No	4		
19	12.4		CABLE EXCAVATION				
	a	PSY 16	Pickable material	m ³	10		
	b	PSY 16	Backfilling of cable trenches.	m ³	10		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	12.5		CABLE ROUTE MARKERS				
	a	PSY 14	The supply and installation of concrete cable route markers	No	4		
19	12.6		CABLE LADDER AND TRAY				
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / bio reactor railing.				
	a	PSY 15	100mm cable ladder	m	20		
	b	PSY 15	200mm cable ladder	m	20		
	c	PSY 15	300mm cable ladder	m	20		
	d	PSY 15	100mm 90° bends	No	2		
	e	PSY 15	200mm 90° bends	No	2		
	f	PSY 15	300mm 90° bends	No	2		
19	12.7		MOTOR STARTER DRIVES				
	a	PSY 5	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for the 1.1kW 3 phase DOL Screw Conveyor motor starter drive as indicated on drawing 18056-73-12-147 (SCV001 & SCV002)	No	2		
	b	PSY 5	Removal of existing switchgear and wiring from existing MCC motor starter cubicles, and the installation of new wiring, cubicle door, chassis plate and switchgear for the 2.2kW 3 phase DOL Lime Mixer motor starter drive as indicated on drawing 18056-73-12-148 (MIX001 & MIX002)	No	2		
19	12.8		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 1.1kW 3 phase motor isolator / stop - start stations.	No	2		
	b	PSY 19	3CR12 support stands for the above item.	No	2		
	c	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	2		
	d	PSY 19	3CR12 support stands for the above item.	No	2		
19	13		NEW HOW BLOWER ROOM				
19	13.1		MOTOR CONTROL CENTRE				
	a	PSY5&8	Manufacture, supply and off loading of the HOW New Blower Room MCC, including PLC marshalling tier as detailed in the specifications and drawings 18056-73-12-127, 128, 129, 130, 131 & 132.	sum	1		
19	13.2		INDOOR STANDBY EMERGENCY GENERATOR.				
	a	PSY 23	200kVA 400V standby emergency generator including automatic change over panel, day tank, filling accessories, transfer pumps, sound attenuated exhaust as detailed in the specifications.	sum	1		
	b	PSY 23	Sound attenuated inlet and outlet louvres, and ducting between the radiator and outlet louvre. (louvres will be built into brick walling by others).	sum	1		
	c	PSY 12&23	Control cabling between the generator's change over panel and the change over switchgear mounted inside the HOW New Blower Room MCC.	sum	1		
			<u>Notes:</u>				
		PSY 5	Tenderes to note that the size of the generator room is indicated on Civil drawing 18056-73-09-110				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment								
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
19	13.3		brought forward					
			LV CABLE					
		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).					
		a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	339		
		b	PSY 11	2.5mm ² x 4 core (Actuators)	m	220		
		c	PSY 11	2.5mm ² x 4 core (Motors)	m	8		
		d	PSY 11	6mm ² x 4 core (Motors)	m	202		
		e	PSY 11	10mm ² x 4 core (Motors)	m	200		
19	13.4		LV CABLE TERMINATION					
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc					
		a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	30		
		b	PSY 11	2.5mm ² x 4 core (Actuators)	No	4		
		c	PSY 11	2.5mm ² x 4 core (Motors)	No	4		
		d	PSY 11	6mm ² x 4 core (Motors)	No	40		
		e	PSY 11	10mm ² x 4 core (Motors)	No	16		
		f	PSY 11	10mm ² x 4 core (63A Welding Socket)	No	2		
19	13.5		JUNCTION BOXES					
		PSY 11	PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).					
		a	PSY 11	1.5mm ² x 7 core	No	4		
19	13.6		CABLE EXCAVATION					
		a	PSY 16	Pickable material	m ³	48		
		b	PSY 16	Backfilling of cable trenches.	m ³	48		
19	13.7		CABLE ROUTE MARKERS					
		a	PSY 14	Concrete cable route markers	No	6		
19	13.8		CABLE LADDER AND TRAY					
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete walls / slabs					
		a	PSY 15	100mm cable ladder	m	90		
		b	PSY 15	200mm cable ladder	m	90		
		c	PSY 15	300mm cable ladder	m	90		
		d	PSY 15	500mm cable ladder	m	90		
		e	PSY 15	100mm 90° bends	No	10		
		f	PSY 15	200mm 90° bends	No	10		
		g	PSY 15	300mm 90° bends	No	10		
SUB-TOTAL CARRIED FORWARD								

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	h	PSY 15	500mm 90° bends	No	10		
	13.9		WIRE MESH CABLE TRAY				
		PSY 15	GS50 Gridspan / wire mesh duplex coating (exterior polyester) 3CR12 cable tray including all accessories mounted to concrete walls / slabs.				
	a	PSY 15	50mm cable tray	m	20		
	b	PSY 15	50mm 90° bends	No	4		
19	13.10		LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	13.11		MCC ROOM FAN ISOLATOR				
	a	PSY3,4&5	MCC Room 30A 3 phase pressurising fan surface isolator	No	1		
19	13.12		MCC ROOM PRESSURISING FAN				
		PSY3,4&5	Room dimensions: L = 5700, W = 3505 & H = 3995mm. Dynamic Fan LDA 500mm axial flow fan or similar approved.				
	a	PSY3,4&5	500mm 3 phase outdoor axial flow fan.	No	1		
	b	PSY3,4&5	Outdoor removable filter including galvanised housing / ducting.	No			
	c	PSY3,4&5	Outdoor galvanised cowl / 90 degree ducting bend.	No	1		
	d	PSY3,4&5	Indoor galvanised louvre.	No	1		
19	13.13		WELDING SOCKET				
	a	PSY3&4	Surface mounted 63A 5 round pin welding socket including male plug.	No	1		
19	13.14		CIRCUIT BREAKER				
		PSY 7	Installation of a circuit breakers into the existing Substation 3 MCC. This item must include cut outs in the existing cubicle door for the circuit breaker toggles, circuit breaker yokes and wiring between the busbars and the circuit breakers.				
	a	PSY 7	250A 3 pole 15kA	No	1		
19	13.15		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 15kW 3 phase motor isolator / stop - start stations.	No	10		
	b	PSY 19	3CR12 support stands for the above item.	No	10		
	c	PSY 19	Local IP65 22kW 3 phase motor isolator / stop - start stations.	No	4		
	d	PSY 19	3CR12 support stands for the above item.	No	4		
19	13.16		LUMINAIRES				
	a	PSY 22	Type B1, surface 18W IP65 LED (natural white) outdoor bulkhead. Beka Bulk LED 18W or similar approved.	No	6		
	b	PSY 22	Type C1, surface 1.2m 46W IP65 polycarbonate LED (natural white) Beka Vapourline VLN LED 46W or similar approved.	No	8		
	c	PSY 22	Type C2, surface 1.2m 46W IP65 polycarbonate LED (natural white) emergency luminaire (1 hour). Beka Vapourline VLN LED 46W (emergency version 1 hour) or similar approved.	No	4		
19	13.17		CONDUIT				
	a	PSY3,4&5	PVC conduit chased into brick including adaptors and all accessories. 20mm including galvanised draw wire.	m	20		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
19	b	PSY3,4&5	PVC conduit cast into floor slab including adaptors and all accessories. 20mm including galvanised draw wire.	m	20		
	c	PSY3,4&5	PVC conduit installed into suspended ceilings including adaptors and all accessories. 20mm including galvanised draw wire.	m	40		
	13.18		CONDUIT ACCESSORIES				
19	a	PSY3,4&5	Round PVC conduit back entry boxes.	No	20		
	b	PSY3,4&5	Round 4 way PVC conduit boxes including cover plate.	No	2		
	c	PSY3,4&5	Flush 100 x 50 x 50mm conduit box including cover plate.	No	2		
19	d	PSY3,4&5	Flush 100 x 100 x 50mm conduit box including cover plate.	No	2		
	13.19		SOCKET OUTLETS				
	a	PSY3,4&5	Flush mounted 16A single switched socket outlets including 100 x 100 x 50mm boxes.	No	3		
19	b	PSY3,4&5	Flush mounted 16A duo switched socket outlets including 100 x 100 x 50mm boxes.	No	1		
	13.2		PHOTO CELL				
	a	PSY3,4&5	Royce Thompson photo cell including conduit box.	No	1		
19	13.21		SWITCHES				
	a	PSY3,4&5	Flush mounted 1 lever 1 way 16A switch including 100 x 50 x 50mm box.	No	2		
	13.22		WIRING				
19			PVC insulated copper conductors drawn into PVC conduit.				
	a	PSY3,4&5	1.5mm ²	m	100		
	b	PSY3,4&5	2.5mm ²	m	50		
19	13.23		EARTH WIRING				
		PSY3,4&5	BCEW drawn into PVC conduit.				
	a	PSY3,4&5	2.5mm ²	m	150		
19	14		NEW WASH WATER FILTER STATION				
19	14.1		MOTOR CONTROL CENTRE				
	a	PSY 8	Manufacture, supply and off loading of the New Wash Water Filter Station MCC, including PLC marshalling tier as detailed in the specifications and drawings 18056-73-12-140, 141, 142, 143 & 144.	sum	1		
	14.2		LV CABLE				
19		PSY 11	PVC/SWA/PVC copper conductor cables strapped to cable ladders or laid in trenches. (trenches, sleeves and cable terminations measured elsewhere).				
	a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	m	84		
	b	PSY 11	2.5mm ² x 4 core (Actuators)	m	270		
19	c	PSY 11	2.5mm ² x 4 core (Motors)	m	27		
	d	PSY 11	6mm ² x 4 core (motors)	m	80		
	e	PSY 11	95mm ² x 4 core (MCC to Substation No 0)	m	200		
19	f	PSY 11	95mm ² BCEW (MCC to Substation No 0)	m	200		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment								
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
19	14.3		LV CABLE TERMINATION					
		PSY 11	PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc					
		a	PSY 11	1.5mm ² x 7 core (Local motor isolators)	No	12		
		b	PSY 11	2.5mm ² x 4 core (Actuators)	No	6		
		c	PSY 11	2.5mm ² x 4 core (Motors)	No	8		
		d	PSY 11	6mm ² x 4 core (motors)	No	16		
		e	PSY 11	95mm ² x 4 core (MCC to Substation No 0)	No	2		
		f	PSY 11	95mm ² BCEW (MCC to Substation No 0)	No	2		
19	14.4		JUNCTION BOXES					
			PVC/SWA/PVC Exe 4 way eze / fit junction box (IP68) complete including terminals, lugs, tapes, drilling etc (glands measured elsewhere).					
19	14.5		CABLE EXCAVATION					
		a	PSY 16	Pickable material	m ³	48		
	b	PSY 16	Backfilling of cable trenches.	m ³	48			
19	14.6		CABLE ROUTE MARKERS					
		a	PSY 14	Concrete cable route markers	No	6		
19	14.7		CABLE LADDER AND TRAY					
		PSY 15	OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete walls / slabs					
		a	PSY 15	100mm cable ladder	m	90		
		b	PSY 15	200mm cable ladder	m	90		
		c	PSY 15	300mm cable ladder	m	90		
		d	PSY 15	500mm cable ladder	m	90		
		e	PSY 15	100mm 90° bends	No	10		
		f	PSY 15	200mm 90° bends	No	10		
		g	PSY 15	300mm 90° bends	No	10		
		h	PSY 15	500mm 90° bends	No	10		
19	14.8		WIRE MESH CABLE TRAY					
			GS50 Gridspan / wire mesh duplex coating (exterior polyester) 3CR12 cable tray including all accessories mounted to concrete walls / slabs.					
		a	PSY 15	50mm cable tray	m	20		
	b	PSY 15	50mm 90° bends	No	4			
19	14.9		LEVEL PROBES					
		a	PSY 5	Level probes as indicated on drawing 18056-73-12-144	sum	1		
SUB-TOTAL CARRIED FORWARD								

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
19	14.10		<i>brought forward</i> LOCAL EMERGENCY STOP STATIONS				
	a	PSY 18	Surface mounted IP65 emergency stop push buttons including IP65 enclosures. (Mounted on the side existing steel work).	No	4		
19	14.11		MCC ROOM FAN ISOLATOR				
	a	PSY3,4&5	MCC Room 30A 3 phase pressurising fan surface isolator	No	1		
19	14.12		MCC ROOM PRESSURISING FAN				
		PSY3,4&5	Room dimensions: L = 7695, W = 3000 & H = 3000mm. Dynamic Fan LDA 500mm axial flow fan or similar approved.				
	a	PSY3,4&5	500mm 3 phase outdoor axial flow fan.	No	1		
	b	PSY3,4&5	Outdoor removable filter including galvanised housing / ducting.	No	1		
	c	PSY3,4&5	Outdoor galvanised cowl / 90 degree ducting bend.	No	1		
	d	PSY3,4&5	Indoor galvanised louvre.	No	1		
19	14.13		WELDING SOCKET				
	a	PSY3&4	Surface mounted 63A 5 round pin welding socket including male plug.	No	1		
19	14.14		CIRCUIT BREAKER				
		PSY 7	Installation of a circuit breakers into the existing Substation 0 MCC. This item must include cut outs in the existing cubicle door for the circuit breaker toggles, circuit breaker yokes and wiring between the busbars and the circuit breakers.				
	a	PSY 7	200A 3 pole 20kA	No	1		
19	14.15		LOCAL MOTOR ISOLATORS / STOP - START STATIONS				
	a	PSY 19	Local IP65 2.2kW 3 phase motor isolator / stop - start stations.	No	1		
	b	PSY 19	3CR12 support stands for the above item.	No	1		
	c	PSY 19	Local IP65 11kW 3 phase motor isolator / stop - start stations.	No	2		
	d	PSY 19	3CR12 support stands for the above item.	No	2		
	e	PSY 19	Local IP65 15kW 3 phase motor isolator / stop - start stations.	No	2		
	f	PSY 19	3CR12 support stands for the above item.	No	2		
19	14.16		LUMINAIRES				
	a	PSY 22	Type B1, surface 18W IP65 LED (natural white) outdoor bulkhead.				
		PSY 22	Beka Bulk LED 18W or similar approved.	No	8		
	b	PSY 22	Type C1, surface 1.2m 46W IP65 polycarbonate LED (natural white) luminaire. Beka Vapourline VLN LED 46W or similar approved.	No	12		
	c	PSY 22	Type C2, surface 1.2m 46W IP65 polycarbonate LED (natural white) emergency luminaire (1 hour). Beka Vapourline VLN LED 46W (emergency version 1 hour) or similar approved.	No	4		
19	14.17		CONDUIT				
		PSY3,4&5	PVC conduit chased into brick including adaptors and all accessories.				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 19 - Electrical Equipment							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	a	PSY3,4&5	20mm including galvanised draw wire.	m	20		
		PSY3,4&5	PVC conduit cast into floor slab including adaptors and all accessories.				
	b	PSY3,4&5	20mm including galvanised draw wire.	m	30		
		PSY3,4&5	PVC conduit installed into suspended ceilings including adaptors and all accessories.				
	c	PSY3,4&5	20mm including galvanised draw wire.	m	30		
19	14.18		CONDUIT ACCESSORIES				
	a	PSY3,4&5	Round PVC conduit back entry boxes.	No	24		
	b	PSY3,4&5	Round 4 way PVC conduit boxes including cover plate.	No	2		
	c	PSY3,4&5	Flush 100 x 50 x 50mm conduit box including cover plate.	No	2		
	d	PSY3,4&5	Flush 100 x 100 x 50mm conduit box including cover plate.	No	2		
19	14.19		SOCKET OUTLETS				
	a	PSY3,4&5	Flush mounted 16A single switched socket outlets including 100 x 100 x 50mm boxes.	No	3		
	b	PSY3,4&5	Flush mounted 16A duo switched socket outlets including 100 x 100 x 50mm boxes.	No	1		
19	14.20		PHOTO CELL				
	a	PSY3,4&5	Royce Thompson photo cell including conduit box.	No	1		
19	14.21		SWITCHES				
	a	PSY3,4&5	Flush mounted 1 lever 2 way 16A switch including 100 x 50 x 50mm box.	No	4		
19	14.22		WIRING				
		PSY3,4&5	PVC insulated copper conductors drawn into PVC conduit.				
	a	PSY3,4&5	1.5mm ²	m	150		
	b	PSY3,4&5	2.5mm ²	m	75		
19	14.23		EARTH WIRING				
		PSY3,4&5	BCEW drawn into PVC conduit.				
	a	PSY3,4&5	2.5mm ²	m	225		
19	15		PROVISIONAL SUMS FOR REFURBISHMENT OF EXISTING ELECTRICAL EQUIPMENT				
19	15.1		PST's Electrical refurbishment	Prov. Sum	1	R 2 000 000.00	R 2 000 000.00
19	15.2		Fermenters Electrical refurbishment	Prov. Sum	1	R 1 000 000.00	R 1 000 000.00
19	15.3		Primary Sludge Pumps (1to3) Refurbishment	Prov. Sum	1	R 1 500 000.00	R 1 500 000.00
19	15.4		Fermented Sludge Pumps Refurbishment	Prov. Sum	1	R 500 000.00	R 500 000.00
19	15.5		Lime Clarifier Electrical refurbishment	Prov. Sum	1	R 2 000 000.00	R 2 000 000.00
19	15.6		Allowance for work at existing infrastructure	Prov. Sum	1	R 1 969 720.00	R 1 969 720.00
TOTAL FOR SECTION 19 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
20			CONTROL AND INSTRUMENTATION				
20	1		HEAD OF WORKS - UNIT 1				
	A		Supply and delivery of Instrumentation				
20	1.1	3.1.1 and 3.1.3.1	Flow meter - Flume	Each	2		
20	1.2	3.1.4	Instrument junction boxes for flume flow meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	1.3	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	7		
20	1.4	3.1.4	Instrument junction box for ultrasonic level meters complete with field brackets, supports, terminals, surge protection etc	Each	7		
20	1.5	3.1.1	Pressure Meter (Priced in the mechanical section)				
20	1.6	3.1.4	Instrument junction box for pressure meter complete with field brackets, supports, terminals, surge protection etc	Each	6		
20	1.7	3.1.1 and 3.1.3.1	Flow meter - Clamp-on	Each	1		
20	1.8	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.9	3.1.1	Compressor high pressure switch (Priced in the mechanical section)				
20	1.10	3.1.1	Compressor low pressure switch (Priced in the mechanical section)				
20	1.11	3.1.4	Terminal box for pressure switches complete with field brackets, supports, terminals, etc.	Each	2		
20	1.12	3.1.1 and 3.1.3.5	Instrument box for indication station (Fitted with terminals, pilot lamps and labels)	Each	4		
20	1.13	3.1.1	Low level switch	Each	1		
20	1.14	3.1.4	Terminal box for level switch complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.15	3.1.2	Modulating actuated valve (Priced in the mechanical section)				
20	1.16	3.1.4	Instrument control panel for modulating valve complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.17	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	1.18	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	18		
20	1.19	3.1.2	Diverter gate actuator (Priced in the mechanical section)				
20	1.20	3.1.4	Instrument control panel for diverter gate actuator complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	1.21	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	1.22	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, etc	Each	36		
20	1.23	2.2.2.1	Unit 1 Head of Works PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	B		C&I CABLING				
			Supply and delivery of C&I Cable (Orange):				
20	1.24	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	420		
20	1.25	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	7 531		
20	1.26	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	m	1		
20	1.27	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	9 853		
SUB-TOTAL CARRIED FORWARD							R -

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	1.28	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	8 174		
20	1.29	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	3 560		
20	1.30	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	4 386		
20	1.31	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	227		
20	1.32	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	1		
20	1.33	3.1.5	Certified CAT-6 Cable	m	15		
	C		C&I CABLE RACKING				
			Supply and delivery of C&I cable racking:				
20	1.34	3.1.5	1000mm wide cable rack	m	1		
20	1.35	3.1.5	800mm wide cable rack	m	1		
20	1.36	3.1.5	600mm wide cable rack	m	1		
20	1.37	3.1.5	300mm wide cable rack	m	60		
20	1.38	3.1.5	150mm wide cable rack	m	50		
20	1.39	3.1.5	1000mm T-pieces	Each	1		
20	1.4	3.1.5	1000mm 90degree bends	Each	1		
20	1.41	3.1.5	800mm T-pieces	Each	1		
20	1.42	3.1.5	800mm 90degree bends	Each	1		
20	1.43	3.1.5	600mm T-pieces	Each	1		
20	1.44	3.1.5	600mm 90degree bends	Each	1		
20	1.45	3.1.5	300mm T-pieces	Each	1		
20	1.46	3.1.5	300mm 90degree bends	Each	1		
20	1.47	3.1.5	150mm T-pieces	Each	1		
20	1.48	3.1.5	150mm 90degree bends	Each	1		
	D		INSTALL, TEST AND COMMISSION OF INSTRUMENTATION WORKS				
			Installation Testing And Commissioning Of Instrumentation - Unit 1 Head of Works				
20	1.49	3.1.1 and 3.1.3.1	Flow meter - Flume	Each	2		
20	1.50	3.1.4	Instrument junction boxes for flume flow meter complete with field	Each	2		
20	1.51	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	7		
20	1.52	3.1.4	Instrument junction box for ultrasonic level meters complete with field brackets, supports, terminals, surge protection etc	Each	7		
20	1.53	3.1.1	Pressure Meter				
20	1.54	3.1.4	Instrument junction box for pressure meter complete with field brackets,	Each	6		
20	1.55	3.1.1 and 3.1.3.1	Flow meter - Clamp-on	Each	1		
20	1.56	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.57	3.1.1	Compressor high pressure switch (Priced in the mechanical section)				
20	1.58	3.1.1	Compressor low pressure switch (Priced in the mechanical section)				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	1.59	3.1.4	Terminal box for pressure switches complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	1.6	3.1.1 and 3.1.3.5	Instrument box for indication station (Fitted with terminals, pilot lamps and labels)	Each	4		
20	1.61	3.1.1	Low level switch	Each	1		
20	1.62	3.1.4	Terminal box for level switch complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.63		Modulating actuated valve (Priced in the mechanical section)				
20	1.64	3.1.4	Instrument control panel for modulating valve complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.65	3.1.4	Instrument control panel for modulating valve complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	1.66	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	1.67	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	18		
20	1.68	3.1.2	Diverter gate actuator (Priced in the mechanical section)				
20	1.69	3.1.4	Instrument control panel for diverter gate actuator complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	1.70	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	1.71	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, surge protection etc	Each	36		
20	1.72	2.2.2.1	Unit 1 Head of Works PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	E		C&I CABLE				
			Installation, Testing And Commissioning of C&I Cable (Orange)				
20	1.73	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	420		
20	1.74	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	7 531		
20	1.75	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	m	1		
20	1.76	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	9 853		
20	1.77	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	8 174		
20	1.78	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	3 560		
20	1.79	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	4 386		
20	1.80	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	227		
20	1.81	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	1		
20	1.82	3.1.5	Certified CAT-6 Cable	m	15		
	F		C&I CABLE				
			Termination Of C&I Cable (Orange):				
20	1.83	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	Each	14		
20	1.84	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	Each	46		
20	1.85	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	Each	1		
20	1.86	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	Each	37		
20	1.87	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	29		
20	1.88	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	16		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	1.89	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	16		
20	1.90	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	2		
20	1.91	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	1		
20	1.92	3.1.5	Certified CAT-6 Cable	Each	1		
	G		C&I CABLE RACKING				
			Installation, Testing & Commissioning Of C&I Cable Racking:				
20	1.93	3.1.5	1000mm wide cable rack	m	1		
20	1.94	3.1.5	800mm wide cable rack	m	1		
20	1.95	3.1.5	600mm wide cable rack	m	1		
20	1.96	3.1.5	300mm wide cable rack	m	60		
20	1.97	3.1.5	150mm wide cable rack	m	50		
20	1.98	3.1.5	1000mm T-pieces	Each	1		
20	1.99	3.1.5	1000mm 90degree bends	Each	1		
20	1.1	3.1.5	800mm T-pieces	Each	1		
20	1.101	3.1.5	800mm 90degree bends	Each	1		
20	1.102	3.1.5	600mm T-pieces	Each	1		
20	1.103	3.1.5	600mm 90degree bends	Each	1		
20	1.104	3.1.5	300mm T-pieces	Each	1		
20	1.105	3.1.5	300mm 90degree bends	Each	1		
20	1.106	3.1.5	150mm T-pieces	Each	1		
20	1.107	3.1.5	150mm 90degree bends	Each	1		
	H		C&I Trenching (Install, Test & Commission)				
20	1.108	3.1.5	Trenching 2m wide in pickable soil with soft sand backfill, tiles and danger tape.	m	145		
20	1.109	3.1.5	Trenching under slabs	m	50		
20	1.11	3.1.5	Trenching 2m wide road crossing with sleeves, soft sand backfill, tiles and danger tape.	m	10		
20	1.111	3.1.6	Route markers supply and deliver.	Each	7		
20	1.112	3.1.6	Route markers install.	Each	7		
	I		C&I Miscellaneous				
20	1.113	1.3	Removal of existing PLC panel & associated equipment.	Sum	1		
20	1.114	1.4	Programming of 2 Siemens Variable Speed Drives	Sum	1		
20	1.115	1.2	Removal of all old eqipment and cabling.	Sum	1		
	2		HEAD OF WORKS UNIT 2				
	A		Supply and delivery of Instrumentation - Unit 2 Head Of Works				
20	2.1	3.1.1	Compressor low pressure switch (Priced in the mechanical section)				
20	2.2	3.1.1	Compressor high pressure switch (Priced in the mechanical section)				
20	2.3	3.1.4	Terminal box for pressure switches complete with field brackets, supports, terminals, etc.	Each	1		
20	2.4	3.1.1	Pressure Meter (Priced in the mechanical section)				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	2.5	3.1.4	Instrument junction boxes for pressure meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	2.6	3.1.1 and 3.1.3.1	Flow meter - Clamp-on	Each	1		
20	2.7	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	2.8	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	1		
20	2.9	3.1.4	Instrument junction box for ultrasonic level meters complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	2.10	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	2.11	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, etc	Each	4		
20	2.12	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	2.13	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	2.14	2.2.2.2	Unit 2 Head of Works PLC hardware complete with circuit breakers, terminals, PLC accessories etc.	Sum	1		
20	2.15	2.2.2.3	Unit 2 HOW Blowers Remote I/O panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	B		C&I CABLLING				
			Supply and delivery of C&I cable (Orange):				
20	2.16	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	150		
20	2.17	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	600		
20	2.18	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	1 600		
20	2.19	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	950		
20	2.20	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	1 000		
20	2.21	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	30		
20	2.22	3.1.5	Certified CAT-6 Cable	m	6		
20	2.23	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	m	235		
	C		C&I CABLE RACKING				
			Supply and delivery of C&I cable racking:				
20	2.24	3.1.5	300mm wide cable rack	m	300		
20	2.25	3.1.5	300mm T-pieces	Each	2		
20	2.26	3.1.5	300mm 90degree bends	Each	4		
	D		INSTALL, TEST AND COMMISSION OF INSTRUMENTATION WORKS				
			Installation Testing And Commissioning of Instrumentation - Unit 2 Head of Works				
20	2.27	3.1.1	Compressor low pressure switch (Priced in the mechanical section)				
20	2.28	3.1.1	Compressor high pressure switch (Priced in the mechanical section)				
20	2.29	3.1.4	Terminal box for pressure switches complete with field brackets, supports, terminals, etc.	Each	1		
20	2.30	3.1.1	Pressure Meter (Priced in the mechanical section)				
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	2.31	3.1.4	Instrument junction boxes for pressure meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	2.32	3.1.1 and 3.1.3.1	Flow meter - Clamp-on	Each	1		
20	2.33	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	2.34	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	1		
20	2.35	3.1.4	Instrument junction box for ultrasonic level meters complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	2.36	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	2.37	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, etc	Each	4		
20	2.38	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	2.39	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	2.40	2.2.2.2	Unit 2 Head of Works PLC hardware complete with circuit breakers, terminals, PLC accessories etc.	Sum	1		
20	2.41	2.2.2.3	Unit 2 HOW Blowers Remote I/O panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	E		C&I CABLING				
			Installation, Testing And Commissioning of C&I Cable (Orange):				
20	2.42	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	150		
20	2.43	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	600		
20	2.44	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	1 600		
20	2.45	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	950		
20	2.46	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	1 000		
20	2.47	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	30		
20	2.48	3.1.5	Certified CAT-6 Cable	m	6		
20	2.49	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	m	235		
	F		C&I CABLE				
			Termination of C&I cable (Orange) :				
20	2.50	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	Each	5		
20	2.51	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	Each	4		
20	2.52	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	Each	6		
20	2.53	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	4		
20	2.54	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	4		
20	2.55	3.1.5	12-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	1		
20	2.56	3.1.5	Certified CAT-6 Cable	Each	1		
20	2.57	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	Each	1		
	G		C&I CABLE RACKING				
			Installation, Testing & Commissioning of C&I Cable Racking:				
20	2.58	3.1.5	300mm wide cable rack	m	300		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	2.59	3.1.5	300mm T-pieces	Each	2		
20	2.60	3.1.5	300mm 90degree bends	Each	4		
	F		C&I Trenching (Install, Test & Commission)				
20	2.61	3.1.5	Trenching 1m wide in pickable soil with soft sand backfill, tiles and danger tape.	m	530		
20	2.62	3.1.5	Trenching under slabs	m	5		
20	2.63	3.1.5	Trenching 1m wide road crossing with sleeves, soft sand backfill, tiles and danger tape.	m	10		
20	2.64	3.1.6	Route markers supply and deliver.	Each	8		
20	2.65	3.1.6	Route markers install.	Each	8		
	G		C&I Miscellaneous				
20	2.66	3.1.8	Fibre-optic patch panels supply & deliver	Each	2		
20	2.67	3.1.8	Fibre-optic patch panels install, test & commission	Each	2		
20	2.68	2.2.2.2	Removal of existing PLC hardware for handing to the client.	Sum	1		
20	3		CONTROL AND INSTRUMENTATION LIME PLANT				
	A		Supply and delivery of Instrumentation - Lime Plant				
20	3.1	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	1		
20	3.2	3.1.4	Instrument junction box for ultrasonic level meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.3	3.1.1	Load Cell (Existing)				
20	3.4	3.1.4	Instrument junction box for load cell complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.5	3.1.1 and 3.1.3.4	pH Meter with temperature meter	Each	1		
20	3.6	3.1.4	Instrument junction box for pH meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.7	3.1.1 and 3.1.3.1	Flow meter - Weir	Each	2		
20	3.8	3.1.4	Instrument junction boxes for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	3.9	3.1.2	Modulating actuated valve (Priced in the mechanical section)				
20	3.10	3.1.4	Instrument control panel for modulating valve complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	3.11	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	3.12	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, etc	Each	4		
20	3.13	2.2.2.1	Lime Plant PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	B		C&I CABLE				
			Supply and delivery of C&I cable (Orange):				
20	3.14	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	150		
20	3.15	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	116		
20	3.16	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	m	50		
20	3.17	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	430		
20	3.18	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	220		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	3.19	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	430		
20	3.20	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	388		
20	3.21	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	116		
20	3.22	3.1.5	Certified CAT-6 Cable	m	10		
	C		C&I CABLE RACKING				
			Supply and delivery of C&I cable racking:				
20	3.23	3.1.5	300mm wide cable rack	m	15		
20	3.24	3.1.5	150mm wide cable rack	m	15		
20	3.25	3.1.5	300mm T-pieces	Each	3		
20	3.26	3.1.5	300mm 90degree bends	Each	3		
	D		INSTALL, TEST AND COMMISSION OF INSTRUMENTATION WORKS - LIME PLANT				
			Installation Testing And Commissioning of Instrumentation - Lime Plant				
20	3.27	3.1.1 and 3.1.3.2	Ultrasonic level meter	Each	1		
20	3.28	3.1.4	Instrument junction box for ultrasonic level meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.29	3.1.1	Load Cell (Existing)				
20	3.30	3.1.4	Instrument junction box for load cell complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.31	3.1.1 and 3.1.3.4	pH Meter with temperature meter	Each	1		
20	3.32	3.1.4	Instrument junction box for pH meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	3.33	3.1.1 and 3.1.3.1	Flow meter - Weir	Each	2		
20	3.34	3.1.4	Instrument junction boxes for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	3.35	3.1.2	Modulating actuated valve (Priced in the mechanical section)				
20	3.36	3.1.4	Instrument control panel for modulating valve complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	3.37	3.1.2	230VAC Solenoid valve (Priced in the mechanical section)				
20	3.38	3.1.4	Terminal box for solenoid valve complete with field brackets, supports, terminals, etc	Each	4		
20	3.39	2.2.2.1	Lime Plant PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	E		C&I CABLE				
			Installation, Testing And Commissioning of C&I Cable (Orange):				
20	3.40	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	150		
20	3.41	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	116		
20	3.42	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	m	50		
20	3.43	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	430		
20	3.44	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	220		
20	3.45	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	430		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	3.46	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	388		
20	3.47	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	116		
20	3.48	3.1.5	Certified CAT-6 Cable	m	10		
	F		Termination of C&I cable (Orange):				
20	3.49	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	Each	5		
20	3.50	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	Each	4		
20	3.51	3.1.5	1.5 mm ² , 7-core PVC, SWA, PVC, PVC, Cu	Each	1		
20	3.52	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	Each	8		
20	3.53	3.1.5	1.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	4		
20	3.54	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	7		
20	3.55	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	8		
20	3.56	3.1.5	4-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	4		
20	3.57	3.1.5	Certified CAT-6 Cable	Each	1		
	G		C&I CABLE RACKING				
			Installation, Testing & Commissioning of C&I Cable Racking:				
20	3.58	3.1.5	300mm wide cable rack	m	15		
20	3.59	3.1.5	150mm wide cable rack	m	15		
20	3.60	3.1.5	300mm T-pieces	Each	3		
20	3.61	3.1.5	300mm 90degree bends	Each	3		
	H		C&I Trenching (Install, Test & Commission)				
20	3.62	3.1.5	Trenching 1m wide road crossing with sleeves, soft sand backfill, tiles	m	5		
20	3.63	3.1.5	Trenching 1m wide in pickable soil with soft sand backfill, tiles and danger tape.	m	65		
20	3.64	3.1.6	Route markers supply and deliver.	Each	4		
20	3.65	3.1.6	Route markers install.	Each	4		
	I		C&I Miscellaneous				
20	3.66	1.3	Removal of existing PLC panel & associated equipment.	Sum	1		
20	3.67	1.2	Removal of all old equipment and cabling.	Sum	1		
	4		CONTROL AND INSTRUMENTATION WASH WATER PUMP STATIONS (PLC & REMOTE I/O)				
	A		SUPPLY AND DELIVERY (INSTRUMENTATION WORKS) Supply and delivery of Instrumentation - Wash Water Pump Stations				
20	4.1	3.1.1 and 3.1.3.1	Magnetic Flow Meter	Each	1		
20	4.2	3.1.4	Instrument junction box for magnetic flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	4.3	3.1.1 and 3.1.3.1	Flow Meter - Clamp-on	Each	2		
20	4.4	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	4.5	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	4.6	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	18		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	4.7	2.2.2.4	Wash Water Pump Station PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
20	4.8	2.2.2.5	Final Effluent Wash Water Pump Station Remote I/O panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	B		C&I CABLE				
			Supply and delivery of C&I cable (Orange):				
20	4.9	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	720		
20	4.10	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	1 845		
20	4.11	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	2 010		
20	4.12	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	210		
20	4.13	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	210		
20	4.14	3.1.5	Certified CAT-6 Cable	m	10		
20	4.15	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	m	240		
	C		C&I CABLE RACKING				
			Supply and delivery of C&I cable racking:-				
20	4.16	3.1.5	300mm wide cable rack	m	30		
20	4.17	3.1.5	150mm wide cable rack	m	60		
20	4.18	3.1.5	300mm T-pieces	Each	4		
20	4.19	3.1.5	300mm 90degree bends	Each	4		
	D		Installation Testing And Commissioning of Instrumentation - Wash Water Pump Stations				
20	4.20	3.1.1 and 3.1.3.1	Magnetic Flow Meter	Each	1		
20	4.21	3.1.4	Instrument junction box for magnetic flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	4.22	3.1.1 and 3.1.3.1	Flow Meter - Clamp-on	Each	2		
20	4.23	3.1.4	Instrument junction box for clamp-on flow meter complete with field brackets, supports, terminals, surge protection etc	Each	2		
20	4.24	3.1.2	Open-close actuated valve (Priced in the mechanical section)				
20	4.25	3.1.4	Instrument control panel for open-close valve complete with field brackets, supports, terminals, surge protection etc	Each	18		
20	4.26	2.2.2.4	Wash Water Pump Station PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
20	4.27	2.2.2.5	Final Effluent Wash Water Pump Station Remote I/O panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	E		C&I CABLE				
			Installation And Testing of C&I cable (Orange):				
20	4.28	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	720		
20	4.29	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	m	1 845		
20	4.30	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	2 010		
20	4.31	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	210		
20	4.32	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	210		
20	4.33	3.1.5	Certified CAT-6 Cable	m	10		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	4.34	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	m	240		
	F		Termination of C&I cable (Orange):				
20	4.35	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	Each	4		
20	4.36	3.1.5	1.5 mm ² , 12-core PVC, SWA, PVC, PVC, Cu	Each	27		
20	4.37	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	Each	21		
20	4.38	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	3		
20	4.39	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	3		
20	4.40	3.1.5	Certified CAT-6 Cable	Each	1		
20	4.41	3.1.8	6 Pair, PVC, SWA, single mode fibre-optic cable	Each	1		
	G		C&I CABLE RACKING				
			Installation And Testing of C&I Cable Racking:				
20	4.42	3.1.5	300mm wide cable rack	m	30		
20	4.43	3.1.5	150mm wide cable rack	m	60		
20	4.44	3.1.5	300mm T-pieces	Each	4		
20	4.45	3.1.5	300mm 90degree bends	Each	4		
	H		C&I Trenching (Install, Test & Commission)				
20	4.46	3.1.5	Trenching 1m wide in pickable soil with soft sand backfill, tiles and danger tape.	m	230		
20	4.47	3.1.5	Trenching 1m wide road crossing with sleeves, soft sand backfill, tiles and danger tape.	m	5		
20	4.48	3.1.6	Route markers supply and deliver.	Each	5		
20	4.49	3.1.6	Route markers install.	Each	5		
	I		C&I Miscellaneous				
20	4.50	3.1.8	Fibre-optic patch panels supply & deliver	Each	2		
20	4.51	3.1.8	Fibre-optic patch panels install, test & commission	Each	2		
20	4.52	1.3	Removal of existing PLC panel & associated equipment.	Sum	1		
20	5		CONTROL AND INSTRUMENTATION EMERGENCY DAM				
	A		SUPPLY AND DELIVERY (INSTRUMENTATION WORKS)				
			Supply and delivery of Instrumentation - Emergency Dam (Dam-01)				
20	5.1	3.1.1 and 3.1.3.1	Flow Meter - Weir	Each	1		
20	5.2	3.1.4	Instrument junction box for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	5.3	3.1.1 and 3.1.3.3	Pressure Meter (Used for hydrostatic level measurement)	Each	1		
20	5.4	3.1.4	Instrument junction box for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	5.5	2.2.2.7	Emergency Dam PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	B		C&I CABLE				
			Supply and delivery of C&I cable (Orange) :-				
20	5.6	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	20		
20	5.7	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	75		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
20	5.8	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	71		
20	5.9	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	75		
20	5.10	3.1.5	Certified CAT-6 Cable	m	10		
	C		C&I CABLE RACKING				
			Supply and delivery of C&I cable racking:-				
20	5.11	3.1.5	150mm wide cable rack	m	20		
20	5.12	3.1.5	150mm T-pieces	Each	1		
20	5.13	3.1.5	150mm 90degree bends	Each	2		
	D		Installation Testing And Commissioning of Instrumentation - Emergency Dam				
20	5.14	3.1.1 and 3.1.3.1	Flow Meter - Weir	Each	1		
20	5.15	3.1.4	Instrument junction box for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	5.16	3.1.1 and 3.1.3.3	Pressure Meter (Used for hydrostatic level measurement)	Each	1		
20	5.17	3.1.4	Instrument junction box for weir flow meter complete with field brackets, supports, terminals, surge protection etc	Each	1		
20	5.18	2.2.2.7	Emergency Dam PLC panel complete with circuit breakers, terminals, SPDs, PLC hardware etc.	Each	1		
	E		Installation and testing of C&I cable (Orange):				
20	5.19	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	m	20		
20	5.20	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	m	75		
20	5.21	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	m	71		
20	5.22	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	m	75		
20	5.23	3.1.5	Certified CAT-6 Cable	m	10		
	F		C&I CABLE				
			Termination of C&I cable (Orange):				
20	5.24	3.1.5	1.5 mm ² , 37-core PVC, SWA, PVC, PVC, Cu	Each	1		
20	5.25	3.1.5	1.5 mm ² , 4-core PVC, SWA, PVC, PVC, Cu	Each	2		
20	5.26	3.1.5	2.5 mm ² , 3-core PVC, SWA, PVC, PVC, Cu	Each	2		
20	5.27	3.1.5	2-pair, 0.5 mm ² , PVC, SWA, PVC, IOS	Each	2		
20	5.28	3.1.5	Certified CAT-6 Cable	Each	1		
	G		C&I CABLE RACKING				
			Installation, Testing & Commissioning of C&I Cable Racking:				
20	5.29	3.1.5	150mm wide cable rack	m	20		
20	5.30	3.1.5	150mm T-pieces	Each	1		
20	5.31	3.1.5	150mm 90degree bends	Each	2		
	F		C&I Trenching (Install, Test & Commission)				
20	5.32	3.1.5	Trenching 1m wide in pickable soil with soft sand backfill, tiles and danger tape.	m	65		
20	5.33	3.1.6	Route markers supply and deliver.	Each	2		
20	5.34	3.1.6	Route markers install.	Each	2		
SUB-TOTAL CARRIED FORWARD							

Employer:		Contractor:	
Witness:		Witness:	

SECTION 20 - CONTROL & INSTRUMENTATION							
SECTION NO	ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			<i>brought forward</i>				
	G		C&I Miscellaneous				
20	5.35	1.3	Removal of existing PLC panel & associated equipment.	Sum	1		
	6		CONTROL AND INSTRUMENTATION CONTROL ROOM PLC				
			SUPPLY AND DELIVERY (INSTRUMENTATION WORKS)				
	A		Supply and delivery of Instrumentation - Emergency Dam				
20	6.1	3.1.1 and 3.1.3.1	Flow meter - Flume	Each	4		
20	6.2	3.1.4	Instrument junction boxes for flume flow meter complete with field brackets, supports, terminals, surge protection etc	Each	4		
			INSTALL, TEST AND COMMISSION (INSTRUMENTATION WORKS)				
	B		Installation Testing And Commissioning of Instrumentation - Emergency Dam				
20	6.3	3.1.1 and 3.1.3.1	Flow meter - Flume	Each	4		
20	6.4	3.1.4	Instrument junction boxes for flume flow meter complete with field	Each	4		
20	7		PROVISIONAL SUMS				
20	7.1		Allowance for refurbishment or replacement of equipment at PST's	Prov Sum	1		
20	7.2		Allowance for refurbishment or replacement of equipment at Fermenters	Prov Sum	1		
20	7.3		Allowance for SCADA update, programming, PLC configuration, etc.	Prov Sum	1		
TOTAL FOR SECTION 20 (Carried to Summary)							

Employer:		Contractor:	
Witness:		Witness:	

SUMMARY OF BILL OF QUANTITIES		
Section	Description	Amount (R)
1	Preliminary and General	
2	Access Roads	
3	Head of Works (Civil)	
4	Primary Sedimentation Tanks (Civil)	
5	Fermenters (Civil)	
6	Secondary Clarifiers (Civil)	
7	Wash Water (Civil)	
8	Overflow Channel	
9	Lime Plant	
10	Minor Structures	
11	Interconnecting Pipework	
12	Security Upgrades	
13	Mechanical Equipment - Head of Works	
14	Mechanical Equipment - Primary Sedimentation Tanks	
15	Mechanical Equipment - Fermentation Tanks	
16	Mechanical Equipment - Bioreactors and Clarifiers	
17	Mechanical Equipment - Wash Water	
18	Mechanical Equipment - Lime Plant	
19	Electrical Equipment	
20	Control and Instrumentation	
	Sub-Total 1	R -
	In respect of the total value of work done by approved SMME's at 30% of Sub Total 1 (This total shall include all amounts payable to SMME's, including P&G's)	
	R..... (A)	
	Allowance as a percentage (maximum 15%) for appointing and handling work done by approved SMME's.....% (B)	
	Handling fees for sub contracting = (A) x (B)	
	Sub Total 2	R -
ADD:	Contingencies at 10%	R -
	The above prices are Firm/Not Firm*(delete one). IF NOT FIRM the client will allow for CONTRACT PRICE ADJUSTMENTS on all sums as provided for in Clause 6.8 of the General Conditions of Contract.	R -
	Sub Total 3	R -
ADD:	15% of above Sub-Total 4 for VALUE ADDED TAX (VAT)	R -
	TOTAL CARRIED TO FORM OF OFFER	R -

10261/15

R E P O R T

to

MESSRS. P.G.J. MEIRING AND PARTNERS INC.
Consulting Civil & Process Engineers

on

SITE INVESTIGATION FOR THE PROPOSED
SEWAGE PURIFICATION WORKS,
BUSHKOPPIE, TRANSVAAL

on behalf of

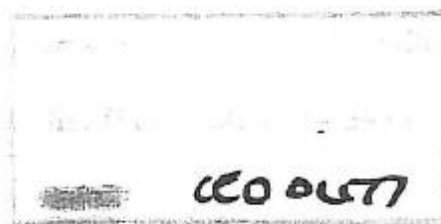
THE CITY ENGINEER'S DEPARTMENT, DESIGN BRANCH,
CITY OF JOHANNESBURG

by

JOHN M. WEAVER
Engineering Geologist
Pretoria

REPORT NO. J46/1

FEBRUARY, 1978



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A P P E N D I X



JOHN M. WEAVER

364 Main Street, Waterkloof, Pretoria. 0181
Telephone : 78-2397

REPORT NO. J46/1

FEBRUARY 1978

REPORT ON SITE INVESTIGATION FOR PROPOSED SEWAGE PURIFICATION WORKS, BUSHKOPPIE, TRANSVAAL.

1. INTRODUCTION

This report presents the results and observations on a seismic survey and foundation drilling and testing investigation conducted on the site for the proposed Sewage Purification Works, Bushkoppie, Transvaal.

The investigation was conducted on behalf of the City Engineer's Department, Design Branch, City of Johannesburg under the auspices of Messrs. P.G.O. Meiring and Partners, Inc., Consulting Civil and Process Engineers, Pretoria.

2. TERMS OF REFERENCE

The objectives of the investigations were:

- a) at the site for the proposed Module Nos. 1 to 4 and adjacent Sedimentation tanks,
 - i) to establish existing subsoil and geological conditions,
 - ii) to provide information on the nature and engineering parameters of the soil and rock materials encountered,
 - iii) to establish groundwater conditions and
 - b) over...../2

- b) over the entire site, to determine depth to bedrock and excavation characteristics of the subsurface materials.

3. AVAILABLE INFORMATION

The following information was available:

- a) Report No. DC-0013-01-00-0574 (Authors Reference LOC B 181(b)) entitled "Report on Site Investigation for Proposed Bushkoppie Sewage Treatment Facility South of Johannesburg", to the City Engineer's Department, Design Branch, Johannesburg by A.B.A. Brink and Associates, Johannesburg, dated 16 May 1974. The report presents the soil profiles revealed by 24 test pits, laboratory testing and aerial photographic interpretation within and beyond the present site;
- b) Report No. DC-0013-01-A1-0877 entitled "First Addendum to the Geotechnical Report on the Bushkoppie Sewage Works Site" by S.G. Grobler of the City Engineer's Department, Design Branch, Johannesburg, dated August 1977, describing the soil profiles of an additional eight trial holes excavated;
- c) Drawing No. 1062-V-1, entitled "Bushkoppie Sewage Purification Works, Site Investigation Site Plan", to a scale of 1:1250 prepared by P.G.J. Meiring and Partners, Consulting Engineers, Pretoria, dated October 1977.
- d) Geological Plan of the West Rand, Sheet No. 2626, to a scale of 1:250 000 produced by the Geological Survey Department, dated 1967.
- e) Discussions were held with Messrs. P.G.J. Meiring and Partners Inc., on the size, nature and design founding levels of the proposed structures.

4. SITE DESCRIPTION

The site, situated approximately 15km south of Johannesburg City Centre, covers some 40ha. in area, measuring approximately 600m in an east-west

direction/3

direction by 650m in a north-south direction.

The physiography of the site has previously been described in some detail by Messrs. A.B.A. Brink and Associates in their Report Reference LOC B 181 (b). From an elevation of 1562m in the northern corner down to about 1540m in the southern corner, the site has a uniform gradient of about seven per cent towards a southward flowing stream which forms the eastern boundary.

A Site Plan, Drawing No. J46/1 to a scale of 1:1250, showing the proposed structures, borehole positions, seismic survey positions and previous trial hole positions is given in the Appendix to this report.

5. SITE EXPLORATION

5.1 Seismic Survey

Using a Huntco FS-3 portable seismograph, a total of 128 geophone stations from 64 reversed traverses were completed between December 9, 1977 and January 20, 1978. Seismic wave velocities, depths and thickness of various soil and rock materials were determined on a grid system of geophone stations, as shown on the Site Plan.

A greater density of seismic traverses were conducted in the area occupied by proposed Module Nos. 1 to 4, 11 and 12 and adjacent Sedimentation Tanks, where it is anticipated that development will initially take place.

The graphs obtained in the field from each geophone station have been retained on the Project File for reference should they be required.

A summary of the seismic survey test results is included in the Appendix of this report on Sheet Nos. 1 to 9.

5.2 Diamond Core Drilling

Between December 10, 1977 and December 19, 1977, nine TNW-size, diamond drill holes were drilled by Messrs. Rodio (SA) (Pty) Ltd.,

at/4

at the positions indicated on the Site Plan. Hole Nos. 30 to 32 were terminated at approximately 12m and hole Nos. 33 to 38 at about 9m or at shallower depths where a minimum of 3m of bedrock had already been encountered. A total of 83,35m was drilled, a summary of which appears in Table 1 below.

TABLE 1
DRILLING SUMMARY

Borehole No.	Soft Material m	Hard Material m	Boulders m	Total Depth m	Total Core Recovery %
30	5,70	5,30	0,70	11,00	66,6
31	6,65	5,35	-	12,00	83,2
32	5,90	5,60	2,45	11,50	67,1
33	4,50	4,65	1,55	9,15	59,9
34	6,80	2,30	-	9,10	78,6
35	6,00	3,45	0,85	9,45	53,2
36	3,20	3,15	0,70	6,35	84,3
37	2,80	3,50	1,15	6,30	69,8
38	2,00	6,50	0,60	8,50	64,9
TOTAL	43,55	39,80	8,00	83,35	69,5

Drilling operations were supervised by an engineering geologist, who visited the site at regular intervals. Two drilling machines, a Boyles BBS 10 and a SECO 12, both mounted on skids, were used to recover TNW-size cores (61mm Ø) in rock and boulders. Where the absence of medium and large gravel, cobbles and boulders permitted, standard penetration tests were carried out in the boreholes at intervals of approximately 1,5m.

Water rest levels in the boreholes were measured by the driller 24 hours after completion of the holes.

Two Shelby tube samples were recovered. The samples were extruded on site, wrapped in polythene sheets, sealed and packed into cardboard tubes and submitted to a soils laboratory for testing. In

addition/5

addition, representative disturbed soil samples were also removed from the cored material for subsequent laboratory testing.

Overburden soils and gravels, decomposed rock and bedrock cores were sealed in polythene sheeting and placed directly into wooden core boxes on site before examination by an engineering geologist. Cores were described in terms of soil consistency or rock hardness, moisture condition, colour and texture, rock quality, degree of weathering and soil or rock type.

Detailed descriptions of the soil and rock materials encountered are provided on the Drilling Record Sheet Nos. 10 to 21 in the Appendix.

6. LABORATORY TESTING

Soil grading tests and Atterberg limit tests were conducted on six disturbed samples by Messrs. Civilab (Pty) Ltd. and were subsequently classified in terms of the Unified Classification System. Expansive potential was determined according to the procedure laid down by Van der Merwe (Reference 1).

Consolidated undrained triaxial tests, with pore water pressure measurement for determination of total and effective strength parameters, together with grading, Atterberg limit, moisture content and dry density tests were carried out on the two Shelby samples by Messrs. Geotechnical Engineering and Mining Laboratory Services (Pty) Ltd.

A summary of sample types and location, soil types and type of tests carried out is given in Table 2 below.

Laboratory test results are shown on the Laboratory Test Results Sheet Nos. 22 and 23 in the Appendix to this report.

TABLE 2/6

REFERENCE 1: Van der Merwe, D.H.: "The Prediction of Heave from the Plasticity Index and Percentage Clay Fraction of Soils" *Trans. S.A. Inst. Civ. Engrs.*, June 1964.

TABLE 2
SUMMARY OF SOIL SAMPLES AND LABORATORY TESTS CONDUCTED

BH No.	Depth (m)	Soil Type	Sample Type	Indicator Test	Consolidated Un-drained Triaxial, Dry Dens. & Moist. Content Tests
30	2,0	Silty CLAY(CH). Colluvium.	Disturbed	x	
	4,0	Clayey SILT(MH). Decomposed andesite.	Disturbed	x	
32	1,8	Silty CLAY(CL). Colluvium.	Disturbed	x	
	2,8-3,3	Silty CLAY(CH). Decomposed andesite.	Shelby	x	
33	2,1	Clayey ferruginous GRAVEL (GC). Colluvium.	Disturbed	x	
	2,7	Silty CLAY(CL). Decomposed andesite.	Disturbed	x	
35	2,4-2,8	Silty CLAY(CL). Decomposed andesite.	Shelby	x	x
	4,5	Clayey SILT(MH). Decomposed andesite.	Disturbed	x	

7. SITE GEOLOGY

7.1 Soils and Bedrock

The results of the drilling investigation confirm the findings of the previous reports and show that the site is located on Recent colluvial soils overlying residual soils derived from Andesite Lavas, Ventersdorp System.

An Engineering Geological Map to a scale of 1:2500 contained in Messrs. A.B.A. Brink and Associates' report, shows faulted Black Reef Series quartzites outcropping along the crest of a steep slope at least 50m to the south of the present site. Beyond the Black Reef quartzite outcrop, dolomite, chert and dolomitic limestones of the Dolomite Series occur. Both the Black Reef Series and the Dolomite Series belong to the Transvaal System and are

younger/7

younger than the Ventersdorp Lavas and do not therefore, underlie the Bushkoppie Sewage Works site.

Two parallel faults are indicated as trending across the south-eastern portion of the present site in a northeasterly direction. The faults are Post-Ventersdorp System in age, probably involving relatively minor displacements and are considered to be inactive.

In the vicinity of Modules 1 to 4, 11 and 12, the transported topsoils generally comprise a sequence of stiff, slightly moist, dark brown, intact, silty, fine and medium gravelly clays, approximately 300mm in thickness, overlying firm, moist, dark red, intact, sandy, silty clay colluvium with some ferruginous nodules and occasional quartzite gravel. In Borehole 30, two additional layers, approximately 2m in total thickness, comprising loose, wet, dark red, slightly clayey and silty, fine and medium sand were recognised within the colluvial sequence. Medium dense, dry to moist, red, brown or yellowish brown, gravel and cobbles in a silty clay matrix, some 900mm in thickness, often forms a pebble marker horizon near the base of the transported soils layer. From the borehole results, the colluvial layers show a decrease in thickness towards the north, from an average depth of 3,2m below the most southerly row of proposed Sedimentation Tanks down to approximately 1,8m thick below the area for the proposed Modules.

Below the base of the transported soils is a zone of stiff, moist, red mottled yellow streaked black, fissured silty clay, with occasional hard rock gravel and cobble corestones derived from decomposed andesite. At an average depth of 4,8m below natural ground level in the area of the proposed Sedimentation Tanks, decreasing to about 2,7m below the positions proposed for Modules 1 to 4, 11 and 12, the material changes gradually with depth to dense and then very dense, moist, yellow streaked red and black, fissured, hard rock gravel and cobble corestones with occasional boulders in a stiff clayey silt matrix. The above two layers are residual soils and gravels derived from decomposed andesite lava.

According to the Report by Messrs. A.B.A. Brink and Associates,

hardpan/8

hardpan ferricrete of local extent occurs in the residual decomposed andesite lavas. Although not identified in any of the drill cores, a hard rock, red, well cemented, ferricrete gravel deposit is exposed in the banks of the stream, in the southeast corner of the site.

Andesite bedrock, generally inclined in a southerly direction, underlies the entire site. Information from Borehole Nos. 30 to 32, 34 and 35 indicates that very soft rock to hard rock, light yellowish brown and grey stained red on joints, fine grained, shattered and fractured, highly weathered to weathered andesite lava forms a transition zone some 0,8m to 2,7m thick between the overlying residual soils and the underlying, less weathered bedrock, which occurs at an average depth of about 8,2m below surface in this area.

The underlying less weathered bedrock, comprising hard rock and very hard rock, grey and brown, stained black and red on joints, fine grained fractured and jointed, weathered and slightly weathered andesite, occurs at depths ranging from 3,2m to 7,2m below ground surface in Borehole Nos. 33 and 36 to 38 where the highly weathered andesite zone is absent. Bedrock is shallowest on the northern sides of Modules 1 to 4 and generally occurs at deeper levels in southerly and southwesterly directions.

Interpreted Geological Sections E-E', F-F' and G-G' through the southern half of the site are shown on Drawing No. J46/2 in the Appendix. The location of sections drawn are indicated on the Site Plan, Drawing No. J46/1.

7.2 Seismic Survey Results

The interpreted seismic profiles, indicating depth changes of material type and average seismic wave velocities of different soil and rock horizons encountered are shown on Results of Seismic Surveys, Drawing No. J46/3 of the Appendix.

Over the entire site a low velocity layer, extending to an average depth of 1,8m below surface and having an average seismic wave

velocity...../9

velocity of 370mps, is regarded as corresponding to the upper, transported soil horizons of the subsoil profile. A contoured plan showing the depths of material having a seismic wave velocity of less than 750mps is shown on the Depth to Rippable Material, Drawing No. J46/4 in the Appendix.

From the Geological Sections E-E', F-F' and G-G', shown on Drawing No. J46/2, there appears to be a good correlation between the depth of the interface between transported and residual soils as observed in the drill cores, compared with the depth to the base of the shallowest seismic wave velocity layer. The differences indicated by adjacent boreholes and seismic traverses rarely exceed 600mm.

The seismic layer immediately underlying the low seismic velocity layer described above, with an average seismic wave velocity of 1050mps, corresponds to the residual, decomposed andesite soils and very soft rock and soft rock andesite, which is likely to contain very hard rock, large diameter boulders of less weathered andesite at depth. Having an average depth of approximately 5.3m, this intermediate layer is absent along the northern and central portions and at small isolated areas of the site, as shown by the sections on Drawing No. J46/3.

Depth to bedrock, classified as having a seismic wave velocity greater than 1500mps, is shown on Depth to Blast Material, Drawing No. J46/5 in the Appendix.

The depth to bedrock, calculated from the seismic investigation may vary considerably with that deduced from cores of adjacent boreholes. As observed in the access cut for the tunnel under construction to the northwest of the site, fresh andesite weathers in an irregular manner leaving a blocky, undulating bedrock profile which varies by several metres in elevation over relatively short horizontal distances. For this reason, the seismic survey results are considered to provide a more realistic assessment over large areas.

Two seismic layers are generally indicated within the bedrock profile. A lower velocity layer, having an average seismic wave velocity of 2180mps, which corresponds to soft rock and hard rock, shattered to fractured, highly weathered to weathered andesite with decomposed zones is underlain by a higher velocity layer, generally some 9m to 13m depth below surface, with an average seismic wave velocity of 5290mps. This layer probably represents hard rock and very hard rock, jointed to fissured, slightly weathered to fresh andesite as intersected at depth in Borehole Nos. 30, 32, 33 and 35.

During the course of the field work for the seismic investigation hard rock andesite boulders were observed in the vicinity of traverses 54 and 55 in the northeast corner of the site. The seismic survey indicated the presence of bedrock at depths ranging from 0,7m to 2,0m below surface in this area.

Depth to Blast Material, Drawing No. J46/5, indicates deep weathered zones in the southeast portion along two sub-parallel trending lines, where bedrock contours are deflected in a northeasterly direction. These linear bedrock depressions are coincident with, and probably due to the existence of the faults described earlier. Seismic results indicate that lower velocity bedrock has been degraded into residual soils, due to advanced preferential weathering of brecciated zones adjacent to the dislocations.

7.3 Seismic Survey Accuracy

Where a hard layer, such as bedrock, occurs below a softer layer, the Huntco FS-3 portable seismograph provides the depth to the hard layer with an accuracy of approximately 5 to 10 per cent for depths greater than 1,5m. A hard layer, such as well-cemented ferricrete, overlying a softer, decomposed bedrock layer, will tend to mask the underlying softer material and could lead to misinterpretation of depths.

8. GEOTECHNICAL CONSIDERATIONS

8.1 Soil/11

8.1 Soil and Rock Excavation Characteristics

In terms of excavation characteristics, the colluvial soils, with an average seismic wave velocity of 370mps, may be stripped off by dozing or removed by scrapers down to an average depth of 1,8m.

The residual decomposed andesite soils and clayey gravels having an average seismic wave velocity of 1050mps, will generally require easy ripping with a D8H or equivalent sized tractor for removal. Conditions are likely to vary however, according to the size and number of boulders encountered at depth within this layer. Hard rock and very hard rock boulders of andesite greater than about 750mm in diameter in a clayey silt matrix may require blasting.

Bedrock, with an average seismic wave velocity of 2180mps generally occurring at depth between 3,2m and 7,7m below surface, will require blasting for removal.

8.2 Groundwater Conditions

Relatively shallow groundwater conditions exist over the southern half of the site and also in the lower lying areas, adjacent to the natural stream at the eastern boundary of the site.

Water rest levels in the open boreholes ranged from depths of 2,2m to 3,8m below surface, with an average depth below ground level of about 2,8m. Over the remainder of the site, groundwater seepage was encountered in eight out of a total of 21 trial holes at an average depth of 1,9m below surface. Natural groundwater conditions are likely to vary seasonally and according to the degree of artificial irrigation the site receives.

Where structures are to be founded at or below the groundwater surface, dewatering of foundation excavations may be necessary.

In view of the high water level conditions prevailing at this site, light basin-type structures, constructed below the water

level, could experience hydrostatic uplift before the completed structures are filled or when subsequently drained for maintenance. A system of underdrains should be considered to lower the water table.

8.3 Expansive Soils

Soil grading and Atterberg limit test results on the soil samples tested, show that both the colluvial soils and residual decomposed andesite soils are predominantly very active silty clays or clayey silts. (CH, CL and MH) and that they classify as high or medium in degree of potential expansiveness.

Predicted heave values at surface for Hole Nos. 30, 32, 33 and 35, where soil sample test results are available, are respectively 35, 20, 35 and 30mm, with an average predicted heave of say 30mm over the entire area initially proposed for development. The high water table, which occurs at an average depth of 2.8m below existing ground surface, must be taken into account, since all clayey material below the water table should be in a saturated condition. Predicted heave at surface then reduces to an average of approximately 20mm.

Soil profiles with a predicted heave range of between 15mm and 50mm are classified as "fair". Buildings constructed on such profiles should adopt the split construction building technique. (Reference 2). Adequate surface drainage facilities should be installed.

8.4 Shear Strength Parameters

Consolidated undrained triaxial shear strength tests, conducted on the shelly tube samples recovered from Hole Nos. 32 and 35 are presented in Table 3.

For design purposes, particularly where the stability of slopes after drawdown is taken into account, the effective stress values of $C=18\text{kPa}$ and $\phi=34^\circ$ should be applied. (Reference 3)

8.5 Allowable/13

REFERENCE 2: Jennings J.E. and Evans G.A. "Practical Procedures for Building in Expansive Soil Areas", S.A. Builder, October 1962.

TABLE 3
TRIAXIAL TEST RESULTS

Hole No.:	32	35
Sample Depth (m)	2,8 - 3,3	2,4 - 2,8
Initial Dry Density (kg/m ³)	1433	1448
Initial Moisture Content (%)	40,3	36,8
Final Moisture Content (%)	31,0	30,2
Cohesion c (kPa)	39	51
Int. Friction Angle ϕ (degrees)	25 ⁰	22,6 ⁰
Effective Cohesion C' (kPa)	18	19
Effective Int. Friction Angle ϕ' (degrees)	33,7 ⁰	34,3 ⁰

8.5 Allowable Bearing Pressures

The transported gravelly clays, clayey sands and gravels vary considerably in consistency, but tend to decrease from stiff at surface down to firm at depth. The upper residual andesite silty clays and clayey silts are firm, changing with increasing depth to stiff and then dense to very dense as the gravel and cobble content increases.

Design bearing pressures for structures founded in the transported or upper residual soils, down to an average depth of 3,0m below surface should not exceed 100 kPa.

From depths of 3,0m to 5,0m below surface, design bearing values should not exceed 200 kPa. Below an average depth of 5,0m, allowable bearing pressures of 350 kPa may be adopted. The highly weathered bedrock has an allowable safe bearing pressure of 700 kPa.

8.6 Settlement

Settlement computations for structures to be founded at this site have not been made as factors such as loads, footing sizes and founding depths were not known at the time of writing.

It/ 14

It is important to note however, that settlements of structures may be differential due to the varying thicknesses of the soil and weathered rock materials encountered at varying levels beneath ground surface.

No settlement is anticipated where structures, such as the Module Tanks, are to be founded at depth since a net decrease in load should result by the removal of the existing soils and their replacement by the proposed structures.

8.7 Site Grading

Most of the colluvial clays and residual clayey soils from decomposed andesite on site are expansive and are not suitable for use as fill material. However, the colluvial clayey sands and the residual clayey gravels, derived from decomposed andesite, should provide stable fill material which should compact to the required densities. Other possible sources of fill material may be located along the Black Reef Quartzite outcrop or obtained from the ferricretes in the southeast corner of the site.

Site grading plans are not available and the proposed depths of cut and fill are not known. However, based on the existing topography and reasonable grading assumptions, the following general observations are presented.

Prior to the start of any grading, all vegetation, weeds, debris and existing fill should be removed. Removal of some loose alluvial soils and soft clayey topsoils may be necessary before any fill is placed.

In areas of cut, where expansive clays are exposed, the clay should be over excavated to a depth of 1.0m below the desired cut level, removed and replaced by selected, approved, stable material which should be brought to approximately optimum moisture content and then compacted to at least 90% Mod. AASHO maximum dry density. These measures should minimise to the effects of the expansive clays.

In areas of fill, the natural soil should be scarified, brought to approximately optimum moisture content and compacted to at least 90% of maximum density to a minimum depth of at least 20cm. All approved fill materials, excluding boulders, should be placed in lifts not exceeding 20cm in compacted thickness, brought to approximately optimum moisture content and then compacted to at least 90% Mod. AASHO maximum dry density.

In order to obtain sufficient suitable material for subsequent use as fill, it may be necessary to control stripping and excavation operations and to select material exposed for stock piling.

9. SUMMARY

The site is located on Recent gravelly clays, clayey sands and gravel and cobble layers of colluvial origin, overlying gravelly clays and clayey gravels from decomposed andesite, changing with increasing depth to soft rock, highly weathered to hard rock weathered andesite.

Drill hole results from the area proposed for development show the colluvial layers decrease in thickness towards the north from an average depth of 3,2m down to an average depth of 1,8m.

Below the colluvial material, down to average depths ranging from between 2,7m and 4,8m, is firm to stiff silty clay containing gravel and cobbles from andesite. Below the gravelly clay is dense to very dense, clayey gravel, cobbles and occasional boulders from decomposed andesite. Hard rock andesite bedrock occurs at average depths ranging from 3,2m to 7,7m below ground surface.

Over the whole site, seismic survey results show that an upper, low seismic wave velocity layer, averaging 370mps, extends down to an average depth of 1,8m below surface. An intermediate seismic wave velocity layer, with an average velocity of 1050mps, often underlies the upper layer. Bedrock, with an average seismic velocity of 2180mps, occurs at depths ranging from 0,2m to 11,2m below surface, with an average depth, over the entire site, of approximately 5,3m.

The upper low velocity layer can be stripped off by dozing or scrapers. The intermediate layer will require ripping with a D8 or equivalent sized tractor for removal. Bedrock will require blasting for excavation.

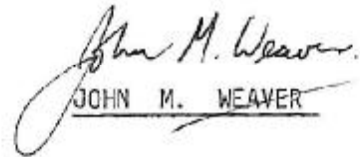
10. GENERAL

The above observations and recommendations are based on the project as described and on the assumption that the foundation materials and conditions throughout the site are not significantly different from those encountered during the field investigation.

In the case of shallow footings, after the excavations have been taken down to the depths to be specified, it is essential that these be examined by your Structural Engineer, who must satisfy himself that the material exposed is not at variance with the material described and that its bearing capacity is adequate for the loads contemplated.



A.M. TILSTONE
Engineering Geologist


JOHN M. WEAVER

APPENDIX

SUMMARY OF SEISMIC SURVEY RESULTS

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
1F*	0,0 - 3,3	440	Topsoil & colluvium	Doze
	3,3 - 8,5	1150	Decomposed andesite & boulders	Hard rip
	8,5+	3340	Very hard rock andesite	Blast
1R*	0,0 - 3,1	270	Topsoil & colluvium	Doze
	3,1 - 8,0	1150	Decomposed andesite & boulders	Hard rip
	8,0+	3530	Very hard rock andesite	Blast
2F	0,0 - 2,9	360	Topsoil & colluvium	Doze
	2,9+	1000	Decomposed andesite	Easy rip
2R	0,0 - 3,0	400	Topsoil & colluvium	Doze
	3,0 - 11,9	670	Decomposed andesite	Easy rip
	11,9+	3000	Hard rock andesite	Blast
3F	0,0 - 2,7	480	Topsoil & colluvium	Doze
	2,7 - 10,0	1250	Decomposed andesite & boulders	Hard rip
	10,0+	2500	Hard rock andesite	Blast
3R	0,0 - 0,4	390	Topsoil & colluvium	Doze
	0,4 - 5,5	480	Colluvium & gravel	Doze
	5,5 - 10,3	1500	Decomposed andesite & boulders	Blast
	10,3+	5000	Very hard rock andesite	Blast
4F	0,0 - 2,0	440	Topsoil & colluvium	Doze
	2,0 - 7,6	600	Colluvium & gravel	Doze
	7,6+	3750	Very hard rock andesite	Blast
4R	0,0 - 3,2	350	Topsoil & colluvium	Doze
	3,2 - 7,9	830	Decomposed andesite	Easy rip
	7,9+	3000	Very hard rock andesite	Blast
5F	0,0 - 1,4	440	Topsoil & colluvium	Doze
	1,4 - 5,0	830	Decomposed andesite	Easy rip
	5,0+	2000	Soft rock & hard rock andesite	Blast
5R	0,0 - 1,5	330	Topsoil & colluvium	Doze
	1,5 - 6,2	700	Decomposed andesite	Easy rip
	6,2+	1580	Soft rock andesite & boulders	Blast
6F	0,0 - 1,8	430	Topsoil & colluvium	Doze
	1,8 - 5,9	910	Decomposed andesite	Easy rip
	5,9+	2000	Soft rock & hard rock andesite	Blast
6R	0,0 - 2,1	410	Topsoil & colluvium	Doze
	2,1 - 7,5	810	Decomposed andesite	Easy rip
	7,5+	4290	Very hard rock andesite	Blast
7F	0,0 - 1,3	450	Topsoil & colluvium	Doze
	1,3 - 7,7	910	Decomposed andesite	Easy rip
	7,7+	3750	Very hard rock andesite	Blast
7R	0,0 - 2,2	340	Topsoil & colluvium	Doze
	2,2 - 7,7	1150	Decomposed andesite & boulders	Hard rip
	7,7+	2860	Soft rock & hard rock andesite	Blast

*F = Forward traverse

*R = Reverse traverse

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
8F	0,0 - 1,2	360	Topsoil & colluvium	Doze
	1,2 - 8,8	970	Decomposed andesite	Easy rip
	8,8+	3330	Very hard rock andesite	Blast
8R	0,0 - 2,9	370	Topsoil & colluvium	Doze
	2,9 - 9,8	1150	Decomposed andesite & boulders	Hard rip
	9,8+	3340	Very hard rock andesite	Blast
9F	0,0 - 2,0	360	Topsoil & colluvium	Doze
	2,0 - 4,5	950	Decomposed andesite	Easy rip
	4,5+	2850	Soft rock & hard rock andesite	Blast
9R	0,0 - 2,1	380	Topsoil & colluvium	Doze
	2,1 - 5,7	1180	Decomposed andesite & boulders	Hard rip
	5,7+	3000	Soft rock & hard rock andesite	Blast
10F	0,0 - 2,1	410	Topsoil & colluvium	Doze
	2,1+	870	Decomposed andesite	Easy rip
10R	0,0 - 2,5	380	Topsoil & colluvium	Doze
	2,5 - 6,0	840	Decomposed andesite	Easy rip
	6,0+	2070	Soft rock & hard rock andesite	Blast
11F	0,0 - 0,8	470	Topsoil & colluvium	Doze
	0,8 - 4,1	1070	Decomposed andesite	Easy rip
	4,1+	2140	Soft rock & hard rock andesite	Blast
11R	0,0 - 1,3	410	Topsoil & colluvium	Doze
	1,3 - 3,9	1070	Decomposed andesite	Easy rip
	3,9+	2220	Soft rock & hard rock andesite	Blast
12F	0,0 - 1,1	450	Topsoil & colluvium	Doze
	1,1 - 3,5	820	Decomposed andesite	Easy rip
	3,5+	2220	Soft & hard rock andesite	Blast
12R	0,0 - 1,3	410	Topsoil & colluvium	Doze
	1,3 - 4,3	1430	Decomposed andesite & boulders	Hard rip
	4,3+	2720	Hard rock andesite	Blast
13F	0,0 - 1,8	370	Topsoil & colluvium	Doze
	1,8 - 4,8	1200	Decomposed andesite & boulders	Hard rip
	4,8+	3340	Very hard rock andesite	Blast
13R	0,0 - 1,6	400	Topsoil & colluvium	Doze
	1,6 - 5,0	1150	Decomposed andesite & boulders	Hard rip
	5,0+	3000	Hard rock andesite	Blast
14F	0,0 - 3,2	580	Topsoil & colluvium	Doze
	3,2+	2500	Soft rock & hard rock andesite	Blast
14R	0,0 - 2,8	540	Topsoil & colluvium	Doze
	2,8 - 11,0	2000	Soft rock & hard rock andesite	Blast
	11,0+	4610	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
15F	0,0 - 1,6	380	Topsoil & colluvium	Doze
	1,6 - 5,0	1760	Soft rock andesite & boulders	Blast
	6,0+	2860	Soft rock & hard rock andesite	Blast
15R	0,0 - 1,6	410	Topsoil & colluvium	Doze
	1,6 - 5,8	1730	Soft rock andesite & boulders	Blast
	5,8+	2500	Soft rock & hard rock andesite	Blast
16F	0,0 - 0,5	740	Decomposed andesite	Easy rip
	0,5 - 5,9	1300	Decomposed andesite & boulders	Blast
	5,9+	4260	Very hard rock andesite	Blast
16R	0,0 - 2,4	860	Decomposed andesite	Easy rip
	2,4 - 6,8	2000	Soft rock & hard rock andesite	Blast
	6,8+	4260	Very hard rock andesite	Blast
17F	0,0 - 1,2	600	Topsoil & colluvium	Doze
	1,2 - 4,1	970	Decomposed andesite	Easy rip
	4,1+	3750	Very hard rock andesite	Blast
17R	0,0 - 1,6	400	Topsoil & colluvium	Doze
	1,6 - 5,7	1670	Soft rock andesite & boulders	Blast
	5,7+	5440	Very hard rock andesite	Blast
18F	0,0 - 0,9	380	Topsoil & colluvium	Doze
	0,9 - 4,1	600	Decomposed andesite	Easy rip
	4,1+	1580	Soft rock andesite & boulders	Blast
18R	0,0 - 3,2	430	Topsoil & colluvium	Doze
	3,2 - 11,2	1300	Decomposed andesite & boulders	Hard rip
	11,2+	4000	Very hard rock andesite	Blast
19F	0,0 - 2,1	400	Topsoil & colluvium	Doze
	2,1 - 7,1	1150	Decomposed andesite & boulders	Hard rip
	7,1+	6000	Very hard rock andesite	Blast
19R	0,0 - 1,6	380	Topsoil & colluvium	Doze
	1,6 - 6,9	1250	Decomposed andesite & boulders	Hard rip
	6,9+	4200	Very hard rock andesite	Blast
20F	0,0 - 2,4	310	Topsoil & colluvium	Doze
	2,4 - 6,4	1700	Soft rock andesite & boulders	Blast
	6,4+	5300	Very hard rock andesite	Blast
20R	0,0 - 1,7	370	Topsoil & colluvium	Doze
	1,7 - 9,4	1090	Decomposed andesite	Easy rip
	9,4+	5080	Very hard rock andesite	Blast
21F	0,0 - 2,0	340	Topsoil & colluvium	Doze
	2,0 - 9,3	1520	Soft rock andesite & boulders	Blast
	9,3+	2750	Soft rock & hard rock andesite	Blast
21R	0,0 - 2,6	310	Topsoil & colluvium	Doze
	2,6 - 9,8	1200	Decomposed andesite & boulders	Hard rip
	9,8+	4550	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
22F	0,0 - 1,7	430	Topsoil & colluvium	Doze
	1,7 - 8,9	790	Decomposed andesite	Easy rip
	8,9+	7320	Very hard rock andesite	Blast
22R	0,0 - 1,5	420	Topsoil & colluvium	Doze
	1,5 - 7,9	820	Decomposed andesite	Easy rip
	7,9+	8110	Very hard rock	Blast
23F	0,0 - 1,7	420	Topsoil & colluvium	Doze
	1,7 - 9,5	1490	Decomposed andesite & boulders	Hard rip
	9,5+	3750	Very hard rock andesite	Blast
23R	0,0 - 1,0	320	Topsoil & colluvium	Doze
	1,0 - 10,7	1420	Decomposed andesite & boulders	Hard rip
	10,7+	3800	Very hard rock andesite	Blast
24F	0,0 - 1,3	320	Topsoil & colluvium	Doze
	1,3 - 13,7	1360	Decomposed andesite & boulders	Hard rip
	13,7+	6250	Very hard rock andesite	Blast
24R	0,0 - 3,0	360	Topsoil & colluvium	Doze
	3,0 - 13,6	1820	Soft rock & andesite boulders	Blast
	13,6+	6820	Very hard rock andesite	Blast
25F	0,0 - 2,7	400	Topsoil & colluvium	Doze
	2,7 - 5,3	1230	Decomposed andesite & boulders	Hard rip
	5,3+	2630	Soft and hard rock andesite	Blast
25R	0,0 - 2,4	350	Topsoil & colluvium	Doze
	2,4 - 10,8	1470	Decomposed andesite & boulders	Hard rip
	10,8+	4920	Very hard rock andesite	Blast
26F	0,0 - 0,8	270	Topsoil & colluvium	Doze
	0,8 - 4,5	740	Decomposed andesite	Easy rip
	4,5 - 10,9	1690	Soft rock andesite & boulders	Blast
	10,9+	4700	Very hard rock andesite	Blast
26R	0,0 - 2,3	350	Topsoil & colluvium	Doze
	2,3 - 7,1	1640	Soft rock andesite & boulders	Blast
	7,1+	4760	Very hard rock andesite	Blast
27F	0,0 - 0,1	380	Topsoil & colluvium	Doze
	0,1 - 2,7	1140	Decomposed andesite & boulders	Hard rip
	2,7+	3570	Very hard rock andesite	Blast
27R	0,0 - 0,4	380	Topsoil & colluvium	Doze
	0,4 - 3,7	1130	Decomposed andesite & boulders	Hard rip
	3,7+	3260	Very hard rock andesite	Blast
28F	0,0 - 2,5	410	Topsoil & colluvium	Doze
	2,5 - 9,4	1300	Decomposed andesite & boulders	Hard rip
	9,4+	6250	Very hard rock andesite	Blast
28R	0,0 - 2,2	380	Topsoil & colluvium	Doze
	2,2 - 9,1	1380	Decomposed andesite & boulders	Hard rip
	9,1+	5080	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
29F	0,0 - 1,3	280	Topsoil & colluvium	Doze
	1,3 - 5,6	1060	Decomposed andesite	Easy rip
	5,6+	4170	Very hard rock andesite	Blast
29R	0,0 - 0,4	270	Topsoil & colluvium	Doze
	0,4 - 2,7	790	Decomposed andesite	Easy rip
	2,7+	3190	Very hard rock andesite	Blast
30F	0,0 - 0,3	300	Topsoil & colluvium	Doze
	0,3 - 3,4	1020	Decomposed andesite	Easy rip
	3,4+	5080	Very hard rock andesite	Blast
30R	0,0 - 0,2	320	Topsoil & colluvium	Doze
	0,2 - 4,0	960	Decomposed andesite	Easy rip
	4,0+	4620	Very hard rock andesite	Blast
31F	0,0 - 0,5	210	Topsoil & colluvium	Doze
	0,5 - 3,1	860	Decomposed andesite	Easy rip
	3,1+	7500	Very hard rock andesite	Blast
31R	0,0 - 0,8	310	Topsoil & colluvium	Doze
	0,8 - 3,4	920	Decomposed andesite	Easy rip
	3,4+	10000	Very hard rock andesite	Blast
32F	0,0 - 0,1	290	Topsoil & colluvium	Doze
	0,1 - 4,2	940	Decomposed andesite	Easy rip
	4,2+	5080	Very hard rock andesite	Blast
32R	0,0 - 0,3	380	Topsoil & colluvium	Doze
	0,3 - 4,7	830	Decomposed andesite	Easy rip
	4,7+	4230	Very hard rock andesite	Blast
33F	0,0 - 0,8	250	Topsoil & colluvium	Doze
	0,8 - 9,0	1420	Decomposed andesite & boulders	Hard rip
	9,0+	6980	Very hard rock andesite	Blast
33R	0,0 - 0,5	270	Topsoil & colluvium	Doze
	0,5 - 6,2	1480	Decomposed andesite & boulders	Hard rip
	6,2+	4050	Very hard rock andesite	Blast
34F	0,0 - 2,5	310	Topsoil & colluvium	Doze
	2,5 - 10,9	1630	Soft rock andesite & boulders	Blast
	10,9+	6820	Very hard rock andesite	Blast
34R	0,0 - 2,7	340	Topsoil & colluvium	Doze
	2,7 - 11,3	1520	Soft rock andesite & boulders	Blast
	11,3+	6520	Very hard rock andesite	Blast
35F	0,0 - 2,1	370	Topsoil & colluvium	Doze
	2,1 - 5,8	1270	Decomposed andesite & boulders	Hard rip
	5,8+	2340	Soft rock & hard rock andesite	Blast
35R	0,0 - 1,3	350	Topsoil & colluvium	Doze
	1,3 - 6,0	1030	Decomposed andesite	Easy rip
	6,0+	2630	Soft rock & hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
36F	0,0 - 1,9	340	Topsoil & colluvium	Doze
	1,9 - 7,0	1490	Decomposed andesite & boulders	Hard rip
	7,0+	4840	Very hard rock andesite	Blast
36R	0,0 - 1,7	320	Topsoil & colluvium	Doze
	1,7 - 7,3	900	Decomposed andesite	Easy rip
	7,3+	3700	Very hard rock andesite	Blast
37F	0,0 - 1,9	330	Topsoil & colluvium	Doze
	1,9 - 5,4	3000	Hard rock andesite	Blast
	5,4+	5880	Very hard rock andesite	Blast
37R	0,0 - 1,3	260	Topsoil & colluvium	Doze
	1,3 - 8,4	1060	Decomposed andesite	Easy rip
	8,4+	5000	Very hard rock andesite	Blast
38F	0,0 - 1,3	340	Topsoil & colluvium	Doze
	1,3 - 7,7	980	Decomposed andesite	Easy rip
	7,7+	9380	Very hard rock andesite	Blast
38R	0,0 - 1,4	300	Topsoil & colluvium	Doze
	1,4 - 6,4	1110	Decomposed andesite	Easy rip
	6,4+	7690	Very hard rock andesite	Blast
39F	0,0 - 3,1	430	Topsoil & colluvium	Doze
	3,1 -11,9	1780	Soft rock & hard rock andesite	Blast
	11,9+	7500	Very hard rock andesite	Blast
39R	0,0 - 2,7	460	Topsoil & colluvium	Doze
	2,7 -12,1	2080	Soft rock & hard rock andesite	Blast
	12,1+	8110	Very hard rock andesite	Blast
40F	0,0 - 1,5	380	Topsoil & colluvium	Doze
	1,5 -11,1	1720	Soft rock andesite & boulders	Blast
	11,1+	6250	Very hard rock andesite	Blast
40R	0,0 - 1,5	350	Topsoil & colluvium	Doze
	1,5 - 6,2	610	Decomposed andesite	Easy rip
	6,2+	7140	Very hard rock andesite	Blast
41F	0,0 - 1,4	340	Topsoil & colluvium	Doze
	1,4 - 6,0	930	Decomposed andesite	Easy rip
	6,0+	5360	Very hard rock andesite	Blast
41R	0,0 - 0,1	340	Topsoil & colluvium	Doze
	0,1 - 8,7	930	Decomposed andesite	Easy rip
	8,7+	6250	Very hard rock andesite	Blast
42F	0,0 - 3,3	400	Topsoil & colluvium	Doze
	3,3+	4290	Very hard rock andesite	Blast
42R	0,0 - 3,2	390	Topsoil & colluvium	Doze
	3,2+	5450	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
43F	0,0 - 0,2	310	Topsoil & colluvium	Doze
	0,2 - 12,5	1880	Soft rock & hard rock andesite	Blast
	12,5+	7320	Very hard rock andesite	Blast
43R	0,0 - 0,7	320	Topsoil & colluvium	Doze
	0,7 - 12,8	2470	Soft and hard rock andesite	Blast
	12,8+	6670	Very hard rock andesite	Blast
44F	0,0 - 1,0	280	Topsoil & colluvium	Doze
	1,0 - 5,9	850	Decomposed andesite	Easy rip
	5,9+	4920	Very hard rock andesite	Blast
44R	0,0 - 0,4	420	Topsoil & colluvium	Doze
	0,4 - 5,3	870	Decomposed andesite	Easy rip
	5,3+	4550	Very hard rock andesite	Blast
45F	0,0 - 1,5	300	Topsoil & colluvium	Doze
	1,5 - 9,1	1760	Soft rock andesite & boulders	Blast
	9,1+	9380	Very hard rock andesite	Blast
45R	0,0 - 1,5	280	Topsoil & colluvium	Doze
	1,5 - 9,3	1660	Soft rock andesite & boulders	Blast
	9,3+	8570	Very hard rock andesite	Blast
46F	0,0 - 2,8	450	Topsoil & colluvium	Doze
	2,8+	3490	Very hard rock andesite	Blast
46R	0,0 - 2,4	470	Topsoil & colluvium	Doze
	2,4+	2650	Soft rock & hard rock andesite	Blast
47F	0,0 - 0,3	260	Topsoil & colluvium	Doze
	0,3 - 4,2	1410	Decomposed andesite & boulders	Hard rip
	4,2+	2700	Soft rock & hard rock andesite	Blast
47R	0,0 - 1,8	400	Topsoil & colluvium	Doze
	1,8+	5880	Very hard rock andesite	Blast
48F	0,0 - 1,6	320	Topsoil & colluvium	Doze
	1,6 - 7,5	1420	Decomposed andesite & boulders	Hard rip
	7,5+	4760	Very hard rock andesite	Blast
48R	0,0 - 1,6	380	Topsoil & colluvium	Doze
	1,6 - 8,2	1580	Soft rock andesite & boulders	Blast
	8,2+	4050	Very hard rock andesite	Blast
49F	0,0 - 0,9	330	Topsoil & colluvium	Doze
	0,9 - 5,7	830	Decomposed andesite	Easy rip
	5,7+	4920	Very hard rock andesite	Blast
49R	0,0 - 0,6	360	Topsoil & colluvium	Doze
	0,6 - 7,8	1380	Decomposed andesite & boulders	Hard rip
	7,8+	2750	Soft rock & hard rock andesite	Blast
50F	0,0 - 1,0	360	Topsoil & colluvium	Doze
	1,0 - 4,7	760	Decomposed andesite	Easy rip
	4,7+	6980	Very hard rock andesite	Blast
50R	0,0 - 1,6	360	Topsoil & colluvium	Doze
	1,6 - 5,3	1430	Decomposed andesite & boulders	Hard rip
	5,3+	4920	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
51F	0,0 - 0,8	540	Topsoil & colluvium	Doze
	0,8+	3530	Very hard rock andesite	Blast
51R	0,0 - 0,6	440	Topsoil & colluvium	Doze
	0,6+	3090	Soft & hard rock andesite	Blast
52F	0,0 - 2,1	340	Topsoil & colluvium	Doze
	2,1 - 5,4	980	Decomposed andesite	Easy rip
	5,4+	3700	Very hard rock andesite	Blast
52R	0,0 - 1,1	300	Topsoil & colluvium	Doze
	1,1 - 3,1	640	Decomposed andesite	Easy rip
	3,1+	6520	Very hard rock andesite	Blast
53F	0,0 - 1,3	350	Topsoil & colluvium	Doze
	1,3 - 7,0	1400	Decomposed andesite & boulders	Hard rip
	7,0+	6670	Very hard rock andesite	Blast
53R	0,0 - 0,5	320	Topsoil & colluvium	Doze
	0,5 - 5,7	850	Decomposed andesite	Easy rip
	5,7+	6120	Very hard rock andesite	Blast
54F	0,0 - 0,5	340	Topsoil & colluvium	Doze
	0,5 - 4,0	1090	Decomposed andesite	Easy rip
	4,0+	6520	Very hard rock andesite	Blast
54R	0,0 - 0,8	440	Topsoil & colluvium	Doze
	0,8 - 1,8	1260	Decomposed andesite & boulders	Hard rip
	1,8+	4050	Very hard rock andesite	Blast
55F	0,0 - 1,2	270	Topsoil & colluvium	Doze
	1,2 - 3,0	1110	Decomposed andesite	Easy rip
	3,0+	6820	Very hard rock andesite	Blast
55R	0,0 - 0,9	280	Topsoil & colluvium	Doze
	0,9 - 8,4	2010	Soft & hard rock andesite	Blast
	8,4+	6120	Very hard rock andesite	Blast
56F	0,0 - 2,1	330	Topsoil & colluvium	Doze
	2,1 - 9,4	630	Decomposed andesite	Easy rip
	9,4+	3800	Very hard rock andesite	Blast
56R	0,0 - 2,7	320	Topsoil & colluvium	Doze
	2,7 - 10,5	700	Decomposed andesite	Easy rip
	10,5+	8570	Very hard rock andesite	Blast
57F	0,0 - 2,9	350	Topsoil & colluvium	Doze
	2,9 - 8,1	2050	Soft & hard rock andesite	Blast
	8,1+	5080	Very hard rock andesite	Blast
57R	0,0 - 3,1	350	Topsoil & colluvium	Doze
	3,1 - 9,6	2170	Soft & hard rock andesite	Blast
	9,6+	7320	Very hard rock andesite	Blast

Traverse No.	Depth m	Seismic Wave Velocity(m/s)	Material Type	Excavation Classification
58F	0,0 - 1,8	390	Topsoil & colluvium	Doze
	1,8 - 14,2	1620	Soft rock andesite & boulders	Blast
	14,2	7140	Very hard rock andesite	Blast
58R	0,0 - 2,0	340	Topsoil & colluvium	Doze
	2,0 - 12,2	1970	Soft & hard rock andesite	Blast
	12,2+	4920	Very hard rock andesite	Blast
59F	0,0 - 1,7	420	Topsoil & colluvium	Doze
	1,7 - 9,2	1790	Soft rock andesite & boulders	Blast
	9,2+	5260	Very hard rock andesite	Blast
59R	0,0 - 2,6	380	Topsoil & colluvium	Doze
	2,6 - 5,8	2970	Soft & hard rock andesite	Blast
	5,8+	3850	Very hard rock andesite	Blast
60F	0,0 - 1,5	320	Topsoil & colluvium	Doze
	1,5 - 6,8	530	Decomposed andesite	Doze
	6,8+	5560	Very hard rock andesite	Blast
60R	0,0 - 1,8	270	Topsoil & colluvium	Doze
	1,8 - 7,0	580	Decomposed andesite	Doze
	7,0+	5660	Very hard rock andesite	Blast
61F	0,0 - 2,4	390	Topsoil & colluvium	Doze
	2,4 - 12,0	1880	Soft and hard rock andesite	Blast
	12,0+	6670	Very hard rock andesite	Blast
61R	0,0 - 2,4	410	Topsoil & colluvium	Doze
	2,4 - 10,5	1840	Soft and hard rock andesite	Blast
	10,5+	9680	Very hard rock andesite	Blast
62F	0,0 - 2,5	400	Topsoil & colluvium	Doze
	2,5 - 8,9	2380	Soft & hard rock andesite	Blast
	8,9+	6120	Very hard rock andesite	Blast
62R	0,0 - 2,5	320	Topsoil & colluvium	Doze
	2,5 - 8,5	2040	Soft and hard rock andesite	Blast
	8,5+	6820	Very hard rock andesite	Blast
63F	0,0 - 3,0	350	Topsoil & colluvium	Doze
	3,0 - 11,1	2610	Soft & hard rock andesite	Blast
	11,1+	7320	Very hard rock andesite	Blast
63R	0,0 - 2,5	330	Topsoil & colluvium	Doze
	2,5 - 10,8	2560	Soft & hard rock andesite	Blast
	10,8+	6670	Very hard rock andesite	Blast
64F	0,0 - 1,8	350	Topsoil & colluvium	Doze
	1,8 - 7,7	1820	Soft & hard rock andesite	Blast
	7,7+	5170	Very hard rock andesite	Blast
64R	0,0 - 1,5	400	Topsoil & colluvium	Doze
	1,5 - 5,7	1570	Soft rock andesite & boulders	Blast
	5,7+	4920	Very hard rock andesite	Blast

DRILLING RECORD

Sheet N° 10

JOHN M. WEAVER
Engineering Geologist
364 MAIN STREET,
WATERKLOOF.
PRETORIA. 0151
Tel. 78-2397

CLIENT PGJ Meiring & Partners
PROJECT Sewage Works
SITE Bushkoppie
LOGGED BY AMT on 15/12/77
DRILLER Radio

JOB N° J45
HOLE N° 30
ELEVATION ± 1556,7m
WATER TABLE 3,0m
DATE STARTED 10/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
SPT	50				14	0,30		Firm, moist, dark reddish brown, mottled black, intact silty CLAY(CL). Topsoil with roots.
					22	1		Firm to stiff with depth, moist, dark red, intact silty CLAY(CL). Colluvium.
SPT	17					1,30		Stiff, slightly moist, dark red intact medium-sandy CLAY(CL). Colluvium.
						1,60		Loose, wet, dark red slightly clayey and silty medium SAND(SP). Colluvium.
	44					2		No core, suspect loose, wet, dark red slightly clayey and silty medium SAND(SP). Colluvium.
						2,65		Stiff, slightly moist, dark red, intact slightly sandy, silty CLAY(CL) with up to 5% ferruginous pisoliths, 3-5mm in size. Colluvium.
SPT		N/A	N/A			3,10		Loose, wet, dark red, fine and medium SAND (SW). Colluvium.
	36					3,90		No core. Suspect loose, wet dark red fine and medium SAND(SW). Colluvium.
						4		Stiff, slightly moist, yellow streaked black fissured, clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA.
SPT	47				28	5		
	10					5,30		Stiff, slightly moist, yellow streaked black, fissured, clayey SILT(ML) with up to 10% hard rock, light grey, 20-50mm in size GRAVEL CORESTONES. Decomposed ANDESITE VENTERSDORP LAVA.
	16					6		
	100	0				6,65		Hard rock and very hard rock, grey stained brown and black, fine grained, 20-80mm in size ANDESITE VENTERSDORP LAVA BOULDERS in very stiff and soft rock clayey SILT(ML) matrix. Highly weathered ANDESITE VENTERSDORP LAVA.
	34	0	> 50			7		
	100	19				8		Very hard rock, grey stained brown and black on joints, fractured, fine grained, weathered ANDESITE VENTERSDORP LAVA. Red speckled white silty CLAY(CH) 1-2mm thick, commonly developed on joints.
	100	0	28			9		
	100	0	39			10		
	100	0						
	100	0						

FRACTURE SPACING (mm)

	< 30
	30 - 100
	100 - 300
	300 - 1000
	> 1000

Fracture frequency or N° of joints per metre

ROD ROCK QUALITY (%)

100 X Core lengths 100mm and longer
Length of run

EXPLANATION

- Ground level
- Standard penetration test
- Water table
- End of drilling

- Indicator or disturbed soil sample
- Core sample
- Approx. material change
- Unconformable material change

Sheet No. 11

Tel. 78-2397

CLIENT _____
PROJECT Sewage Works
SITE _____
LOGGED BY _____
DRILLER _____

JOB N° 146
HOLE N° 30 Cont.
ELEVATION _____
WATER TABLE _____
DATE STARTED _____

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
TNW	100	42	30			11		Very hard rock, grey stained brown and black on joints, fractured, fine grained, weathered ANDESITE VENTERSDORP LAVA. Red speckled white silty CLAY(CH) 1-2mm thick, commonly developed on joints.
	100	0						
	100	0						
	100	0						

FRACTURE SPACING (mm)

	< 30
	30 - 100
	100 - 300
	300 - 1000
	> 1000

Fracture frequency or N° of joints per metre

ROD ROCK QUALITY (%)

Core lengths 100 mm and longer

100 X $\frac{\text{Length of run}}{\text{Length of run}}$

EXPLANATION

	Ground level		Indicator or disturbed soil sample
	Standard penetration test		Core sample
	Water table		Approx. material change
	End of drilling		Unconformable material change

DRILLING RECORD

Sheet No. 12

JOHN M. WEAVER
Engineering Geologist

364 MAIN STREET,
WATERKLOOF,
PRETORIA, 0161

Tel. 75-2397

CLIENT PGJ Meiring & Partners

PROJECT Sewage Works

SITE Bushkoppie

LOGGED BY AMT 15/12/77

DRILLER Rodio

JOB No 346

HOLE No 31

ELEVATION ± 1553.6m

WATER TABLE 3.8m

DATE STARTED 10/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
A NXC TNM	N/A				26	0.30		Stiff, slightly moist, dark brown, fine sandy silty CLAY(CL). Topsoil with roots.
						1		Stiff, slightly moist, dark reddish brown, slightly sandy, with up to 30% 30-200mm quartzite gravel and cobbles in silty CLAY (CL). Colluvium.
	SPT				22	1.20		Firm, moist, dark red mottled, black, poorly ferruginized sandy silty CLAY(CL). Colluvium.
	60					2		Medium dense, moist, red, mottled yellow and black, clayey sandy 2-4mm GRAVEL(GP). Colluvium.
	48	N/A	N/A					Stiff, moist, red, silty CLAY(CL) with occasional 2-4mm ferruginous pisoliths. Colluvium.
	SPT				10	2.90		Stiff, moist, red mottled yellow and black, intact, silty CLAY(CL). Decomposed ANDESITE VENTERSDORP LAVA.
	49					4		
	SPT				16	4.65		Stiff, moist, yellow streaked black, fissured clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA. Occasional hard rock, light yellowish brown and grey ANDESITE cobbles. SPT unreliable - hit gravel.
	100					5		
	100					6		
	SPT				R			
	16					6.60		Poor core recovery. Dense, light grey, very hard rock, 250mm in size COBBLES(GP) in stiff to soft rock, light yellow, fissured, clayey SILT(ML) matrix. Decomposed ANDESITE VENTERSDORP LAVA.
	83	83				7		
	58	0				7.65		Soft rock and hard rock, light yellowish brown and grey, stained black and red on joints, fractured, highly weathered ANDESITE VENTERSDORP LAVA. Up to 10mm thick silty CLAY (CL) on joints.
	81	0	30			8		
	100	12				8.90		Very hard rock, grey and light brownish grey stained red on joints, fractured, fine grained, weathered ANDESITE VENTERSDORP LAVA. Up to 3mm thick light yellow silty CLAY(CL) developed on joints.
	100	11	28			9		
						10		

FRACTURE SPACING (mm)

	< 30
	30 - 100
	100 - 300
	300 - 1000
	> 1000

Fracture frequency or No of joints per metre

EXPLANATION

RQD ROCK QUALITY (%)

Core lengths 100mm and longer
100 X Length of run

- Ground level
- Standard penetration test
- Water table
- End of drilling

- Indicator or disturbed soil sample
- Core sample
- Approx. material change
- Unconformable material change

Sheet № 13

IOB No 246

HOLE NO. 31 Cont.

ELEVATION _____

WATER TABLE _____

DATE STARTED _____

Drilling Method						Material Description					
% Core Recovery	% Rock Quality	Fracture Frequency	Fracture Spacing	Sampling and Testing	Depth (m)	Profile					
100	15	27			11	Very hard rock, gray and light brownish grey stained red on joints, fractured, fine grained, weathered ANDESITE VENTERSDOORP LAVA. Up to 3mm thick light yellow silty CLAY(CL) developed on joints.					
86	10	16			12						
85	18										

TNW

FRACTURE SPACING (mm)

- < 30
- 30 - 100
- 100 - 300
- 300 - 1000
- > 1000

RQD ROCK QUALITY (%)

Core lengths 100 mm and longer

100 x Length of run

EXPLANATION

- Ground level
- Standard penetration test
- Water table
- End of drilling
- Indicator or disturbed soil sample
- Core sample
- Approx. material change
- Unconformable material change

DRILLING RECORD

Sheet No. 14

JOHN M. WEAVER
Engineering Geologist
364 MAIN STREET,
WATERKLOOF,
PRETORIA, 0181
Tel. 78-2397

CLIENT PGJ Meiring & Partners
PROJECT Sewage Works
SITE Bushkoppie
LOGGED BY AMT on 16/12/77
DRILLER Rodio

JOB No. J46
HOLE No. 32
ELEVATION ±1549,3
WATER TABLE Hole blocked
DATE STARTED 13/12/77

DRILLING METHOD					% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION		
NXC					15	N/A	N/A		5	0.30	49.20	Stiff, dry, dark brown, silty 6-80mm gravelly CLAY(CL). Topsoil with roots.		
					30					1	Medium dense, dry to moist at depth, dark red, 6-250mm size GRAVEL and COBBLES(GW) in 50% silty CLAY(CL) matrix.			
					36					1.50				
					SPT					2	Soft to firm at depth, moist, dark red, sandy silty CLAY(CL). Colluvium			
					Shelby sample					2.70				
					SPT					3	Stiff, slightly moist, light yellow streaked black, fissured, clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA with small boulders and gravel size corestones at depth. SPT unreliable, hit gravel.			
					30					4				
					18					4.50	Poor core recovery. Stiff, slightly moist, light yellow streaked black, fissured, clayey 10-100mm gravelly SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA becoming very soft rock and highly weathered at depth.			
					33					5.60				
					92					6	Soft rock, yellowish brown stained black on joints, fractured fine grained, weathered, ANDESITE VENTERSDORP LAVA with hard rock corestones.			
TMW					83	0	65		44	6.40		Very hard rock, light grey, stained brown and black on joints, fractured, fine grained weathered ANDESITE VENTERSDORP LAVA with 2-3mm thick silty CLAY(CL) on joints.		
					90					7				
					100					7.90	41.50	Hard rock, light yellowish brown stained dark brown on joints, fractured, fine grained weathered ANDESITE VENTERSDORP LAVA, with 5 to 10m soft rock zones adjacent to joints.		
					100					9				
					88					9.20		Very hard rock, light grey stained black and brown on joints, fractured to jointed at depth, fine grained slightly weathered ANDESITE VENTERSDORP LAVA.		
										10				
FRACTURE SPACING (mm)												EXPLANATION		
Fracture frequency or No of joints per metre												RQD ROCK QUALITY (%)		
												Core lengths 100 mm and longer		
												100 X Length of run		
														Ground level
														Standard penetration test
														Water table
														End of drilling
														Indicator or disturbed soil sample
														Core sample
														Approx. material change
														Unconformable material change

Sheet No. 15

Tel. 78-2397

DRILLER

DATE STARTED _____

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
TNW	100	57	12			10	^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^	Very hard rock, light grey stained black and brown on joints, fractured to jointed at depth, fine grained slightly weathered ANDESITE VENTERSDORP LAVA.
			6			11	^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^	
						11.50	^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^ ^^^	

FRACTURE SPACING (mm)

[Pattern]	< 30
[Pattern]	30 - 100
[Pattern]	100 - 300
[Pattern]	300 - 1000
[Pattern]	> 1000

Fracture frequency or N° of joints per metre

EXPLANATION

[Symbol]	Ground level	[Symbol]	Indicator or disturbed soil sample
[Symbol]	Standard penetration test	[Symbol]	Core sample
[Symbol]	Water table	[Symbol]	Approx. material change
[Symbol]	End of drilling	[Symbol]	Unconformable material change

RQD ROCK QUALITY (%)

Core lengths 100 mm and longer

100 X Length of run

DRILLING RECORD

Sheet N° 16

JOHN M. WEAVER
Engineering Geologist

364 MAIN STREET,
WATERKLOOF,
PRETORIA. 0181
Tel. 78-2397

CLIENT PGJ Meiring & Partners
PROJECT Sewage Works
SITE Bushkoppie
LOGGED BY AMT on 15/12/77
DRILLER Rodio

JOB N° J46
HOLE N° 33
ELEVATION ±1557,8
WATER TABLE 2,65m
DATE STARTED 13/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
SPT	46				26	0,40		Stiff, moist, dark brown, fine gravelly silty CLAY(CL). Topsoil with roots. SPT unreliable. hit gravel.
						0,90		Stiff, moist, dark red, 30% 10-200mm quartzite gravel in silty CLAY(CL) matrix. Colluvium.
SPT	47				6	1		Firm, moist, dark red, silty CLAY(CL) with up to 20% 2-6mm feruginous pisoliths. Colluvium.
						2,10		Stiff, moist, dark red, fissured silty CLAY (CL). Decomposed ANDESITE VENTERSDORP LAVA.
SPT	26				84	2,35		Stiff, slightly moist, light yellow streaked black and brown, fissured clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA.
	32					3		
	20					3,45		Poor core recovery. Very stiff, moist, light yellow and reddish brown, 20% 20-60mm hard rock, light grey gravelly, fissured clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA.
	0	N/A	N/A			4		
	37					5		
	42					5,70		
	100					6		Stiff, dry, light yellow and reddish brown, fissured, clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA.
	100					7		
	44	0				7,15		
	100	0	45			8		Very hard rock, grey, weathered brown on joints, fractured fine grained, weathered ANDESITE VENTERSDORP LAVA.
	100	0				8		
	100	20	29			9		
	91	0				9,15		

FRACTURE SPACING (mm)		EXPLANATION	
	< 30		Ground level
	30 - 100		Standard penetration test
	100 - 300		Water table
	300 - 1000		End of drilling
	> 1000		Indicator or disturbed soil sample
Fracture frequency or N° of joints per metre			Core sample
			Approx. material change
			Unconformable material change

ROD ROCK QUALITY (%)
Core lengths 100 mm and longer
100 X Length of run

Sheet No. 17

DATE STARTED 16/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
SPT	33	N/A	N/A			0		Medium dense, moist, dark yellowish red clayey SAND(SC) with abundant GRAVEL and occasional COBBLES(GW) of ANDESITE, QUARTZ and QUARTZITE.
						1		
						14		
						185		
						2		
						3		
						36		
						370		
						4		
						5		
SPT	100	N/A	N/A			6		Stiff, wet, light yellow, speckled and stained black, fissured silty CLAY(CL) with scattered GRAVEL(GW) from decomposed ANDESITE.
						7		
						8		
SPT	100	N/A	N/A			9		Very stiff, moist, yellowish brown, speckled and stained black, fissured clayey SILT(ML) with GRAVEL and COBBLES(GW) from decomposed ANDESITE VENTERSDORP LAVA.
						10		
						11		
SPT	100	N/A	N/A			12		Soft rock, yellowish brown stained dark brown and black, fractured to shattered at base, highly weathered ANDESITE VENTERSDORP LAVA.
						13		
						14		
SPT	100	N/A	N/A			15		Hard rock, greenish grey stained dark red and black on joints, fractured, weathered ANDESITE VENTERSDORP LAVA.
						16		
						17		
SPT	100	N/A	N/A			18		Soft rock, yellowish brown stained dark red and black on joints, shattered, highly weathered ANDESITE VENTERSDORP LAVA.
						19		
						20		

DRILLING RECORD

Sheet No. 18

JOHN M. WEAVER
Engineering Geologist
354 MAIN STREET,
WATERKLOOF.
PRETORIA. 0181
Tel. 78-2397

CLIENT PGJ Meiring & Partners
PROJECT Sewage Works
SITE Bushkoppia
LOGGED BY AMT on 18/12/77
DRILLER Rodin

JOB No. 346
HOLE No. 35
ELEVATION \pm 1550.0m
WATER TABLE 2.20m
DATE STARTED 15/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
SPT						0.15		Stiff, slightly moist, dark brown fine gravelly CLAY(CL). Topsoil with roots.
22						1		Loose, dry, dark red, 70% 2-100mm GRAVEL and CBBLES(GW) average size 7mm of QUARTZITE and weathered ANDESITE in silty CLAY(CL) matrix. Colluvium.
SPT						1.30		Firm, moist, dark red mottled yellow, silty CLAY(CL). Decomposed ANDESITE VENTERSDORP LAVA.
NXC	Shalby Sample	N/A	N/A			2		
SPT						2.10		Stiff, slightly moist to moist with depth, light yellow streaked red and black, fissured clayey SILT(ML). Decomposed ANDESITE VENTERSDORP LAVA with occasional hard rock core-stones.
42						3		
53						4		
43						5		
30	0	100				6		Very soft rock, light yellowish brown and reddish brown, shattered, highly weathered and decomposed ANDESITE VENTERSDORP LAVA with up to 20% hard rock corestones.
35	0	100				7		
100	0	100				7.65		Soft rock, light yellowish brown streaked dark brown and black, shattered, highly weathered ANDESITE VENTERSDORP LAVA with 15% very hard rock corestones up to 40mm in size.
			50			8		Hard rock, dark yellowish brown stained black and dark red on joints, fractured, fine grained, weathered ANDESITE VENTERSDORP LAVA.
						8.75		
						9		
						9.45		

FRACTURE SPACING (mm)		EXPLANATION	
	< 30		Ground level
	30 - 100		Standard penetration test
	100 - 300		Water table
	300 - 1000		End of drilling
	> 1000		Indicator or disturbed soil sample
Fracture frequency or No of joints per metre			Core sample
			Approx. material change
			Unconformable material change

DRILLING RECORD

Sheet N° 19

JOHN M. WEAVER
Engineering Geologist
364 MAIN STREET,
WATERKLOOF,
PRETORIA. 0181
Tel. 78-2397

CLIENT PGJ Meiring & Partners
PROJECT Sewage Works
SITE Bushkoppie
LOGGED BY AMT on 16/12/77
DRILLER Rodia

JOB N° J46
HOLE N° 36
ELEVATION ± 1558,4m
WATER TABLE 3,00m
DATE STARTED 15/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
NXC	N/A					0.20		Stiff, slightly moist, dark brown, silty CLAY (CL). Topsoil with roots and 20% 30mm gravel.
54	N/A	N/A	N/A			1.10		Medium dense, dry, dark brown, 70% 5-40mm GRAVEL(GW) in silty CLAY(CL) matrix. Colluvium
SPT						1.10		
50						2		Stiff, moist, light red, mottled yellow, fissured silty CLAY(CL). Decomposed ANDESITE VENTERSDORP LAVA with occasional hardrock corestones. SPT unreliable, hit gravel.
82						250		
33						320		Very dense, moist, light yellow streaked red, fissured clayey SILT matrix containing up to 70% very hard rock GRAVEL and COBBLES(GW). Decomposed ANDESITE VENTERSDORP LAVA.
80						320		
36	36		13			4		Very hard rock, light grey, weathered brown and black on joints, fractured, fine grained slightly weathered ANDESITE VENTERSDORP LAVA with a hard rock, weathered zone from 5.20m to 5.90m.
100	0		14			5		
100	0		24			6		
71	0					6.35		
100	22							

FRACTURE SPACING (mm)



Fracture frequency or N° of joints per metre

EXPLANATION

RQD ROCK QUALITY (%)

Core lengths 100 mm and longer
100 X Length of run

Ground level
Standard penetration test
Water table
End of drilling

Indicator or disturbed soil sample
Core sample
Approx. material change
Unconformable material change

Sheet No. 20

JOB N° 146
HOLE N° 37
ELEVATION + 1554.3m
WATER TABLE 3.00m
DATE STARTED 18/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
NXC	SPT	N/A	N/A			0		Medium dense, slightly moist, dark greyish brown silty SAND(SM) with abundant GRAVEL(GW) Colluvium.
	17					0.65		Medium dense, moist, dark yellowish brown, speckled light olive, clayey SAND(SC) with abundant small angular GRAVEL(GP). Colluvium.
	80					1		
	60					1.65		Dense, moist, hard rock GRAVEL and COBBLES of ANDESITE and QUARTZITE(GW) in matrix of dark yellowish red clayey SAND(SC). Colluvium.
	50					2		
	83					2.80		Dense, wet, yellowish red clayey SAND(SC) with abundant small GRAVEL(GP) from decomposed ANDESITE.
	100					3.25		
	100					4		Hard rock, dark grey speckled white stained dark and light brown on joints, fractured, weathered ANDESITE VENTERSOORP LAVA.
	100					4.65		
	82					5		Very hard rock, dark grey with light brown clayey SILT(ML) developed on joints, jointed to fractured at base, weathered ANDESITE VENTERSOORP LAVA.
					6			
					6.30			

FRACTURE SPACING (mm)

	< 30
	30 - 100
	100 - 300
	300 - 1000
	> 1000

Fracture frequency or N° of joints per metre

EXPLANATION

ROD ROCK QUALITY (%)

100 X Core lengths 100 mm and longer
Length of run

	Ground level		Indicator or disturbed soil sample
	Standard penetration test		Core sample
	Water table		Approx. material change
	End of drilling		Unconformable material change

DRILLING RECORD

Sheet No. 21

JOHN M. WEAVER
Engineering Geologist

364 MAIN STREET,
WATERKLOOF,
PRETORIA. 0181

Tel. 76-2397

CLIENT PGJ Meiring & Partners

PROJECT Sewage Works

SITE Bushkoppie

LOGGED BY AMT on 17/12/77

DRILLER Rodio

JOB No J46

HOLE No 38

ELEVATION ± 1550,4

WATER TABLE 3,0m

DATE STARTED 16/12/77

DRILLING METHOD	% CORE RECOVERY	% ROCK QUALITY	FRACTURE FREQUENCY	FRACTURE SPACING	SAMPLING AND TESTING	DEPTH (m)	PROFILE	MATERIAL DESCRIPTION
NXC	SPT	43	N/A			14	Q20	Stiff, dry, dark brown, 2-8mm gravelly silty CLAY(CL). Topsoil with roots.
						0.80		Medium dense, moist reddish brown 40% 6-200mm GRAVEL and COBBLES(GW) in a silty CLAY(CL) matrix.
						1		Firm, moist, yellowish orange, mottled red and brown, 6-12mm gravelly silty CLAY(CL). Colluvium.
	SPT	36	N/A			30		
						1.80		Stiff, moist, light yellow mottled red streaked black, fissured clayey SILT(ML) with up to 30% hard rock, light brownish grey gravel and boulder sized corestones. Decomposed ANDESITE VENTERSDORP LAVA.
						2		
						3		
		39	0			3.60		
				51		4		Hard rock, light brownish grey, fractured, fine grained weathered ANDESITE VENTERSDORP LAVA with occasional soft rock light yellowish brown zones, and with 4-5cm silty CLAY (CL) on joints.
		90	0			5		
TNW		100	0			5.25		Poor core recovery. Hard rock, light brownish grey, shattered and fractured, highly weathered and decomposed ANDESITE VENTERSDORP LAVA with up to 60% stiff, light yellow, clayey SILT(ML)
		90	0	60		6		
		39	0	60		6.50		
		100	0			7		Hard rock, light greyish brown, stained brown on joints, fractured, fine grained, weathered ANDESITE VENTERSDORP LAVA with 3-4cm silty CLAY(CL) on joints.
		100	0			7.95		
		100	0	26		8		Very hard rock, light grey, stained brown on joints, fractured becoming jointed at depth, fine grained, slightly weathered ANDESITE VENTERSDORP LAVA.
		81	12			8.50		

FRACTURE SPACING (mm)



Fracture frequency or No of joints per metre

RQD ROCK QUALITY (%)

Core lengths 100 mm and longer
100 X Length of run

EXPLANATION

- Ground level
- Standard penetration test
- Water table
- End of drilling

- Indicator or disturbed soil sample
- Core sample
- Approx. material change
- Unconformable material change

LABORATORY TEST RESULTS

SITE Proposed Bushkoppie Sewage Works Site

BAG N°						
BOREHOLE N°	30	30	32	32	33	33
DEPTH	2,0	4,0	1,8	2,8-3,3	2,1	2,7
DESCRIPTION OF MATERIAL	Silty CLAY(CH) Colluvium	Clayey SILT(MH) Dec. andesite	Silty CLAY(CL) Colluvium	Silty CLAY (CH) Dec. andesite	Clayey FER-RUGINOUS GRAVEL (GC) Colluvium	Silty CLAY (CL) Dec. andesite

SIEVE ANALYSIS (% PASSING)

MAXIMUM SIZE (mm)						
53 mm						
37,5 mm					100	
26,5 mm					74	
19,0 mm			100		67	
13,2 mm	100		99		66	
4,75 mm	94		96	100	63	100
2,0 mm	85	100	86	96	55	95
0,425 mm	82	99	79	93	45	79
0,075 mm	71	97	67	87	34	73
0,002 mm	40	29	35	48	18	28

SOIL CONSTANTS AND PROPERTIES

LIQUID LIMIT	51	61	49	56	51	45
PLASTICITY INDEX	30	28	25	30	27	21
LINEAR SHRINKAGE (%)	12,0	12,0	11,5	15,0	12,0	10,0
EXPANSIVENESS	High	High	Medium	High	Medium	Medium
NATURAL DENSITY						
NATURAL MOIST. CONTENT (%)				40,3		
PARTICLE REL. DENSITY (kg/m ³)						
DRY DENSITY (kg/m ³)				1433		
pH						
SULPHATES						