



TENDER REFERENCE: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

VOLUME 1

A Tender for category 9CE CIDB registered contractors

ISSUED BY:	PREPARED BY:
The Divisional Head Supply Chain Management 320 Madiba Street, Pretoria PO Box 440 Pretoria 0001 Tel: (012) 358 8100	Group Head Human Settlements Department 320 Madiba Street, Pretoria PO Box 440 Pretoria 0001 Contact: Ms Semakaleng Dlavani Tel: (012) 358 5775 Email: SemakalengD@tshwane.gov.za

Registered Name of Tenderer:	
Trading Name of Tenderer:	
Registration No. of Entity:	
Postal address of Tenderer:	
Contact Person:	CoT Vendor No:
Tel. No.:	E-mail Address:
Cell No.:	Fax No:
CIDB CRS Number(s) :	

CONTENTS

DESCRIPTION		COLOUR
PORTION 1: TENDER		
PART T1	TENDERING PROCEDURES	
	T1.1 TENDER NOTICE AND INVITATION TO TENDER	White
	T1.2 TENDER DATA	Pink
	T1.3 STANDARD CONDITIONS OF TENDER	Pink
PART T2	RETURNABLE DOCUMENTS	Yellow
PORTION 2: CONTRACT		
PART C1	AGREEMENTS AND CONTRACT DATA	
	C1.1 FORM OF OFFER AND ACCEPTANCE	Yellow
	C1.2 CONTRACT DATA	Yellow
	C1.3 FORM OF GUARANTEE	White
	C1.4 HEALTH AND SAFETY AGREEMENT	White
	C1.5 ADJUDICATOR’S AGREEMENT	White
PART C2	PRICING DATA	
	C2.1 PRICE INSTRUCTIONS	Yellow
	C2.2 PRICE SCHEDULE	Yellow
PART C3	SCOPE OF WORK	
	C3.1 DESCRIPTION OF THE WORKS	Blue
	C3.2 ENGINEERING	Blue
	C3.3 PROCUREMENT	Blue
	C3.4 CONSTRUCTION	Blue
	C3.5 MANAGEMENT	Blue
	C3.6 SPECIFICATION AND VARIATIONS	Blue
	C3.7 CORRECTIONS & AMENDMENT TO STANDARD SPECIFICATION	Blue
	C3.9 HEALTH & SAFETY SPECIFICATION	Blue
PART C4	SITE INFORMATION	
	C4.1 SITE INFORMATION	Green
	C4.2 LIST OF DRAWINGS	Green

T1.1 TENDER NOTICE AND INVITATION TO TENDER

HS 04-2025/26
CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT



TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION FOR A PERIOD OF 36 MONTHS.

Tenders are hereby invited for the above tender.

Tenderers should have a CIDB contractor grading designation of **9CE**.

The tender documents will be available on the City of Tshwane and national treasury official website (www.tshwane.gov.za) or www.etenders.gov.za

Tenders will be evaluated on the basis of awarding points for the **90/10 Preference** Point System will be applied to this tender.

A **COMPULSORY CLARIFICATION MEETING** with a representative of the Employer will take place in Pretoria West, Andeon AH, Corner Hornsnek Road and Kenneth Street GPS coordinates: -25.705136,28.089546 on **20th January 2026 at 10h00.**

The lowest or any tender will not necessarily be accepted, and the Municipality reserves the right to accept any tender as a whole or in part or no tender.

Tenders must remain valid for a period of **90 days** after the closing date for the submission of tenders, during which period a tender may not be amended or withdrawn and may be accepted at any time by the Municipality.

The closing time for receipt of tenders is **10h00 on 25th February 2026**. Tenders will be received on the closing date and time shown, must be enclosed in sealed envelopes bearing the applicable tender heading and reference number, as well as the closing time and due date, and must be addressed to the Divisional Head, SUPPLY CHAIN MANAGEMENT, PRETORIA, 0001 and must be submitted in the tender box situated at **Tshwane House, 320 Madiba street, Pretoria**. Tenders will be opened at the latter address at the time indicated.

TECHNICAL ENQUIRIES:	Employer:	Ms Semakaleng Dlavani
	Tel (Office):	(012) 358 5775
	E-Mail:	SemakalengD@tshwane.gov.za

SUPPLY CHAIN EQUIRIES:	Employer:	Maureen Radingoana
	Telephone:	(012) 358 6153
	E-mail:	Maureenr@tshwane.gov.za

PORTION 1: TENDER

PART T1: TENDER PROCEDURES

TABLE OF CONTENTS

T1.1	TENDER DATA.....	3
T1.2	STANDARD CONDITIONS OF TENDER.....	27

T1.1 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in **Annexure C of Standard for Uniformity in Engineering and Construction Works Contracts (Board Notice 423 Government Gazette No 42622 of 8 August 2019)**, bound into Section T1.2

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

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

CLAUSE NUMBER		TENDER DATA
C.1.1	Actions	The Employer is City of Tshwane Metropolitan Municipality
C.1.2	Tender Documents	<u>Volume 1: Tender Document</u> THE TENDER Part T1: Tendering Procedures T1.1 – Tender data T1.2 – Standard Conditions of Tender Part T2: Returnable documents T2.1 – List of returnable documents T2.2 – Returnable schedules THE CONTRACT Part C1: Agreements and contract data C1.1 – Form of offer and acceptance C1.2 – Contract data C1.3 – Form of guarantee C1.4 – Guarantee or Cash deposit C1.5 – Health and safety agreement C1.6 – Adjudicators contract Part C2: Pricing data C2.1 Pricing assumptions C2.2 Pricing schedule Part C3: Scope of work C3 – Scope of work Part C4: Site information C4 – Site information <u>Volume 2: Tender Drawings</u>
C.1.3	Interpretation	Add the following new clause:
C.1.34		<i>The tender documents have been drafted in English. The contract arising from the invitation to tender shall be interpreted and construed in English</i>
C.1.4	Communication and Employer's Agent	Agent: DPT Civil and Structural JV Address: 285 Braam Pretorius Sinoville Corner Pretoria Tel: 012 567 7831 Contact person: Mr. Lehlohonolo Makhoali

CLAUSE NUMBER	TENDER DATA																
	E-Mail: lehlohonolom@ditshimega.co.za																
	CHS Agent: TMA Consulting Engineers CC Address: 10 Bowkeria Street Brackendowns 1448 Tel: 082 814 8953 E-Mail: tmabokatshaba@gmail.com																
C.2.1 Eligibility	Only those tenderers who are registered with the CIDB or are capable of being so prior to the evaluation of submissions, in a contract grading designation equal to a contractor grading designation determined in accordance with the sum tendered for a 9CE class of construction work, are eligible to submit tenders. All the following mandatory requirements must be complied with, or the tender will be regarded as non-responsive and not be considered further, mandatory requirements as follows: <table border="1"> <tr> <td colspan="2">1) Tendering Firm</td></tr> <tr> <td>Mandatory criteria</td><td>Supporting evidence</td></tr> <tr> <td>CIDB Grading of 9CE</td><td>Valid CIDB grading certificate</td></tr> <tr> <td>Tendering Firm's experience of successfully completing <u>at least one reinforced concrete water retaining structure</u> project, with a <u>minimum size of 10ML</u></td><td>Appointment letter and approved Completion Certificate</td></tr> <tr> <td>Tendering Firm's experience of successfully completing <u>at least one bulk water pipeline</u> project, with a <u>minimum value of R20 million</u> or more</td><td>Appointment letter and approved Completion Certificate</td></tr> <tr> <td colspan="2">2) Key Personnel</td></tr> <tr> <td>Mandatory criteria</td><td>Supporting evidence</td></tr> <tr> <td> Contracts Manager - Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA) and registered as a professional with: (i) Engineering Council Of South Africa (ECSA) as Engineer or Technologist; OR (ii) South African Council for the Project and Construction Management Professions (SACPCMP) as Construction Project Manager or Construction Manager and a minimum experience of 5 years post registration. Experience: 5 years and above post registration on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation. </td><td>Certified copy of qualification, ECSA registration or SACPCMP registration and detailed CV indicating years of experience are compulsory</td></tr> </table>	1) Tendering Firm		Mandatory criteria	Supporting evidence	CIDB Grading of 9CE	Valid CIDB grading certificate	Tendering Firm's experience of successfully completing <u>at least one reinforced concrete water retaining structure</u> project, with a <u>minimum size of 10ML</u>	Appointment letter and approved Completion Certificate	Tendering Firm's experience of successfully completing <u>at least one bulk water pipeline</u> project, with a <u>minimum value of R20 million</u> or more	Appointment letter and approved Completion Certificate	2) Key Personnel		Mandatory criteria	Supporting evidence	Contracts Manager - Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA) and registered as a professional with: (i) Engineering Council Of South Africa (ECSA) as Engineer or Technologist; OR (ii) South African Council for the Project and Construction Management Professions (SACPCMP) as Construction Project Manager or Construction Manager and a minimum experience of 5 years post registration. Experience: 5 years and above post registration on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification, ECSA registration or SACPCMP registration and detailed CV indicating years of experience are compulsory
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	Site Agent Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
	Assistant Site Agent Qualification: National Diploma in Civil Engineering (NQF level 6) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
	Foreman 1 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering works recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced concrete works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
	Foreman 2 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering infrastructure works recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
	Construction Health and Safety Officer - Qualification: Minimum NQF level 5 qualification in health and safety management or equivalent. - Professional Registration: South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Officer (CHSO). Experience: 3 years and above on civil engineering infrastructure works.	Certified copy of qualification, SACPCMP registration and detailed CV indicating years of experience are compulsory.
Joint Ventures are eligible to submit tenders provided that: - every member of a joint venture is registered with the CIDB not later than 21 working days from the closing date for tenderers; - the lead partner has a contractor grading designation in the 9CE class of construction work; and - The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor designation in accordance with the sum tendered for a 9CE class of construction work or a value determined in accordance with		

CLAUSE NUMBER		TENDER DATA
		Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations.
C.2.2	Cost of Tendering	The employer will not compensate the tenderer for any costs incurred in attending interviews or making any submissions in the office of the employer.
C.2.5	Reference Documents	Add the following: Unless specified otherwise in this document, the following standards and conditions of contract will be applicable under this Contract: - The document <i>“Standard Specifications for Municipal Civil Engineering Works”, Third Edition, 2005</i> issued by the Divisional Head: Roads and Stormwater of the City of Tshwane. The drawings <i>“Roads and transport department: Standard construction details and design standards for roads and stormwater drainage infrastructure, 2023”</i> issued by the Divisional Head: Roads and Stormwater of the City of Tshwane. This document is obtainable free of charge on the website www.tshwane.gov.za. - The latest print version as current at 30 days before close of tenders of the document <i>“General Conditions of Contract for Construction Works 3rd Edition, 2015”</i> including corrections thereto as current at 30 days before close of tenders, as published by the <i>South African Institution of Civil Engineering</i>. The document may be purchased in hard copy from the <i>South African Institution of Civil Engineering</i> or may be purchased online as an electronic reference document in PDF format by following the relevant links on www.saice.org.za. The corrections may be downloaded from the SAICE website www.saice.org.za.
C.2.7	Clarification meeting	The arrangements for a compulsory briefing meeting are as stated in the tender notice and invitation to tender Confirmation of attendance will be recorded on site in the attendance register to be signed by all tenderers. Addenda will be issued to and tenders received from those tendering entities appearing on the attendance register. Tender documents will not be made available at the clarification meeting.
C.2.8	Seek clarification	Replace the clause with the following: <i>Request clarification of the tender documents, if necessary, by notifying the employer at least 7 (seven) working days before the closing time stated in the tender data.</i> The document is downloadable on the National Treasury website (www.etenders.gov.za) and City of Tshwane website (www.tshwane.gov.za)
C.2.9	Insurance	Add the following to the clause <i>Accept that the submission of a tender shall be construed as an acknowledgement by the tenderer that he is satisfied with, where applicable, the insurance cover the Employer will affect under the contract.</i>
C.2.12	Alternative offers	Alternative tender offers will not be considered.
C.2.13	Submitting a tender offer	The tender offer shall be completed in non-erasable black ink Any entry made by the tenderer in the document which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and

CLAUSE NUMBER	TENDER DATA
	the correct entry shall be written above in non-erasable black ink and the full signature of the tenderer shall be placed next to the correction.
C.2.13.2	Replace the contents of the clause with the following: <i>Return all volumes of the tender document to the Employer after completion of the relevant sections of each volume in their entirety, either electronically (if they were issued in electronic format) or by writing in black ink.</i> <i>All volumes are to be left intact in original format and no pages shall be removed or re-arranged</i>
C.2.13.3	Parts of each tender offer communicated on paper shall be submitted as an original, plus a scanned copy in PDF format on a Universal Serial Bus (USB) flash drive. In addition to the hard copy submission, each tenderer is required to submit a soft copy of the <u>fully completed and signed</u> tender submission document. This is to be on a USB Flash Drive attached to the original tender submission documents, adequately identifiable as belonging to the tenderer, in a PDF format scanned at 400 DPI, and in full colour.

CLAUSE NUMBER	TENDER DATA
C.2.13.4	Add the following to the clause <i>Only authorised signatories may sign the original and all copies of the tender offer where required.</i> <i>In the case of a ONE-PERSON CONCERN submitting a tender, this shall be clearly stated.</i> <i>In the case of a COMPANY submitting a tender, include a copy of a <u>resolution by its board of directors</u> authorising a director or other official of the company to sign the documents on behalf of the company.</i> <i>In the case of a CLOSE CORPORATION submitting a tender, include a copy of a <u>resolution by its members</u> authorising a member or other official of the corporation to sign the documents on each member's behalf.</i> <i>In the case of a PARTNERSHIP submitting a tender, <u>all the partners</u> shall sign the documents, unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case <u>proof of such authorisation</u> shall be included in the Tender.</i> <i>In the case of a JOINT VENTURE/CONSORTIUM submitting a tender, include <u>a resolution of each company</u> of the joint venture together with a <u>resolution by its members</u> authorising a member of the joint venture to sign the documents on behalf of the joint venture.</i> <u>Accept that failure to submit proof of authorisation to sign the tender shall result in the tender offer being regarded as non-responsive.</u>
C.2.13.5	The identification details are: Tender/Reference HS 04- 2025/26 Tender Description: TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION FOR A PERIOD OF 36 MONTHS. Closing Time: 10:00 am Closing Date: 25 February 2026 Each tender shall be enclosed in a sealed envelope, bearing the correct identification details and shall be submitted (HAND DELIVERED) at:

CLAUSE NUMBER	TENDER DATA
	PROCUREMENT ADVICE CENTRE (TENDER BOX AT THE ENTRANCE OF TSHWANE HOUSE) TSHWANE HOUSE 320 MADIBA STREET PRETORIA CBD 0001 This address is 24 hours available for delivery of tender offers. Please ensure that all required compliance documents are included upon submission as no additional documents will be requested from bidders after closing.
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed offers will <u>not</u> be accepted
C.2.13.10	Add the following sub- clause C.2.13.10: <i>Accept that all conditions, which are printed or written upon any stationery used by the Tenderer for the purpose of or in connection with the submission of a tender offer for this Contract, which are in conflict with the conditions laid down in this document shall be waived, renounced and abandoned.</i>
C.2.14 Information and data to be completed in all respects	Add the following to the clause: <i>The Tenderer is required to enter information in the following sections of the document:</i> <i>Section T2.2 : Returnable Schedules</i> <i>Section C1.1 : Form of Offer and Acceptance</i> <i>Section C1.2 : Contract Data (Part 2)</i> <i>Section C2.2 : Pricing Schedule</i> <i>The above sections shall be signed by the Tenderer (and witnesses where required). Individual pages should only be initialled by the successful Tenderer and by the witnesses after acceptance by the Employer of the Tender Offer.</i> <i>The Tenderer shall complete and sign the Form of Offer prior to the submission of a Tender Offer.</i> <i>The Schedule of Deviations (if applicable) shall be signed by the successful Tenderer after acceptance by the Employer of the Tender Offer.</i> <i>Accept that failure on the part of the Tenderer to submit any one of the Returnable Documents listed in Part T2 – Returnable Documents within the period stipulated, shall be just cause for the Employer to consider the tender offer as being regarded as non-responsive.</i> <i>Accept that the Employer shall in the evaluation of tender offers take due account of the Tenderer's past performance in the execution of similar engineering works of comparable magnitude, and the degree to which he possesses the necessary technical, financial and other resources to enable him to complete the Works successfully within the contract period. Satisfy the Employer and the Engineer as to his ability to perform and complete the Works timeously, safely and with satisfactory quality, and furnish details in Part T2 – Returnable Documents.</i>

CLAUSE NUMBER	TENDER DATA
	<i>Accept that the Employer is restricted in accordance with clause 5 (1) of the Construction Regulations, 2014, to only appoint a contractor whom he is satisfied has the necessary competencies and resources to carry out the work safely. Accept that submitting inferior and inadequate information relating to health and safety (as required in clause 2.23) shall be regarded as justifiable and compelling reasons not to accept the Tender Offer of the Tenderer scoring the highest number of tender evaluation points.</i>
C.2.15 Closing time	The closing time for submission of tender offers is stated in the tender notice and invitation to tender.
C.2.16 Tender offer validity C.2.16.5	The tender offer validity period is 90 days. CoT shall have right and power to extend any tender validity period beyond any initial validity period set and subsequent extensions. SCM shall ensure that an extension of validity is requested in writing from all bidders before the validity expiry date. Extension of validity shall be finalised while the quotations/bids are still valid. Add the following new clause <i>If the tender validity period expires on a Saturday, Sunday or public holiday, the tender offer shall remain valid and open for acceptance until closure of business on the following working day.</i>
C.2.16.6	Add the following new clause: <i>Accept that should the Tenderer unilaterally withdraw his tender during the tender validity period, the Employer shall, without prejudice to any other rights he may have, be entitled to accept any less favourable tender for the Works from those received, or to call for fresh tenders, or to otherwise arrange for execution of the Works, and the Tenderer shall pay on demand any additional expense incurred by the Employer on account of the adoption of the said courses, as well as either the difference in cost between the tender withdrawn (as corrected in terms of clause 3.9 of the Conditions of Tender) and any less favourable tender accepted by the Employer, or the difference between the tender withdrawn (as corrected) and the cost of execution of the Works by the Employer as well as any other amounts the Employer may have to pay to have the Works completed</i>
C.2.17 Clarification of Tender Offer after Submission	Replace the contents of the clause with the following clause: <i>“Provide clarification of a Tender Offer in response to a request to do so from the Employer during the evaluation of Tender Offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors resulting from the product of the unit rate and the quantity by the adjustment of certain line-item totals. No change in the unit rate or prices or substance of the Tender Offer is sought, offered, or permitted.”</i>
C.2.19 Inspections, tests and analysis	Add the following at the end of the clause: <i>....or upon written request.</i>
C.2.20 Submit securities, bonds, policies, etc.	The tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the performance bond to the format included in Section C1.3 of Part C1 Agreements and Contract Data of this document.
C.2.23 Certificates	Refer to Part T2 of this procurement document for a list of the documents that are to be returned with the tender.
C.2.24	Add the following new clause <i>The Tenderer, undertakes to:</i>

CLAUSE NUMBER	TENDER DATA
<i>Conditions Associated with the Granting of Preferences</i>	a) <i>engage one or more Targeted Enterprises / Targeted Labour in accordance with the provisions of the SANS 1914 as varied in the Procurement Section of the Scope of Works;</i> b) <i>deliver to the Employer, within 5 working days of being requested in writing to do so, a Targeted Enterprise Declaration Affidavit in respect of all Targeted Enterprises engaged at prime contract level to satisfy Contract Participation Goal requirements;</i> c) <i>accept the sanctions set out in the Scope of Works should such conditions be breached.</i>
C.2.25 <i>Canvassing and obtaining of additional information by tenderers</i>	Add the following new clause <i>The Tenderer shall not 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.</i> <i>The Tenderer shall not make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.</i>
C.2.26 <i>Prohibitions on awards to persons in service of the state</i>	Add the following new clause <i>The Employer is prohibited to award a tender to a person -</i> a) <i>who is in the service of the state; or</i> b) <i>if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or</i> c) <i>a person who is an advisor or consultant contracted with the municipality or municipal entity.</i> <i>In the service of the state means to be -</i> a) <i>a member of:-</i> • <i>any municipal council;</i> • <i>any provincial legislature; or</i> • <i>the National Assembly or the National Council of Provinces;</i> b) <i>a member of the board of directors of any municipal entity;</i> c) <i>an official of any municipality or municipal entity;</i> d) <i>an employee of any national or provincial department;</i> e) <i>provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);</i> f) <i>a member of the accounting authority of any national or provincial public entity; or</i> g) <i>an employee of Parliament or a provincial legislature.</i> <i>In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.</i>
C.2.27 <i>Awards to close family members of persons in the service of the state</i>	Add the following new clause <i>Accept that the notes to the Employer's annual financial statements must disclose particulars of any award of more than R2000 to a person who is a spouse, child or parent of a person in the service of the state (defined in clause F2.25), or has been in the service of the state in the previous twelve months, including -</i> a) <i>the name of that person;</i> b) <i>the capacity in which that person is in the service of the state; and</i> c) <i>the amount of the award.</i>

CLAUSE NUMBER		TENDER DATA
		In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in Part T2 of this procurement document must be completed.
C.2.28	Vendor registration	Add the following new clause <i>The contractor will required registering as a supplier/ service provider on the City of Tshwane's vendor register before any payment can be done.</i> <i>If the tenderer is already registered as a vendor, it is required to record the vendor number in space provided on the cover page of this Tender document.</i> <i>Vendor registration documents are available from the Procurement Advice Centre or can be downloaded from http://www.tshwane.gov.za/procurement.cfm</i> <i>All parties of a joint venture or consortium submitting a tender shall comply with the requirements of this clause.</i>
C.2.29	Tax	Add the following new clause National Treasury SCM Instruction no. 7 of 2017/18 clause 4 application during SCM Processes state that: <i>The designated official(s) must verify the tenderer's tax compliance status prior to the finalisation of the award of the tender or price quotation.</i> <i>Where the recommended tenderer is not tax compliant, the tenderer should be notified of their non- compliant status and the tenderer must be requested to submit to the municipality or municipal entity, within 7 working days, written proof from South African Revenue Services of their tax compliance status or proof from SARS that they have made an arrangement to meet their outstanding tax obligations. The proof of tax compliance status submitted by the tenderer to the municipality or municipal entity must be verified via the Central Supplier Database or eFiling</i> <i>Accept that the tenderer will be rejected if such tenderer fails to provide proof of tax compliance status in terms of clause 4.2 of National Treasury SCM Instruction no. 7 of 2017/18</i>
C.3.1	Respond to requests from the tenderer	
C.3.1.1		The employer will respond to requests for clarification up to 7 (seven) working days before the tender closing time.
C.3.4	Opening of tender submissions	Tenders will be opened immediately after the closing time for tenders. Bidders are also requested to refer to the City's website were there closing register will be published. Only the tenderer's name will be announced
C.3.11	Evaluation of tender offers	All tenderers who submitted responsive tenders will be evaluated
C.3.11.1	General	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

CLAUSE NUMBER	TENDER DATA																	
	stated in C.3.11.2, C.3.11.3 and C3.11.4 below supported by proof/ documentation stated in the conditions of this tender. STAGES OF EVALUATION The following stages of evaluation will be applicable for this tender Stage 1: Administrative Compliance Stage 2: Mandatory Requirements Stage 3: Functionality Criteria Stage 4: Preference Points System 90/10																	
C.3.11.2 Method of Evaluation	The following tender will be evaluated in four (4) Stages namely: STAGE 1: ADMINISTRATIVE COMPLIANCE <table><tr><th>Compulsory Returnable Documentation (Submission of these are compulsory)</th><th>Submitted (YES or NO)</th><th>Checklist (Guide for Bidder and the Bid Evaluation Committee)</th></tr><tr><td>a) To enable The City to verify the bidder’s tax compliance status, the bidder must provide; • Tax compliance status PIN. - or • Central Supplier Database (CSD) </td><td></td><td>Tax status must be compliant before the award.</td></tr><tr><td>b) A copy of their Central Supplier Database (CSD) registration; or indicate their Master Registration Number / CSD Number;</td><td></td><td>CSD must be valid.</td></tr><tr><td>c) Confirmation that the bidding company’s rates and taxes are up to date: Original or copy of Municipal Account Statement of the Bidder (bidding company) not older than 3 months and account must not be in arrears for more than ninety (90) days; or ,signed lease agreement or In case of bidders located in informal settlement, rural areas or areas where they are not required to pay Rates and Taxes a letter from the local councillor confirming they are operating in that area</td><td></td><td>Was a Municipal Account Statement, or signed lease agreement or letter from the local councillor provided for the bidding company? The name and / or addresses of the bidder’s statement correspond with CIPC document, Address on CSD or Company profile? Are municipal service charges, rates and taxes up to date (i.e. not in arrears for more than 90 days)?</td></tr><tr><td>d) In addition to the above, confirmation that all the bidding company’s owners / members / directors / major shareholders rates and taxes are up to date: • Original or copy of Municipal Account Statement of all the South African based owners / members / directors / major shareholders not older than 3 months and the account/s</td><td></td><td>Was a Municipal Account Statement, or signed lease agreement or letter from the local councillor provided for the company’s owners / members / directors / major shareholders? Are municipal service charges,</td></tr></table>			Compulsory Returnable Documentation (Submission of these are compulsory)	Submitted (YES or NO)	Checklist (Guide for Bidder and the Bid Evaluation Committee)	a) To enable The City to verify the bidder’s tax compliance status, the bidder must provide; • Tax compliance status PIN. - or • Central Supplier Database (CSD)		Tax status must be compliant before the award.	b) A copy of their Central Supplier Database (CSD) registration; or indicate their Master Registration Number / CSD Number;		CSD must be valid.	c) Confirmation that the bidding company’s rates and taxes are up to date: Original or copy of Municipal Account Statement of the Bidder (bidding company) not older than 3 months and account must not be in arrears for more than ninety (90) days; or ,signed lease agreement or In case of bidders located in informal settlement, rural areas or areas where they are not required to pay Rates and Taxes a letter from the local councillor confirming they are operating in that area		Was a Municipal Account Statement, or signed lease agreement or letter from the local councillor provided for the bidding company? The name and / or addresses of the bidder’s statement correspond with CIPC document, Address on CSD or Company profile? Are municipal service charges, rates and taxes up to date (i.e. not in arrears for more than 90 days)?	d) In addition to the above, confirmation that all the bidding company’s owners / members / directors / major shareholders rates and taxes are up to date: • Original or copy of Municipal Account Statement of all the South African based owners / members / directors / major shareholders not older than 3 months and the account/s		Was a Municipal Account Statement, or signed lease agreement or letter from the local councillor provided for the company’s owners / members / directors / major shareholders? Are municipal service charges,
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CLAUSE NUMBER	TENDER DATA		
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	e) Duly Signed and completed MBD forms (MBD 1, 4, 5, 8 and 9) The person signing the bid documentation must be authorized to sign on behalf of the bidder. Where the signatory is not a Director / Member / Owner / Shareholder of the company, an official letter of authorization or delegation of authority should be submitted with the bid document. NB: Bidders must ensure that the directors, trustees, managers, principal shareholders, or stakeholders of this company, declare any interest in any other related companies or business, whether or not they are bidding for this contract. <u>See Question 3.14 of MBD 4. Failure to declare interest will result in a disqualification</u>		All documents fully completed (i.e. no blank spaces)? All documents fully signed by (any director / member / trustee as indicated on the CIPC document, alternatively a delegation of authority would be required? Documents completed in black ink (i.e. no "Tippex" corrections, no pencil, no other colour ink, or non-submission of the MBD forms , will be considered)?
	f) Audited Financial Statements for the most recent three (3) years or Audited Financial Statements from date of existence for companies less than three years old. NB: The bidder must submit signed audited annual financial statements for the most recent three years, or if established for a shorter period, submit audited annual financial statements from date of establishment. If the bidder is not required by law to prepare signed annual financial statements for auditing purposes, then the bidder must submit proof that the bidder is not required by law to prepare audited financial statements.		Applicable for tenders above R10m in conjunction with (MBD 5) Are Audited financial statements provided (Audited financials must be signed by auditor) Or proof that the bidder is not required by law to prepare audited financial statements.
	g) Joint Ventures (JV) – (Only applicable when the bidder tenders as a joint venture) Where the bidder bids as a joint venture (JV), the required or relevant documents as per (a) to (f)		If applicable. JV agreement provided? JV agreement complete and relevant? Agreement signed by all parties? All required

CLAUSE NUMBER	TENDER DATA		
	above must be provided for all JV parties. In addition to the above the bidder must submit a Joint Venture (JV) agreement signed by the relevant parties. NB: It is a condition of this bid that the successful bidder will continue with the same Joint Venture (JV) for the duration of the contract unless prior approval is obtained from the City.		documents as per (i.e. a to f) must be provided for all partners of the JV.
	h) Bidder attended a compulsory briefing session where applicable		A compulsory briefing register must be signed by the bidder. Bidders will be disqualified should they fail to attend compulsory briefing session
	i) Pricing schedule (All items must be quoted for in pricing schedule and if not, all items are quoted the bidder will be disqualified). Unless the tender is awarded per item or per section where the bidder only quoted the items or sections, they are interested in.		Incomplete pricing schedule results in totals being incomparable. Bidder must be disqualified. Bidder will be disqualified should they make corrections on the price schedule without attaching a signature or initialising thereto. Bidder will be disqualified should they use tippex/ correction ink, on the price schedule.
STAGE 2: MANDATORY REQUIREMENTS			
It is expected that the bidder will deploy experienced key personnel that have in the past tenant installation/fit-out works, and this team should possess the relevant skills adequate for performing the tasks set out in this specification document.			
The following information must be provided:			
1) Tendering Firm			
Mandatory criteria		Supporting evidence	
CIDB Grading of 9CE		Valid CIDB grading certificate	
Tendering Firm's experience of successfully completing <u>at least one reinforced concrete water retaining structure</u> project, with a <u>minimum size of 10ML</u>		Appointment letter and approved Completion Certificate	
Tendering Firm's experience of successfully completing <u>at least one bulk water pipeline</u> project, with a <u>minimum value of R20 million</u> or more.		Appointment letter and approved Completion Certificate	

2) Key Personnel	
Mandatory criteria	Supporting evidence
Contracts Manager - Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA) and registered as a professional with: (iii) Engineering Council Of South Africa (ECSA) as Engineer or Technologist; OR (iv) South African Council for the Project and Construction Management Professions (SACPCMP) as Construction Project Manager or Construction Manager and a minimum experience of 5 years post registration. Experience: 5 years and above post registration on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification, ECSA registration or SACPCMP registration and detailed CV indicating years of experience are compulsory
Site Agent Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Assistant Site Agent Qualification: National Diploma in Civil Engineering (NQF level 6) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Foreman 1 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering works recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced concrete works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Foreman 2 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering infrastructure works recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.

CLAUSE NUMBER	TENDER DATA																				
	Construction Health and Safety Officer - Qualification: Minimum NQF level 5 qualification in health and safety management or equivalent. - Professional Registration: South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Officer (CHSO). Experience: 3 years and above on civil engineering infrastructure works. Certified copy of qualification, valid SACPCMP registration and detailed CV indicating years of experience are compulsory																				
	STAGE 3: FUNCTIONALITY CRITERIA Only tenderers who obtain a minimum of 70 points in respect of the following criteria will be considered for the next stage of evaluation. Bidders that do not achieve a minimum 70 points out of 100 points will not be evaluated further. <table border="1"> <thead> <tr> <th colspan="2">Functionality and Quality Criteria – Tender Rating Matrix</th><th>A Tenderer rating (Score 0-5)</th><th>B Weighting</th><th>C Maximum score to be achieved</th><th>C Tenderer Score =(A x B)</th></tr> </thead> <tbody> <tr> <td rowspan="3">FORM RD.D.3 Reinforced Concrete Water Retaining Structure Company work experience as per</td><td>Tendering Firm's experience of successfully completing a reinforced concrete water retaining structure project, with a minimum size of 10ML or higher. (attach appointment letters and completion certificates as proof). Failure to submit, will result in zero score allocated <u>Maximum of 1 project to be evaluated.</u></td><td></td><td rowspan="3">4</td><td rowspan="3">20</td><td rowspan="3"></td></tr> <tr> <td>Successfully completed one 25ML or higher reinforced concrete water retaining structure.</td><td>5</td></tr> <tr> <td>Successfully completed Above 15ML up to 25ML reinforced concrete water retaining structure.</td><td>4</td></tr> </tbody> </table>					Functionality and Quality Criteria – Tender Rating Matrix		A Tenderer rating (Score 0-5)	B Weighting	C Maximum score to be achieved	C Tenderer Score =(A x B)	FORM RD.D.3 Reinforced Concrete Water Retaining Structure Company work experience as per	Tendering Firm's experience of successfully completing a reinforced concrete water retaining structure project, with a minimum size of 10ML or higher. (attach appointment letters and completion certificates as proof). Failure to submit, will result in zero score allocated <u>Maximum of 1 project to be evaluated.</u>		4	20		Successfully completed one 25ML or higher reinforced concrete water retaining structure.	5	Successfully completed Above 15ML up to 25ML reinforced concrete water retaining structure.	4
Functionality and Quality Criteria – Tender Rating Matrix		A Tenderer rating (Score 0-5)	B Weighting	C Maximum score to be achieved	C Tenderer Score =(A x B)																
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	Successfully completed one 25ML or higher reinforced concrete water retaining structure.	5																			
	Successfully completed Above 15ML up to 25ML reinforced concrete water retaining structure.	4																			

CLAUSE NUMBER	TENDER DATA					
		Successfully completed a 10ML to 15ML reinforced concrete water retaining structure.	3			
	Company work experience as per FORM RD.D.3 Bulk Water Pipeline	Tendering Firm's experience of successfully completing bulk water pipeline projects, with a minimum value of R20 million or more. (attach appointment letters and completion certificates as proof). Failure to submit, will result in zero score allocated. <u>Maximum of 5 projects to be evaluated.</u>		4	20	
		Successfully completed 5 or more similar projects with a minimum value of R20 million or more, for each completed project.	5			
		Successfully completed 3 to 4 similar projects with a minimum value of R20 million or more, for each completed project.	4			
		Successfully completed 1 to 2 similar projects with a minimum value of R20 million or more, for each completed project.	3			
	Company work experience as per FORM RD.D.3 Water Reticulation	Tendering Firm's experience of successfully completing water reticulation projects, with a minimum value of R10 million or more. (attach appointment letters and completion certificates as proof). Failure to submit, will result in zero score allocated <u>Maximum of 3 projects to be evaluated.</u> Successfully completed 3 or more similar projects with a minimum value of R10 million or more, for each completed project.	5	2		

CLAUSE NUMBER	TENDER DATA					
		Successfully completed 1 to 2 similar projects with a minimum value of R10 million or more, for each completed project.	4		10	
	Company work experience as per FORM RD.D.3 Sewer Reticulation	Tendering Firm's experience of successfully completing sewer reticulation projects, with a minimum value of R10 million or more. (attach appointment letters and completion certificates as proof). Failure to submit, will result in zero score allocated <u>Maximum of 3 projects to be evaluated.</u>				
		Successfully completed 3 or more similar projects with a minimum value of R10 million or more, for each completed project.	5			
		Successfully completed 1 to 2 similar with a minimum value of R10 million or more, for each completed project.	4	2	10	
		TOTAL SCORE FOR TENDERER EXPERIENCE			60	

CLAUSE NUMBER	TENDER DATA					
	Functionality Criteria – Tender Rating Matrix		A	B	C	D
			Tenderer rating (Score 0-5)	Weighting	Maximum score to be achieved	Tenderer Score =(A x B)
	Key Project Personnel as per Form RD.D.8 Contracts Manager	Contracts Manager Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA) and registered as a professional with: (i) Engineering Council Of South Africa (ECSA) as Engineer or Technologist; OR (ii) South African Council for the Project and Construction Management Professions (SACPCMP) as Construction Project Manager or Construction Manager and a minimum experience of 5 years post registration. Specific Experience: Attach a CV detailing experience in the position of Contracts Manager on reinforced concrete water retaining structures; bulk water, water and sewer reticulation projects.				
		More than 5 years experience	5	3	15	
		5 Years experience	4			

CLAUSE NUMBER	TENDER DATA				
	Key Project Personnel as per Form RD.D.8 Site Agent/Construction Manager	Site Agent Qualification: B-Tech in civil engineering (NQF level 7) recognized by South African Qualifications Authority (SAQA) or higher qualification in civil engineering, and a minimum experience of 5 years post qualification. Specific Experience: Attach a CV detailing experience in the position of Site Agent on reinforced concrete water retaining structures; bulk water, water and sewer reticulation projects.		1	5
		More than 5 years experience	5		
		5 Years experience	4		
	Key Project Personnel as per Form RD.D.8 Assistant Site Agent/Construction Manager	Assistant Site Agent/Construction Manager Qualifications: Minimum National Diploma in Civil Engineering (NQF level 6) recognized by South African Qualifications Authority (SAQA) or higher qualification in Civil Engineering, and a minimum of 3 years experience post qualification Specific Experience: Attach a CV detailing experience in the position of Site Agent on water and sewer reticulation projects		1	5
		More than 3 years experience	5		
		3 years experience	4		

CLAUSE NUMBER	TENDER DATA				
	Key Project Personnel as per Form RD.D.8 Foreman 1	Foreman 1 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering works recognized by South African Qualifications Authority (SAQA), and a minimum experience of 5 years post qualification. Specific Experience: Attach a CV detailing experience in the position of Foreman on reinforced concrete works.		1	5
		More than 5 Years experience	5		
		5 Years experience	4		
	Key Project Personnel as per Form RD.D.8 Foreman 2	Foreman 2 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering works recognized by South African Qualifications Authority (SAQA), and a minimum experience of 3 years post qualification. Specific Experience: Attach a CV detailing experience in the position of Foreman on water and sewer reticulation projects.		1	5
		More than 3 years experience	5		
		3 Years experience	4		

CLAUSE NUMBER	TENDER DATA					
	Key Project Personnel as per Form RD.D.8 Health and Safety Officer	Construction Health & Safety Officer (CHS) Qualification: Minimum NQF level 5 qualification in health and safety management or equivalent. Professional Registration: South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Officer (CHSO), and a minimum experience of 3 years post qualification. Specific Experience: Attach a CV detailing experience in the position of Construction Health & Safety Officer in civil engineering infrastructure projects.				
		More than 3 years experience	5			
		3 Years experience	4			
		TOTAL SCORE FOR KEY PERSONNEL			40	
	STAGE 4: PREFERENCE POINT SYSTEM The preferential point system used will be the 90/10 points system in terms of the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000) Regulations 2022. 90 points for price 10 points for specific goals 10 points for Specific Goals (service provider to submit the certified copy of the specific goals). Refer to Table 1 below:					

CLAUSE NUMBER	TENDER DATA		
	Specific goals	90/10 preference point system	Proof of specific goals to be submitted
	BB-BEE score of companies - Level 1 - Level 2 - Level 3 - Level 4 - Level 5 - Level 6 - Level 7 - Level 8 - Non-compliant	4 Points 3.5 Points 3 Points 2.5 Points 2 Points 1.5 Points 1 Point 0.5 Points 0 Points	Valid Certified copy of BBBEE certificate. Sworn Affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises or CIPC BBBEE certificate.
	EME and/ or QSE	1 Point	Valid Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises or CIPC BBBEE certificate
	At least 51% of Women-owned companies	1 Point	Certified copy of Identity Document/s and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)
	At least 51% owned companies by People with disability	1 Point	Medical Certificate with doctor's details (Practice Number, Physical Address, and contact numbers) and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)
	At least 51% owned companies by Youth	1 Point	Certified copy of Identity Document/s and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)
	Local Economic Participation - City of Tshwane - Gauteng - National	2 Points 1 Point 1 Point	Municipal Account statement/Lease agreement.

CLAUSE NUMBER	TENDER DATA
C.3.11.3 Functionality will be evaluated based on the tender's ability to prove with supporting documentation experience and capacity to implement a similar project	Method 2: Functionality In the case of functionality: 1) Score functionality, rejecting all tender offers that fail to achieve the minimum number of points for functionality as stated in the Tender Data. 2) No tender must be regarded as an acceptable tender if it fails to achieve the minimum qualifying score for functionality as indicated in the tender invitation. Tenders that have achieved the minimum qualification score for functionality must be evaluated further in terms of the preference points system prescribed in clauses C3.11.4.
C.3.11.4	The preferential point system used will be the 90/10 points system in terms of the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000) Regulations 2022 • 90 points for price • 10 points for specific goals A maximum of 90 points is allocated for price on the following basis: $Ps = 90(1 - \frac{Pt - Pmin}{Pmin})$ Where Ps = Points scored for price of tender under consideration; Pt = Price of tender under consideration; and Pmin = Price of lowest acceptable tender. • A maximum of 10 points may be awarded to a tenderer for the specific goal specified for the tender. • The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places. • Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.
C.3.11.6 Scoring Functionality and Quality	A minimum of 70 points out of 100 must be scored to move to the next evaluation level Points allocation Company experience – 60 points Key personnel experience – 40 points

C.3.13 Acceptance of Tender Offer	Tender offers will only be accepted if: - a.) the tenderer has complied in full with all the eligibility criteria; - b.) the tenderer is able to provide proof of tax compliance status in terms of clause 4.2 of National Treasury SCM Instruction no. 7 of 2017/18; - c.) the tenderer is not in arrears for more than 3 months with municipal rates and taxes and municipal service charges; - d.) the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; - e.) the tenderer has not: i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect. - f.) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract; - g.) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer. - h.) 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.
C 3.16 Registration of the award	Add the following to the clause: Notice of non-acceptance of the tender will not be sent to individual unsuccessful tenderers. Particulars of the accepted tender can be obtained from the Employer' Agent.
C 3.17 Provide Copies of Contract	One signed copy of the contract shall be provided by the Employer to the successful Tenderer.

T1.2 STANDARD CONDITIONS OF TENDER

TABLE OF CONTENTS

C.1	General.....	29
C.1.1	Actions	29
C.1.2	Tender Documents	29
C.1.3	Interpretation	29
C.1.4	Communication and Employer's agent	30
C.1.5	Cancellation and re-invitation of tenders	30
C.1.6	Procurement procedures.....	30
C.1.6.1	General	30
C.1.6.2	Competitive negotiation procedure	30
C.1.6.3	Proposal procedure using the two stage-system	31
C.2	Tenderer's obligations	31
C.2.1	Eligibility.....	31
C.2.2	Cost of tendering	31
C.2.3	Check documents.....	31
C.2.4	Confidentiality and copyright of documents	31
C.2.5	Reference documents.....	32
C.2.6	Acknowledge addenda	32
C.2.7	Clarification meeting	32
C.2.8	Seek clarification	32
C.2.9	Insurance.....	32
C.2.10	Pricing the tender offer	32
C.2.11	Alterations to documents.....	32
C.2.12	Alternative tender offers.....	32
C.2.13	Submitting a tender offer	33
C.2.14	Information and data to be completed in all respects	33
C.2.15	Closing time	33
C.2.16	Tender offer validity	34
C.2.17	Clarification of tender offer after submission	34
C.2.18	Provide other material	34
C.2.19	Inspections, test and analysis.....	34
C.2.20	Submit securities, bonds, policies, etc.	34
C.2.21	Check final draft.....	35
C.2.22	Return of other tender documents	35
C.2.23	Certificates	35
C.3	The employer's undertakings	35
C.3.1	Respond to requests from the tenderer	35
C.3.2	Issue addenda	35
C.3.3	Return late tender offers.....	35
C.3.4	Opening of tender submissions	35
C.3.5	Two-envelope system.....	36
C.3.6	Non-disclosure	36
C.3.7	Grounds for rejection and disqualification	36
C.3.8	Test for responsiveness	36
C.3.9	Arithmetical errors, omissions and discrepancies	37
C.3.10	Clarification of a tender offer	37
C.3.11	Evaluation of tender offers	37
C.3.11.1	General	38
C.3.12	Insurance provided by the employer	38
C.3.13	Acceptance of tender offer	38
C.3.14	Prepare contract documents.....	39
C.3.15	Complete adjudicator's contract.....	39
C.3.16	Notice to unsuccessful tenderers.....	39
C.3.17	Provide copies of the contracts.....	39

C.3.18	Provide written reasons for actions taken	40

C.1 General

C.1.1 Actions

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

C.1.1.2 The Employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the Employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict, and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) *A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.*

2) *Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.*

C.1.1.3 The Employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

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

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

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

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation which:

- i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
- ii) an individual or organisation is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
- iii) incompatibility or contradictory interests exist between an employee and the organisation which employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the Employer or his staff or agents in the tender process;

- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the Employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and Employer's agent

Each communication between the Employer and a tenderer shall be to or from the Employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The Employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the Employer's agent are stated in the tender data.

C.1.5 Cancellation and re-invitation of tenders

C.1.5.1 An organ of state may, prior to the award of the tender, cancel the tender if-

- (a) due to changed circumstances, there is no longer a need for the services, works or goods requested; or
- (b) funds are no longer available to cover the total envisaged expenditure;
- (c) no acceptable tenders are received; or
- (d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel the tender must be published in the same manner in which the original tender invitation was advertised.

C.1.5.3 An Employer may only with the prior approval of the relevant treasury cancel a tender invitation for a second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

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

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

Notwithstanding the provisions of C.2.17, the Employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the Employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The Employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The Employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The Employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with Employer.

C.2.1.2 Notify the Employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the Employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the Employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the Employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the Employer shall be limited to the actual cost incurred by the Employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the Employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the Employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the Employer may issue, and if necessary, apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the Employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the Employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the Employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the Employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

- C.2.12.2** Accept that an alternative tender offer may be based only on the criteria stated in the tender data or criteria otherwise acceptable to the Employer.
- C.2.12.3** An alternative tender offer may only be considered in the event that the main tender is the winning tender.
- C.2.13 Submitting a tender offer**
- C.2.13.1** Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.
- C.2.13.2** Return all returnable documents to the Employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.
- C.2.13.3** Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the Employer.
- C.2.13.4** Sign the original and all copies of the tender offer where required in terms of the tender data. The Employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the Employer shall hold liable for the purpose of the tender offer.
- C.2.13.5** Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the Employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.6** Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the Employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.7** Seal the original tender offer and copy packages together in an outer package that states on the outside only the Employer's address and identification details as stated in the tender data.
- C.2.13.8** Accept that the Employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.
- C.2.13.9** Accept that tender offers submitted by facsimile or e-mail will be rejected by the Employer, unless stated otherwise in the tender data.
- C.2.14 Information and data to be completed in all respects**
- Accept that tender offers, which do not provide all the data or information requested completely and, in the form, required, may be regarded by the Employer as non-responsive.
- C.2.15 Closing time**
- C.2.15.1** Ensure that the Employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.
- C.2.15.2** Accept that, if the Employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

- C.2.16.1** Hold the tender offer(s) valid for acceptance by the Employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.
- C.2.16.2** If requested by the Employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.
- C.2.16.3** Accept that a tender submission that has been submitted to the Employer may only be withdrawn or substituted by giving the Employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the Employer evaluating tender, the Contractor reserves the right to review the price based on Consumer Price Index (CPI).
- C.2.16.4** Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the Employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

C.2.18 Provide other material

- C.2.18.1** Provide, on request by the Employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the Employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the Employer's request, the Employer may regard the tender offer as non-responsive.

- C.2.18.2** Dispose of samples of materials provided for evaluation by the Employer, where required.

C.2.19 Inspections, test and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the Employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.20.1 Letter of Good Standing

Upon the finalisation of the contract, the Employer will request proof of compliance with the Department of Labour: Letter of good standing with compensation fund, the confirmation will form part of the contract.

C.2.21 Check final draft

Check the final draft of the contract provided by the Employer within the time available for the Employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the Employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the Employer with any certificates as stated in the tender data.

C.3 The Employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the Tender Data respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

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

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or

- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of the arithmetical error in the manner described above.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the Employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require Employers to conduct the process of offer and acceptance in terms of a set of standard procedures

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the Employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the Employer to provide.

C.3.13 Acceptance of tender offer

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

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the Employer's procurement,
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
- c) has the legal capacity to enter into the contract,
- d) is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
- e) complies with the legal requirements, if any, stated in the tender data, and
- f) is able, in the opinion of the Employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the Employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents, and
- c) other revisions agreed between the Employer and the successful tenderer.

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

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An Employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the CIDB Register of Projects.

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

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the tender data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.



PART T2: RETURNABLE DOCUMENTS

TABLE OF CONTENTS

T2.1	LIST OF RETURNABLE DOCUMENT.....	2
T2.2	RETURNABLE SCHEDULES.....	5

T2.1 LIST OF RETURNABLE DOCUMENTS

RD.A MANDATORY RETURNABLE DOCUMENTS

Note: *Failure to submit, fully complete and sign the applicable documents and submit all required attachments will result in the tender offer being disqualified from further consideration*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Compulsory Enterprise Questionnaire	Form RD.A.1	
MBD 4: Declaration of interest in tender of persons in service of state	Form RD.A.2	
MBD 8: Declaration of tenderer's past supply chain management practises	Form RD.A.3	
MBD 9: Certificate of independent tender determination	Form RD.A.4	
Certificate of authority of signatory	Form RD.A.5	
Certificate of authority of signatory for joint ventures and consortia	Form RD.A.6	

RD.B RETURNABLE DOCUMENTS REQUIRED FOR PREFERENTIAL PROCUREMENT EVALUATION PURPOSES

Note: *Failure to submit, fully complete and sign the applicable documents and submit all required attachments will result in the tender offer being awarded 0 (zero) preference points*

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed, signed and included in the tender)
MBD 6.1: Preference Points Claim Form in terms of the Preferential Procurement Regulations 2022	Form RD.B.1	
Valid B-BBEE Status Level of Contributor Certificate	Form RD.B.2	
B-BBEE Exempted Micro Enterprise – Sworn Affidavit	Form RD.B.3	
Promotion of local enterprises (Local Economic Participation)	Form RD.B.4	
Certified copy of Identity Document/s proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)	Form RD.B.5	
Medical Certificate with doctor's details (Practice Number, Physical Address and contact numbers) proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)	Form RD.B.6	

RD.C ADDITIONAL RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

Note: Failure to submit, fully complete and sign the applicable documents and submit all required attachments will result in the Tenderer having to submit same upon request within 7 days and if not complied with, will result to the tender offer being disqualified from further consideration.

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Proof of registration on CSD with National Treasury	RD.C.1	
MBD 5: Declaration for procurement above R10 million (all applicable taxes included)	RD.C.2	
Proof of Registration with CIDB	RD.C.3	
Compliance with OHSA (Act 85 of 1993)	RD.C.4	
Record of services provided to organs of state	RD.C.5	
Schedule of plant and equipment	RD.C.6	
Status of concern submitting tender	RD.C.8	
Classification of business	RD.C.9	
Letter of intent to provide a performance bond	RD.C.10	
Proof of Registration with Engineering Council of South Africa (ECSA)	RD.C.11	
Proof of Registration with South African Council of Project And Construction Management Professions (SACPCMP)	RD.C.12	

RD.D OTHER DOCUMENTS RETURNABLE DOCUMENTS REQUIRED FOR FUNCTIONALITY EVALUATION PURPOSES

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

Document Name	Reference	Confirmation of Document Included (Tenders may use this column to confirm documents have been completed and included in the tender)
Record of addenda to tender documents	RD.D.1	
Mandatory requirements	RD.D.2	
Schedule of Tenderer's experience	RD.D.3	
Curriculum vitae of key personnel	RD.D.4	
Summary of Tenderer's Experience	RD.D.5	
Data provided by the contractor	Section C1.2	
Data provided by the contractor	Section C1.2	



T2.2 RETURNABLE SCHEDULES

TABLE OF CONTENTS

FORM RD.A.1	COMPULSORY ENTERPRISE QUESTIONNAIRE	5
FORM RD.A.2	DECLARATION OF INTEREST.....	6
FORM RD.A.3	MBD 8: DECLARATION OF TENDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTISES	11
FORM RD.A.4	MBD 9: CERTIFICATION OF INDEPENDENT TENDER DETERMINATION	13
FORM RD.A.5	CERTIFICATE OF AUTHORITY OF SIGNATORY	16
FORM RD.A.6	CERTIFICATE OF AUTHORITY OF SIGNATORY FOR JOINT VENTURES AND CONSORTIA	17
RDB.1 MBD 6.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022		18
FORM RD.B.2	VALID B-BBEE STATUS LEVEL OF CONTRIBUTOR CERTIFICATE	22
FORM RD.B.3	B-BBEE EXEMPTED MICRO ENTERPRISE – SWORN AFFIDAVIT	23
FORM RD.B.4	PROMOTION OF LOCAL ENTERPRISES	24
FORM RD.B.5	AT LEAST 51% WOMEN OWNED COMPANIES AND AT LEAST 51% OWNED COMPANIES BY YOUTH	24
FORM RD.B.6	AT LEAST 51% OWNED COMPANIES BY PEOPLE WITH DISABILITY	26
FORM RD.C.1	PROOF OF REGISTRATION ON CSD WITH NATIONAL TREASURY	27
FORM RD.C.2	MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION	28
FORM RD.C.3	PROOF OF REGISTRATION WITH THE CIDB	29
FORM RD.C.4	COMPLIANCE WITH OHSA (ACT 85 OF 1993)	30
FORM RD.C.5	RECORD OF SERVICES PROVIDED TO ORGANS OF STATE	31
FORM RD.C.6	SCHEDULE OF PLANT AND EQUIPMENT	32
FORM RD.C.8	STATUS OF CONCERN SUBMITTING TENDER	33
FORM RD.C.9	CLASSIFICATION OF BUSINESS	35
FORM RD.C.10	LETTER OF INTENT TO PROVIDE A PERFORMANCE BOND	375
FORM RD.C.11	PROOF OF REGISTRATION WITH ENGINEERING COUNCIL OF SOUTH AFRICA (ECSA)	36
FORM RD.C.12	PROOF OF REGISTRATION WITH SOUTH AFRICAN COUNCIL FOR THE PROJECT AND CONSTRUCTION MANAGEMENT PROFESSIONS (SACPCMP)	37
FORM RD.D.2	MANDATORY REQUIREMENTS	38
FORM RD.D.3	SCHEDULE OF TENDERERS EXPERIENCE	41
FORM RD.D.8	KEY PERSONNEL	465
FORM RD.D.9.1	CURRICULUM VITAE FOR PROFESSIONALLY REGISTERED PERSONNEL.....	506
FORM RD.D.9.2	CURRICULUM VITAE OF KEY PERSONNEL.....	517
FORM RD.D.15	SUMMARY OF TENDERER'S EXPERIENCE SCORE	528
FORM RD.E.1	RECORD OF ADDENDA TO TENDER DOCUMENTS	49

FORM RD.A.1 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: CSD number:

Section 5: 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 6: Particulars of companies and close corporations

Company registration number:

Close corporation number:

Tax reference number:

Section 7: MBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 9: MBD8 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 10: MBD9 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

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

- i) authorizes the employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order;
- ii) 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;
- iii) 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;
- iv) 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
- v) 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:			

Contract: **HS 04-2025/26**

**TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE,
WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS**

Part T2: Returnable Documents



FORM RD.A.2 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/her representative:

 - 3.2 Identity Number:

 - 3.3 Position occupied in 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.

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

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

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

3.8 Are you presently in the service of the state?

YES	NO

If yes, furnish particulars _____

3.9 Have you been in the service of the state for the past twelve months?

YES	NO

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

If yes, furnish particulars _____

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?

YES	NO

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

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

If yes, furnish particulars _____

3.14 Do you or any of the directors, trustees, managers, principal shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?

YES	NO

Contract: **HS 04-2025/26**

**TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE,
WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS**

Part T2: Returnable Documents



If yes, furnish particulars

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

Full Name	Identity Number	State Employee Number

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.A.3 MBD 8: DECLARATION OF TENDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTISES

1. This municipal tender document must form part of all tenders invited.
2. It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
3. The tender of any tenderer may be rejected if that tenderer, or any of its directors have:
 - a. abused the municipality's/municipal entity's supply management system or committed any improper conduct in relation to such system;
 - b. been convicted for fraud or corruption during the past five years;
 - c. wilfully neglected, reneged on or failed to comply with any government, Municipal or other public sector contract during the past five years; or
 - d. been listed in the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004).
4. In order to give effect to the above, the following questionnaire must be completed and submitted with the tender:

Item	Question	Response	
4.1	Is the tenderer, any of its directors listed on the National Treasurer's database as a company or persons prohibited from doing business with the public sector? (Companies for persons who are listed on this database were informed in writing of this restriction by the National Treasury after the <i>audi alteram partem</i> rule was applied)	YES	NO
	If so, furnish particulars:		
4.2	Is the tenderer 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, 2004 (Act 12 of 2004)? (The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.)	YES	NO
	If so, furnish particulars:		
4.3	Was the tenderer or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	YES	NO
	If so, furnish particulars:		

Item	Question	Response	
4.4	Does the tenderer or any of its directors owe any municipal rates and taxes or municipal charges to the municipality/municipal entity, or to any other municipality/municipal entity, that is in arrears for more than three months?	YES	NO
	If so, furnish particulars:		
4.5	Was any contract between the tenderer and the municipality/municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	YES	NO
	If so, furnish particulars:		

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

I accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.A.4 MBD 9: CERTIFICATION OF INDEPENDENT TENDER DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all bids ³invited.
2. Section 4 (1) (b) (iii) of the Competition Act Nol. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive tendering (or bid rigging⁴). Collusive tendering is a *per se* prohibition meaning that it cannot be justified under any grounds.
3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. Take all reasonable steps to prevent such abuse;
 - b. Reject the tender of any tenderer if that tenderer or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. Cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the tendering process or the execution of the contract.
4. This will serve as a certificate of declaration that would be used by institutions to ensure that, when tenders are considered, reasonable steps are taken to prevent any form of tender-rigging.
5. In order to give effect to the above, the attached Certificate of Tender Determination must be completed and submitted with the tender.

³ Includes price quotations, advertised competitive bids, limited bids and proposals.

⁴ Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying tender:

CONTRACT HS 04-2025/26: THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

in response to the invitation for the tender made by

City of Tshwane Metropolitan Municipality

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

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

1. I have read and understand the contents of this certificate;
2. I understand that the accompanying tender will be disqualified if this certificate is found not to be true and complete in every aspect;
3. I am authorised by the tenderer to sign this certificate, and to submit the accompanying tender, on behalf of the tenderer;
4. Each person whose signature appears on the accompanying tender has been authorised by the tenderer to determine the terms of, and to sign, the tender, on behalf of the tenderer;
5. For the purposes of this Certificate and the accompanying tender, I understand that the word “competitor” shall include any individual or organization, other than the tenderer, whether or not affiliated with the tenderer who:
 - a. Has been requested to submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - b. Could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer.
6. The tenderer has arrived at the accompanying tender independently form, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium⁵ will not be construed as collusive tendering.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a. Prices;
 - b. Geographical area where product or services will be rendered (market allocation);
 - c. Methods, factors or formulas used to calculate prices;
 - d. The intention or decision to submit or not to submit, a tender;
 - e. The submission of a tender which does not meet the specifications and conditions of the tender; or
 - f. Tendering with the intention not to win the tender.

⁵ Joint venture or consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.



8. In addition, there have been no consultations, communications, agreements or arrangement with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender invitation relates.
9. The terms of the accompanying tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or to the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practises related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No. 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted form conduction 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.

111

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

Contract: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS
Part T2: Returnable Documents



FORM RD.A.5 CERTIFICATE OF AUTHORITY OF SIGNATORY

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

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

Held at: _____ (place)

On: _____ (date)

RESOLVED that:

1. The enterprise submits a tender to the Tshwane Metro Municipality in respect of the following project:

Tender Number:	HS 04-2025/26
Tender Description:	TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

2. *Mr/Ms:

in *his/her capacity as

and who will sign as follow:

Proof signature	Proof signature

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

NAME	CAPACITY	SIGNATURE

Note:

- *Delete which is not applicable.
- IMPORTANT: This resolution must be signed by all the directors/members/ partners of the tendering enterprise.
- Should the number of directors/members/partners exceed the space available above, additional names and signatures must be supplied on a separate page.

Enterprise stamp

FORM RD.A.6 CERTIFICATE OF AUTHORITY OF SIGNATORY FOR JOINT VENTURES AND CONSORTIA

*Joint venture/consortium name: _____

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

_____ authorised signatory of the enterprise

_____ acting in the capacity of lead partner

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

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

Note:

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

RDB.1 MBD 6.1 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 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
 - **the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).**
- 1.2 To be completed by the organ of state
- a) The applicable preference point system for this tender is the 90/10 preference point system.
- b) The 90/10 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.
- 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 80 or 90 points is allocated for price on the following basis:

90/10

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

Where

P_s = Points scored for price of tender under consideration
 P_t = Price of tender under consideration
 P_{min} = 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:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

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

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

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) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)
BB-BEE score of companies		
Level 1	4 Points	
Level 2	3.5 Points	
Level 3	3 Points	
Level 4	2.5 Points	
Level 5	2 Points	
Level 6	1.5 Points	

Level 7	1 Point	
Level 8	0.5 Points	
Non-compliant	0 Points	
EME and/or QSE	1 Point	
At least 51% Women owned companies	1 Point	
At least 51% owned companies by People with disability	1 Point	
At least 51% owned companies by Youth	1 Point	
Local Economic Participation		
City of Tshwane Participants	2 Points	
Gauteng Participants	1 Point	
National participants	1 Point	

N.B For points to be allocated as per above the tenderers will be required to submit proof of documentation as evidence for claims made. Any tenderer that does not submit evidence as stated in the bid document to claim applicable points will be allocated zero point.

DECLARATION WITH REGARD TO COMPANY/FIRM

- 4.3. Name of company/firm.....
- 4.4. Company registration number:
- 4.5. 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]

- 4.6. 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:
- The information furnished is true and correct;
 - The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
 - In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
 - If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - disqualify the person from the tendering process;
 - recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - recommend that the 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.

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at

_____ on this

_____ day of

WITNESSES:

(Full name in BLOCK letters and
signature)

1.

2.



FORM RD.B.2 VALID B-BBEE STATUS LEVEL OF CONTRIBUTOR CERTIFICATE

Submit B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA).

NOTE:

- 1. Attach original copy of B-BBEE Verification Certificate to this page.**
- 2. In the case of a joint venture / consortium parties must each attach original copy of their B-BBEE Verification Certificates.**

FORM RD.B.3 B-BBEE EXEMPTED MICRO ENTERPRISE – SWORN AFFIDAVIT

I, the undersigned

Full Name & Surname																		
Identity Number								-						-			-	

Hereby declare under oath as follow:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a member / director / owner of the following enterprise and am duly authorised to act on its behalf.

Enterprise Name	
Trading Name	
Registration Number	
Enterprise Address	

3. I hereby declare under oath that:

- The enterprise is _____ % black owned;
- The enterprise is _____ % woman owned;
- Based on the audited management accounts and other information available on the _____ financial year, the income did not exceed R 10,000,000 (ten million rands);
- Please confirm on the below the B-BBEE level contributor, by ticking the applicable.

100% Black owned	Level One (135% B-BBEE procurement recognition)	
More than 51% Black owned	Level Two (125% B-BBEE procurement recognition)	
Less than 51% Black owned	Level Four (100% B-BBEE procurement recognition)	

4. The entity is an empowering supplier in terms of the DTI Codes of Good Practice
5. I know and understand the contents of the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the owners of the enterprise which I represent in this matter.
6. The sworn affidavit will be valid for a period of 12 (twelve) month from the date signed by the commissioner.

Deponent Signature:	Date:
 Commissioner of oaths (Signature and stamp)	

FORM RD.B.4 PROMOTION OF LOCAL ENTERPRISES

The City of Tshwane has mandated the promotion of local enterprises. To comply with this the tenderer must provide proof of the type of business unit and whether the unit resides within the Tshwane and will be scored as follow:

90/10 preference point system applies:

	Promotion of local enterprises
No Response (score 0)	The tenderer did not respond or comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in this regard,
Satisfactory (score 1)	The tenderer operates a head office or fully staffed office or his sole office outside the boundaries of Gauteng Province. (I.e. no business unit or office resides within the boundaries of Tshwane Metropolitan Municipality)
Good (score 1)	The tenderer's office resides within the boundaries of Gauteng Province. (I.e. no business unit or office resides within the boundaries of Tshwane Metropolitan Municipality)
Very good (score 2)	The tenderer's office resides within the boundaries of the Tshwane Metropolitan Municipality.

Municipal Rates & Taxes not older than three months from tender advertisement date or Valid Lease Agreement should be attached as evidence.

(If necessary the tenderer will be requested to present the office / business unit to officials of the City)

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

FORM RD.B.5 AT LEAST 51% WOMEN OWNED COMPANIES AND AT LEAST 51% OWNED COMPANIES BY YOUTH

The City of Tshwane has mandate for the promotion At least 51% Women owned companies and At least 51% owned companies by youth. To comply with this the tenderer must provide Certified copy of Identity Document/s that proof that company is 51% owned by Women or youth

	promotion At least 51% Women owned companies and At least 51% owned companies by youth
No Response (score 0)	The tenderer did not respond or comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in this regard,
Good (score 1)	Certified copy of Identity Document/s that proof that company is 51% owned by Women and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)
Good (score 1)	Certified copy of Identity Document/s that proof that company is 51% owned by youth and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership)

(If necessary the tenderer will be requested to present the office / business unit to officials of the City)

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.B.6 AT LEAST 51% OWNED COMPANIES BY PEOPLE WITH DISABILITY

The City of Tshwane has mandate for the promotion of At least 51% owned companies by People with disability. To comply with this the tenderer must provide Medical Certificate with doctor's details (Practice Number, Physical Address and contact numbers that proof that company is 51% owned by People with disability

	Promotion of At least 51% owned companies by People with disability
No Response (score 0)	The tenderer did not respond or comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in this regard,
Good (score 1)	Medical Certificate with doctor's details (Practice Number, Physical Address and contact numbers and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership

(If necessary the tenderer will be requested to present the office / business unit to officials of the City)

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____



FORM RD.C.1 PROOF OF REGISTRATION ON CSD WITH NATIONAL TREASURY

1. Attach original or certified copy of CSD registration certificate to this page.
2. In the case of a joint venture / consortium (excluding consulting engineering partners) the joint venture / consortium must attach original or certified copy of their CSD registration certificate to this page.

FORM RD.C.2 MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION

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

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

Indicate whether these have been included in the tender:

YES	NO

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

YES	NO

If so, state particulars _____

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

YES	NO

If so, state particulars _____

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

YES	NO

If so, state particulars _____

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

YES	NO

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

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

I accept that the state may act against me should this declaration prove to be false.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.3 PROOF OF REGISTRATION WITH THE CIDB

1. Attach original or certified copy of CIDB registration certificate to this page.
2. In the case of a joint venture / consortium (excluding consulting engineering partners) parties must each attach original or certified copy of their CIDB registration certificate.

Firm	CRS Number	CIDB Grading	Lead Partner (Indicate with X)
Combined CIDB Grading for Joint Venture / Consortium:			

(Calculator is available at <https://registers.cidb.org.za/common/jvcalc.asp>)

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.4 COMPLIANCE WITH OHSA (ACT 85 OF 1993)

Tenderers are required to satisfy the employer and the engineer as to their ability and available resources to comply with the above by answering the following questions and providing the relevant information required below.

(Tick applicable box)

1. Are your company familiar with the OHSA (ACT 85 of 1993) and its Regulations?	YES	NO
2. Who will prepare your company's Health and Safety Plan? Provide a copy of the person/s curriculum vitae/s or company profile.		
3. Do your company have a health and safety policy? If YES provide a copy.	YES	NO
4. How is this policy communicated to your employees? Provide supporting documentation.	YES	NO
5. Do your company keep record of safety aspects of each site where work is performed? If YES what records are kept?	YES	NO
6. Do your company conduct monthly safety meetings? If YES, who is the chairperson of the meeting, and attend these meetings?	YES	NO
7. Do your company have a safety officer in its employment, responsible for overall safety of your company? If YES, explain his duties and provide a copy of his CV	YES	NO
8. Do your company have trained first aid employees? If YES, indicate who.	YES	NO
9. Do your company have a safety induction training programme in place? If YES, provide a copy.	YES	NO
10. Does your company conduct medical surveillance for its employees?	YES	NO

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.5 RECORD OF SERVICES PROVIDED TO ORGANS OF STATE

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

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

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

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

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

(Attach additional pages if more space is required.)

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.C.6 SCHEDULE OF PLANT AND EQUIPMENT

The following are lists of the major items of relevant equipment that I/we presently own/lease and will have available for this contract or will hire/acquire for this contract as proof of the requirements for Clause C.3.13 b) of the Standard Conditions of Tender

Major equipment owned/leased that is immediately available for the execution of the works	
Quantity	Description, size, capacity etc.

(Attach additional pages if more space is required)

Major equipment that will be hired or acquired for the execution of the works	
Quantity	Description, size, capacity etc.

(Attach additional pages if more space is required)

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

FORM RD.C.8 STATUS OF CONCERN SUBMITTING TENDER**1. General**

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

Public Company

Private Company

Closed Corporation

Partnership

Sole Proprietary

Joint Venture / Consortium

Co-operative

(Mark the appropriate option)

2. Information to be provided

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



If the Tendering Entity is a:		Documentation to be submitted with the tender
6	<u>Co-operative</u>	CIPRO CR2 - Certified copies of Company registration document.
7	<u>Joint Venture / Consortium</u>	All the documents (as described above) as applicable to each partner in the joint venture / consortium as well as a certified copy of the joint venture / consortium agreement.

Note:

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

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

Yes

☐

No

☐

(Make an X in the appropriate space)

REGISTRATION NO: _____

FORM RD.C.9 CLASSIFICATION OF BUSINESS

1. The Small Businesses are defined in the National Small Business Act, 1996 (Act 102 of 1996).
2. Information furnished with regard to the classification of Small businesses
 - (b.) Indicate whether the company/entity is defined as a small, medium or micro enterprise by the National Small Business Act.

YES	NO

(Tick appropriate box)

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

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

- ii. Size or class:

- iii. Total full-time equivalent of paid employees:

- iv. Total annual turnover:

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

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

- (d.) The tenderer should substantiate the information provided by submitting the following documentation:
 - i. A letter from the tenderer's auditor or an affidavit from the South African Police Services confirming the correctness of the abovementioned information,
 - ii. Company profile indicating the tenderer's staff compliment, and
 - iii. 3 year financial statement or since their establishment if established during the past 3 years.

SCHEDULE OF SECTORS

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

FORM RD.C.10

LETTER OF INTENT TO PROVIDE A PERFORMANCE BOND

It is hereby agreed that a Performance Bond drafted exactly as set out in the attached examples (See Section C1.3: Form of Guarantee) will be provided by the Surety named below:

Name of Surety (Bank or Insurer)

Address:

Signed:

Name:

Capacity:

On behalf of Tenderer (name of tenderer)

Date:

CONFIRMED BY Surety's Authorised representative

Signature(s):

Name (print):

Capacity

On behalf of Surety (Bank or Insurer)

Date:

Note: Refer to the Annexure to **C1.3 Form of Guarantee** for the List of Institutions from who Contract/Deposit Guarantees will be accepted.

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date: _____

FORM RD.C.11 PROOF OF REGISTRATION IN TERMS OF THE ENGINEERING PROFESSIONS ACT, 2000

The tenderer must provide proof of persons in their **full-time employ** that are registered in terms of the Engineering Professions Act, 2000 (Act 46 of 2000). The tenderer must confirm that registered employees are in their full-time employ by means of a declaration to this effect on the company's letterhead and duly signed.

NAME	REGISTRATION			Confirm full time employed
	Professional Category	Discipline	ECSA Number	

(Attach required documentary proof to this page)

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature: _____

Date: _____

FORM RD.C.12 SOUTH AFRICAN COUNCIL OF PROJECT AND CONSTRUCTION MANAGEMENT PROFESSIONS (SACPCMP)

NAME	REGISTRATION			Confirm full time employed
	Professional Category	Discipline	SACPCMP Number	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____



Signature: _____
Date: _____

FORM RD.D.2 MANDATORY REQUIREMENTS

Appointment letters and approved completion certificates.

Curriculum Vitae's including experience, level of education and training, and positions held for each of the key staff including certified copies of the qualifications:

1) Tendering Firm	
Mandatory criteria	Supporting evidence
CIDB Grading of 9CE	Valid CIDB grading certificate
Tendering Firm's experience of successfully completing <u>at least one reinforced concrete water retaining structure</u> project, with a <u>minimum size of 10ML</u>	Appointment letter and approved Completion Certificate
Tendering Firm's experience of successfully completing <u>at least one bulk water pipeline</u> project, with a <u>minimum value of R20 million</u> or more.	Appointment letter and approved Completion Certificate
2) Key Personnel	
Mandatory criteria	Supporting evidence
Contracts Manager - Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA) and registered as a professional with: (i) Engineering Council Of South Africa (ECSA) as Engineer or Technologist; OR (ii) South African Council for the Project and Construction Management Professions (SACPCMP) as Construction Project Manager or Construction Manager and a minimum experience of 5 years post registration. Experience: 5 years and above post registration on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification, ECSA registration or SACPCMP registration and detailed CV indicating years of experience are compulsory
Site Agent Qualification: BSc or BEng or B-Tech in Civil Engineering (NQF level 7) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced water retaining structures, bulk water pipelines, water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Assistant Site Agent Qualification: National Diploma in Civil Engineering (NQF level 6) or higher qualification in Civil Engineering recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Foreman 1 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering works recognized by South African Qualifications Authority (SAQA). Experience: 5 years and above post qualification on reinforced concrete works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.

Foreman 2 Qualification: Artisan qualification/certification (NQF level 3) or higher qualification in Civil Engineering infrastructure works recognized by South African Qualifications Authority (SAQA). Experience: 3 years and above post qualification on water and sewer reticulation works.	Certified copy of qualification and detailed CV indicating years of experience are compulsory.
Construction Health and Safety Officer - Qualification: Minimum NQF level 5 qualification in health and safety management or equivalent. - Professional Registration: South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Officer (CHSO). Experience: 3 years and above on civil engineering infrastructure works.	Certified copy of qualification, valid SACPCMP registration and detailed CV indicating years of experience are compulsory

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.D.3 SCHEDULE OF TENDERERS EXPERIENCE

The experience of the tenderer or joint venture partners in the case of an unincorporated joint venture consortium, in similar projects, shall be evaluated. Proof of experience (Appointment letters and Completion certificates) will influence the scoring on listed projects.

NOTE: The General Conditions of Contract prohibit the sub-contracting of the whole of the Contract.

The scoring of the Tenderer's experience shall be for a similar project (Welded Steel Bulk Water Pipelines; Concrete Water Retaining Structures; Water and sewer reticulation project) as follows:

Previous Project Description:

- A maximum of 60 points will be allocated for similar projects over the project values as specified, within the last 10 years

The following is a statement of similar work successfully executed by myself / ourselves:

	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – 10ML or higher, reinforced concrete water retaining structure project (points to be allocated for one project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
1	Employer: _____ Contact Person: _____ Tel: _____			
2	Employer: _____ Contact Person: _____ Tel: _____			
3	Employer: _____ Contact Person: _____ Tel: _____			
4	Employer: _____ Contact Person: _____ Tel: _____			
5	Employer: _____ Contact Person: _____ Tel: _____			

Contract: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

Part T2: Returnable Documents



	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – 10ML or higher, reinforced concrete water retaining structure project (points to be allocated for one project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
MAXIMUM TOTAL POINTS TENDERERS TOTAL			(20)	

	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description - Bulk water pipeline projects, with a minimum value of R20 million or more (points to be allocated for each project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
1	Employer: _____ Contact Person: _____ Tel: _____			
2	Employer: _____ Contact Person: _____ Tel: _____			
3	Employer: _____ Contact Person: _____ Tel: _____			
4	Employer: _____ Contact Person: _____ Tel: _____			
5	Employer: _____ Contact Person: _____ Tel: _____			
MAXIMUM TOTAL POINTS TENDERERS TOTAL			(20)	

	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – water reticulation projects, with a minimum value of R10 million or more. (points to be allocated for each project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
1	Employer: _____ Contact Person: _____ Tel: _____			
2	Employer: _____ Contact Person: _____ Tel: _____			

	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – water reticulation projects, with a minimum value of R10 million or more. (points to be allocated for each project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
3	Employer: Contact Person: Tel:			
4	Employer: Contact Person: Tel:			
5	Employer: Contact Person: Tel:			
MAXIMUM TOTAL POINTS TENDERERS TOTAL			(10)	

	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – sewer reticulation projects, with a minimum value of R10 million or more. (points to be allocated for each project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
1	Employer: Contact Person: Tel:			
2	Employer: Contact Person: Tel:			
3	Employer: Contact Person: Tel:			
4	Employer: Contact Person: Tel:			



	Employer, contact person and telephone number (Project will be rejected without current accurate contact data)	Description of contract – sewer reticulation projects, with a minimum value of R10 million or more. (points to be allocated for each project of similar nature, scope and value – ref C3.11)	Date completed	Points/ contract To be completed by Evaluator
5	Employer: _____ Contact Person: _____ Tel: _____			
MAXIMUM TOTAL POINTS TENDERERS TOTAL			(10)	

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

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RD.D.8 KEY PERSONNEL

The Tenderer shall schedule the following Key Personnel who would be assigned to this Contract. The Contractor shall be contractually obliged to make these personnel available for the duration of the Contract, failing which alternative personnel of equal or higher qualification may be accepted by the employer.

POSITION	NAME	YEARS OF EXPERIENCE	NUMBER OF PROJECTS COMPLETED OF SIMILAR NATURE
Contracts Manager			
Site Agent			
Assistant Site Agent			
Foreman 1			
Foreman 2			
Construction Health & Safety Officer			

The Tenderer shall complete a CV for each of the Key Personnel in Form RD.D.9 accompanied by the valid and certified proof of Qualifications, Professional Registrations, and Proof of Identity for all personnel.

FORM RD.D.9.1 CURRICULUM VITAE FOR PROFESSIONALLY REGISTERED PERSONNEL

Note: This form should be completed for the Contract Manager, as listed in Form RD.D.8.

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership, registration or license:	
Name of employer (firm):	
Current position:	Years with firm:
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.	
_____ _____ (Signature of person named in schedule) Date:	

D.9.1.1 EMPLOYMENT RECORD (from most recent)

EMPLOYER	POSITION HELD / ROLES	DATES		YEARS EXPERIENCE	POINTS
		FROM	TO		
TOTAL POINTS					

D.9.1.2 PARTICULAR & APPROPRIATE EXPERIENCE

(A project will be rejected without current & accurate contact details)

CLIENT & CONTACT	PROJECT DESCRIPTION (ref C3.1)	DATES		VALUE	POINTS
		FROM	TO		
TOTAL POINTS					
GRAND TOTAL POINTS (CARRIED OVER TO FORM RD.D.8)					

FORM RD.D.9.2 CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for other personnel as listed in Form RD.D.8.

Name:	Date of birth:
Profession:	Nationality:
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	Years with firm:
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. _____ (Signature of person named in schedule) _____ Date:	

D.9.2.1 EMPLOYMENT RECORD (from most recent)

EMPLOYER	POSITION HELD / ROLES	DATES		YEARS EXPERIENCE	POINTS
		FROM	TO		
TOTAL POINTS					

D.9.2.2 PARTICULAR & APPROPRIATE EXPERIENCE

(A project will be rejected without current & accurate contact details)

CLIENT & CONTACT	PROJECT DESCRIPTION (ref C3.1)	DATES		VALUE	POINTS
		FROM	TO		
TOTAL POINTS					
GRAND TOTAL POINTS (CARRIED OVER TO FORM RD.D.8)					

FORM RD.D.15

SUMMARY OF TENDERER'S EXPERIENCE SCORE

CRITERIA	REFERENCE	MAX POINTS	TENDERER'S SCORE
Tenderers Experience			
Reinforced concrete water retaining structure	RD.D.3	20	
Bulk water pipe	RD.D.3	20	
Water reticulation	RD.D.3	10	
Sewer reticulation	RD.D.3	10	
Total		60	
Key Personnel			
Contract Manager	RD.D.8	15	
Site Agent	RD.D.8	5	
Assistant Site Agent	RD.D.8	5	
Foreman 1	RD.D.8	5	
Foreman 2	RD.D.8	5	
Construction Health and Safety Officer	RD.D.8	5	
Total		40	
GRAND TOTAL		100	
Min Points		70	

A minimum of **70 points** will be required to remain in the tender process.

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

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

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

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

Person authorized to sign the tender:

Full name (in BLOCK letters):

Signature:

Date:

PORTION 2: CONTRACT

PART C1: AGREEMENTS AND CONTRACT DATA

TABLE OF CONTENTS

C1.1	FORM OF OFFER AND ACCEPTANCE	2
C1.2.	CONTRACT DATA.....	8
C1.3	FORM OF GUARANTEE	28
C1.4:	HEALTH AND SAFETY AGREEMENT	31
C1.5:	ADJUDICATOR'S AGREEMENT.....	33

C1.1 FORM OF OFFER AND ACCEPTANCE

STAMP

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

CONTRACT HS 04-2025/26 - THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the returnable schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

THE OFFERED TOTAL OF PRICES INCLUSIVE OF VALUE ADDED TAX IS

R

(in figures)

(in words)

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

NAME(s): (BLOCK LETTERS)

CAPACITY of authorized agents:

SIGNATURE(s) of authorized agents:

SIGNED at on this day of

WITNESSES: (Full name – BLOCK LETTERS – and signature)

1.

2.

ACCEPTANCE

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

The terms of the contract, are contained in

Part T1	Tendering Procedures
Part T2	Returnable Documents
Part C1	Agreements and Contract Data, (which includes this Agreement)
Part C3	Scope of Work
Part C4	Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

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

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties¹.

¹ As an alternative, the following wording may be used:

Notwithstanding anything contained herein, this agreement comes into effect two days after the submission by the Employer of one fully completed original copy of this document including the schedule of deviations (if any), to a courier-to-counter delivery / counter-to-counter delivery / door-to-counter delivery / door-to-door delivery / courier service (delete that which is not applicable), provided that the Employer notifies the Tenderer of the tracking number within 24 hours of such submission. Unless the Tenderer (now Contractor) within seven days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties.

NAME(S): (BLOCK LETTERS)

CAPACITY of authorized agents:

SIGNATURE(S) of authorized agents:

SIGNED at on this day of

WITNESSE(S): (Full name – BLOCK LETTERS – and signature)

1.

2.

SCHEDULE OF DEVIATIONS**Notes:**

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

4.1	Subject	.....
	Details	.....
4.2	Subject	.....
	Details	.....
4.3	Subject	.....
	Details	.....
4.4	Subject	.....
	Details	.....
4.5	Subject	.....
	Details	.....

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

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

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

NAME(s): (in block letters)

.....

CAPACITY of authorized agents:

.....

SIGNATURE(s) of authorized agents:

.....

SIGNED at on this day of

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

1.

.....

.....

2.

.....

.....

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

NAME(s): (in block letters)

.....

CAPACITY of authorized agents:

.....

SIGNATURE(s) of authorized agents:

.....

SIGNED at on this day of

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

1.

.....

.....

2.

.....

.....

C1.2 CONTRACT DATA

TABLE OF CONTENTS

C1.2.1 GENERAL CONDITIONS OF CONTRACT 9
C1.2.2 VARIATIONS AND ADDITIONS TO THE CONDITIONS OF CONTRACT 10
C1.2.3 DATA PROVIDED BY THE EMPLOYER 23
C1.2.4 DATA PROVIDED BY THE CONTRACTOR 27

C.1.2.1 GENERAL CONDITIONS OF CONTRACT

The conditions of contract applicable to this contract shall be the latest Revision **General Conditions of Contract for Construction Works, Third Edition (2015)** of the South African Institution of Civil Engineering (SAICE), read together with the Variations and Additions to the Conditions of Contract as well as the Data provided by Employer.

Should there be any contradicting conditions/statements between these Conditions of Contract and any other part of the tender documents/specifications, the Employer's Agent will give clarity on which version applies to this contract. For pricing purposes, the Contractor must take the least favourable meaning into consideration when tendering, no claims will be considered attributable to the contradicting conditions/statements.

Tenderers, contractors and subcontractors shall obtain their own copies of the document **General Conditions of Contract for Construction Works, Third Edition (2015)** for tendering purposes and for use for the duration of the contract from the Secretary of the South African Institution of Civil Engineering, Private Bag X200, Halfway House, Midrand, 1685 and shall bear all expenses in this regard.

C1.2.2 VARIATIONS AND ADDITIONS TO THE CONDITIONS OF CONTRACT

The following variations and additions to the General Conditions of Contract for Construction Works, Third Edition (2015), shall apply to this contract:

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
1.1	Add the following definitions: <i>1.1.1.13 The Defects Liability Period is 365 Days (12 months) from the date of the Completion Certificate</i> <i>1.1.1.14.1 The starting/ commencement date is the date of site handover. The contractor is to submit documents listed under clause 5.3.1 herein prior to commencement.</i> <i>1.1.1.14.2 The time for achieving Practical Completion is 36 months from date of commencement.</i> <i>1.1.1.15 The name of the Employer is:</i> <i>City of Tshwane, represented by the Group Head Human Settlements Department, and / or any other person or persons duly authorised thereto by the Employer in writing.</i> <i>1.1.1.16 The name of the Employer's Agent is:</i> <i>DPT Civil and Structural JV (Pty) Ltd, acting through a principal or an official authorised thereto in writing. The principal representing the Employer's Agent is Mr Lehlohonolo Makhoali.</i> <i>1.1.1.17 The name of the OHS / CHS's Agent is:</i> <i>TMA Consulting Engineers, acting through an OHS / CHS Agent official authorised thereto in writing. The CHS representing the CHS is Mr Thapelo Mabokatshaba.</i> <i>1.1.1.26 The pricing strategy of a re-measurement Contract shall apply.</i>
1.2.1	Add the following to the clause: <i>1.2.1.2 The address of the Employer is:</i> <i>Postal address:</i> <i>P O Box 440</i> <i>PRETORIA</i> <i>0001</i> <i>Details of the Project Manager:</i> <i>Physical address:</i> <i>Human Settlements Department</i> <i>1st floor Tshwane House</i> <i>320 Madiba Street</i> <i>Pretoria</i> <i>0002</i> <i>Contact numbers:</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	Telephone: 012 358 5775 Fax: NA e-mail address: semakalengd@tshwane.gov.za
1.2.2	- The Employer has authorised the Group Head to act on his behalf in respect of this Contract, save for such duties or functions: - which other holders of office ex officio execute on behalf of the Employer; or - for which the Group Head has no authority and the Employer's approval is required before execution thereof. The Group Head is: Nonto Memela Human Settlements Department
3.2.3	The Employer's Agent is required in terms of his appointment by the Employer to obtain the specific approval of the Employer for any variations to the Scope of Work which may increase the contract sum.
4.3	Add the following new sub-clause: 1.3.3 Wages and conditions of work: i. For conventional construction works the Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) shall apply and the minimum employment conditions which will apply shall be guided by the latest Sectoral Determination: Civil Engineering Sector published from time to time. ii. Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) as per Government Notice R63 of 25 January 2002, shall apply to works described in the Scope of Work as being labour intensive and which are undertaken by unskilled or semi-skilled workers. Add the following new sub-clause: 4.3.4 Notwithstanding any actions which the Employer may take, the Contractor accepts sole liability for due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures imposed by the Occupational Health and Safety Act, 1993 (Act 85 of 1993), and all its regulations, including the Construction Regulations, 2014, for which he is liable as mandatory. By entering into this Contract it shall be deemed that the parties have agreed in writing to the above provisions in terms of Section 37(2) of the Act. The Contractor shall sign the Occupational Health and Safety Agreement for Contract Work in the City of Tshwane Metropolitan Municipality included in section C1.5. Add the following new sub-clause: 4.3.5 The Employer retains an interest in all inquiries conducted under this Contract in terms of Section 31 and/or 32 of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and its Regulations following any incident involving the Contractor and/or Sub-Contractor and/or their employees. The Contractor shall

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	<i>notify the Employer in writing of all investigations, complaints or criminal charges which may arise pursuant to work performed under this Contract in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Regulations.</i> Add the following new sub-clause: 4.3.6 Contractor's Designer <i>The Contractor and his designer shall accept full responsibility and liability to comply with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and the Construction Regulations, 2014 for the design of the Temporary Works and those part of the Permanent Works which the Contractor is responsible to design in terms of the Contract</i>
5.3.1	<i>The documentation required before commencement with Works execution are :</i> <i>A signed copy of the Form of Offer and Agreement between the Employer and the Contractor for the Works to be completed by the Contractor in terms of the contract.</i> <i>A permit or notification of construction works in terms of Regulations 3(1) and (2) of the Construction Regulations 2014.</i> <i>Health and Safety Plan (Refer to Clause 4.3) approved by Safety Agent, Safety File approved by Safety Agent and/or CoT OHS Department.</i> <i>A signed Agreement between the Employer and the Contractor for the Works to be completed by the Contractor in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act No.85 of 1993) and the Construction Regulations promulgated thereunder (Refer to Clause 4.3) use latest 2014.</i> <i>Proof of payment to the Employer, that the Contractor has paid all contributions required in terms of the Compensation for Occupational Injuries and Diseases Act, No. 130 of 1993 (Refer to Clause 4.3).</i> <i>Initial programme (Refer to Clause 5.6)</i> <i>Security (Refer to Clause 6.2)</i> <i>Insurance (Refer to Clause 8.6)</i> <i>Initial Cashflow Projections for the approval by Engineer</i> <i>Additional documentation required before commencement with Works execution are:</i> <i>Quality Control Site Books, such as Site Diary, Compaction Control Tests, Levels, Concrete Tests, Site Instructions, Plant and Equipment, Labour for approval by Employer's Agent / Representative and acknowledgement to adhere to Engineer's QMS</i> <i>Construction Method Statements</i> <i>Staff CVs for approval by Employer and Employer's Agent as per contract specification (Part T1.2-Tender Data, Clause C2.1)</i> <i>SMME Management and Monitoring plan for CoT approval. The SMME Management Plan shall entail breakdown of the scope of works to be executed by local SMMEs, SMME selection approach, management and skills transfer approach, number of local SMMEs to be engaged on the project</i>
5.3.2	<i>The time to submit the documentation required before commencement with Works execution is 21 calendar days.</i>
5.4.2	<i>Section of the pipeline is in a private and business property therefore working areas needs to be barricaded and signs erected to limit access to the construction working areas.</i>
5.5.1	<i>The Works shall be completed within Thirty Six (36) months, inclusive of non-working days, special non-working days such as Sundays, statutory public holidays and the year-end break, as envisaged by the employer.</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
5.8.1	<i>The non-working days are Saturdays and Sundays</i> <i>The special non-working Days are:</i> <i>Statutory public holidays, Sundays and</i> <i>All annual year-end and shutdown periods as recommended by the South African Federation of Civil Engineering Contractors, and which commence before the Completion Date.</i>
5.12	Add the following new sub-clause 5.12.5 Critical path provision <i>A delay in so far as extension of time is concerned, will be regarded as a delay only if, on a claim by the Contractor in accordance with the General Conditions of Contract, the Engineer rules that all progress on an item or items of work on the critical path of the approved programme for the execution of the Works by the Contractor, has been brought to a halt. Delays on normal working days only, based on a working week, of five normal working days, will be taken in account for the extension of time.</i> Add the following new sub-clause 5.12.6 Extension of time due to abnormal rainfall <i>Extension of time due to abnormal rainfall shall be determined by means of Method 1, if rainfall records and/or values derived from rainfall records are supplied in the Scope of Work, otherwise Method 2 shall apply.</i> <u>Method 1: Rainfall formula method</u> <i>The rainfall records and/or values derived from rainfall records from a suitable rainfall station near the Site, which are supplied in the Project Specifications, shall be considered suitable for the determination of extension of time due to abnormal rainfall in accordance with this method.</i> <i>Extension of time arising from abnormal rainfall, shall be calculated separately for each calendar month or part thereof for the full period of completion of the Contract, including any extension thereof, in accordance with the rainfall formula given below:</i> $V = (N_w - N_n) + \frac{(R_w - R_n)}{X}$ <i>If V is negative and its absolute value exceeds N_n, then V shall be equal to minus N_n.</i> <i>If V is positive and greater than the number of calendar days in the calendar month under consideration, V shall be taken as equal to the number of calendar days in the relevant calendar month.</i> <i>The symbols shall have the following meaning:</i> V = Extension of time in calendar days in respect of the calendar month under consideration

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	N_w = Actual number of days during the calendar month on which a rainfall of Y mm or more has been recorded. R_w = Actual rainfall in mm for the calendar month under consideration. N_n = Average number of days as derived from existing rainfall records, on which a rainfall of Y mm or more has been recorded for the calendar month. Rainfall records and/or the derived values of N_n will be provided in the Specifications. R_n = Average rainfall in mm for the calendar month, as derived from existing rainfall records. Rainfall records and/or the derived values of R_n will be provided in the Project Specifications. X = 20 unless otherwise provided in the Project Specifications Y = 10 unless otherwise provided in the Project Specifications The total extension of time shall be the algebraic sum of the monthly totals for the period under consideration. However, if the grand total is negative the time for completion shall not be reduced on account of abnormal rainfall. Extension of time for parts of a month shall be calculated by pro rata values of N_n and R_n being used. The factor $(N_w - N_n)$ shall be considered to represent a fair allowance for variations from the average number of days during which rainfall exceeds Y mm and wet conditions prevented or disrupted work. The factor $\frac{(R_w - R_n)}{X}$ shall be considered to represent a fair allowance for variations from the allowance for variations from the average number of days when wet conditions further to that allowed for the factor $(N_w - N_n)$, prevented or disrupted work during the calendar month. Accurate rain gauging shall be taken at a suitable point on Site and the Contractor shall, at his own expense, take all necessary precautions to ensure that the rain gauges cannot be interfered with. This formula does not take into account further on concurrent delays which could be caused by other abnormal climatic conditions such as floods, which have to be determined separately in accordance with Sub-Clause (42.5 Critical Path Provision) hereof. <u>Method 2: Expected delay method</u> The Contractor shall make provision in his programme for the execution of the Works, for an expected delay of "n" normal working days (based on a working week of five normal working days) due to normal rainfall, for which he will not receive any extension of time. Unless otherwise provided in the Project Specifications, the value of "n" shall be taken as equal to the tendered time for completion of the Works in months, rounded off to an integer. Extension of time during normal working days will be granted to the degree to which actual delays as determined in accordance with Sub-Clause (42.5 Critical Path Provision) hereof, exceed the number of "n" normal working days. The value of "n" does not take into account further or concurrent delays which are caused by other abnormal climatic conditions such as floods, which have to

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	<i>be determined separately in accordance with Sub-Clause (42.5 Critical Path Provision) hereof.</i>
5.13.1	<i>The penalty for failing to complete the Works is R 10 000.00 per calendar day.</i>
5.16.3	<i>The latent defect period is 10 years, commencing on the day after the date of certification of Final Completion</i>
6.1	Add the following new sub-clause: 6.1.2 <i>Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way of his obligations either in contract or in delict.</i> Add the following new sub-clause 6.1.3 <i>The Contractor shall be paid at Pretoria in the currency of the Republic of South Africa only at the Office of the Chief Financial Officer of the CITY OF TSHWANE, unless otherwise stated in the Data provided by Employer.</i>
6.2.1	<i>The form of Security for this Contract will be a Performance Guarantee.</i> <i>This Performance Guarantee is to be 10% of the Contract Value.</i>
6.5.1.2.3	<i>The percentage allowance to cover overhead charges is 10%.</i>
6.8.2	<i>The value of payment certificates is to be adjusted in accordance with the Contract Price Adjustment Schedule (GCC 2015, 3rd edition, page 86), where:</i> $(1 - x) \left[\frac{aLt}{Lo} + \frac{bPt}{Po} + \frac{cMt}{Mo} + \frac{dFt}{Fo} - 1 \right]$ <i>The value of "x" is 0,10</i> <i>The values of the coefficients are:</i> <i>a = 0.20</i> <i>b = 0.25</i> <i>c = 0.40</i> <i>d = 0.15</i> <i>The site or largest part thereof shall be deemed to be located in the national province of Gauteng</i> <i>The applicable industry for the Producer Price index for materials is Building and Construction Civil Engineering.</i> <i>The area for the Producer Price Index for fuel is Witwatersrand.</i> <i>The base month is the month before the month in which the tenders close.</i>
6.10.1.5	<i>The percentage advance on materials not yet built into the Permanent Works is 80%. Proof of ownership is required.</i>
6.10.3	<i>The percentage retention money is 10 % of the Certificate Value.</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION				
6.10.3	<i>The limit of retention money is 5% of the Contract Sum.</i>				
8.6	8.6.1 For contracts above R50 million, the contractor is to choose between the following options and submit proof of the documentation requested: <table border="1"> <thead> <tr> <th>OPTION A</th><th>OPTION B</th></tr> </thead> <tbody> <tr> <td> <u>The Contractor's own Public Liability Insurance Policy and/or Contractors All Risk Policy only applicable for Service Contracts</u> Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment, owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the execution of the contract to the amount of at least R5-million per claim with the number of claims unlimited. c) SASRIA cover for motor vehicles and Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. d) In respect of Plant and Materials and Equipment and Motor Vehicles brought onto the Site by or on behalf of Sub-contractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause by ensuring that such Sub-contractors have similarly insured such Plant and Materials and Equipment and Motor Vehicles. </td><td> <u>The City of Tshwane's Public Liability for Contractors Policy or Principal Controlled Contractors All Risk Policy for all contracts including Service Contracts</u> The City of Tshwane to only insure the works by the Contractor. The Contractor/Sub-contractor must obtain for the duration of the contract until the issuing of the Defects Certificate or the end of the Maintenance Period, the following insurance policies in the name of the Contractor (including all Subcontractors whether nominated or otherwise) at an insurance company within 21 (twenty-one) days of the notification of acceptance of the tender and must pay all premiums and supply proof thereof to the relevant Project Manager 30 (thirty) days before the inception of the contract, that the policies have been taken out and that all premiums have been paid: Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Passenger Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the </td></tr> </tbody> </table>	OPTION A	OPTION B	<u>The Contractor's own Public Liability Insurance Policy and/or Contractors All Risk Policy only applicable for Service Contracts</u> Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment, owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the execution of the contract to the amount of at least R5-million per claim with the number of claims unlimited. c) SASRIA cover for motor vehicles and Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. d) In respect of Plant and Materials and Equipment and Motor Vehicles brought onto the Site by or on behalf of Sub-contractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause by ensuring that such Sub-contractors have similarly insured such Plant and Materials and Equipment and Motor Vehicles.	<u>The City of Tshwane's Public Liability for Contractors Policy or Principal Controlled Contractors All Risk Policy for all contracts including Service Contracts</u> The City of Tshwane to only insure the works by the Contractor. The Contractor/Sub-contractor must obtain for the duration of the contract until the issuing of the Defects Certificate or the end of the Maintenance Period, the following insurance policies in the name of the Contractor (including all Subcontractors whether nominated or otherwise) at an insurance company within 21 (twenty-one) days of the notification of acceptance of the tender and must pay all premiums and supply proof thereof to the relevant Project Manager 30 (thirty) days before the inception of the contract, that the policies have been taken out and that all premiums have been paid: Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Passenger Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the
OPTION A	OPTION B				
<u>The Contractor's own Public Liability Insurance Policy and/or Contractors All Risk Policy only applicable for Service Contracts</u> Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment, owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the execution of the contract to the amount of at least R5-million per claim with the number of claims unlimited. c) SASRIA cover for motor vehicles and Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. d) In respect of Plant and Materials and Equipment and Motor Vehicles brought onto the Site by or on behalf of Sub-contractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause by ensuring that such Sub-contractors have similarly insured such Plant and Materials and Equipment and Motor Vehicles.	<u>The City of Tshwane's Public Liability for Contractors Policy or Principal Controlled Contractors All Risk Policy for all contracts including Service Contracts</u> The City of Tshwane to only insure the works by the Contractor. The Contractor/Sub-contractor must obtain for the duration of the contract until the issuing of the Defects Certificate or the end of the Maintenance Period, the following insurance policies in the name of the Contractor (including all Subcontractors whether nominated or otherwise) at an insurance company within 21 (twenty-one) days of the notification of acceptance of the tender and must pay all premiums and supply proof thereof to the relevant Project Manager 30 (thirty) days before the inception of the contract, that the policies have been taken out and that all premiums have been paid: Contractor to insure the following: a) All Risk Insurance cover with regard to all Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Passenger Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the				

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	e) Proof must also be submitted that the Contractor complies with the conditions of the following legislation: 1. Compensation for Occupational Injuries and diseases, 1993. 2. Unemployment Insurance Act, 1996. 3. The Contractor shall in respect of the Site of the contract works appoint in writing a competent person to meet the requirements of the Health and Safety Act, No 85 of 1993 as amended. f) Public Liability insurance cover in the name of the contractor. The minimum limit of indemnity for any one event is R5- million and the number of claims will be unlimited. g) The insurance period must be specified in the Insurance Policy. h) The rights and interests of the City of Tshwane must be noted in the Insurance Policy in the form of an endorsement. execution of the contract to the amount of at least R10-million per claim with the number of claims unlimited. c) SASRIA cover for motor vehicles and Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. d) In respect of Plant and Materials and Equipment and Motor Vehicles brought onto the Site by or on behalf of Subcontractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause by ensuring that such Subcontractors have similarly insured such Plant and Materials and Equipment and Motor Vehicles. e) Without limiting the Contractor's obligation in terms of the Contract, the Contractor will effect and maintain for the duration of the contract period until the issuing of the Defects Certificate or the end of the Maintenance Period insurance against all accidents or misfortunes including accidental loss of or damage to tangible property (except the Works, Plant and Materials and Equipment) and liability for accidental death of or bodily injury to or illness or disease contracted by any person (not an employee of the Contractor) occurring during the Period of Insurance and arising out of or in connection with the performance of the Insured Contract at the Contract Site as defined in the Schedule at any insurance company or under the policy effected by the Employer within 30 (thirty) days before the inception of the contract. The minimum limit of indemnity for any one event is R5-million and the number of claims will be unlimited. f) Proof must also be submitted that the Contractor complies with the conditions of the following legislation: 1. Compensation for Occupational Injuries and diseases, 1993.

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	2. Unemployment Insurance Act, 1996. 3. The Contractor shall in respect of the Site of the contract works appoint in writing a competent person to meet the requirements of the Health and Safety Act, No 85 of 1993 as amended.
8.6.1.2	<i>The Employer's insurer will indemnify the Contractor against all sums for which the Contractor shall become legally liable towards third party claimants to pay for and in consequence of:</i> <i>a) Accidental death of or bodily injury to or illness or disease contracted by any person (excluding employees of the Contractor/Sub-contractor);</i> <i>b) Accidental physical loss or damage to tangible property occurring during the Period of Insurance and arising out of or in connection with the performance of the Insured Contract at the Contract Site as defined in the Schedule. The minimum limit of indemnity for any one event is R10-million in respect of contracts with a contract value of up to R50-million (excluding VAT).</i>
8.6.2	<i>Insurance Premium payable</i> <i>The Employer will pay the insurance premium for the works damage and public liability insurance cover. The insurance premium will be calculated based on the approved Capital Budget per financial year and the insurance premium will be charged out to the relevant departments by the Section: Insurance and Risk Management.</i>
8.6.3	<i>Additional insurance by the Employer</i> <i>The Employer shall be free to effect at his own cost any additional insurance, which he deems necessary in own interest to cover loss or damage not insured in terms of the insurance policies of Sub-Clause 1 of this Clause.</i>
8.6.4	<i>Additional insurance by Contractor/Sub-contractor</i> <i>The Contractor and Sub-contractor shall be free to effect and maintain at their own cost any additional insurance which the Contractor/Sub-contractor deem necessary to cover damage, loss or injury not insured in terms of the insurance effected by the Employer's insurer. The cost of the additional insurance will be for the account of the Contractor/Sub-contractor.</i>
8.6.5	<i>Contractor satisfied with insurance</i> <i>The submission of a tender shall be construed as acknowledgement by the Contractor that he is satisfied with the insurance cover effected by the Employer.</i>
8.6.6	<i>Contractor to observe conditions</i> <i>The Contractor shall give all notices and observe all conditions and requirements imposed by the relevant insurance policies, which shall be binding on the Contractor.</i>
8.6.7	<i>Contractor to Insure</i> <i>The Contractor must obtain for the duration of the contract until the issuing of the Defects Certificate or the end of the Maintenance Period, the following insurance policies at an insurance company within 21 (twenty-one) days of the notification of acceptance of the tender and must pay all premiums and supply proof thereof to the relevant Project Manager, 30 (thirty) days before the inception of the contract, that the policies have been taken out and that all premiums have been paid:</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	a) All Risk Insurance cover with regard to all Plant and Materials and Equipment, owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. b) Motor Vehicle and Liability Insurance cover indicating the registration numbers of the vehicles owned, leased or hired by the Contractor that are used in the execution of the contract to the amount of at least R10-million per claim with the number of claims unlimited. c) SASRIA cover for motor vehicles and Plant and Materials and Equipment owned, leased or hired by the Contractor that are used in the execution of the contract for the full replacement value thereof. d) In respect of Plant and Materials and Equipment and Motor Vehicles brought onto the Site by or on behalf of Subcontractors, the Contractor shall be deemed to have complied with the provisions of this Sub-Clause by ensuring that such Subcontractors have similarly insured such Plant and Materials and Equipment and Motor Vehicles. e) Proof must also be submitted that the Contractor complies with the conditions of the following legislation: i. Compensation for Occupational Injuries and diseases, 1993. ii. Unemployment Insurance Act, 1996. iii. The Contractor shall in respect of the Site of the contract works appoint in writing a Section 16 appointee to meet the requirements of the Health and Safety Act, No. 85 of 1993 as amended. f) The Project Manager involved must furnish the required insurance documentation 30 (thirty) days before the inception of the contract to the Section: Insurance and Risk Management. g) In addition to any statutory obligations and/or requirements contained in the General Conditions of Contract, the Contractor shall notify the Employer and the Project Manager of every occurrence within 48 (forty-eight) hours giving the circumstances, nature and an estimate of the loss or damage. h) The Project Manager will be responsible too complete and submit the relevant claim documentation for each incident within 30 (thirty) days after the incident occurred to the Section: Insurance and Risk Management. Should the incident be reported by the Project Manager more than 30 (thirty) days after the incident occurred to the Section: Insurance and Risk Management, the claim will only be considered if the claim documentation is accompanied by a letter from the relevant Strategic Executive Officer motivating the reason(s) for the late reporting of the incident, but the Project Manager must take note the Insurer might repudiate the loss if it is found that the insurers rights have been compromised as a result of the late reporting. i) The following documentation must be included with the claim documentation: a. Photos of damages caused or suffered as proof or substantiation of the claims. j) In the event of Insured Property being damaged during the Contract Works beyond economical repair, the property must be safeguarded and be handed over to the Employer's insurer for salvage. k) The Section: Insurance and Risk Management will inform the Employer's insurer of the incident. The Contractor/Subcontractor shall afford all reasonable access to the Site to the Employer, the Project Manager, the Employer's insurers and/or representatives for the purpose of assessment of any loss or damage. 8.6.8 Reporting of catastrophic incidents In the event of an occurrence, which is likely to give rise to a claim, under the insurance policy effected by the Employer, with an estimated loss or damage of

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	<i>more than R250 000,00, the Contractor and the Project Manager will adhere to the following procedures:</i> a) <i>In addition to any statutory obligations and/or requirements contained in the General Conditions of Contract, the Contractor shall notify the Employer and the Project Manager of every occurrence within 24 (twenty-four) hours giving the circumstances, nature and an estimate of the loss or damage.</i> b) <i>The Project Manager must notify the Section: Insurance and Risk Management on the same day that the Contractor has notified the Project Manager of the incident.</i> c) <i>The Section: Insurance and Risk Management will notify the Employer's insurer of the incident. The Contractor shall afford all reasonable access to the Site to the Employer, the Project Manager, the Employer's insurers and/or representatives for the purpose of assessment of any loss or damage</i> d) <i>The Project Manager will be responsible to complete and submit the relevant claim documentation for each incident within 30 (thirty) days after the incident occurred to the Section: Insurance and Risk Management. Should the incident be reported by the Project Manager more than 30 (thirty) days after the incident occurred to the Section: Insurance and Risk Management, the claim will only be considered if the claim documentation is accompanied by a letter from the relevant Group Head motivating the reason(s) for the late reporting of the incident. Should the relevant claim documentation not be submitted within 30 (thirty) days, the claim will be repudiated.</i> 8.6.9 <i>Reporting of crime related incidents</i> <i>All crime related incidents, losses or shortages irrespective of the value, must be reported within 24 (twenty-four) hours by the person who was involved or who has discovered the incident to the nearest South African Police Services (SAPS) station. The name of the Police Station, Investigation Officer and the Case number must be obtained and stated on the Contractor Claim Form. Should the incident not be reported to the SAPS, the claim will be repudiated.</i> 8.6.10 <i>Claim documentation</i> <i>The Project Manager must obtain all relevant information from the Contractor and complete the Contractor Claim Form, included in this report as Annexure B that is available on the Intranet. The project number must be stated on the Contractor Claim Form.</i> <i>The Project Manager must submit with the Contractor Claim Form a detailed cost sheet indicating the estimate of the loss or damage.</i> <i>Any misrepresentation, mis-description or non-disclosure of material facts, at the option of the insurers, can result in claims submitted being declared null and void.</i> 8.6.11 <i>Authorization of claim forms</i> <i>It is imperative that a formally delegated official or his nominee of the Employer should authorize the Contractor Claim forms as proof of the appropriate authorization, verification and approval of claims submitted. The Group Head must provide an authorization letter to the Section: Insurance and Risk Management stating the names and the specimen signatures of the delegated official or his nominee within 30 (thirty) days from approval of this report by</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	<i>Council. Should the delegated official or his nominee not sign the relevant claim form, the claim will be repudiated as this may lead to inappropriate independent verification of the validity of claims, thereby increasing the risk of insurance fraud and consequent reputation damage to the Employer.</i>
8.6.12	<i>Contractor to pay deductibles</i> <i>Any claim in terms of the insurance affected by the Employer shall be subject to the Contractor being responsible for the payment of the amount stated in the Annexure to the Policies as being the deductible (first amount payable or Excess) as defined in the Certificate of Insurance issued by the Employer's insurer in terms of the Policy.</i>
8.6.13	<i>Settlement of claims</i> <i>All incidents reported to the Section: Insurance and Risk Management in respect of an occurrence, which is likely to give rise to a claim will be forwarded to the Employer's insurer who will take the necessary actions for the settlement of any such claims.</i> <i>The Contractor shall negotiate for the settlement of claims with the Employer or the Employer's insurer through the Section: Insurance and Risk Management. The Employer's Chief Financial Officer will authorize all settlements of claims. Should action for the settlement of any such claim to the satisfaction of the Project Manager not be taken by the Contractor within 30 (thirty) days after receipt of such claim by the Contractor, the Employer or the Employer's insurer may settle any such claim, after giving the Contractor notice of its intention to do so; provided that no such claim shall be settled by the Employer or the Employer's insurer without first consulting the Contractor.</i> <i>The foregoing provisions of this Sub-Clause shall apply mutatis mutandis to any such claim received by the Contractor directly</i> <i>Add the following Clause:</i> <i>Pricing of Standing Time</i> <i>The Contractor shall price the standing time items included in the Pricing Data and set out all labour and equipment he proposes to use in the execution of the Contract and their respective daily rates in a Schedule attached to the Bill of Quantity of this tender.</i> <i>These rates shall only be subject to escalation if the Contract is subject to escalation, failing which they will be fixed for the duration of the Contract including any extension of time that may be granted in accordance with the provisions of the Contract.</i> <i>Contractor's Plant:</i> <i>The standing time rates shall be the total cost to the Employer in respect of any standing time incurred by the Contractor and shall include for all Contractor's profits, overheads, transport to site, establishment on site, removal from site, supervision, hire rates, fuel, oil, maintenance and servicing, associated items such as slings, jackets, etc. test certificates, operator costs (including overtime and Sunday time), accommodation, travelling, subsistence and other costs relative to the employment by the Contractor of the personnel.</i>

CLAUSE / SUB-CLAUSE	VARIATION / ADDITION
	<i>Contractor's Labour:</i> <i>The standing time rates shall be the total cost to the Employer in respect of standing time of labour and shall include for all Contractor's profits, overheads, establishments, supervision, wages, accommodation, travelling, subsistence and other costs relative to the employment by the Contractor of the categories of labour detailed, and for hand and small tools such as cutting and welding torches, angles grinders, drilling machines, etc. and consumables normal to the trade or labour category.</i>
11.2	<i>Where the Contractor has not inserted rates for specific labour or plant, that could have reasonably have been foreseen at tender stage, the Employer's Agent – in agreement with the employer shall have the sole discretion, in the event of such foreseeable labour and plant becoming necessary, to set a rate that is in his opinion the most appropriate for such labour or tradesmen.</i> <i>No additional Preliminary and General costs shall be paid for standing time as these costs shall be deemed to be covered for in the rates and prices for Preliminary and General items. If the contract duration is extended, then the Preliminary and General charges shall be adjusted accordingly as stated in the General Condition of Contract only if the motivation is recommended by the engineer and approved by the client.</i>
11.3	<i>The payment of any standing time by the Employer shall be subject to the Contractor demonstrating that it has a valid claim in terms of Clause 10.1 of the GCC.</i>

C1.2.3 DATA PROVIDED BY THE EMPLOYER

CLAUSE/OPTION		DATA	
1.1.1.13	The Defects Liability period is:	12 (twelve) months from the date of the Certificate of Completion.	
1.1.1.14.1	Start/ commencement date	The starting/commencement date is the date from the date of site handover. The contractor is to submit documents listed under clause 5.3.1 herein prior to commencement.	
1.1.1.14.2	The time for achieving Practical Completion is:	36 months from date of commencement as allocated by the Employer's Agent	
1.1.1.15	The name of the Employer is:	City of Tshwane Metropolitan Municipality.	
1.1.1.26	The Pricing Strategy is:	Re-measurement Contract	
1.2.1.2	The address of the Employer is:	Physical Address:	Human Settlements Division 1st floor Tshwane House 320 Madiba Street Pretoria 0002
		Postal Address:	P O Box 440 PRETORIA 0001
		E-Mail Address:	semakalengd@tshwane.gov.za
1.1.1.16	The name of the Employer's Agent is:	DPT Civil and Structural Engineers	
1.2.1.2	The address of the Employer's Agent is:	Physical Address:	284 Braam Pretorius, Sinoville Street Sinoville Corner Complex, Pretoria 0129
		Postal Address:	Postnet Suite 453 Private BAG X504 Sinoville Pretoria 0129
		E-Mail Address:	lehlohonolom@ditshimega.co.za
1.1.1.17	The name of the Construction Health and Safety Agent is:	TMA Consulting Engineers	
1.2.1.3	The address of the Employer's Agent is:	Physical Address:	10 Bowkeria Street Brackendowns 1448
		Postal Address:	10 Bowkeria Street Brackendowns 1448
		E-Mail Address:	tmabokatshaba@gmail.com
3.1.3		- The Employer's Agent is required to obtain approval of the Employer: - for expenditure on the Contract to exceed the Contract Price;	

		▪ prior to the execution of any of the following duties of functions: <table><tr><th>CLAUSE</th><th>DUTY/FUNCTION</th></tr><tr><td>3.2.4</td><td>Authorization to Employer’s Agent Representative or any other person</td></tr><tr><td>3.3.1</td><td>Nomination of person as Employer’s Agent Representative</td></tr><tr><td>4.10.1</td><td>Approval to use the Site for any other purpose such as housing</td></tr><tr><td>5.3.1</td><td>Delivery of the written notice to commence the execution of the works</td></tr><tr><td>5.6.3</td><td>Approval of programme of construction</td></tr><tr><td>5.7.2</td><td>Permission to carry out work by day and by night</td></tr><tr><td>5.8.1.1</td><td>Approval to work on special non-working days and between sunset and sunrise</td></tr><tr><td>5.9.7</td><td>Approval of Contractor’s designs</td></tr><tr><td>5.11</td><td>Suspension of progress of the Works</td></tr><tr><td>5.13.2</td><td>Reduction of penalty for delay</td></tr><tr><td>5.14.2</td><td>The issue of a Certificate of Practical Completion</td></tr><tr><td>5.14.4</td><td>The issue of a Certificate of Completion</td></tr><tr><td>5.16.1</td><td>The issue of a Final Approval Certificate</td></tr><tr><td>6.3.1</td><td>Variation Orders in respect of variations which are not small</td></tr><tr><td>6.6</td><td>Instruction to expend on Provisional and Prime Cost Sums</td></tr><tr><td>6.11</td><td>Adjustment of Preliminary and General allowances</td></tr><tr><td>7.8.1</td><td>Order to execute work of repair, etc, during the Defects Liability Period</td></tr><tr><td>7.8.2</td><td>Determination of value of repair work</td></tr><tr><td>8.2.2.2</td><td>Order to repair and make good damage arising from any excepted risk</td></tr></table>	CLAUSE	DUTY/FUNCTION	3.2.4	Authorization to Employer’s Agent Representative or any other person	3.3.1	Nomination of person as Employer’s Agent Representative	4.10.1	Approval to use the Site for any other purpose such as housing	5.3.1	Delivery of the written notice to commence the execution of the works	5.6.3	Approval of programme of construction	5.7.2	Permission to carry out work by day and by night	5.8.1.1	Approval to work on special non-working days and between sunset and sunrise	5.9.7	Approval of Contractor’s designs	5.11	Suspension of progress of the Works	5.13.2	Reduction of penalty for delay	5.14.2	The issue of a Certificate of Practical Completion	5.14.4	The issue of a Certificate of Completion	5.16.1	The issue of a Final Approval Certificate	6.3.1	Variation Orders in respect of variations which are not small	6.6	Instruction to expend on Provisional and Prime Cost Sums	6.11	Adjustment of Preliminary and General allowances	7.8.1	Order to execute work of repair, etc, during the Defects Liability Period	7.8.2	Determination of value of repair work	8.2.2.2	Order to repair and make good damage arising from any excepted risk
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5.3.1	The documentation required before commencement with Works execution are:	• Health and Safety Plan (Refer to Clause 4.3) • Initial programme (Refer to Clause 5.6) • Security (Refer to Clause 6.2) • Proof that all contributions required in terms of the provisions of the Workman’s Compensation Act (Act no 30 of 1941) as amended in 1993, 2002 have been paid (Refer to Cause 4.3.2) • A certified copy of Unemployment Insurance Certificate, Act of 1996 (Refer to Clause 4.3.2) or proof of registration																																								
5.3.2	The time to submit the documentation required from the Commencement Date is:	21 calendar days																																								
5.8.1	The non-working days are:	Saturdays and Sundays																																								
	The special non-working days are:	• Annual builders holiday																																								

		- Statutory public holidays - Sundays																		
5.13.1	The penalty for failing to complete the works is:	The penalty for failing to complete the Works is R10 000.00 per calendar day.																		
5.16.3	The latent defect period is:	10 years, commencing on the day after the date of certification of Final Completion																		
6.2.1	Type of security for due performance:	Guarantee from approved financial institution or cash deposit. The Form of Guarantee is to contain the wording of the pro forma document included as C1.3 contained herein.																		
	Liability of performance guarantee	The liability of the guarantee shall be 10% of the contract value																		
6.8.2	Adjustment in rates and/or prices	- The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values: “L” is the “Labour Index” and shall be Gauteng, under CPI as published by Statistics South Africa. “P” is the “Plant Index” and shall be Plant and equipment, under Mining and construction plant and equipment price index as published by Statistics South Africa. “M” is the “Material Index” and shall be Civil Engineering – total, under Civil engineering material price indices as published by Statistics South Africa. “F” is the “Fuel Index” and shall be Diesel, under PPI as published by Statistics South Africa. <table border="1"> <thead> <tr> <th>Coefficient</th><th>Description</th><th>Value</th></tr> </thead> <tbody> <tr> <td>X</td><td>Portion not subject to adjustment</td><td>0.10</td></tr> <tr> <td>A</td><td>Labour</td><td>0.20</td></tr> <tr> <td>B</td><td>Civil Engineering Plant</td><td>0.25</td></tr> <tr> <td>C</td><td>Materials</td><td>0.40</td></tr> <tr> <td>D</td><td>Fuel</td><td>0.15</td></tr> </tbody> </table> (Coefficients a, b, c and d must sum to one) - The urban area nearest the Site is Tshwane. - The base month is <u>the month prior to the closing of the procurement process required for a financial offer.</u>	Coefficient	Description	Value	X	Portion not subject to adjustment	0.10	A	Labour	0.20	B	Civil Engineering Plant	0.25	C	Materials	0.40	D	Fuel	0.15
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D	Fuel	0.15																		
6.8.3	Price adjustment for variations in the cost of special materials	Not allowed																		
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is:	80% (Eighty percent)																		
6.10.3	Percentage retention is:	10% (ten percent) exclusive of VAT of monthly invoice																		
	The limit of retention money is:	5% (five percent) of Contract Sum, excluding contingencies and VAT.																		

8.6	Insurance of the Works and Public Liability Insurance	The Employer shall arrange this insurance. A copy of the policy and the list of excesses may be obtained from Contractors All Risk and Liability Insurance Ms. Morongwa Mokoena (Tel: 012 358 1126) (morongwam@tshwane.gov.za) Mrs Ronett Marlow-Reid (Tel: 012 358 1131) (ronettm@tshwane.gov.za) Mr Lawrence Matjila (Tel: 012 358 1374) (lawrencem@tshwane.gov.za)
	The value of plant and materials supplied by the Employer to be included in the insurance sum is:	R 0 (zero)
	Responsibility for payment of deductibles in respect of Insurance of Works as well as Public Liability Insurance:	Deductibles are the responsibility of the Contractor
	Construction Plant:	Contractor to insure. Policy to be approved by Employer
10.5	Determination of disputes	Ad-hoc Adjudicator
10.5.3	Number of Adjudication Board members to be appointed:	One
10.6	Disagreement with Adjudication Board's decision, refer matters to:	Court proceedings

C1.2.4 DATA PROVIDED BY THE CONTRACTOR

CLAUSE/OPTION		DATA		
1.1.1.9	The name of the Contractor is:			
1.2.1.2	The address of the Contract is:	• Physical Address:		
		• Postal Address:		
		• Facsimile:		
		• E-Mail Address:		
6.2.1	The security to be provided by the Contractor shall be	Performance guarantee (10% <i>(ten percent)</i> of the Contract Sum of the project allocated, excluding contingencies and VAT)		
6.8.3	Price adjustments for variations in the cost of special materials (if applicable)	The variation in cost of special materials is:		
		Type of material	Unit	Base Rate or Price

***THE BELOW FORMS WILL BE COMPLETED ONCE THE TENDER IS AWARDED**

C1.3 FORM OF GUARANTEE

WHEREAS

The City of Tshwane Metropolitan Municipality

(hereinafter referred to as the "Council"),

enters into a Contract (No _____) with

(hereinafter referred to as the "Contractor")

for _____

AND WHEREAS in terms of the General Conditions of the Contract the Contractor is required to furnish an acceptable independent guarantee for the due and proper fulfilment by him of all his duties and obligations in terms of the said contract.

NOW THEREFORE we the undersigned _____

_____ (full names of authorized agent(s))

and acting in my/our capacity as _____

and _____

and as such duly authorized thereto, do hereby bind the said _____

(hereinafter referred to as the "Guarantor") as surety and co-principal Debtor *in solidum* for the sum of

R _____ (_____)

for the due and proper fulfilment by the Contractor of all or any of his duties and obligations in terms of the said Contract. The guarantee shall not be interpreted as accessory to the contract between Council and the Contractor.

The Guarantor further undertakes, in the event of the Contractor failing duly and properly to fulfil any of his duties and obligations in terms of the said Contract, or if the Contractor is placed under provisional liquidation or in the event of termination of the Contract by the Council in terms of the General Conditions of Contract, to pay to the Council the said sum of

R _____ (_____)

or such portion thereof as may be required by the Council, immediately upon receiving written demand from the Council which written demand shall be addressed to the Guarantor at (*domicilium* address)

The Guarantor further hereby renounces the benefits of the legal exceptions:

Exceptio non numerate pecuniae

Exception non causa debiti

Beneficium de duobus vel pluribus reis debendi

Beneficium ordinis deu excussionis

Beneficium divisionis

and all other defence which could be pleaded against the validity of this guarantee, with the meaning and effect of which it declares itself to be fully acquainted.

This undertaking shall remain in full force and effect up to and including the date of issue of the Certificate of Completion, as provided for in the General Conditions of Contract, unless the Guarantor is advised in writing by the Council of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated. Notwithstanding the aforesaid, the Council may at its' sole discretion elect to have the amount provided for under this guarantee, paid out directly to it in the case of breach of contract by the Contractor by giving the Guarantor written notice to that effect, notwithstanding the fact that the Council may decide not to institute any further legal action against the Contractor.

This document is not negotiable or transferable.

FOR AND ON BEHALF OF THE BANKER/INSURER:

BANKER/INSURER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at

on this

day of

WITNESSES:

(Full name in BLOCK letters and signature)

1.

2.

ANNEXURE

List of some institutions from which contract /deposit guarantees can be accepted. The contractor can utilize other institutions as long as they are registered with the NCR.

ABSA Bank
Credit Agricole Indosuez (South Africa Branch)
Development Bank of South Africa
FirstRand Bank
ING Bank N.V. (South Africa Branch)
Investec Bank
Landbank
National Housing Finance Co.
Nedcor Bank
South African Reserve Bank
Standard Bank
AIG South Africa
Credit Guarantee Insurance Co
Emerald Insurance Company
Federated Employers Mutual Assurance Co
Global Insurance Company
Guardrisk Insurance Company
Hannover Re:
Home Loan Guarantee Company
Lion of Africa Insurance Company
Metropolitan Life
Metropolitan Odyssey Ltd
MUA Insurance
Mutual & Federal Insurance Company
Rand Mutual Assurance Company
Regent Insurance Company
SA Eagle Insurance Company
Lombard Insurance.

C1.4 HEALTH AND SAFETY AGREEMENT

Article of Agreement in terms of Section 37(2) of the Occupational Safety Act, 1993 between

CITY OF TSHWANE

(Hereinafter referred to as the "EMPLOYER")

AND

Herein represented by _____ in his/her capacity as _____ duly authorised
by virtue of a resolution dated _____, attached hereto Annexure A, of the said
_____ (herein after referred to as the
"CONTRACTOR")

WHEREAS the CONTRACTOR is the mandatory of the EMPLOYER as contemplated in an agreement in respect of

TENDER FOR THE APPOINTMENT OF A CONTRACTOR FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

AND WHEREAS section 37 of the Occupational Health and Safety act, 1993 (Act 85 of 1993, hereinafter referred to as the "ACT"), imposes certain powers and duties upon the EMPLOYER.

AND WHEREAS the parties have agreed to enter into an agreement in terms of section 37(2) of the ACT.

NOW THEREFORE the parties agree as follows:

- (a) The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.
- (b) The CONTRACTOR undertakes that all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations will be fully complied with. Provided that should the EMPLOYER prescribe certain arrangements and procedures, that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.
- (c) The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedure, if any, imposed by the ACT and Regulations and the EMPLOYER expressly absolves the EMPLOYER from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedure as the case may be.

- (d) The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with the undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to inspect any appropriate records held by the CONTRACTOR or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.
- (e) The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigations, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such an investigation, complaint or criminal charge as the case may be

FOR AND ON BEHALF OF THE CONTRACTOR:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at _____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1. _____

2. _____

FOR AND ON BEHALF OF THE EMPLOYER:

NAME:

(in BLOCK letters)

CAPACITY:

(of authorized agent)

SIGNATURE:

(of authorized agent)

SIGNED at _____ on this _____ day of _____

WITNESSES:

(Full name in BLOCK letters and signature)

1. _____

2. _____

C1.5 ADJUDICATOR'S AGREEMENT

This agreement is made on the _____ day of _____ between:

(name of company /
organisation)

of _____

(address) and

(name of company /
organisation)

of _____

(address)

(the Parties) and

(name of
Adjudicator)

of _____

(address)

(the Adjudicator).

Disputes or differences may arise/have arisen¹ between the Parties under a Contract dated _____ and known as _____

and these disputes or differences shall be/have been² referred to adjudication in accordance with the CIDB Adjudication Procedure, (hereinafter called "the Procedure") and the Adjudicator may be or has been requested to act.

IT IS NOW AGREED as follows:

- 1 The rights and obligations of the Adjudicator and the Parties shall be as set out in the Procedure.
- 2 The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.
- 3 The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure as set out in the Contract Data.
- 4 The Parties and the Adjudicator shall at all times maintain the confidentiality of the adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.
- 5 The Adjudicator shall inform the Parties if he intends to destroy the documents which have been sent to him in relation to the adjudication and he shall retain documents for a further period at the request of either Party.

¹ Delete as necessary

² Delete as necessary

SIGNED by:

Name:

who warrants that he / she is duly authorised to sign for and on behalf of the first Party in the presence of

Witness

Name:

Address:

Date:

SIGNED by:

Name:

who warrants that he / she is duly authorised to sign for and behalf of the second Party in the presence of

Witness:

Name

Address:

Date:

SIGNED by:

Name:

the Adjudicator in the presence of

Witness:

Name:

Address:

Date:

Contract Data

1	The Adjudicator shall be paid at the hourly rate of R _____ in respect of all time spent upon, or in connection with, the adjudication including time spent travelling.
2	The Adjudicator shall be reimbursed in respect of all disbursements properly made including, but not restricted to: (a) Printing, reproduction and purchase of documents, drawings, maps, records and photographs. (b) Telegrams, telex, faxes, and telephone calls. (c) Postage and similar delivery charges. (d) Travelling, hotel expenses and other similar disbursements. (e) Room charges. (f) Charges for legal or technical advice obtained in accordance with the Procedure.
3	The Adjudicator shall be paid an appointment fee of R _____. This fee shall become payable in equal amounts by each Party within 14 days of the appointment of the Adjudicator, subject to an Invoice being provided. This fee will be deducted from the final statement of any sums which shall become payable under item 1 and/or item 2 of the Contract Data. If the final statement is less than the appointment fee the balance shall be refunded to the Parties.
4	The Adjudicator is/is not ³ currently registered for VAT.
5	Where the Adjudicator is registered for VAT it shall be charged additionally in accordance with the rates current at the date of invoice.
6	All payments, other than the appointment fee (item 3) shall become due 7 days after receipt of invoice, thereafter interest shall be payable at 5% per annum above the Reserve Bank base rate for every day the amount remains outstanding.

³ Delete as necessary

Contract No: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

Part C2: Pricing Data

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

**THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION
OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER
RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36
MONTHS**

PART C2: PRICING DATA

PRICING DATA

INDEX

Section	Description	Page No
C2.1	PRICING INSTRUCTIONS.....	C2.1.1
C2.2	BILL OF QUANTITIES	C2.2
C2.3	SUMMARY OF SCHEDULES.....	C2.3

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C2.1 PRICING INSTRUCTIONS

C2.1 PRICING INSTRUCTIONS

1. General

1.1 This section provides the tenderer with guidelines and requirements with regard to the completion of the Bill of Quantities. The Schedule **shall be completed in non-erasable black ink** and the tenderer is referred to the Tender Specifications in regard to the correction of errors.

1.2 The Bill of Quantities shall be read with all the documents which form part of this Contract.

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

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

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

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

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

Lump sum: An amount tendered for an item, the extent of which is described in the Bill of Quantities, the Specifications and the Project Specifications, but the quantity of work of which is not measured in any units.

1.4 Reference shall be made to the General and Special Conditions of Contract regarding Provisional and Prime Costs Sums.

2. Pay Items

2.1 The method of measurement published by the City of Tshwane in section 001 clause 04 and the clauses titled "Measurement and Payment" in the various sections of the Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005, is applicable, subject to the variations and amendments contained in section C3.5.

2.2 Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standard Specifications. The measurement and payment clause of each Standard 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 Standard Specification, or the Scope of Work, conflict with the terms of the Bill of Quantities, the requirements of the Standard Specification or Scope of Work, as applicable,

shall prevail.

- 2.3 The item numbers appearing in the Bill of Quantities refer to the corresponding item number in the standard specifications or as amended in the Scope of Work. In the latter case, the item number is prefixed with the letter “B”. The same applies to new clauses added to the standard specifications.
- 2.4 Those parts of the contract to be constructed using labour-intensive methods have been marked in the bill of quantities with the letter LI in a separate column filled in against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
- 2.5 Payment for items which are designated to be constructed labour-intensive (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.
- 2.6 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
- 2.7 The quantities set out in the Bill of Quantities are the estimated quantities of the Works, but the Contractor will be required to undertake whatever quantities may be directed by the Engineer from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
- 2.8 The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities 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 meter 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	P/sum	=	Provisional sum
kl	=	kilolitre	%	=	Per cent
MPa	=	megaspascal	kW	=	kilowatt
PS	=	Pipe Special number	V	=	Valve number

3. Rates

3.1 The prices and rates to be inserted in the Bill of Quantities are to be full inclusive prices for the work described under the several items. Such prices and rates 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 on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out.

3.2 A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered or where a word or phrase such as "included" or "provided elsewhere" will be accepted as a rate of nil (R0,00) having been entered against such items and covered by the other prices or rates in the Schedule.

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

3.3 The Tenderer shall fill in a rate against all items.

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

3.5 All rates and sums of money quoted in the Bill of Quantities shall be in rands and whole cents. Fractions of a cent shall be discarded.

3.6 All prices and rates entered in the Bill of Quantities must be excluding VAT. VAT will be added last on the summary page of the Bill of Quantities.

3.7 Should excessively high unit prices be tendered, such prices may be of sufficient importance to warrant rejection of a tender by the Employer.

CORRECTION OF ENTRIES MADE BY TENDERER

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

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

**TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE
COMPLETION OF A BULK WATER FEEDER LINE, WATER
RETICULATION AND SEWER RETICULATION IN BOOYSENS
EXTENSION 4 FOR A PERIOD OF 36 MONTHS.**

C2.2 BILL OF QUANTITIES

SIGNATURE OF PERSON AUTHORISED TO SIGN TENDER:

DATE :

PARTICULARS OF PERSON AUTHORISED TO SIGN THE TENDER:

Name: _____

Tel no: _____

ID no: _____

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 0		GENERAL				
SECTION 001	001	GENERAL REQUIREMENTS AND CHARGES				
B001.01	1,1	Preliminary and general charges				
001.01.01	1.1.1	Fixed charges	Lump Sum	1,00		
B001.01.02	1.1.2	Time-related charges	Months	36,00		
001.02	1,2	Locating existing services	Lump Sum	1,00		
001.03 (LI)	1.2.3	Excavate by hand to expose existing services, and backfill	m ³	400,00		
001.04	1,3	Compliance with the Occupational Health and Safety Act and applicable regulations				
001.04.01	1.3.1	Provision of Health and Safety plan	Lump Sum	1,00		
001.04.02	1.3.2	Provision of Health and Safety file	Lump Sum	1,00		
001.04.03	1.3.3	Provision of construction supervisors	Lump Sum	1,00		
B001.04.04	1.3.4	Provision of a SACPCMP registered safety officer (Full-time)	Month	36,00		
001.04.05	1.3.5	Health and Safety training	Lump Sum	1,00		
001.04.06	1.3.6	Provision of personal protective clothing and equipment	Lump Sum	1,00		
001.04.07	1.3.7	Provision of safety fences, signs and barricades	Lump Sum	1,00		

001.04.08	1,4	Other Obligations				
001.04.08.01	1.4.1	Provision of Environmental plan	Lump Sum	1,00		
001.04.08.02	1.4.2	Provision of Environmental file	Lump Sum	1,00		
001.04.08.03	1.4.3	Implementation of Health and Safety Obligations	Lump Sum	1,00		
001.04.08.04	1.4.4	Implementation and Compliance with Environmental Management Obligations (See Section C3.9)	Lump Sum	1,00		
001.04.08.05	1.4.5	Environmental training	Lump Sum	1,00		
001.04.08.06	1.4.6	Provision of Environmental Officer	Lump Sum	1,00		
001.04.08.07	1.4.7	Provision of Waste Management	Lump Sum	1,00		
001.05	1,5	Community liaison officer				
B001.05.01	1.5.1	Community liaison officer appointed at Task Level 5 Level 1 notch	Prov Sum	1,00	R720 000,00	R720 000,00
B001.05.02	1.5.2	Overheads, charges & profits on item B001.05.01	%	R720 000,00		
B001.07	1,6	Protection of services that intersect or adjoin a pipe trench				
B001.07.01	1.6.1	(i) Concrete Driveways	Prov Sum	1,00	R5 000,00	R5 000,00
B001.07.02	1.6.2	(ii) Walls	Prov Sum	1,00	R5 000,00	R5 000,00
	1.6.3	(iii) Water house connections	Prov Sum	1,00	R10 000,00	R10 000,00
	1.6.4	(iv) Electrical House Connections	Prov Sum	1,00	R10 000,00	R10 000,00
B001.07.03	1.6.5	(iii) Contractor's charge to allow for handling costs and profit in respect of sub item 001.07	%	R30 000,00		

Contract No: HS 04-2025/26
TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER
RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS
Part C2: Pricing Data

Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
B001.09	1,9	Day Works				
		.01 Provision of skilled, semi skilled and unskilled for day works				
	1.9.1	.01 Qualified Artisan	hr	10,00		
	1.9.2	.02 Semi-skilled labourer	hr	10,00		
	1.9.3	.03 Labourer	hr	10,00		
		.02 Plant Hire (use of plant already established on site for day works)				
	1.9.4	.01 Tipper Truck (10 ton)	hr	10,00		
	1.9.5	.02 Flatbed truck (5 ton)	hr	10,00		
	1.9.6	.03 Light delivery vehicle	hr	10,00		
	1.9.7	.04 Water Tanker (large)	hr	10,00		
	1.9.8	.05 Rammer	hr	10,00		
	1.9.9	.06 TLB	hr	10,00		
	1.9.10	.07 Impact Roller	hr	10,00		
	1.9.11	.08 Smooth Roller	hr	10,00		
	1.9.12	.09 Grader	hr	10,00		
B001.10	1,10	Appointment Of Local (Grade C and D) Security Company For The Duration Of Project	Lump Sum	1,00		
B001.11	1,11	Print, supply, distributions and removal of water interruptions notice colour printed				
B001.11.01	1.11.1	Colour printed in correx A5 flyers	No	500,00		
B001.12	1,12	Contract Notice Board				
B001.12.01	1.12.1	(Rate to include supply, erection, maintenance and dismantling and removal of the contract notice board)	No	2,00		

Contract No: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

Part C2: Pricing Data

B001.13	1,13	Cost of Survey in terms of the Land Survey Act				
B001.13.01	1.13.1	Trigonometrical Survey and Plot boundary pegs, Verify Benchmarks and Nodes Mark and Record Critical levels During Construction and As-Built	Prov Sum	1,00	R50 000,00	R50 000,00
B001.13.02	1.13.2	(a) Handling cost in respect of item B001.13.01	%	R50 000,00		
B001.14	1,15	SMME and Subcontractors Preliminary and General				
B001.14.01	1.15.1	Provisional Sum for subcontractor Preliminary and General	Prov Sum	1,00	R1 400 000,00	R1 400 000,00
B001.14.02	1.15.2	(a) Handling cost in respect of item B001.15.01	%	R1 400 000,00		
TOTAL SECTION 001: GENERAL - CARRIED TO SUMMARY						

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

[illegible]

TOTAL SECTION 002 : GENERAL - CARRIED TO SUMMARY	

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS

[illegible]

C.2.2.8

SPECIFICAT ION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUN T
Series 1		ANCILLARY WORK				
Section 101	1,1	SITE CLEARING AND GRUBBING				
101,01	1.1.1	Clearing and grubbing				
101.01.01	1.1.2	Areas	m ²	20,00		
101.01.02	1.1.3	Strips - pipeline route up to 6m wide	m	8076,00		
101,02	1.1.4	Cutting and removing larges trees with a girth-				
101.02.01	1.1.5	Exceeding 1-m up to and including 2-m	No.	2,00		
101.02.02	1.1.6	Exceeding 2-m up to and including 3-m	No.	2,00		
101,03	1.1.7	Grubbing and the removal of the stumps and roots of large trees with a girth-				
101.03.01	1.1.8	Exceeding 1-m up to and including 2-m	No.	2,00		
101.03.01	1.1.9	Exceeding 2-m up to and including 3-m	No.	2,00		
101.04	1.1.10	Re-clearing area (only on the written instructions of the Engineer)				
101.04.01	1.1.11	Strips 3m wide	m	4,00		
101.04.02	1.1.12	Areas Not classified as strips	m ²	4,00		
101.05	1.1.13	Removal and disposal of specific elements				
101.05.01	1.1.14	Concrete kerbing / kerbing combination	m	10,00		
101.05.02	1.1.15	Concrete or brick elements (reinforced or unreinforced)				
101.05.02.01	1.1.16	Concrete Work	m ³	20,00		
101.05.02.02	1.1.17	Brickwork	m ²	15,00		
TOTAL SECTION 101: SITE CLEARING AND GRUBBING						

C.2.2.10

C.2.2.11

SPECIFICAT ION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 1		ANCILLARY WORK				
Section 104	1,4	LANDSCAPING AND GRASSING				
104.01	1.4.1	Trimming:				
104.01.01	1.4.2	Machine trimming	m ²	10,00		
104.01.02	1.4.3	Hand trimming	m ²	10,00		
104.02	1.4.4	Use of machines for trimming or shaping (alternative to subitem 104.01.01):				
104.02.01	1.4.5	Smooth Roller	h	10,00		
104.02.02	1.4.6	Motor grader	h	10,00		
104.03	1.4.7	Preparing areas for grassing and ground covers:				
104.03.01	1.4.8	Scarifying	ha	1,00		
104.03.02	1.4.9	Topsoiling on the Site with:				
104.03.02.01	1.4.10	Topsoil obtained from the Site or borrow areas provided by the Employer	m ³	100,00		
104.03.02.02	1.4.11	Topsoil provided by the Contractor from other sources (including all haul)	m ³	100,00		
104.03.03	1.4.12	Topsoiling of borrow pits with topsoil obtained from borrow areas of from the Site	m ³	100,00		
104.03.04	1.4.13	Supplying and applying chemical fertilizers:				
104.03.04.01	1.4.14	Lime	t	1,00		
104.03.04.02	1.4.15	Superphosphate	t	1,00		
104.03.04.03	1.4.16	Limestone ammonium nitrate	t	1,00		
104.03.04.04	1.4.17	2:3:2 (22) 'Fertilizer'	t	1,00		
104.03.04.05	1.4.18	Other fertilizers if required (as instructed by the engineer)	t	1,00		

C.2.2.13

C.2.2.14

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 2		EARTHWORKS				
SECTION 202		TRENCHING				
202,01		Trench excavations:				
202,01,01		Up to 1,0m wide				
202.01.01.01		up to 1,0-m deep	m ³	60,00		
202.01.01.02		over 1-m up to 1,5-m deep	m ³	300,00		
202.01.01.03		Over 1,5 up to 2-m deep	m ³	250,00		
202.01.01.04		Over 2 up to 2,5-m deep	m ³	500,00		
202.01.01.05		Over 2,5 up to 3-m deep	m ³	200,00		
202.01.01.06		Over 3 up to 3.5-m deep	m ³	10,00		
202.01.01.07		Over 3.5 up to 4-m deep	m ³	10,00		
202,01,02		Over 1,0 m and up to 2,0 m wide				
202.01.02.01		up to 1,0-m deep	m ³	100,00		
202.01.02.02		over 1-m up to 1,5-m deep	m ³	120,00		
202.01.02.03		Over 1,5 up to 2-m deep	m ³	50,00		
202.01.02.04		Over 2 up to 2,5-m deep	m ³	1 500,00		
202.01.02.05		Over 2,5 up to 3-m deep	m ³	1 600,00		
202.01.02.06		Over 3 up to 3.5-m deep	m ³	1750,00		
202.01.02.07		Over 3.5 up to 4-m deep	m ³	1 350,00		
202,02		Extra over item 5.6.1 for excavating in-				
202.02.01		Intermediate excavation	m ³	1 050,00		
202.02.02		Hard material	m ³	10,00		
202,03		Excavations outside the Normal trench profile	m ³	3 500,00		
202,04		Hand excavation	m ³	100,00		
202,06		Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	6 790,00		

202,07		Extra over item 5.6.10 for using backfill material obtained –				
202.07.01		From borrow areas	m ³	20,00		
202.07.02		From source provided by contractor	m ³	100,00		
202.08		Backfilling additional excavations in trench floor, using -				
202.08.01		Class 1:3:6/19 concrete	m ³	10,00		
202.08.02		Concrete aggregate, max size 38 mm	m ³	10,00		
202.10		Removal of spoil material –				
202.10.02		To dumping areas to be provided by the Contractor	m ³	500,00		
202,13		Extra over item 202.06 for additional compaction of backfill to 93% of MOD AASHTO density in road reserves	m ³	50,00		
TOTAL SECTION 202: GENERAL EARTHWORKS						

C.2.2.17

SPECIFICAT ION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 8	1.1	SPECIFIC WORKS				
B810		BULK STEEL PIPELINE REMEDIAL WORK				
B810.01	1.1.6	Pigging services. (Cleaning, Inspection, Gauging and Batching for 1100mm, 1000mm, 900mm, 800mm and 700mm pipe)	Prov Sum	1,00	R1 280 000,00	R1 280 000,00
B810.02	1.1.7	Cleaning of all foreign materials inside partially installed Steel Pipes by previous contractor,				
B810.02.01	1.1.8	1 100mm NB	m	10,00		
B810.02.02	1.1.9	1 000mm NB	m	10,00		
B810.02.03	1.1.10	900mm NB	m	10,00		
B810.02.04	1.1.11	800mm NB	m	10,00		
B810.03	1.1.17	Testing of internal pipe lining and external coating of partially installed Steel Pipes by previous contractor,	Lump Sum	1,00		
B810.04	1.1.18	X-ray scanning of partially installed steel pipe joints by previous contractor				
B810.04.01	1.1.19	1100mm steel	No.	30,00		
B810.04.02	1.1.20	1000mm steel	No.	35,00		
B810.04.03	1.1.21	900mm steel	No.	20,00		
B810.04.04	1.1.22	800mm steel	No.	45,00		
B810.05	1.1.23	lidar Camera Inspection of Existing steel pipe irrespective of pipe diameter	PC sum	1,00		
B810.06	1.1.24	Service detection along pipe route including detection of existing bulk water pipe	m	4831,00		
B810.07	1.1.25	Repair of all pipe defects of partial installed Steel Pipes by previous contractor,	PC sum	1,00		
TOTAL SECTION 001: BULK WATER REMEDIAL						

C.2.2.19

C.2.2.20

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 8	1,8	SPECIFIC WORKS				
B813		SEWER RETICULATION PIPELINE REMEDIAL WORK				
B813.01		Sewer testing of manholes as per the project SANS Specification for manholes of depths;				
B813.01.01		For excavations below 2.5m deep	No.	18,00		
B813.01.02		Over 2,5 m and up to 4,0 m deep	No.	3,00		
B813.02		Air testing of sewers				
B813.02.01		110 mm uPVC Class 34 (LI)	m	10,00		
B813.02.02		160 mm uPVC Class 34 (LI)	m	1800,00		
B813.02.03		200 mm uPVC Class 34 (LI)	m	10,00		
B813.02.04		250 mm uPVC Class 34 (LI)	m	10,00		
B813.03.01		CCTV Camera Inspection				
B813.03.02		110 mm uPVC Class 34 (LI)	m	10,00		
B813.03.03		160 mm uPVC Class 34 (LI)	m	3600,00		
B813.03.03		200 mm uPVC Class 34 (LI)	m	10,00		
B813.03.08		250 mm uPVC Class 34 (LI)	m	10,00		
B813.04		Breaking and repairing benching and channelling in existing manhole to accommodate	No.	21,00		
B813.02 (LI/SC)		Point repairs				
B813.02.01		Point repair by replacing pipe	No.	50,00		
B813.02.02		(Extra over item 302.01 if pipe is replaced during point repair as specified) B813.02.01 Point repair of backfall in new pipe	No.	50,00		
B813.04		Sewer pipework cleaning				
B813.04.01		Removal of sand, silt, roots, etc (all causes) from sewer pipes using various rodding equipment for pipe diameter				
B813.04.01.01		a) 110mm uPVC	m	0,00		
B813.04.01.02		b) 160mm uPV	m	250,00		

B813.04.01.03		c) 200mm uPVC	m	0,00		
B813.04.02		<u>Removal of sand silt, roots, etc. (all causes) using high pressure water jetting equipment at +450bar pressure diameter</u>				
B813.04.02.01		a) 110mm uPVC	m	0,00		
B813.04.02.02		b) 160mm uPV	m	1450,00		
B813.04.02.03		c) 200mm uPVC	m	0,00		
B813.04.03		<u>Removal of silt, fat, etc. (all causes) using combination of vacuum jetting methods apart from high pressure equipment for sewer pipes (Vactor or similar) for pipe diameter</u>				
		a) 110mm uPVC	m	0,00		
		b) 160mm uPV	m	1450,00		
		c) 200mm uPVC	m	0,00		
B813.05		Combination truck with a storage size of 10 kl or better, complete with high pressure washing and vacuum suction facility	day	10,00		
B813.06		Sewer Manhole Cover Replacement				
B813.06.01		Supply all material and equipment required for the removal of damaged sewer manholes and replace with new sewer manhole covers per the requirement by the CoT Standards	No	3,00		
B813.07		Leaking/ seeping precast concrete manholes				
		Remove sand from leaking manholes and relay with proper jointing and seal for manholes of depth:				
B813.06.01		for excavations below 1.5m deep	No	12,00		
Total Carried forward						

C.2.2.23

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 1		ANCILLARY WORK				
SECTION 101	2.1	SITE CLEARING AND GRUBBING				
101.01	2,1	Clearing and grubbing				
101.01.01	2.1.1	Areas	m ²	10,00		
101.01.02	2.1.2	Strips - pipeline route up to 6m wide	m	1360,00		
101.02	2.1.3	Cutting and removing larges trees with a girth-				
101.02.01	2.1.4	Exceeding 1-m up to and including 2-m	No.	10,00		
101.02.02	2.1.5	Exceeding 2-m up to and including 3-m	No.	10,00		
101.03	2.1.6	Grubbing and the removal of the stumps and roots of large trees with a girth-				
101.03.01	2.1.7	Exceeding 1-m up to and including 2-m	No.	10,00		
101.03.01	2.1.8	Exceeding 2-m up to and including 3-m	No.	10,00		
101.04	2.1.9	Re-clearing area (only on the written instructions of the Engineer)				
101.04.01	2.1.10	Strips 6m wide	m	10,00		
101.04.02	2.1.11	Areas Not classified as strips	m ²	5,00		
101.05	2.1.12	Removal and disposal of specific elements				
101.05.01	2.1.13	Concrete kerbing / kerbing combination	m	10,00		
101.05.02	2.1.14	Concrete or brick elements (reinforced or unreinforced)				
101.04.02.01	2.1.15	Concrete Work	m ³	50,00		
101.04.02.02	2.1.16	Brickwork	m ²	50,00		
101.04.03	2.1.17	Asphalt surfacing	m ²	20,00		
TOTAL SECTION 101: SITE CLEARING AND GRUBBING						

C.2.2.29

C.2.2.30

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 2		EARTHWORKS				
Section 202	2,4	TRENCHING				
202.01	2.4.1	Trench excavations:				
202.01.01	2.4.2	Over 1,0-m and up to 2,0-m wide				
202.01.01.01	2.4.3	up to 1,0-m deep	m ³	50,00		
202.01.01.02	2.4.4	over 1-m up to 1,5-m deep	m ³	150,00		
202.01.01.03	2.4.5	Over 1,5 up to 2-m deep	m ³	630,00		
202.01.01.04	2.4.6	over 2-m up to 2,5-m deep	m ³	3600,00		
202.01.01.05	2.4.7	Over 2,5 up to 3-m deep	m ³	50,00		
202.01.01.06	2.4.8	over 3-m up to 3,5-m deep	m ³	50,00		
202.01.01.07	2.4.21	Over 3,5 up to 4-m deep	m ³	50,00		
202,02	2.4.22	Extra over item 5.6.1 for excavating in-				
202.02.01	2.4.23	Intermediate excavation	m ³	250,00		
202.02.02	2.4.24	Hard material	m ³	550,00		
202,03	2.4.25	Excavations outside the Normal trench profile	m ³	100,00		
202,04	2.4.26	Hand excavation	m ³	150,00		
202,06	2.4.27	Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	2880,00		
202,07	2.4.28	Extra over item 5.6.10 for using backfill material obtained –				
202.07.01	2.4.29	From borrow areas	m ³	10,00		
202.07.02	2.4.30	From source provided by contractor	m ³	10,00		
202.10	2.4.31	Removal of spoil material –				
202.10.02	2.4.32	To dumping areas to be provided by the Contractor	m ³	50,00		
202,12	2.4.33	Extra over item 5.6.15 for additional compaction of backfill to 93% of MOD AASHTO density in road reserves	m ³	2880,00		
202,13	2.4.34	Backfilling trenches with soilcrete	m ³	10,00		

202,15	2.4.35	Reinstatement of bitumen surfaced roads	m²	5,00		
TOTAL SECTION 202: TRENCHING						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	2,5	CONSTRUCTION				
402,01	2.5.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	2.5.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	2.5.3	1 100mm NB x 10mm wall	m	150,00		
	2.5.4	1 000mm NB x 10mm wall	m	650,00		
	2.5.4	900mm NB x 10mm wall	m	10,00		
	2.5.5	800mm NB x 8mm wall	m	50,00		
	2.5.6	700mm NB x 8mm wall	m	263,00		
402,02	2.5.15	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	2.5.16	Bends, long radius, up to and including 15°				
	2.5.17	1 100mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	3,00		
	2.5.18	1 000mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	4,00		
	2.5.18	900mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	1,00		
	2.5.19	800mm NB (813 OD) x 8mm wall, plain-ended for field welding	No.	3,00		
402.02.02	2.5.20	Bends, long radius, over 15° up to and including 30°				
	2.5.21	1 100mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	1,00		
	2.5.22	1 000mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	3,00		

	2.5.23	900mm NB (813 OD) x 8mm wall, plain-ended for field welding	No.	1,00		
	2.5.23	800mm NB (813 OD) x 8mm wall, plain-ended for field welding	No.	1,00		
402.02.03	2.5.24	Bends, long radius, over 30° up to and including 45°				
	2.5.25	1 100mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	2,00		
	2.5.26	1 000mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	2,00		
	2.5.27	900mm NB (813 OD) x 8mm wall, plain-ended for field welding	No.	1,00		
	2.5.28	800mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	4,00		
402.02.04	2.5.32	Bends, long radius, over 45° up to and including 90°				
	2.5.33	1 100mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	3,00		
	2.5.34	1 000mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	3,00		
	2.5.34	900mm NB (1 016 OD) x 10mm wall, plain-ended for field welding	No.	1,00		
	2.5.36	800mm NB (813 OD) x 8mm wall, plain-ended for field welding	No.	1,00		
	2.5.36	700mm NB (000 OD) x 8mm wall, plain-ended for field welding	No.	5,00		
B402.02.24	2.5.37	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
PS 402.02	2.5.38	<u>Protective pipe wrapping system for pipe joints, bends and all other exposed steel pipe specials & flanges, Denso or equal approved</u>				
PS 402.02.01	2.5.39	Priming Solution	l	171,00		
PS 402.02.02	2.5.40	Profiling Mastic	kg	50,00		
PS 402.02.03	2.5.41	Petrolatum Tape	m	1000,00		
PS 402.02.04	2.5.42	PVC Noon-adhesive tape	m	1000,00		

Contract No: **HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS**

Part C2: Pricing Data

402.02.04	2.5.43	Wrapper plates, 150-mm wide x 10mm thick mild steel, curvature to suit OD of steel pipe				
	2.5.44	1100-mm Nominal diameter	No.	3,00		
	2.5.45	1000-mm Nominal diameter	No.	3,00		
Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
402.02.09.03	2.5.46	900-mm Nominal diameter	No	1,00		
	2.5.47	800-mm Nominal diameter	No.	3,00		
402.02.05	2.5.48	Wrought steel plate flanges prepared for field welding to SANS 1123, table 2500/3, welded to pipeline in diameters:				
	2.5.49	1100-mm Nominal diameter	No.	3,00		
	2.5.50	1000-mm Nominal diameter	No.	3,00		
	2.5.51	900-mm Nominal diameter	No.	1,00		
	2.5.52	800-mm Nominal diameter	No.	3,00		
	2.5.53	Encasement of pipes using class 20/19 concrete	m ³	10,00		
402.04	2.5.54	Providing thrust blocks using class 20/19 concrete	m ³	1000,00		
402,05	2.5.55	Supplying and placing unscreened selected backfill material under alongside and up to 200mm above pipe barrels using:				
402.05.01	2.5.56	Excavated material	m ³	10,00		
402.05.02	2.5.57	Imported material from source provided by the Employer	m ³	10,00		
402.05.03	2.5.58	Imported material from source provided by the Contractor	m ³	720,00		
402,06	2.5.59	Extra over item 2.8.42 for screening excavated material for selected backfill	m ³	10,00		
402.08	2.5.60	Installation of marker blocks	No.	27,00		
402,10	2.5.61	Sterilising of pipelines				
	2.5.62	1 100mm Nominal diameter	m	1200,00		
	2.5.63	1 000mm Nominal diameter	m	1800,00		
	2.5.64	900mm Nominal diameter	m	650,00		
	2.5.65	800mm Nominal diameter	m	1550,00		
	2.5.66	700mm Nominal diameter	m	303,00		

B402.14	2.5.67	Tie into existing water mains				
B402.14.01	2.5.68	PVC / AC / HDPE water				
B402.14.01.01	2.5.69	Connection point pipe diameter up to 200mm	No	1,00		
B402.14.01.02	2.5.70	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
B402.14.01.03	2.5.71	Connection point pipe diameter over 400mm up to 1100mm	No	2,00		
B402.14.02	2.5.72	Steel water				
B402.14.02.01	2.5.73	Connection point pipe diameter up to 200mm	No	1,00		
B402.14.02.02	2.5.74	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
B402.14.02.03	2.5.75	Connection point pipe diameter over 400mm up to 1100mm	No	4,00		
TOTAL SECTION 402: WATER CONSTRUCTION						

C.2.2.38

C.2.2.39

C.2.2.40

C.2.2.41

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 2		EARTHWORKS				
Section 202	3,4	TRENCHING				
202.01	3.4.1	Trench excavations:				
202.01.01	3.4.2	Up to 1,0-m wide				
202.01.01.01	3.4.3	up to 1,0-m deep	m ³	50		
202.01.01.02	3.4.4	over 1-m up to 1,5-m deep	m ³	450		
202.01.01.03	3.4.5	Over 1,5 up to 2-m deep	m ³	1 300		
202.01.01.04	3.4.6	Over 2 up to 2,5-m deep	m ³	50		
202.01.01.05	3.4.7	Over 2,5 up to 3-m deep	m ³	50		
202,02	3.4.8	Extra over item 5.6.1 for excavating in-				
202.02.01	3.4.21	Intermediate excavation	m ³	50		
202.02.02	3.4.22	Hard material	m ³	100		
202,03	3.4.23	Excavations outside the Normal trench profile	m ³	50		
202,04	3.4.24	Hand excavation	m ³	50		
202,06	3.4.25	Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	1 500		
202,07	3.4.26	Extra over item 5.6.10 for using backfill material obtained –				
202.07.01	3.4.27	From borrow areas	m ³	10		
202.07.02	3.4.28	From source provided by contractor	m ³	250		
202.10	3.4.29	Removal of spoil material –				
202.10.02	3.4.30	To dumping areas to be provided by the Contractor	m ³	250		
202,12	3.4.31	Extra over item 5.6.15 for additional compaction of backfill to 93% of MOD AASHTO density in road reserves	m ³	1500		
202,13	3.4.32	Backfilling trenches with soilcrete	m ³	5		
202,15	3.4.33	Reinstatement of bitumen surfaced roads	m ²	14		
TOTAL SECTION 202: TRENCHING						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	3,5	CONSTRUCTION				
402,01	3.5.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	3.5.2	Pipes : Class 12.5 (PN 12.5) PVC-O , SANS 16422:2007 (PVC-O 500)				
	3.5.3	450mm NB	m	300,00		
	3.5.4	355mm NB	m	30,00		
	3.5.5	200mm ND	m	200,00		
402,02	3.5.5	Extra over item 5.7.1 for providing and installing fittings, valves and specials:				
402.02.01	3.5.6	Bends, mild steel 11¼° for uPVC pipes (epoxy powder coated refer to Series 401.05) : with restrained V.J Couplings:				
	3.5.7	450mm NB	No.	1,00		
	3.5.8	355mm NB	No.	1,00		
402.02.02	3.5.9	Bends, uPVC 22½° (Class 16):				
	3.5.10	450mm NB	No.	1,00		
	3.5.11	355mm NB	No.	1,00		
402.02.03	3.5.12	Bends, uPVC 45° (Class 16):				
	3.5.13	450mm NB	No.	1,00		
	3.5.14	355mm NB	No.	1,00		
402.02.04	3.5.15	Bends, uPVC 90° (Class 16):				
	3.5.16	450mm NB	No.	2,00		
	3.5.17	355mm NB	No.	1,00		
402,05	3.5.18	Supplying and placing unscreened selected backfill material under alongside and up to 200mm above pipe barrels using:				
402.05.01	3.5.19	Excavated material	m³	10,00		
402.05.02	3.5.20	Imported material from source provided by the Employer	m³	10,00		

402.05.03	3.5.21	Imported material from source provided by the contractor	m ³	300,00		
402,06	3.5.22	Extra over item 5.7.26 for screening excavated material for selected backfill	m ³	10,00		
402,08	3.5.23	Installation of marker blocks	No.	6,00		
402,10	3.5.24	Sterilising of pipelines				
	3.5.25	450mm Nominal diameter	m	600,00		
	3.5.26	355mm Nominal diameter	m	260,00		
	3.5.27	200mm Nominal diameter	m	200,00		
B402.14	3.5.28	Tie into existing water mains				
B402.14.01	3.5.29	PVC / AC / HDPE water				
B402.14.01.01	3.5.30	Connection point pipe diameter up to 200mm	No	1,00		
B402.14.01.02	3.5.31	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
B402.14.02	3.5.32	Steel water				
B402.14.02.01	3.5.33	Connection point pipe diameter up to 200mm	No	1,00		
B402.14.02.02	3.5.34	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
TOTAL SECTION 402: WATER CONSTRUCTION						

C.2.2.45

C.2.2.46

C.2.2.47

Part C2: Pricing Data

C.2.2.48

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 2		EARTHWORKS				
Section 202	5,3	TRENCHING				
202,01	5.3.1	Trench excavations:				
202,01,01	5.3.2	Up to 1,0m wide				
202.01.01.01	5.3.3	up to 1,0-m deep	m ³	1,00		
202.01.01.02	5.3.4	over 1-m up to 1,5-m deep	m ³	1159,80		
202.01.01.03	5.3.5	Over 1,5 up to 2-m deep	m ³	32,00		
202.01.01.04	5.3.6	Over 2 up to 2,5-m deep	m ³	40,00		
202.01.01.05	5.3.7	Over 2,5 up to 3-m deep	m ³	40,00		
202,02	5.3.8	Extra over item 5.6.1 for excavating in-				
202.02.01	5.3.21	Intermediate excavation	m ³	50,00		
202.02.02	5.3.22	Hard material	m ³	50,00		
202,03	5.3.23	Excavations outside the Normal trench profile	m ³	50,00		
202,04	5.3.24	Hand excavation	m ³	50,00		
202,06	5.3.25	Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	1050,00		
202,07	5.3.26	Extra over item 5.6.10 for using backfill material obtained –				
202.07.01	5.3.27	From borrow areas	m ³	10,00		
202.07.02	5.3.28	From source provided by contractor	m ³	100,00		
202,09	5.3.24	Subsurface drains in trench bottoms	m	380,00		
202.10	5.3.29	Removal of spoil material –				
202.10.02	5.3.30	To dumping areas to be provided by the Contractor	m ³	100,00		
202,12	5.3.31	Extra over item 5.6.15 for additional compaction of backfill to 93% of MOD AASHTO density in road reserves	m ³	1050,00		
202,13	5.3.32	Backfilling trenches with soilcrete	m ³	1,00		
202,15	5.3.33	Reinstatement of bitumen surfaced roads	m ²	5,00		
TOTAL SECTION 202: TRENCHING						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	5,4	CONSTRUCTION				
402,01	5.4.1	Supplying, laying and jointing of water pipes irrespective of depth:				
402.01.01	5.4.2	Class 12 uPVC pipes, SANBS 966: 1998 Part 1				
402.01.01.01	5.4.3	200mm NB	m	250,00		
402.01.01.02	5.4.4	160mm NB	m	370,00		
402.01.01.03	5.4.5	110mm NB	m	150,00		
402.01.02	5.4.6	Medium Galvanised mild steel, medium class pipes, including all fittings and couplings (wrapped with grease tape and then covered with PVC tape): (LI)				
402.01.02.01	5.4.7	80mm diameter	m	20,00		
402,02	5.4.8	Extra over item 402,01 for providing and installing fittings, valves and specials:				
402.02.01	5.4.9	uPVC 90° Bends (Class 16):				
402.02.01.01	5.4.10	200mm diameter	No.	2,00		
402.02.01.02	5.4.11	160mm diameter	No.	2,00		
402.02.01.03	5.4.12	110mm diameter	No.	2,00		
402.02.02	5.4.13	.02 uPVC 45° Bends (Class 16):				
402.02.02.01	5.4.14	200mm diameter	No.	1,00		
402.02.02.02	5.4.15	160mm diameter	No.	1,00		
402.02.02.03	5.4.16	110mm diameter	No.	1,00		
402.02.03	5.4.17	.03 uPVC 22½° Bends (Class 16):				
402.02.03.01	5.4.18	200mm diameter	No.	1,00		
402.02.03.02	5.4.19	160mm diameter	No.	1,00		
402.02.03.03	5.4.20	110mm diameter	No.	1,00		
402.02.04	5.4.21	.04 uPVC 11¼° Bends (Class 16):				

402.02.04.01	5.4.22	200mm diameter	No.	1,00		
402.02.04.02	5.4.23	160mm diameter	No.	1,00		
402.02.04.03	5.4.24	110mm diameter	No.	1,00		
402.02.05	5.4.25	.14 Cast iron end caps for uPVC pipes:				
402.02.05.01	5.4.26	200mm diameter	No.	1,00		
402.02.05.02	5.4.27	160mm diameter	No.	1,00		
402.02.05.03	5.4.28	110mm diameter	No.	1,00		
402.02.06	5.4.29	.16 Cast iron or steel flanged reducers:				
		(epoxy powder coated - refer to Series 401.05):				
402.02.06.01	5.4.30	200 x 160 mm	No.	1,00		
402.02.06.02	5.4.31	160 x 110 mm	No.	3,00		
402.02.07	5.4.32	.17 Cast iron flange adaptor for uPVC pipes,				
		drilled in accordance with SABS 1123 Table 16:				
402.02.07.01	5.4.33	200mm diameter	No.	1,00		
402.02.07.03	5.4.34	160mm diameter	No.	1,00		
402.02.07.05	5.4.35	110mm diameter	No.	1,00		
402.02.08	5.4.36	Provides and install" Plasson type " or similar product thermoplastic saddles female threaded inclusive of drilling hole into reticulation pipe, rubber O-rings and galvanised mild steel nuts and bolts,				
402.02.08.01	5.4.37	200 x 40 mm	No.	24,00		
402.02.08.02	5.4.38	160 x 40 mm	No.	13,00		
402.02.08.03	5.4.39	110 x 40 mm	No.	11,00		
Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
402.02,09	5.4.40	.21 Cast iron reducing Tees for uPVC pipes:				
402.02.09.01	5.4.41	250 x 160 mm diameter	No.	1,00		
402.02.09.02	5.4.42	200 x 160 mm diameter	No.	2,00		
402.02.09.03	5.4.43	200 x 110 mm diameter	No.	1,00		
402.02.09.04	5.4.44	160 x 110 mm diameter	No.	5,00		
402.02.10	5.4.45	.24 Cast iron equal Tees for uPVC pipes:				
402.02.10.01	5.4.46	200mm diameter	No.	1,00		
402.02.10.02	5.4.47	160mm diameter	No.	4,00		
402.02.10.03	5.4.48	110mm diameter	No.	1,00		
402.02.12	5.4.49	.39 Double flanged, anti clockwise closing				
		"RSV"(Class 16) capped top valves drilled in accordance with SABS 1123 Table 16:				
402.02.12.01	5.4.50	200 mm	No.	2,00		
402.02.12.02	5.4.51	150 mm	No.	3,00		
402.02.12.03	5.4.52	100 mm	No.	2,00		
402.02.12.04	5.4.53	80 mm	No.	10,00		
402.02.13	5.4.54	.41 Restrained Quick flange adaptor for PVC pipe Epoxy coated:				
402.02.13.01	5.4.55	200 mm	No.	2,00		
402.02.13.02	5.4.56	160 mm	No.	4,00		
402.02.13.03	5.4.57	110 mm	No.	6,00		
402,04	5.4.58	Providing thrust blocks using class 15/19 concrete	m ³	20,00		
402,05	5.4.59	Supplying and placing unscreened selected backfill material under, alongside and up to 200 mm above pipe barrel using:				
402.05.01	5.4.60	Excavated material (L1)	m ³	10,00		
402.05.02	5.4.61	Imported material from sources provided by the Employer	m ³	10,00		

C.2.2.53

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
402.10.03	5.4.79	110mm dia	m	540,00		
B402.12	5.4.80	The provision and installation of connections to users complete (excluding supply of water meters or saddles but including installation of water meters) as per detail drawing 7515-W206				
B402.12.01	5.4.81	Short single erf connection				
B402.12.01.01	5.4.82	0-5m single connection	No.	1,00		
B402.12.02	5.4.83	Short double erf connections				
B402.12.02.01	5.4.84	0-5m double connection	No.	86,00		
B402.12.03	5.4.85	Long single erf connections				
B402.12.03.01	5.4.86	5-10m single connection	No.	3,00		
B402.12.04	5.4.87	Long double erf connections				
B402.12.04.01	5.4.88	5-10m double connection	No.	12,00		
B402.13	5.4.89	The provision and installation of domestic yard Stand Pipes as per detail drawing 7515-W206	No	105,00		
B402.14	5.4.90	Tie into existing water mains				
B402.14.01	5.4.91	PVC / AC / HDPE water				
B402.14.01.01	5.4.92	Connection point pipe diameter up to 200mm	No	4,00		
B402.14.01.02	5.4.93	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
B402.14.01.03	5.4.94	Connection point pipe diameter over 400mm up to 1100mm	No	1,00		
B402.14.02	5.4.95	Steel water				
B402.14.02.01	5.4.96	Connection point pipe diameter up to 200mm	No	2,00		
B402.14.02.02	5.4.97	Connection point pipe diameter over 200mm up to 400mm	No	1,00		
B402.14.02.03	5.4.98	Connection point pipe diameter over 400mm up to 1100mm	No	1,00		
TOTAL SECTION 402: WATER CONSTRUCTION						

C.2.2.55

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C.2.2.57

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 2		EARTHWORKS				
Section 202	6.3	TRENCHING				
202,01	6.3.1	Trench excavations:				
202,01,01	6.3.2	Over 1,0-m and up to 2,0-m wide				
202.01.01.01	6.3.3	up to 1,0-m deep	m ³	10		
202.01.01.02	6.3.4	over 1-m up to 1,5-m deep	m ³	35		
202.01.01.03	6.3.5	Over 1,5 up to 2-m deep	m ³	70		
202.01.01.04	6.3.6	Over 2 up to 2,5-m deep	m ³	250		
202.01.01.05	6.3.7	Over 2,5 up to 3-m deep	m ³	80		
202,02	6.3.8	Extra over item 5.6.1 for excavating in-				
202.02.01	6.3.21	Intermediate excavation	m ³	10		
202.02.02	6.3.22	Hard material	m ³	10		
202,03	6.3.23	Excavations outside the Normal trench profile	m ³	50		
202,04	6.3.24	Hand excavation	m ³	10		
202,06	6.3.25	Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	305		
202,07	6.3.26	Extra over item 5.6.10 for using backfill material obtained –				
202.07.01	6.3.27	From borrow areas	m ³	10		
202.07.02	6.3.28	From source provided by contractor	m ³	60		
202,09	5.3.24	Subsurface drains in trench bottoms	m	281,00		
202.10	6.3.29	Removal of spoil material –				
202.10.02	6.3.30	To dumping areas to be provided by the Contractor	m ³	60		
202,12	6.3.31	Extra over item 5.6.15 for additional compaction of backfill to 93% of MOD AASHTO density in road reserves	m ³	305		
202,13	6.3.32	Backfilling trenches with soilcrete	m ³	10		
202,15	6.3.33	Reinstatement of bitumen surfaced roads	m ²	5		
TOTAL SECTION 202:TRENCHING						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 3		SEWERS				
Section 302	6.4	CONSTRUCTION				
302,01	6.4.1	Supply, laying and jointing of sewer pipes irrespective of depth or Width of Trench:				
302.01	6.4.2	Pipes : Class 34 (PN 34) PVC-U				
302.01.01	6.4.3	110 mm uPVC Class 34 (LI)	m	200,00		
302.01.02	6.4.4	160 mm uPVC Class 34 (LI)	m	362,00		
302.01.03	6.4.5	200 mm uPVC Class 34 (LI)	m	10,00		
302.01.04	6.4.6	250 mm uPVC Class 34 (LI)	m	10,00		
302.02	6.4.7	Constructing of pipe beddings				
302.02.01 (LI)	6.4.8	Class B bedding for flexible pipes using selected material from excavation				
302.02.01.01	6.4.9	110 mm uPVC Class 34 (LI)	m	200,00		
302.02.01.02	6.4.10	160 mm uPVC Class 34 (LI)	m	362,00		
302.02.01.03	6.4.11	200 mm uPVC Class 34 (LI)	m	10,00		
302.02.01.04	6.4.12	250 mm uPVC Class 34 (LI)	m	10,00		
302.03	6.4.13	Concrete encasing of pipes	m ³	5,00		
302,04	6.4.14	Extra over item 302.01 for supplying and installation with an Approved Method of coupling the Following pipe fittings in main sewer (type specified)				
302.04.01	6.4.15	Branch Junctions				
	6.4.16	110mm Diameter Pipe to 160mm Dia	No.	1,00		
	6.4.17	160mm Diameter Pipe to 160mm Dia	No.	11,00		
	6.4.18	160mm Diameter Pipe to 200mm Dia	No.	1,00		
302.07	6.4.19	Construction of cleaning eyes (Lamp poles) (DWG 7515-S208)				
302.07.01	6.4.20	Up to but Not exceeding 1,5 m in depth	No.	25,00		
302.07.02	6.4.21	Exceeding 1,5 m in depth but Not exceeding 2,0 m in depth	No.	109,00		

302.07.03	6.4.22	Exceeding 2,0m but Not exceeding 2,5m in depth	No.	40,00		
302.07.04	6.4.23	Exceeding 2,5m but Not exceeding 3,0m in depth	No.	25,00		
302.09 (LI)	6.4.24	Construction of manholes, up to 1,0 m deep				
302.09.01	6.4.25	Manhole Details For Sewer Pipes Up To 300mm Nominal Diameter as per drw. 7515-S203				
302.09.01.01	6.4.26	Type III	No.	31,00		
302.10	6.4.27	Extra over item 302.09 for the construction of manholes in excess of 1,0 m deep				
302.10.01	6.4.28	For sewers 300 mm in diameter and smaller				
302.10.01.01	6.4.29	Type III	m	93,00		
302.12	6.4.30	Supplying and installing manhole covers and frames				
302.12.01	6.4.31	SANS 558 Type 4 circular frame (LI)	No.	11,00		
302.12.03	6.4.32	Precast concrete cover with type 4 CI frame (LI)	No.	11,00		
302.13	6.4.33	Extra over item 302.09 for construction of house connections for manholes				
302.13.01	6.4.34	One-house connections	No.	164,00		
302.13.02	6.4.35	Two-house connections	No.	35,00		
302.14 (LI)	6.4.36	Supplying and placing selected backfill material around and up to 300 mm above pipe barrels using				
302.14.01	6.4.37	Excavated material (LI)	m ³	10,00		
302.14.02	6.4.38	Imported material (LI)	m ³	144,80		
Total Carried forward						

C.2.2.61

C.2.2.62

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	7,1	CONSTRUCTION				
402,01	7.1.2	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	7.1.3	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	7.1.4	700mm NB x 8mm wall	m	5,00		
402,02	7.1.5	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	7.1.6	Item 1				
		700mm dia x 3575mm long pipe with, PUDDLE FLANGE (FLANGED TO SANS 1123- 2500/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	1,00		
402.02.02	7.1.7	Item 2				
		700mm x 700mm dia steel Equal TEE with all ends flanged , flanged to SANS 1123-2500/3 (for flange details see the relevant table)	No	1,00		
402.02.04	7.1.9	Item 3				
		700mm x 350mm dia steel TEE with all ends flanged , flanged to SANS 1123-2500/3	No	1,00		
402.02.05	7.1.10	Item 4				
		700mm dia x 90 degree long steel bend with all ends flanged to SANS 1123-2500/3	No	2,00		
402.02.06	7.1.11	Item 5A				
		700mm dia VOSA Gate Valve, PN25 or similar approved with hand wheel and anti-clockwise closing to SANS 684, non rising stem, both ends flanged to SANS 1123-2500/3 (for flange details see the relevant table)	No	2,00		
402.02.07	7.1.12	Item 5B				
		700mm dia VOSA Gate Valve, PN16 or similar approved with hand wheel and anti-clockwise	No	2,00		

		closing to SANS 684, non rising stem, both ends flanged to SANS 1123-1600/3 (for flange details see the relevant table)				
402.02.08	7.1.13	Item 6A				
		700dia x 250dia Concentric Steel Reducer BOTH ENDS FLANGED TO SANS 1123 -2500/3 (for flange details see the relevant table)	No	2,00		
402.02.09	7.1.14	Item 6B				
		700dia x 250dia Concentric Steel Reducer BOTH ENDS FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	2,00		
402.02.10	7.1.15	Item 7				
		250dia Steel Straight with both ends FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	4,00		
402.02.11	7.1.16	Item 8				
		250dia Berman 70F Strainer, PN25 Stainless Steel Screen & Basket or similar approved ENDS FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	2,00		
402.02.12	7.1.17	Item 9				
		250dia Clayton 963-01 Pressure reducing VALVE & SOLENOID SHUT-OFF VALVE ORSIMILAR APPROVED, PN25, ENDS FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	2,00		
402.02.13	7.1.18	Item 10				
		250dia Steel Coupling Such as klamflex DISMANTLING JOINT OR SIMILAR APPROVED, PN25. FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	2,00		
402.02.14	7.1.19	Item 11				
		250dia Steel Straight ONE END FLANGED TO SANS 1123 - 2500/3 ONE END FLANGED TO SANS 1123 - 1600/3(for flange details see the relevant table)	No	2,00		
402.02.15	7.1.20	Item 12				
		250dia Meineck Turbine Cosmoss WPD WATER METER OR SIMILAR APPROVED, PN16. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
402.02.16	7.1.21	Item 13				
		250dia Steel Straight Both ends Flanged TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.17	7.1.22	Item 14				
		700Ø x 5500mm LONG MANIFOLD WITH FLANGE (FLANGED TO SANS 1123 - 1600/3). 2 x 700Ø BRANCE, 400Ø BRANCH & 350Ø BRANCH. (for flange details see the relevant table)	No	1,00		
402.02.18	7.1.23	Item 15				
		700mm dia Cathodic protection flange between MS and SS pipes	No	3,00		
402.02.19	7.1.24	Item 16				
		700Ø x 4380mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.20	7.1.25	Item 17				
		400Ø x 4600mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS	No	1,00		
402.02.21	7.1.26	Item 18				
		350Ø x 2550mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. BOTH ENDS FLANGED TO SANS 1123 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.22	7.1.27	Item 19				
		400Ø VOSA GATE VALVE. PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.23	7.1.28	Item 20				
		350Ø VOSA GATE VALVE. PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS	No	1,00		

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TOTAL SERIES 7 701 : STRUCTURES - CARRIED TO SUMMARY - BILL 7

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	7,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	7.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	7.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	158		
702.02.01.01b	7.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	158		
702.02.01.01c	7.3.4	Plane, horizontal to soffits of slab at entrance	m ²	4		
702.02.01.01d	7.3.5	Plane, inclined to soffit of stairs	m ²	6		
702.02.01.01e	7.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	215		
702.02.01.01f	7.3.7	Plane, vertical to edges of external roofs	m ²	14		
702.02.01.01g	7.3.8	Plane, vertical to edges of pipe supports	m ²	6		
702.02.02	7.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	7.3.10	Plane, vertical, to walls	m ²	400		
702.02.02.01b	7.3.11	Plane, vertical to column sides	m ²	25		
702.02.02.01c	7.3.12	Plane, vertical to beam sides	m ²	29		
702.02.02.01d	7.3.13	Plane, vertical to main roof edges beam sides	m ²	26		
702,06	7.3.14	Formwork to openings	m ²	7		
702.07	7.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	7.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 7						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		SPECIFIC WORKS				
Section 801	7,6	MISCELLANEOUS ITEMS				
	7.6.1	Structural steelwork				
801.03.01	7.6.2	Supply and install				
801.03.01.01	7.6.3	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	1,00		
801.03.01.02	7.6.4	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	7.6.5	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	2,00		
801.03.01.04	7.6.6	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	3,00		
801.03.01.05	7.6.7	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	7.6.8	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
B801.03.01.07	7.6.9	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	5,00		
B801.03.01.08	7.6.10	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 7						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	8,1	CONSTRUCTION				
402,01	8.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	8.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	8.1.3	1 100mm NB x 12mm wall	m	5,00		
	8.1.4	900mm NB x 10mm wall	m	5,00		
402,02	8.1.5	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	8.1.6	Item 1				
		900mm dia x 2200mm long stainless steel WITH PUDDLE FLANGE (FLANGED TO SANS1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.02	8.1.7	Item 2				
		900mm dia Cathodic protection flange between MS and SS pipes	No	2,00		
402.02.03	8.1.8	Item 3				
		900mm dia straight steel pipe, both end flanged TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.04	8.1.9	Item 4				
		900mm x 600mm dia Eccentric steel reducer, both ends flanged to SANS 1123-1600/3 (for flange details see the relevant table)	No	2,00		
402.02.05	8.1.10	Item 7				
		600mm dia straight steel pipe TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	4,00		
402.02.06	8.1.11	Item 9				
		1000mm x 600mm dia Eccentric steel reducer, both ends flanged to SANS 1123-	No	2,00		

		1600/3				
402.02.07	8.1.12	Item 10				
		1000mm x 1000mm dia steel Equal TEE with all ends flanged , flanged to SANS 1123-1600/3 (for flange details see the relevant table)	No	3,00		
402.02.08	8.1.13	Item 11				
		1000dia Steel Straight both ends flanged TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.09	8.1.14	Item 12				
		1000mm dia x 1590mm long steel PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	8.1.15	Item 13				
		1100mm x 1000mm dia Eccentric steel reducer, both ends bevelled	No	1,00		
402.02.11	8.1.16	Item 5				
		600mm dia VOSA Gate Valve, PN16 or similar APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	4,00		
402.02.12	8.1.17	Item 6				
		600mm dia steel coupling as kamflex DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.13	8.1.18	Item 8				
		600mm dia Sensus WP QF Water meter, PN16 OR SIMILAR APPROVED. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.14	8.1.19	Item 9				
		1000di x 600dia eccentric steel reducer BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.17	8.1.20	Item 14				
		700mm dia VOSA Gate Valve, PN16 or similar approved with hand wheel and	No	1,00		

		anti-clockwise closing to SANS 684, non rising stem, both ends flanged to SANS 1123-1600/3 (for flange details see the relevant table)				
402.02.18	8.1.21	Item 15				
		700mm dia x 3575mm long pipe with, PUDDLE FLANGE (FLANGED TO SANS 1123 - 2500/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 2500/3 (for flange details see the relevant table)	No	1,00		
B402.02.24	8.1.22	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 8						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	8,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	8.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	8.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	198		
702.02.01.01b	8.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	198		
702.02.01.01c	8.3.4	Plane, horizontal to soffits of slab at entrance	m ²	4		
702.02.01.01d	8.3.5	Plane, inclined to soffit of stairs	m ²	6		
702.02.01.01e	8.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	231		
702.02.01.01f	8.3.7	Plane, vertical to edges of external roofs	m ²	16		
702.02.01.01g	8.3.8	Plane, vertical to edges of pipe supports	m ²	6		
702.02.02	8.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	8.3.10	Plane, vertical, to walls	m ²	431		
702.02.02.01b	8.3.11	Plane, vertical to column sides	m ²	25		
702.02.02.01c	8.3.12	Plane, vertical to beam sides	m ²	11		
702.02.02.01d	8.3.13	Plane, vertical to main roof edges beam sides	m ²	31		
702,06	8.3.14	Formwork to openings	m ²	2		
702.07	8.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	8.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 8						

TOTAL SERIES 7 703 : STRUCTURES - CARRIED TO SUMMARY - BILL 8

C.2.2.78

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	7,1	CONSTRUCTION				
402,01	9.1.2	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	9.1.3	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	9.1.4	1 100mm NB x 10mm wall	m	5,00		
402,02	9.1.5	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	9.1.6	Item 1				
		1100 Ø x 1000 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS BEVELLED	No	4,00		
402.02.02	9.1.7	Item 2				
		1000 Ø x 2335mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.03	9.1.8	Item 3				
		1000 Ø x 700 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	4,00		
402.02.04	9.1.9	Item 6				
		1000 Ø x 500 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.05	9.1.10	Item 7				
		1000 Ø x 3400mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.06	9.1.11	Item 8				

C.2.2.81

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C.2.2.84

C.2.2.85

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	9,6	MISCELLANEOUS ITEMS				
	9.6.1	Structural steelwork				
801.03.01	9.6.2	Supply and install				
801.03.01.01	9.6.3	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No	No	2,00		
801.03.01.02	9.6.4	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	4,00		
801.03.01.03	9.6.5	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	2,00		
801.03.01.04	9.6.6	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	4,00		
801.03.01.05	9.6.7	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	9.6.8	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	9.6.9	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	20,00		
B801.03.01.07	9.6.10	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	4,00		
B801.03.01.08	9.6.11	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	2,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 9						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	10,1	CONSTRUCTION				
402,01	10.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	10.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	10.1.3	1 100mm NB x 10mm wall	m	5,00		
	10.1.4	1 000mm NB x 10mm wall	m	5,00		
402.01.02	10.1.5	Pipes : Class 12.5 (PN 12.5) PVC-O , SANS 16422:2007 (PVC-O 500)				
	10.1.6	450mm NB	m	5,00		
402,02	10.1.6	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	10.1.7	Item 1				
		1100 Ø x 1000 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS BEVELLED	No	1,00		
402.02.02	10.1.8	Item 2				
		1000 Ø x 1815mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	10.1.9	Item 3				
		1000 Ø x 1000 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	10.1.10	Item 4				
		1000 Ø x 700 Ø ECCENTRIC STEEL REDUCER.BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.05	10.1.11	Item 7				
		1000mm x 500mm dia steel TEE with all ends flanged , flanged to SANS 1123-	No	1,00		

		1600/3				
402.02.06	10.1.12	Item 8				
		1000mm dia x 1905mm long steel puddle pipe, flanged on one side and plain ended on the other, paddle flange 755mm from flanged end	No	1,00		
402.02.07	10.1.13	Item 9				
		1000mm x 450mm dia Eccentric steel reducer, both ends flanged, flanged to SANS 1123-1600/3	No	1,00		
402.02.08	10.1.14	Item 12				
		450 Ø x 2880mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	10.1.15	Item 14				
		200 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 500 Ø) WITH STUB (AIR VALVE NB, 200 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	10.1.16	Item 18				
		450mm dia straight steel pipe, one end plain, the other end flanged to to SANS 1123-1600/3	No	1,00		
402.02.11	10.1.17	Item 17				
		450 Ø x 90° STEEL BEND WITH BOTH ENDS BEVELLED	No	1,00		
402.02.12	10.1.18	Item 5				
		700 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.13	10.1.19	Item 6				
		700 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.14	10.1.20	Item 10				
		450 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
Total Carried forward						

C.2.2.89

TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 10	

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	10,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	10.3.1	Single-surface formwork				
702.02.01.01a	10.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	60,00		
702.02.01.01b	10.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	60,00		
702.02.01.01c	10.3.4	Plane, horizontal to soffits of slab at entrance	m ²	1,00		
702.02.01.01d	10.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	10.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	125,00		
702.02.01.01f	10.3.7	Plane, vertical to edges of external roofs	m ²	8,00		
702.02.01.01g	10.3.8	Plane, vertical to edges of pipe supports	m ²	6,00		
702.02.02	10.3.9	Double-surface formwork (both sides measured)				
702.02.02.01a	10.3.10	Plane, vertical, to walls	m ²	231,00		
702.02.02.01b	10.3.11	Plane, vertical to column sides	m ²	19,00		
702.02.02.01c	10.3.12	Plane, vertical to beam sides	m ²	19,00		
702.02.02.01d	10.3.13	Plane, vertical to main roof edges beam sides	m ²	17,00		
702,06	10.3.14	Formwork to openings	m ²	2,00		
702.07	10.3.15	Chamfers larger than 25mm x 25mm				
702.07.01	10.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 10						

C.2.2.93

C.2.2.94

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	10,6	MISCELLANEOUS ITEMS				
	10.6.1	Structural steelwork				
801.03.01	10.6.2	Supply and install				
801.03.01.01	10.6.3	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	1,00		
801.03.01.02	10.6.4	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	10.6.5	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	10.6.6	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	2,00		
801.03.01.05	10.6.8	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	10.6.9	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	10.6.10	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	10,00		
801.03.01.08	10.6.7	Stainless steel 400mm x 400mm grating on scour pipe as per detail	No	1,00		
B801.03.01.07	10.6.4	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	2,00		
B801.03.01.08	10.6.1	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 10						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	11,1	CONSTRUCTION				
402,01	11.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	11.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	11.1.3	1 000mm NB x 10mm wall	m	5,00		
402,02	11.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	11.1.5	Item 1				
		1000mm dia x 3508mm long steel puddle pipe, flanged on one side and plain ended on the other, paddle flange 2358mm from flanged end	No	2,00		
402.02.02	11.1.6	Item 2				
		1000mm x 500mm dia steel TEE with all ends flanged , flanged to SANS 1123-1600/3	No	1,00		
402.02.03	11.1.7	Item 3				
		1000mm x 200mm dia steel TEE (Scour) with all ends flanged , flanged to SANS 1123-1600/3	No	2,00		
402.02.04	11.1.8	Item 4				
		1100mm x 1000mm dia Eccentric steel reducer, both ends plain ended	No	2,00		
402.02.05	11.1.9	Item 9				
		1000mm x 600mm dia Eccentric steel reducer, both ends flanged, flanged to SANS 1123-1600/3	No	2,00		
402.02.06	11.1.10	Item 12				
		450mm dia x 90o steel bend with all ends flanged to SANS 1123-1600/3	No	1,00		
402.02.07	11.1.11	Item 13				

		200mm x 200mm dia steel Equal TEE with all ends flanged , flanged to SANS 1123-1600/3	No	1,00		
402.02.08	11.1.12	Item 8				
		450mm dia x 90o steel bend with all ends flanged to SANS 1123-1600/3	No	2,00		
402.02.09	11.1.13	Item 5				
		600mm dia steel coupling as kamflex dismantling joint or similar approved, PN16, flanged to SANS 1123-1600/3	No	1,00		
402.02.10	11.1.14	Item 6				
		600mm dia VOSA Gate Valve, PN16 or similar approved with hand wheel and anti- clockwise closing to SANS 684, non rising stem, both ends flanged to SANS 1123- 1600/3	No	1,00		
402.02.11	11.1.15	Item 7				
		200mm dia VOSA Gate Valve, PN16 or similar approved with hand wheel and anti- clockwise closing to SANS 684, non rising stem, both ends flanged to SANS 1123- 1600/3	No	3,00		
402.02.12	11.1.16	Item 11				
		200mm dia steel coupling as kamflex dismantling joint or similar approved, PN16, flanged to SANS 1123-1600/3	No	1,00		
402.02.13	11.1.17	Item 14				
		200mm dia VOSA Gate Valve, PN16 or similar approved with hand wheel and anti- clockwise closing to SANS 684, non rising stem, both ends flanged to SANS 1123- 1600/3	No	1,00		
402.02.14	11.1.18	Item 15				
		200mm dia VAG Duojet Automatic air release & vacuum break valve single- chamber Type PN16 or similar approved, flanged to SANS 1123-1600/3	No	1,00		
B402.02.24	11.1.19	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 11						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 701	11,2	FOUNDATIONS FOR STRUCTURES				
701,01	11.2.1	Additional foundation investigations	Prov Sum	1,00	R2 000,00	R2 000,00
701,02	11.2.2	Excavation for structures				
701.02.01	11.2.3	Excavation of soft material situated in the following depth ranges:				
701.02.01.01	11.2.4	0 m up to 2 m	m ³	268,00		
701.02.01.02	11.2.5	Exceeding 2 m up to 4 m	m ³	198,00		
701.02.02	11.2.6	Extra over sub-item 701.02.01 for excavation in hard material irrespective of depth	m ³	174,00		
701.02.03	11.2.7	Extra over sub-item 701.02.01 for additional excavation required by the Engineer after the excavation has been completed	m ³	70,00		
701,04	11.2.8	Dewatering of foundation excavations	Lump Sum	1,00		
701,05	11.2.9	Backfill to excavations utilizing:				
701.05.01	11.2.10	Material from the excavations compacted to:				
701.05.01.02	11.2.11	93% of Mod AASHTO	m ³	195,00		
		(Please note that no extra over will be paid for fill within restricted areas)				
TOTAL SERIES 7 701 : STRUCTURES - CARRIED TO SUMMARY - BILL 11						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	11,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	11.3.1	Single-surface formwork				
702.02.01.01a	11.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	79,00		
702.02.01.01b	11.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	79,00		
702.02.01.01c	11.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	11.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	11.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	149,00		
702.02.01.01f	11.3.7	Plane, vertical to edges of external roofs	m ²	10,00		
702.02.01.01g	11.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	11.3.9	Double-surface formwork (both sides measured)				
702.02.02.01a	11.3.10	Plane, vertical, to walls	m ²	277,00		
702.02.02.01b	11.3.11	Plane, vertical to column sides	m ²	18,00		
702.02.02.01c	11.3.12	Plane, vertical to beam sides	m ²	19,00		
702.02.02.01d	11.3.13	Plane, vertical to main roof edges beam sides	m ²	20,00		
702,06	11.3.14	Formwork to openings	m ²	2,00		
702.07	11.3.15	Chamfers larger than 25mm x 25mm				
702.07.01	11.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 11						

C.2.2.100

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	11,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	11.6.1	Supply and install				
801.03.01.01	11.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	2,00		
801.03.01.02	11.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	11.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	2,00		
801.03.01.04	11.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	3,00		
801.03.01.05	11.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	11.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	11.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	7,00		
801.03.01.08	11.6.8	Stainless steel 400mm x 400mm grating on scour pipe as per detail	No	1,00		
801.03.01.09	11.6.9	Supply and place gabions to scour chambers	m2	15,00		
B801.03.01.07	11.6.10	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	3,00		
B801.03.01.08	11.6.11	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	2,00		

TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 11	

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	12,1	CONSTRUCTION				
402,01	12.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	12.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	12.1.3	1 000mm NB (1 016 OD) x 10mm wall	m	5,00		
402,02	12.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	12.1.5	Item 1				
		1000 Ø x 2365mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.02	12.1.6	Item 2				
		1000 Ø x 700 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	6,00		
402.02.03	12.1.7	Item 5				
		1000 Ø x 500 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.04	12.1.8	Item 6				
		1000 Ø x 3490mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		

402.02.05	12.1.9	Item 7				
		200 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 500 Ø) WITH STUB (AIR VALVE NB, 200 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.06	12.1.10	Item 3				
		700 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.07	12.1.11	Item 4				
		700 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.08	12.1.12	Item 8				
		200 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.09	12.1.13	Item 9				
		200 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE- CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
B402.02.24	12.1.14	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 12						

[illegible]

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	12,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	12.3.1	Single-surface formwork				
702.02.01.01a	12.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	106,00		
702.02.01.01b	12.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	106,00		
702.02.01.01c	12.3.4	Plane, horizontal to soffits of slab at entrance	m ²	6,00		
702.02.01.01d	12.3.5	Plane, inclined to soffit of stairs	m ²	16,00		
702.02.01.01e	12.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	297,00		
702.02.01.01f	12.3.7	Plane, vertical to edges of external roofs	m ²	20,00		
702.02.01.01g	12.3.8	Plane, vertical to edges of pipe supports	m ²	6,00		
702.02.02	12.3.9	Double-surface formwork (both sides measured)				
702.02.02.01a	12.3.10	Plane, vertical, to walls	m ²	554,00		
702.02.02.01b	12.3.11	Plane, vertical to column sides	m ²	37,00		
702.02.02.01c	12.3.12	Plane, vertical to beam sides	m ²	38,00		
702.02.02.01d	12.3.13	Plane, vertical to main roof edges beam sides	m ²	40,00		
702,06	12.3.14	Formwork to openings	m ²	2,00		
702.07	12.3.15	Chamfers larger than 25mm x 25mm				
702.07.01	12.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 12						

C.2.2.108

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 704	12,5	CONCRETE				
704,01	12.5.1	Cast in situ concrete				
704.01.01	12.5.2	Class 35/19 mm concrete				
704.01.01.01	12.5.3	Foundation, walls, stair, column and slab at entrance	m³	120,00		
704.01.02	12.5.4	Class 35/19 mm concrete				
704.01.02.01	12.5.5	Roof slabs	m³	36,00		
		Concrete for water retaining structures as per specialist design:				
		Cement content to be 420 kg/m³				
		Cement type to be CEM2 B-V				
		Water Cement Ratio to be 0.4				
704.01.02.02	12.5.6	Concrete Screed to Falls (1 Cement CEM1:5 River sand)	m³	2,8		
704.01.03	12.5.7	Class 10/19 concrete				
704.01.03.01	12.5.8	50 mm thick blinding layer and forming around sump	m³	9,00		
704,07	12.5.9	Design of concrete mixes by a specialist organisation appointed by the engineer	Lump Sum	1,00		
TOTAL SERIES 7 704 : STRUCTURES - CARRIED TO SUMMARY - BILL 12						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	12,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	12.6.1	Supply and install				
801.03.01.01	12.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	3,00		
801.03.01.02	12.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	6,00		
801.03.01.03	12.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	3,00		
801.03.01.04	12.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	6,00		
801.03.01.05	12.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	3,00		
801.03.01.06	12.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	6,00		
801.03.01.07	12.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	27,00		
B801.03.01.07	12.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for supportwork measured elsewhere.	No	6,00		
B801.03.01.08	12.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	3,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 12						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	13,1	CONSTRUCTION				
402,01	13.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	13.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	13.1.3	1 000mm NB (1 016 OD) x 10mm wall	m	5,00		
402,02	13.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	13.1.5	Item 1				
		1000 Ø x 1885mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	13.1.6	Item 2				
		1000 Ø x 700 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.03	13.1.7	Item 5				
		1000 Ø x 200 Ø STEEL SCOUR WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	13.1.8	Item 6				
		1000 Ø x 500 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	13.1.9	Item 7				
		1000 Ø x 1910mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END	No	1,00		

		FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)				
402.02.06	13.1.10	Item 10				
		200 Ø x 1650mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.07	13.1.11	Item 12				
		200 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 500 Ø) WITH STUB (AIR VALVE NB, 200 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	13.1.12	Item 3				
		700 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	13.1.13	Item 4				
		700 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	13.1.14	Item 8				
		200 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.11	13.1.15	Item 9				
		200 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.12	13.1.16	Item 11				
		200 Ø STEEL COUPLING SUCH AS KLAMFLEX RANGER	No	1,00		

		FLANGE ADAPTOR OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)				
402.02.13	13.1.17	Item 13				
		200 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE- CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	1,00		
B402.02.24	13.1.18	<u>Custom made Steel special to be measured,</u> <u>manufactured and installed (epoxy</u> <u>powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 13						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	13,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	13.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	13.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	39,00		
702.02.01.01b	13.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	39,00		
702.02.01.01c	13.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	13.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	13.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	107,00		
702.02.01.01f	13.3.7	Plane, vertical to edges of external roofs	m ²	7,00		
702.02.01.01g	13.3.8	Plane, vertical to edges of pipe supports	m ²	6,00		
702.02.02	13.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	13.3.10	Plane, vertical, to walls	m ²	200,00		
702.02.02.01b	13.3.11	Plane, vertical to column sides	m ²	12,00		
702.02.02.01c	13.3.12	Plane, vertical to beam sides	m ²	15,00		
702.02.02.01d	13.3.13	Plane, vertical to main roof edges beam sides	m ²	14,00		
702,06	13.3.14	Formwork to openings	m ²	2,00		
702.07	13.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	13.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 13						

C.2.2.159

C.2.2.160

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	13,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	13.6.1	Supply and install				
801.03.01.01	13.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No	No	1,00		
801.03.01.02	13.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	13.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	13.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	2,00		
801.03.01.05	13.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	13.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	13.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	10,00		
B801.03.01.07	13.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	2,00		
B801.03.01.08	13.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 13						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	14,1	CONSTRUCTION				
402,01	14.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	14.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	14.1.3	1000mm NB (1 016 OD) x 10mm wall	m	5,00		
402,02	14.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	14.1.5	Item 1				
		1000 Ø x 1890mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	14.1.6	Item 2				
		1000 Ø x 700 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	14.1.7	Item 3				
		1000 Ø x 900 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	14.1.8	Item 5				
		900 Ø x 3190mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	14.1.9	Item 4				

C.2.2.163

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	14,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	14.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	14.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	33,00		
702.02.01.01b	14.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	33,00		
702.02.01.01c	14.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	14.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	14.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	91,00		
702.02.01.01f	14.3.7	Plane, vertical to edges of external roofs	m ²	6,00		
702.02.01.01g	14.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	14.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	14.3.10	Plane, vertical, to walls	m ²	169,00		
702.02.02.01b	14.3.11	Plane, vertical to column sides	m ²	12,00		
702.02.02.01c	14.3.12	Plane, vertical to beam sides	m ²	9,00		
702.02.02.01d	14.3.13	Plane, vertical to main roof edges beam sides	m ²	12,00		
702,06	14.3.14	Formwork to openings	m ²	2,00		
702.07	14.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	14.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 14						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	14,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	14.6.1	Supply and install				
801.03.01.01	14.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No	No	1,00		
801.03.01.02	14.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	14.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	14.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support,bolts, flat bars and strip	No	1,00		
801.03.01.05	14.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	14.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	14.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	6,00		
801.03.01.08	14.6.8	Stainless steel 400mm x 400mm grating on scour pipe as per detail	No	1,00		
B801.03.01.07	14.6.9	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219.Concrete for support work measured elsewhere.	No	1,00		
B801.03.01.08	14.6.10	500mm x 500mm Sump completely supplied and Installed with 150mmx 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoTDetail Drawing No 7515-VC207.	No	1,00		

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	15,1	CONSTRUCTION				
402,01	15.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	15.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	15.1.3	900mm NB (1 016 OD) x 10mm wall	m	5,00		
402,02	15.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	15.1.5	Item 1				
		900 Ø x 2380mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	15.1.6	Item 2				
		900 Ø x 600 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.03	15.1.7	Item 5				
		900 Ø x 450 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	15.1.8	Item 6				
		900 Ø x 4050mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		

402.02.05	15.1.9	Item 7				
		150 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 450 Ø) WITH STUB (AIR VALVE NB, 150 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.06	15.1.10	Item 3				
		600 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.07	15.1.11	Item 4				
		600 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	15.1.12	Item 8				
		150 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	15.1.13	Item 9				
		150 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE-CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
B402.02.24	15.1.14	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 15						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	15,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	15.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	15.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	30,00		
702.02.01.01b	15.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	30,00		
702.02.01.01c	15.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	15.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	15.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	90,00		
702.02.01.01f	15.3.7	Plane, vertical to edges of external roofs	m ²	6,00		
702.02.01.01g	15.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	15.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	15.3.10	Plane, vertical, to walls	m ²	169,00		
702.02.02.01b	15.3.11	Plane, vertical to column sides	m ²	12,00		
702.02.02.01c	15.3.12	Plane, vertical to beam sides	m ²	10,00		
702.02.02.01d	15.3.13	Plane, vertical to main roof edges beam sides	m ²	12,00		
702,06	15.3.14	Formwork to openings	m ²	2,00		
702.07	15.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	15.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 15						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	15,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	15.6.1	Supply and install				
801.03.01.01	15.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	1,00		
801.03.01.02	15.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	15.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	15.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	2,00		
801.03.01.05	15.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	15.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	15.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	10,00		
B801.03.01.07	15.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	2,00		
B801.03.01.08	15.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 15						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	16,1	CONSTRUCTION				
402,01	16.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	16.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	16.1.3	900mm NB (1 016 OD) x 10mm wall	m	5,00		
402,02	16.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	16.1.5	Item 1				
		900 Ø x 2200mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	16.1.6	Item 2				
		900 Ø x 600 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	16.1.7	Item 5				
		800 Ø x 600 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	16.1.8	Item 6				
		800 Ø x 400 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	16.1.9	Item 7				
		800 Ø x 1860mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END	No	1,00		

		FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)				
402.02.06	16.1.10	Item 8				
		150 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 400 Ø) WITH STUB (AIR VALVE NB, 150 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.07	16.1.11	Item 3				
		600 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	16.1.12	Item 4				
		600 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	16.1.13	Item 9				
		150 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	16.1.14	Item 10				
		150 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE-CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
B402.02.24	16.1.15	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 11						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	16,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	16.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	16.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	26,00		
702.02.01.01b	16.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	26,00		
702.02.01.01c	16.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	16.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	16.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	83,00		
702.02.01.01f	16.3.7	Plane, vertical to edges of external roofs	m ²	6,00		
702.02.01.01g	16.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	16.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	16.3.10	Plane, vertical, to walls	m ²	154,00		
702.02.02.01b	16.3.11	Plane, vertical to column sides	m ²	12,00		
702.02.02.01c	16.3.12	Plane, vertical to beam sides	m ²	10,00		
702.02.02.01d	16.3.13	Plane, vertical to main roof edges beam sides	m ²	11,00		
702,06	16.3.14	Formwork to openings	m ²	2,00		
702.07	16.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	16.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 16						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 704	16,5	CONCRETE				
704,01	16.5.1	Cast in situ concrete				
704.01.01	16.5.2	<u>Class 35/19 mm concrete</u>				
704.01.01.01	16.5.3	Foundation, walls, stair, column and slab at entrance	m³	37,00		
704.01.02	16.5.4	<u>Class 35/19 mm concrete</u>				
704.01.02.01	16.5.5	Roof slabs	m³	7,00		
		Concrete for water retaining structures as per specialist design:				
		Cement content to be 420 kg/m³				
		Cement type to be CEM2 B-V				
		Water Cement Ratio to be 0.4				
704.01.02.02	16.5.6	Concrete Screed to Falls (1 Cement CEM1:5 River sand)	m³	0,5		
704.01.03	16.5.7	<u>Class 10/19 concrete</u>				
704.01.03.01	16.5.8	50 mm thick blinding layer and forming around sump	m³	3,00		
704,07	16.5.9	Design of concrete mixes by a specialist organisation appointed by the engineer	Lump Sum	1,00		
TOTAL SERIES 7 704 : STRUCTURES - CARRIED TO SUMMARY - BILL 1						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	16,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	16.6.1	Supply and install				
801.03.01.01	16.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	1,00		
801.03.01.02	16.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	16.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	16.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	1,00		
801.03.01.05	16.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	16.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	16.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	6,00		
B801.03.01.07	16.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	1,00		
B801.03.01.08	16.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 16						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	17,1	CONSTRUCTION				
402,01	17.1.2	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	17.1.3	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	17.1.4	800mm NB x 10mm wall	m	5,00		
402,02	17.1.5	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	17.1.6	Item 1				
		800 Ø x 1975mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	17.1.7	Item 2				
		800 Ø x 200 Ø STEEL SCOUR WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.03	17.1.8	Item 3				
		800 Ø x 600 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.04	17.1.9	Item 6				
		800 Ø x 400 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	17.1.10	Item 7				
		800 Ø x 2290mm LONG STEEL PIPE WITH PUDDLE (FLANGED TO SANS 1123 -1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS	No	2,00		

		1123 - 1600/3 (for flange details see the relevant table)				
402.02.06	17.1.11	Item 10				
		200 Ø STEEL STRAIGHT. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.07	17.1.12	Item 11				
		200 Ø x 200 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	17.1.13	Item 13				
		200 Ø x 1000mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END PLAIN. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	17.1.14	Item 14				
		150 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 400 Ø) WITH STUB (AIR VALVE NB, 150 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.10	17.1.15	Item 9				
		200 Ø x 90° STEEL BEND WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.11	17.1.16	Item 4				
		600 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.12	17.1.17	Item 5				
		600 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		

402.02.13	17.1.18	Item 8				
		200 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	3,00		
402.02.14	17.1.19	Item 12				
		200 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
Total Carried forward						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	17,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	17.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	17.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	59,00		
702.02.01.01b	17.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	59,00		
702.02.01.01c	17.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	17.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	17.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	124,00		
702.02.01.01f	17.3.7	Plane, vertical to edges of external roofs	m ²	8,00		
702.02.01.01g	17.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	17.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	17.3.10	Plane, vertical, to walls	m ²	231,00		
702.02.02.01b	17.3.11	Plane, vertical to column sides	m ²	18,00		
702.02.02.01c	17.3.12	Plane, vertical to beam sides	m ²	19,00		
702.02.02.01d	17.3.13	Plane, vertical to main roof edges beam sides	m ²	17,00		
702,06	17.3.14	Formwork to openings	m ²	2,00		
702.07	17.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	17.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 17						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	17,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	17.6.1	Supply and install				
801.03.01.01	17.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	2,00		
801.03.01.02	17.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	17.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	2,00		
801.03.01.04	17.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support, bolts, flat bars and strip	No	2,00		
801.03.01.05	17.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	17.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	17.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	7,00		
801.03.01.08	17.6.8	Stainless steel 400mm x 400mm grating on scour pipe as per detail	No	1,00		
801.03.01.09	17.6.9	Supply and place gabions to scour chambers	m2	15,00		
B801.03.01.07	17.6.10	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	2,00		

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	18,1	CONSTRUCTION				
402,01	18.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	18.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	18.1.3	800mm NB x 10mm wall	m	5,00		
402,02	18.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	18.1.5	Item 1				
		800 Ø x 2640mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.02	18.1.6	Item 2				
		800 Ø x 600 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	4,00		
402.02.03	18.1.7	Item 5				
		800 Ø x 400 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.04	18.1.8	Item 6				
		800 Ø x 1880mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). DOWNSTREAM END BEVELLED. UPSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.05	18.1.9	Item 7				

		150 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN CENTER OF SPECIAL FLANGE (BRANCH NB, 400 Ø) WITH STUB (AIR VALVE NB, 150 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.06	18.1.10	Item 3				
		600 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.07	18.1.11	Item 4				
		600 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.08	18.1.12	Item 8				
		150 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.09	18.1.13	Item 9				
		150 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE-CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	2,00		
B402.02.24	18.1.14	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 18						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 701	18,2	FOUNDATIONS FOR STRUCTURES				
701,01	18.2.1	Additional foundation investigations	Prov Sum	1,00	R2 000,00	R2 000,00
701,02	18.2.2	Excavation for structures				
701.02.01	18.2.3	Excavation of soft material situated in the following depth ranges:				
701.02.01.01	18.2.4	0 m up to 2 m	m ³	225,00		
701.02.01.02	18.2.5	Exceeding 2 m up to 4 m	m ³	166,00		
701.02.02	18.2.6	Extra over sub-item 701.02.01 for excavation in hard material irrespective of depth	m ³	152,00		
701.02.03	18.2.7	Extra over sub-item 701.02.01 for additional excavation required by the Engineer after the excavation has been completed	m ³	61,00		
701,04	18.2.8	Dewatering of foundation excavations	Lump Sum	1,00		
701,05	18.2.9	Backfill to excavations utilizing:				
701.05.01	18.2.10	Material from the excavations compacted to:				
701.05.01.02	18.2.11	93% of Mod AASHTO	m ³	210,00		
		(Please note that no extra over will be paid for fill within restricted areas)				
TOTAL SERIES 7 701 : STRUCTURES - CARRIED TO SUMMARY - BILL 18						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	18,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	18.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	18.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	32,00		
702.02.01.01b	18.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	32,00		
702.02.01.01c	18.3.4	Plane, horizontal to soffits of slab at entrance	m ²	4,00		
702.02.01.01d	18.3.5	Plane, inclined to soffit of stairs	m ²	10,00		
702.02.01.01e	18.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	168,00		
702.02.01.01f	18.3.7	Plane, vertical to edges of external roofs	m ²	12,00		
702.02.01.01g	18.3.8	Plane, vertical to edges of pipe supports	m ²	6,00		
702.02.02	18.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	18.3.10	Plane, vertical, to walls	m ²	308,00		
702.02.02.01b	18.3.11	Plane, vertical to column sides	m ²	24,00		
702.02.02.01c	18.3.12	Plane, vertical to beam sides	m ²	20,00		
702.02.02.01d	18.3.13	Plane, vertical to main roof edges beam sides	m ²	22,00		
702,06	18.3.14	Formwork to openings	m ²	2,00		
702.07	18.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	18.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 18						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	18,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	18.6.1	Supply and install				
801.03.01.01	18.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	4,00		
801.03.01.02	18.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	4,00		
801.03.01.03	18.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	2,00		
801.03.01.04	18.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support,bolts, flat bars and strip	No	2,00		
801.03.01.05	18.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	2,00		
801.03.01.06	18.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	4,00		
801.03.01.07	18.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	12,00		
B801.03.01.07	18.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	2,00		
B801.03.01.08	18.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	2,00		
TOTAL SERIES 7: STRUCTURES - CARRIED TO SUMMARY - BILL 18						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	19,1	CONSTRUCTION				
402,01	19.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	19.1.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	19.1.3	800mm NB x 10mm wall	m	5,00		
402,02	19.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	19.1.5	Item 1				
		800 Ø x 1865mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	19.1.6	Item 3				
		800 Ø x 800 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	19.1.7	Item 4				
		800 Ø x 250 Ø CONCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.04	19.1.8	Item 6				
		250 Ø x 2460mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	19.1.9	Item 8				
		250 Ø x 250 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the	No	1,00		

		relevant table)				
402.02.06	19.1.10	Item 9				
		250 Ø x 2800mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.07	19.1.11	Item 10				
		250 Ø x 100 Ø CONCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	19.1.12	Item 12				
		100 Ø x 2685mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	19.1.13	Item 2				
		800 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	19.1.14	Item 5				
		250 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.11	19.1.15	Item 7				
		250 Ø STEEL COUPLING SUCH AS KLAMFLEX RANGER FLANGE ADAPTOR OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	2,00		
402.02.12	19.1.16	Item 11				
		100 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.13	19.1.17	Item 13				
		100 Ø STEEL COUPLING SUCH AS KLAMFLEX RANGER FLANGE ADAPTOR OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		

B402.02.24	19.1.18	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 19						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 702	19,3	FALSEWORK, FORMWORK AND CONCRETE FINISH				
702.02.01	19.3.1	<u>Single-surface formwork</u>				
702.02.01.01a	19.3.2	Plane, horizontal, internally to soffit of main roof slab	m ²	31,00		
702.02.01.01b	19.3.3	Plane, horizontal, externally to soffit of main roof slab	m ²	31,00		
702.02.01.01c	19.3.4	Plane, horizontal to soffits of slab at entrance	m ²	2,00		
702.02.01.01d	19.3.5	Plane, inclined to soffit of stairs	m ²	5,00		
702.02.01.01e	19.3.6	Plane, vertical to edges of foundation, slab, walls and stair	m ²	91,00		
702.02.01.01f	19.3.7	Plane, vertical to edges of external roofs	m ²	6,00		
702.02.01.01g	19.3.8	Plane, vertical to edges of pipe supports	m ²	4,00		
702.02.02	19.3.9	<u>Double-surface formwork (both sides measured)</u>				
702.02.02.01a	19.3.10	Plane, vertical, to walls	m ²	169,00		
702.02.02.01b	19.3.11	Plane, vertical to column sides	m ²	12,00		
702.02.02.01c	19.3.12	Plane, vertical to beam sides	m ²	10,00		
702.02.02.01d	19.3.13	Plane, vertical to main roof edges beam sides	m ²	12,00		
702,06	19.3.14	Formwork to openings	m ²	2,00		
702.07	19.3.15	<u>Chamfers larger than 25mm x 25mm</u>				
702.07.01	19.3.16	Size and member indicated	m	100,00		
TOTAL SERIES 7 702 : STRUCTURES - CARRIED TO SUMMARY - BILL 19						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	11,6	MISCELLANEOUS ITEMS				
		Structural steelwork				
801.03.01	11.6.1	Supply and install				
801.03.01.01	11.6.2	Stainless steel cat ladders supplied and installed as per CoT details (Drawing No 7515- VC222). Approx. 3 m long, with 20 dia plug welded rungs, bolted to wall and floor with chemical anchors; all inclusive.	No	1,00		
801.03.01.02	11.6.3	Roof Ventilators (Air vents), Mild steel. All pipes, rounds and flats to be hot-dip galvanized - complete with extension	No	2,00		
801.03.01.03	11.6.3	Screw lid manhole access (950mm x 750mm) and vaults complete with rails for screw lid	No	1,00		
801.03.01.04	11.6.4	Concrete pedestal in chamber complete with base plate, steel pipe support,bolts, flat bars and strip	No	3,00		
801.03.01.05	11.6.5	Supply and install no gap high security sliding-lids in PRV valve chambers c/w rails and locking mechanisms	No	1,00		
801.03.01.06	11.6.6	Supply an opening tool and key assembly to lock and unlock the sliding lids.	No	2,00		
801.03.01.07	11.6.7	Wilson Commodore bollards or similar size (250mm dia x 1180mm high) with exposed aggregate finish, buried to depth of 300mm	No	10,00		
B801.03.01.07	11.6.8	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	No	3,00		
B801.03.01.08	11.6.9	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC-U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	No	1,00		
TOTAL SERIES 8 - 801 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 11						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	20,1	CONSTRUCTION				
402,01	20.1.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	20.1.2	Pipes : Class 12.5 (PN 12.5) PVC-O , SANS 16422:2007 (PVC-O 500)				
	20.1.3	450mm NB	m	5,00		
402,02	20.1.4	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	20.1.5	Item 2				
		400 Ø x 2430mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	20.1.6	Item 3				
		400 Ø x 200 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	20.1.7	Item 6				
		300 Ø x 200 Ø ECCENTRIC STEEL REDUCER. BOTH ENDS FLANGED TO SANS 1123 -1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	20.1.8	Item 7				
		300 Ø x 150 Ø STEEL TEE WITH ALL ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.05	20.1.9	Item 8				
		300 Ø x 2570mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.06	20.1.10	Item 10				
		100 Ø STEEL SPACER BETWEEN BRANCH FLANGE & VALVE MADE UP BY 200mm LONG STUB MOUNTED IN	No	1,00		

		CENTER OF SPECIAL FLANGE (BRANCH NB, 150 Ø) WITH STUB (AIR VALVE NB, 100 Ø) FLANGED & DRILLED TO SANS 1123 - 1600/3 (for flange details see the relevant table)				
402.02.07	20.1.11	Item 1				
		400 Ø STEEL COUPLING SUCH AS KLAMFLEX RANGER FLANGE ADAPTOR OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	20.1.12	Item 4				
		200 Ø STEEL COUPLING SUCH AS KLAMFLEX DISMANTLING JOINT OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	20.1.13	Item 5				
		200 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.10	20.1.14	Item 9				
		300 Ø STEEL COUPLING SUCH AS KLAMFLEX RANGER FLANGE ADAPTOR OR SIMILAR APPROVED, PN16. FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.11	20.1.15	Item 11				
		100 Ø VOSA GATE VALVE, PN16, OR SIMILAR APPROVED WITH HAND WHEEL AND ANTI-CLOCKWISE CLOSING TO SANS 664. NON RISING STEM. BOTH ENDS FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.12	20.1.16	Item 12				
		100 Ø VAG DUOJET AUTOMATIC AIR RELEASE & VACUUM BREAK VALVE SINGLE-CHAMBER TYPE, PN16, OR SIMILAR APPROVED, FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
B402.02.24	20.1.17	<u>Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 20						

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C.2.2.211

C.2.2.212

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C.2.2.214

C.2.2.215

C.2.2.216

C.2.2.217

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 6		ROADS AND PARKING AREAS				
SECTION 610	21,14	CONCRETE PAVEMENTS				
610.01	21.14.1	Concrete pavement				
		(Class, thickness and nominal cement content indicated)	m2	3 200,00		
610.02		Texturing and curing of concrete pavement				
610.02.01		Wire-brush texturing	m2	3 200,00		
610.02.02		Curing	m2	3 200,00		
610,04		Joints				
610.04.03		<u>Transverse contraction joints</u>				
610.04.03.01		Sawn contraction joints (sealed) completed in a single operation (width as shown on Drawings)	m	622,00		
610.04.04		Dowel bars (mild steel) (diameter and length indicated)	no.	778,00		
610.04.05		Tie bars (diameter and length indicated)	no.	778,00		
610.04.06		End caps for dowels at expansion joints	no.	778,00		
610.05		Coring and testing of cores				
610.05.01		100 mm cores drilled from pavement	no.	20,00		
610.05.02		150 mm cores drilled from pavement and tested for compressive strength	no.	20,00		
610.06		Repairing cracks				
610.06.01		By the injection of epoxy resin	m	10,00		
610.06.02		By routing and sealing with cold- applied liquid sealant	m	15,00		
TOTAL SECTION 610 : CONCRETE PAVEMENT-BILL 21						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 6		ROADS AND PARKING AREAS				
SECTION 612	21,11	Traffic Signs				
612.01		Sign boards with painted back-ground, symbols, lettering and borders in engineering-grade retro-reflective material with sign boards constructed from -				
612.01.03		Sheet steel (Chromadek) with an -				
612.01.03.01		Area not exceeding 2m ²	m ²	10,00		
612.01.03.02		Area exceeding 2m ² but not 10m ²	m ²	5,00		
612.02		Extra over Item 612.01 for -				
612.02.01		Background of retro-reflective material of -				
612.02.01.01		Engineering grade	m ²	10,00		
612.02.01.02		High-intensity grade	m ²	5,00		
612.02.01.03		Super-engineering grade	m ²	5,00		
612.02.02		Lettering, symbols and borders of retro-reflective material of -				
612.02.02.01		High-intensity grade	m ²	5,00		
612.02.02.02		Super-engineering grade	m ²	5,00		
612.03		Sign supports				
612.03.01		Structural steel	t	0,50		
612.03.02		Steel tubing	t	0,20		
612.04		Extra over Items 612.03.01 and 612.03.02 for providing				
612.04.01		Unpainted galvanized steel members	t	0,50		

C.2.2.222

C.2.2.223

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 1		ANCILLARY WORK				
SECTION 101	22,1	SITE CLEARING AND GRUBBING				
101.01	22,1	Clearing and grubbing				
101.01.01	22.1.1	Areas	m ²	12100,00		
101,02	22.1.2	Cutting and removing larges trees with a girth-				
101.02.01	22.1.3	Exceeding 1-m up to and including 2-m	No.	5,00		
101.02.02	22.1.4	Exceeding 2-m up to and including 3-m	No.	1,00		
101,03	22.1.5	Grubbing and the removal of the stumps and roots of large trees with a girth-				
101.03.01	22.1.6	Exceeding 1-m up to and including 2-m	No.	5,00		
101.03.01	22.1.7	Exceeding 2-m up to and including 3-m	No.	1,00		
101,04	22.1.8	Reclearing areas (only on the written instructions of the Engineer)				
101.04.01	22.1.9	Strips (1m width)	m	500,00		
101.04.02	22.1.10	Area	m ²	10,00		
101,05	22.1.11	Removal and disposal of specific elements				
101.05.01	22.1.12	Concrete kerbing / kerbing combination	m	100,00		
101.05.02	22.1.13	Concrete or brick elements (reinforced or unreinforced)				
101.05.02.01	22.1.14	Concrete Work	m ³	10,00		
101.05.02.02	22.1.15	Brickwork	m ²	10,00		
TOTAL SECTION 101: SITE CLEARING AND GRUBBING-BILL 22						

C.2.2.226

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C.2.2.228

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 1		ANCILLARY WORK				
Section 106	22,6	SERVICE DUCTS				
106.01	22.6.1	Bedding and backfilling up to 300 mm above pipes				
106.01.01	22.6.2	Using selected excavated material	m³	100,00		
106.01.02	22.6.3	Using imported selected material	m³	50,00		
106.04	22.6.4	Service duct pipes				
106.04.01	22.6.5	Ordinary pipes:				
106.04.01.01	22.6.6	75mm Diameter pipes	m	100,00		
106.04.02	22.6.7	Split pipes:				
106.04.02.01	22.6.8	75mm Diameter pipes	m	100,00		
106.05	22.6.9	Duct markers	no.	10,00		
TOTAL SECTION 106 : SERVICE DUCTS – BILL 22						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 2		EARTHWORKS				
Section 202	22,8	TRENCHING				
202,01	22.8.1	Trench excavations:				
202,01,01	22.8.2	Up to 1,0m wide				
202.01.01.01	22.8.3	up to 1,0-m deep	m ³	10,00		
202.01.01.02	22.8.4	over 1-m up to 1,5-m deep	m ³	10,00		
202.01.01.03	22.8.5	Over 1,5 up to 2-m deep	m ³	10,00		
202.01.01.04	22.8.6	Over 2 up to 2,5-m deep	m ³	50,00		
202.01.01.05	22.8.7	Over 2,5 up to 3-m deep	m ³	50,00		
202.01.01.06	22.8.8	Over 3 up to 3.5-m deep	m ³	200,00		
202.01.01.07	22.8.9	Over 3.5 up to 4-m deep	m ³	100,00		
202.01.01.08	22.8.10	Over 4.5 up to 5-m deep	m ³	100,00		
202.01.01.09	22.8.11	Over 5.5 up to 6-m deep	m ³	100,00		
202.01.01.10	22.8.12	Over 6.5 up to 7-m deep	m ³	1 400,00		
202,02	22.8.13	Extra over item 5.6.1 for excavating in-				
202.02.01	22.8.14	Intermediate excavation	m ³	840,00		
202.02.02	22.8.15	Hard material	m ³	280,00		
202,03	22.8.16	Excavations outside the Normal trench profile	m ³	100,00		
202,04	22.8.17	Hand excavation	m ³	100,00		
202,06	22.8.18	Backfilling of trenches (excluding backfill around the pipe barrel) with material obtained from trench excavations	m ³	1 400,00		
202,07	22.8.19	Extra over item 5.6.10 for using backfill material obtained –				

C.2.2.232

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 4		WATER RETICULATION & WATER MAINS				
Section 402	22.10	CONSTRUCTION				
402,01	22.10.1	Handling, laying and jointing of water pipes irrespective of depth:				
402.01.01	22.10.2	Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with 2000 micron polyurethane coating). All welding of joints repaired according to Field joint repair specification				
	22.10.3	700mm NB x 10mm wall	m	5,00		
	22.10.4	900mm NB x 10mm wall	m	5,00		
402,02	22.10.5	Extra over item 402.01 for providing and installing fittings, valves and specials:				
402.02.01	22.10.6	Item 1				
		700 Ø x 5700mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.02	22.10.6	Item 2				
		700 Ø x90° MEDIUM RADIUS STAINLESS STEEL BEND FLANGED END. BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.03	22.10.7	Item 3				
		700 Ø x 1250mm LONG STEEL PIPE (GRADE 3046) WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.04	22.10.8	Item 4				
		700 Ø x45° MEDIUM RADIUS STAINLESS STEEL BEND FLANGED END. BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		

402.02.05	22.10.9	Item 5				
		700 Ø x 1550mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.06	22.10.10	Item 6				
		900 Ø x 6950mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.07	22.10.11	Item 7				
		900 Ø x 90° SHORT RADIUS STAINLESS STEEL BEND FLANGED END. BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.08	22.10.12	Item 8				
		900 Ø x 660mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.09	22.10.13	Item 9				
		6mm VORTEX PLATE 1400 Ø to 1000 Ø STEEL FITTING. UPSTREAM END BEVELLED. DOWNSTREAM END BEVELLED TO SANS 1123 - 1600/3	No	1,00		
402.02.10	22.10.14	Item 10				
		REDUCER 1000 Ø to 900 Ø STEEL FITTING. UPSTREAM END BEVELLED. DOWNSTREAM END BEVELLED TO SANS 1123 - 1600/3	No	1,00		
402.02.11	22.10.15	Item 11				
		600 Ø x 7710mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.12	22.10.16	Item 12				
		600 Ø x 90° MEDIUM RADIUS STAINLESS STEEL BEND FLANGED END. BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		

402.02.13	22.10.17	Item 13				
		600 Ø x 1310mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.14	22.10.18	Item 14				
		600 Ø x 1500mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
402.02.15	22.10.19	Item 15				
		600 Ø x 2350mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.16	22.10.20	Item 16				
		REDUCER 1000 Ø to 600 Ø STEEL FITTING. UPSTREAM END BEVELLED. DOWNSTREAM END BEVELLED TO SANS 1123 - 1600/3	No	1,00		
402.02.17	22.10.21	Item 17				
		250 Ø x 8435mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.18	22.10.22	Item 18				
		250 Ø x90° MEDIUM RADIUS STAINLESS STEEL BEND FLANGED END. BOTH END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.19	22.10.23	Item 19				
		250 Ø x 980mm LONG STEEL PIPE WITH PUDDLE FLANGE (FLANGED TO SANS 1123 - 1600/3). UPSTREAM END BEVELLED. DOWNSTREAM END FLANGED TO SANS 1123 - 1600/3 (for flange details see the relevant table)	No	1,00		
402.02.20	22.10.24	Item 20				
		REDUCER 400 Ø to 250 Ø STEEL FITTING. UPSTREAM END BEVELLED. DOWNSTREAM END BEVELLED TO SANS 1123 - 1600/3	No	1,00		
B402.02.24	22.10.25	<u>Custom made Steel special to be measured, manufactured and installed (epoxy</u>	Prov Sum	1,00	R10 000,00	R10 000,00
TOTAL SERIES 4: WATER MAINS - CARRIED TO SUMMARY - BILL 22						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 5		DRAINAGE AND EROSION PROTECTION				
Section 502	22.12	PREFABRICATED CULVERTS AND STORMWATER SEWERS				
502,01	22.12.1	Backfilling with selected excavated material compacted to -				
502.01.01	22.12.2	90% of modified AASHTO density	m ³	100		
502.01.02	22.12.3	93% of modified AASHTO density	m ³	100		
502,02	22.12.4	Supplying and laying of concrete pipe culverts (type SC-pipes)				
502.02.01	22.12.5	class B Bedding, Class 50D pipe				
502.02.01.01	22.12.6	450 mm dia concrete pipe	m	200,00		
502.02.01.02	22.12.7	650 mm dia concrete pipe	m	200,00		
		NOTE: Trench excavations for item 502.02.01 are covered in item 202.01				
502.07	22.12.8	Extra over item 502.02 for end units for concrete pipe culverts with a skew of more than 20°				
502.07.01	22.12.9	Class 50D pipe				
502.07.01.01	22.12.10	450 mm dia concrete pipe	no.	5,00		
502.07.01.02	22.12.11	650 mm dia concrete pipe	no.	5,00		
502,16	22.12.12	Manholes, catchpits, precast inlet and outlet structures and junction boxes complete				
502.16.01	22.12.13	Manholes 1250mm diameter ring, up to a depth of 3.0m	No	5,00		
502.16.02	22.12.14	Catchpits (type indicated)	No	2,00		
502.16.06	22.12.15	502.16.06 Extra over or under item 502.16.01 for variation in depth of manholes	m	10,00		

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TOTAL SECTION 504: OPEN DRAINS - BILL 22

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 5		DRAINAGE AND EROSION PROTECTION				
Section 505	22,15	EROSION PROTECTION				
505,01	22.15.1	Foundation trench excavation and backfilling				
505.01.01	22.15.2	In solid rock (material which requires blasting)	m3	500,00		
505.01.02	22.15.3	In all other classes of material	m3	1 000,00		
B505.02	22.15.4	Surface preparation for the bedding of terraforce retaining wall	m2	1 800,00		
505,03	22.15.5	Gabions				
505.03.01	22.15.6	Gabion baskets (2m x 1m x1m) 80 - 100mm mesh	m³	20,00		
505.03.02	22.15.7	Gabion mattresses (4m x 2m x 0.3m) 80 - 100mm mesh	m³	20,00		
505,05	22.15.8	Filter fabric for gabions and riprap (Type, class and grade stated)	m2	10,00		
505,07	22.15.9	Riprap				
505.07.02	22.15.10	Dumped riprap (Critical mass of stone indicated)	m3	800,00		
505.07.03	22.15.11	Filter backing (sub-clauses 02.02 of section 501 and 07.02 of this section) which consists of -				
505.07.03.01	22.15.12	Crushed stone	m3	800,00		
505,09	22.15.13	Concrete pitching				
505.09.04	22.15.14	Precast concrete blocks	m2	1 500,00		
505.10	22.15.15	Concrete in edge beams and foundation trenches (15mpa concrete)	m3	150,00		
505,11	22.15.16	Provision and application of:				
505.11.01	22.15.17	Ant poison	PC Sum	1,00	R20 000,00	R20 000,00

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 701	22.19	FOUNDATIONS FOR STRUCTURES				
701.01	22.19.1	Additional foundation investigations	Prov Sum	1,00	R100 000,00	R100 000,00
701.02	22.19.2	Excavation for Structures				
701.02.01	22.19.3	Excavation of soft material situated in the following depth ranges:				
701.02.01.01	22.19.4	0 m up to 1 m	m ³	12 100,00		
701.02.01.02	22.19.5	Exceeding 2 m up to 4 m	m ³	7 260,00		
701.02.02	22.19.6	Extra over sub-item 701.02.01 for excavation in hard material irrespective of depth	m ³	14 520,00		
701.02.03	22.19.7	Extra over sub-item 701.02.01 for additional excavation required by the Engineer after the excavation has been completed	m ³	100,00		
B701.02.04	22.19.8	excavating in intermediate material irrespective of depth	m ³	1 936,00		
701.04	22.19.9	Dewatering of foundation excavation	Lump Sum	1,00		
701.05	22.19.10	Backfilling of Excavations utilising				
701.05.01	22.19.11	Material from the excavation compacted to -				
701.05.01.01	22.19.12	90% of Modified AASHTO Density	m ³	7 260,00		
701.05.02	22.19.13	Imported material compacted to -				
701.05.02.03	22.19.14	96% of Modified AASHTO Density	m ³	14 520,00		
701.07	22.19.15	Foundation Fill Consisting of				
701.07.01	22.19.16	Rock	m ³	100,00		
701.07.02	22.19.17	Crushed Stone	m ³	500,00		

701.07.03	22.19.18	Compacted Granular material	m³	36 300,00		
701.07.04	22.19.19	Mass concrete (class 20/19 concrete)	m³	907,00		
701.07.05	22.19.20	75 mm thick blinding layer, class 15/19 concrete	m³	340,00		
TOTAL SERIES 7 701 : STRUCTURES - CARRIED TO SUMMARY - BILL 22						

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C.2.2.251

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 704	22,22	CONCRETE				
704.01		Cast In Situ Concrete				
704.01.01.01		75mm Blinding Layer in 15/19 Concrete	m ³	390,00		
704.01.01.02		35MPA/19 Concrete in Foundations Floor	m ³	1 972,00		
704.01.01.01		35MPA/19 Concrete in Column Bases	m ³	260,00		
704.02		Manufacture of precast concrete members				
B704.02		Establishment on site for-				
B704.02.01		Precast Reservoir	Lump sum	1,00		
		Precast Walls				
704.02.01		Wall Panels (9.688 Ton) 8.625 high	no	78,00		
704.02.02		Wall Buttress Panels 8.625 high - ANC A	no	3,00		
704.02.03		Wall Buttress Panels 8.625 high - ANC B	no	3,00		
		Precast Columns				
704.02.04		460x460mm PC Columns 9500mm - DBL Corbel	no	4,00		
704.02.05		460x460mm PC Columns 9550mm - DBL Corbel	no	2,00		
704.02.06		460x460mm PC Columns 9500mm - No Corbel	no	4,00		
704.02.07		460x460mm PC Columns 9550mm - No Corbel	no	2,00		
704.02.08		460x460mm PC Columns 9575mm - No Corbel	no	4,00		
704.02.09		460x460mm PC Columns 9600mm - No Corbel	no	4,00		
704.02.10		460x460mm PC Columns 9675mm - No Corbel	no	1,00		
704.02.11		460x460mm PC Columns 9475mm - No Corbel	no	4,00		
		Precast Beams				
704.02.12		460x655mm PC Beam 10355mm	no	8,00		

704.02.13		460x655mm PC Beam 10825mm	no	10,00		
704.02.14		460x655mm PC Beam 9890mm	no	10,00		
		Precast HC Slabs & Copings				
B704.02.15		250mm (MS6) pre-cast concrete hollow-core slabs	m2	389,00		
B704.02.16		250mm (MS9) pre-cast concrete hollow-core slabs	m2	2 658,00		
704.02.17		Coping 562x562 Mixcop 562x562	no	468,00		
Total Carried forward						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
Series 7		STRUCTURES				
Section 704	22,23	CONCRETE				
704.03		Transportation and erection of precast concrete members				
		Precast Walls				
704.03.01		Wall Panels (9.688 Ton) 8.625 high	no	78,00		
704.03.02		Wall Buttress Panels 8.625 high - ANC A	no	3,00		
704.03.03		Wall Buttress Panels 8.625 high - ANC B	no	3,00		
		Precast Columns				
704.03.04		460x460mm PC Columns 9500mm - DBL Corbel	no	4,00		
704.03.05		460x460mm PC Columns 9550mm - DBL Corbel	no	2,00		
704.03.06		460x460mm PC Columns 9500mm - No Corbel	no	4,00		
704.03.07		460x460mm PC Columns 9550mm - No Corbel	no	2,00		
704.03.08		460x460mm PC Columns 9575mm - No Corbel	no	4,00		
704.03.09		460x460mm PC Columns 9600mm - No Corbel	no	4,00		
704.03.10		460x460mm PC Columns 9675mm - No Corbel	no	1,00		
704.03.11		460x460mm PC Columns 9475mm - No Corbel	no	4,00		
		Precast Beams				
704.03.12		460x655mm PC Beam 10355mm	no	8,00		
704.03.13		460x655mm PC Beam 10825mm	no	10,00		
704.03.14		460x655mm PC Beam 9890mm	no	10,00		
704.05		Cast in situ no-fines concrete				
704.05.01		15/19 Concrete no-fines in concrete floors	m ³	520,00		
704.07		Design of concrete mixes by a specialist organization appointed by the Engineer	Pro Sum	1,00	R50 000,00	R50 000,00
TOTAL SERIES 7 704 : STRUCTURES - CARRIED TO SUMMARY - BILL 22						

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 7		STRUCTURES				
Section 706	22,25	JOINTS IN STRUCTURES				
706.01		Proprietary Expansion Joints				
706.01.01		Prime cost sum allowed for the purchase and taking delivery of expansion joints	PC	1,00	R1 000 000,00	R1 000 000,00
706.01.02		Percentage on prime Cost for Charges and Profit	%	1 000 000,00		
706.03		Expansion joints as detailed on the Drawings and/or specified in the Project Specifications				
		Floor joints & Kicker/Floor				
706.03.01		Supply and install 200mm x 2mm Combiflex Bandage (CJ's, Floor/Kicker, Floor/Base)	m	670,00		
706.03.02		20mm x 20mm Polyurethane secondary seal.	m	500,00		
		Wall/Kicker joint				
706.03.03		Supply and install 200mm x 2mm Combiflex Bandage (CJ's, Floor/Kicker, Floor/Base)	m	200,00		
		Column/Base Joint				
706.03.04		Supply and install 25 x 25mm plastered cementitious fillet and 535mm wide	m	220,00		
		Vertical Wall joints (between panels)				
706.03.05		Waterproofing of vertical grout joints using Mapelastc Smart (150mm wide)	m	200,00		
TOTAL SERIES 7 706 : STRUCTURES - CARRIED TO SUMMARY - BILL 22						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		STRUCTURES				
Section 801	22.26	CONCRETE RESERVOIRS				
801.01	22.26.1	Crushed Stone on Reservoir Roof	m ³	5,00		
801.02	22.26.2	Lightning Protection	lump sum	1,00		
801.04	22.26.3	Sterilizing of Reservoir	lump sum	1,00		
801.05	22.26.4	Testing of Reservoir Water Tightness	lump sum	1,00		
B801.06	22.26.5	Waterproofing of vertical grout joints(150mm wide)	m2	180,00		
B801.07	22.26.6	Waterproofing of Roof / Thermal Insulation	m2	2 961,00		
B801.08		Allow Provisional Sum for Electrical Supply	Pro Sum	1,00	R1 000 000,00	R1 000 000,00
	22.26.7					
B801.08.01		(a) Handling cost in respect of item B801.08	%	R1 000 000,00		
B801.09	22.26.8	Allow Provisional Sum for Rand Water Works	Pro Sum	1,00	R3 000 000,00	R3 000 000,00
B801.09.01		(a) Handling cost in respect of item B801.09	%	R3 000 000,00		
	22.26.9					
B801.10		Allow Provisional Sum for Telemetry System	Pro Sum	1,00	R2 000 000,00	R2 000 000,00
B801.10.01	22.26.10	(a) Handling cost in respect of item B801.10	%	R2 000 000,00		
809.01		Miscellaneous Structural steel Items				
809.01.01.01	22.26.11	250 Galvanised Manhole Cover (X2)	kg	400,00		
809.01.01.02		Stainless Steel Z Hangers 2No 150 x 150 x 10mm B2B	kg	1 000,00		
	22.26.12					
809.01.01.03		Stainless Steel Angle Supports 120 x 120 x 10mm	kg	400,00		
809.01.04.01	22.26.13	100mm Diameter Downpipes	No	30,00		
809.01.04.02	22.26.14	Stainless Steel Ladder in Reservoir Tank (Cat	No	1,00		

		ladder - C304) refer drw number				
809.01.04.03		Stainless Steel Cat Ladder Outside Reservoir - Galvanised	No	1,00		
TOTAL SERIES 8 : SPECIFIC WORKS - CARRIED TO SUMMARY - BILL 22						

SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Series 8		SPECIFIC WORKS				
Section 804	23,1	PIPE JACKING & BORING				
		<u>ROAD NAME: HORNSNEK</u>				
804,01	23.1.1	Establishment on site for-				
804.01.01	23.1.2	Culvert jacking	Lump sum	1,00		
804,02	23.1.3	Access to and from the thrust and reception pits	Lump sum	1,00		
804,03	23.1.4	Excavating in soft material for-				
804.03.01	23.1.4.1	Thrust and reception pits	Lump sum	1,00		
804,04	23.1.3	Extra over item 2.11.4 for excavating hard material	m³	20,00		
804,05	23.1.4	Backfilling the				
804.05.01	23.1.5	Thrust and reception pits with:				
804.05.01.01	23.1.5.1	Excavated material	m³	70,00		
804.05.01.02	23.1.5.2	Imported material	m³	20,00		
804,06	23.1.6	Supply of Culverts to be jacked				
		2500 x 2500mm CL100S Portal Culvert complete with precast floor slab to SANS 986	m	40,00		
804,07	23.1.7	Jacking of pipes through :				
804.07.01	23.1.7.1	Soft material	m³	312,50		
804.07.02	23.1.7.2	Hard material	m³	50,00		
804,09	23.1.8	Supplying, jointing and inserting pipes				
		<u>Spiral welded grade 300 WA Mild Steel Pipe, Internally lined with 600 micron epoxy lining (according to lining specification), and Coated with</u>				

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
Total Brought Forward						
Series 8		SPECIFIC WORKS				
Section 804	23,2	PIPE JACKING & BORING				
		<u>ROAD NAME: BEVELEY STREET</u>				
804,01	23.2.1	Establishment on site for-				
804.01.02	23.2.2	Pipe boring	Lump sum	1,00		
804,02	23.2.3	Access to and from the thrust and reception pits	Lump sum	1,00		
804,03	23.2.4	Excavating in soft material for-				
804.03.02	23.2.4.1	Pipe boring pits	Lump sum	1,00		
804,04	23.2.3	Extra over item 804.03 for excavating hard material	m ³	20,00		
804,05	23.2.4	Backfilling the				
804.05.02	23.2.5	Pipe boring pits with				
804.05.02.01	23.2.5.1	Excavated material	m ³	70,00		
804.05.02.02	23.2.5.2	Imported material	m ³	20,00		
804,06	23.2.6	Supply of Pipe to be jacked				
		PN12.5 PE100 600mm diameter HDPE pipe	m	20,00		
804,08	23.2.7	Boring of holes through –				
804.08.01		<u>Soft material</u>				
804.08.01.01	23.2.7.1	NB600mm diameter	m	20,00		
804.08.02		<u>Hard material</u>				
804.08.02.01	23.2.7.1	NB600mm diameter	m	5,00		
804,09	23.2.8	Supplying, jointing and inserting pipes				

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SPECIFICATION REFERS	ITEM	DESCRIPTION	UNIT	Q'TY	RATE	AMOUNT
SERIES 9		QUALITY CONTROL				
Section 903	24,1	TESTING				
B903.03	24.1.1	Special tests on concrete				
B903.03.01	24.1.2	Compressive-strength tests on concrete cubes	Prov Sum	1,00	R300 000,00	R300 000,00
B903.03.02	24.1.3	Charge on Prime cost sum (B903.03.01)	%	R300 000,00		
B903.04	24.1.4	Special tests on welded specimens				
B903.04.01	24.1.5	Specimen welded connection (fillet and arch welding)	Prov Sum	1,00	R200 000,00	R200 000,00
B903.04.02	24.1.6	Charge on Prime cost sum (B903.04.01)	%	R200 000,00		
903,06	24.1.7	Other special tests requested by the Engineer				
903.06.01	24.1.8	Cost of Geotech testing	PC sum	1,00	R400 000,00	R400 000,00
903.06.02	24.1.9	Charge on Prime cost sum (903.06.01)	%	R400 000,00		
903.06.03	24.1.10	Cost of testing of the existing pipeline external coating	PC sum	1,00	R200 000,00	R200 000,00
903.06.04	24.1.11	Charge on Prime cost sum (903.06.03)	%	R200 000,00		
903.06.05	24.1.12	Cost of testing of the existing pipeline internal lining	PC sum	1,00	R150 000,00	R150 000,00
903.06.06	24.1.13	Charge on Prime cost sum (903.06.05)	%	R150 000,00		
903.06.07	24.1.14	Cost of X-Rays testing of the existing steel pipeline joints	PC sum	1,00	R600 000,00	R600 000,00
903.06.08	24.1.15	Charge on Prime cost sum (903.06.07)	%	R600 000,00		
TOTAL SECTION 903: TESTING						

SECTIONS	DESCRIPTION	AMOUNT
BILL 0	GENERAL	
001	General Requirements and Charges	
002	Engineers Accommodation	
B003	Training and Development	
BILL 1	REMEDIAL WORK	
101	Site Clearing and Grubbing	
102	Accommodation of Traffic	
103	Overhaul	
104	Landscaping and Grassing	
201	General Earthworks	
202	Trenching	
501	Surface Drains and Drainage Blankets	
B810	Remedial - Bulk Steel Water	
B811	Remedial - Bulk UPVC Water	
B812	Remedial - Water Reticulation	
B813	Remedial - Sewer Reticulation	
BILL 2	BULK STEEL WATER PIPELINE	
101	Site Clearing and Grubbing	
102	Accommodation of Traffic	
103	Overhaul	
202	Trenching	
402	Construction	
403	Testing	
BILL 3	BULK uPVC WATER PIPELINE	
101	Site Clearing and Grubbing	
102	Accommodation of Traffic	
103	Overhaul	
202	Trenching	
402	Construction	
403	Testing	
BILL 4	CATHODIC PROTECTION	
B1001	Cathodic Protection System	
BILL 5	WATER RETICULATION & WATER MAINS	
101	Site Clearing and Grubbing	
103	Overhaul	
202	Trenching	
402	Construction	
403	Testing	

BILL 6	SEWER RETICULATION & SEWER MAINS	
101	Site Clearing and Grubbing	
103	Overhaul	
202	Trenching	
302	Construction	
303	Testing	
BILL 7	HORNSNEK LL RESERVOIR REINFORCED CONCRETE VALVES CHAMBER - CHAMBER C.01(18.0m L x 8.0m W x 3.5m H)	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
TOTAL CARRIED FORWARD		

SECTIONS	DESCRIPTION	AMOUNT
TOTAL BROUGHT FORWARD		
BILL 8	HORNSNEK LL RESERVOIR MANOUVERING ROOM REINFORCED CONCRETE VALVES CHAMBER - CHAMBER C.02 (18.0m L x 10.0m W x 3.5m H)	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 9	BULK DISTRIBUTION NETWORK - CHAMBER C.03 & C.04	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 10	BULK DISTRIBUTION NETWORK - CHAMBER C.05	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 11	BULK DISTRIBUTION NETWORK - CHAMBER C.06	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 12	BULK DISTRIBUTION NETWORK - CHAMBER C.08, C.08 & C.09	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 13	BULK DISTRIBUTION NETWORK - CHAMBER C.10	

402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 14	BULK DISTRIBUTION NETWORK - CHAMBER C.11	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
TOTAL CARRIED FORWARD		

SECTIONS	DESCRIPTION	AMOUNT
TOTAL BROUGHT FORWARD		
BILL 15	BULK DISTRIBUTION NETWORK - CHAMBER C.12	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 16	BULK DISTRIBUTION NETWORK - CHAMBER C.13	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 17	BULK DISTRIBUTION NETWORK - CHAMBER C.14	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 18	BULK DISTRIBUTION NETWORK - CHAMBER C.15 & C.16	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 19	BULK DISTRIBUTION NETWORK - CHAMBER C.17	
402	Water Reticulation & Water Mains	
701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 20	BULK DISTRIBUTION NETWORK - CHAMBER C.18	
402	Water Reticulation & Water Mains	

701	Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
801	Specific Works	
BILL 21	ACCESS ROADS	
101	Site Clearance	
102	Accommodation of Traffic	
103	Overhaul	
201	General Earthworks	
203	Mass Earthworks	
501	Surface Drains and Drainage Blankets	
503	Kerbing and Channelling	
601	Gravel Pavement Layers	
604	Stabilisation	
609	Segmented Paving	
701	Excavation for Structures	
702	Falsework, Formwork and Concrete Finish	
703	Steel Reinforcement for Structures	
704	Concrete	
705	Prestressing of Concrete	
706	Joints in Structures	
801	Specific Works	
BILL 23	SPECIFIC WORKS	
804	Pipe Jacking & Boring	
BILL 24	QUALITY CONTROL	
903	Testing	
TOTAL CARRIED FORWARD		

DESCRIPTION		AMOUNT
TOTAL OF SCHEDULED PRICES		
ADD ESTIMATED CPA @ 10% BASED ON THE FORMULA TO BE APPLIED TO TOTAL SCHEDULED PRICES		
ADD CONTINGENCIES @ 10% of TOTAL SCHEDULED PRICES TO BE APPLIED TO TOTAL SCHEDULE PRICES		
SUBTOTAL		
ADD 15% VAT		
CONTRACT PRICE CARRIED FORWARD TO FORM OF OFFER		
Signature of person authorised to sign the tender:		Date

Contract No: **HS 04-2025/26**

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

Part C3: Scope of Work

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

PORTION 2: CONTRACT

PART C3: SCOPE OF WORK

SCOPE OF WORK

INDEX

Section	Description	Page No
C3.1	DESCRIPTION OF THE WORKS	C3.1
C3.2	ENGINEERING	C3.2
C3.3	PROCUREMENT	C3.3
C3.4	CONSTRUCTION	C3.4
C3.5	MANAGEMENT	C3.5
C3.6	PARTICULAR SPECIFICATIONS AND VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS	C3.6
C3.7	SOCIO-ECONOMIC PLAN AND COMMUNITY PARTICIPATION AND UPLIFTMENT THROUGH PROJECTS.....	C3.7
C3.8	REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS: HEALTH AND SAFETY SPECIFICATION	C3.8
C3.9	REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE ENVIRONMENTAL MANAGEMENT PLAN	C3.9

NOTE: ALL DRAWINGS REFERED TO UNDER THIS SECTION OF THE TENDER DOCUMENT ARE INCLUDED UNDER VOLUME 2

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.1 DESCRIPTION OF THE WORKS

C3.1 DESCRIPTION OF THE WORKS

1.1 EMPLOYER'S OBJECTIVES

The objective of the project is to address bulk water capacity constraints affecting the BooySENS as well as the adjacent Kirkney and Andeon areas. The aim is to ensure that the standard of living is improved through the provision of basic water and sanitation services to the broader community. The project is also aimed at delivering public infrastructure to the community through construction by using conventional methods, and most importantly using labour intensive methods to empower the community according to the Expanded Public Works Programme (EPWP).

BooySENS Extension 4 informal settlement is situated in ward 55, region 3 of the City of Tshwane. The informal settlement is located on Portions 45, 83, 87, R/88, 89, R/90, 98, R/99, R/101, 102, 164 and 165 of the farm Zandfontein 317-JR and Erf 287 Claremont. The beneficiaries of the BooySENS Extension 4 development are from Gomora and Malusi informal settlements. According to the approved township layout plan, the development will comprise of 492 erven of which 481 are classified as residential 5 erven. The objective of the project is to provide water and sewer reticulation services to the beneficiaries. However, the development is without bulk water infrastructure. In order to accommodate the development, bulk water infrastructure is required to provide sufficient supply to the reticulation network.

A contractor was appointed in March 2018 for the construction of the required infrastructure. The construction works for the project entailed the following components:

- 30 mega litre reservoir;
- 6.0km bulkwater feeder pipelines;
- water reticulation and house connections to 481 stands; and
- sewer reticulation and house connections to 481 stands.

The project has encountered numerous delays and challenges. The contract for the contractor has since lapsed and as such, construction activities have stopped. Various components of the works are at various stages of completion. A number of key milestones are still outstanding, and the progress achieved to date is as follows:

- 30 ML reservoir = 30%
- bulkwater feeder pipeline= 87%
- water reticulation = 78%
- sewer reticulation = 86%

The overall extent of construction works for the project is as follows:

- (i) 30ML reinforced concrete reservoir

- (ii) 6000m of bulk pipelines and ancillary works
- (iii) 6800m of water reticulation and ancillary works
- (iv) 7810m of sewer reticulation and ancillary works
- (v) Construction of 18 concrete water chambers
- (vi) Construction of a 700m access road to the reservoir

COMPLETED SCOPE OF WORKS

The completed and outstanding works are listed on the Tables below:

RESERVOIR ITEMS	ACTIVITY	PERCENTAGE COMPLETE	OUTSTANDING
1.	Setting Out	100%	0%
2.	Bulk Earthworks	100%	0%
3.	Layer works (Platform)	100%	0%
4.	Sub- Soil Drainage	50%	50%
5.	Blinding	50%	50%
6.	Steel Reinforcement	0%	0%
7.	Concrete Works	0%	0%
8.	Pipe Works & Fittings	0%	0%
Overall Reservoir Progress			30%

BULKWATER PIPE SIZE (STEEL)	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
1100 mm (1168m)	1018 m	150 m	87.2%
1000 mm (1761m)	1226 m	650 m	69.6%
900 mm (641m)	631 m	10 m	98%
800 mm (1530m)	1480 m	50 m	97%
700 mm (303m)	0 m	303 m	0%
BULKWATER PIPE SIZE (UPVC)	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
450 mm (598m)	298 m	300 m	50%
355 mm (258m)	228 m	30 m	88%
200 mm (200m)	0 m	200 m	0%
Overall Bulk Pipeline Progress			87%

Out of the 1761m of the 1000mm diameter bulkwater pipeline, 40m thereof will be installed using the pipe-jacking methodology. Some works have already been undertaken on the pipe-jacking. The progress achieved is listed on the

Table below:

PIPE JACKING ITEM	ACTIVITY	PERCENTAGE COMPLETE	OUTSTANDING
1.	Excavation	30%	70%
2.	Culverts	22%	78%
Overall Pipe Jacking Progress			12%

It should be noted that the water and sewer reticulation network located on the southern part of the development has been fully completed. A total of 266 house connections have been installed. The network has been tested and connected to the link pipelines. Works on the network located on the northern part of the development were left incomplete at different milestones.

WATER RETIC PIPE SIZE	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
Total Water (6800m)			
250mm (631m)	631m	0 m	100%
200 mm (598m)	350 m	248 m	58,5%
160 mm (3 282m)	2 912 m	370 m	88%
110 mm (2 214)	2 064 m	150 m	93%
HOUSE CONNECTIONS	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
Total (481) No.	379 No.	102 No.	78%
Overall Water Reticulation progress			78%

SEWER PIPE SIZE	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
Total Sewer (7810m)			
250mm(880m)	870 m	10 m	98%
200 mm(480m)	470 m	10 m	98%
160 mm(5150m)	4 787 m	363 m	93%
110mm (1300m)	1065 m	235 m	81%
HOUSE CONNECTIONS	INSTALLED TO DATE	OUTSTANDING	PERCENTAGE COMPLETE
Total (481) No.	392	89	81%
Manholes (86 no)	57	29	63%
Sewer Reticulation Progress			86%

SUMMARY OF PIPEWORK

TOTAL SCOPE	INSTALLED TO DATE	OUTSTANDING
BULK WATER PIPE - STEEL		
5403m	4355m	1163m
BULK WATER PIPE - uPVC		
1056m	526m	530m
WATER RETICULATION		
6725m	5957m	768m
SEWER RETICULATION		
7810m	7192m	618m

ACCESS ROAD ITEMS	ACTIVITY	PERCENTAGE COMPLETE	OUTSTANDING
3.	Setting Out	100%	0%
4.	Site Clearance	100%	0%
5.	Bulk Earthworks	100%	0%
6.	Layer Works	0%	100%
7.	Surfacing	0%	0%
8.	Ancillary Works	0%	0%
Overall Access Road Progress			5%

The employer's objectives are to have the works constructed cost-effectively without compromising quality or construction standards, in such a manner that:

- employment and entrepreneurial opportunities are created for members of the local community in the execution of the works and in aspects of the third-party management support that is to be provided by the Contractor;
- the amount of the construction cost retained by the local community is significant;
- entrepreneurs from the local community are developed through the performance of construction contracts with assistance from, and under guidance of, third-party management support provided by the Contractor and,
- entrepreneurs are given sufficient support in construction management and materials management to ensure their success.

NOTE 1 The employer's objective in requiring the appointment of a SMME Development Agent is to provide expertise and resources that selected sub-contractors might lack, capacitate these contractors to successfully complete their contracts and to minimize the risk of works not being constructed to stated requirements, within budget and on time.

NOTE 2 The employer's objective in appointing a SMME Development Agent is to ensure that supported contractors are supplied timeously with materials that comply with the requirements of the project. The Contractor may be required to procure materials on behalf of the sub-contractors and the SMME Development Agent will be required to facilitate and plan accordingly with the Contractor.

Works earmarked for Labour Intensive construction methods will be numbered with a prefix "LI" in the bill of quantities to distinguish them from the conventional construction works. Such work shall be constructed using local workers who are temporarily employed in terms of the project specification.

The Contractor will be appointed with a minimum Construction Industry Development Board (CIDB) 9CE.

City of Tshwane is not bound to accept the lowest or any tender and reserves the right to accept the whole or any part of a tender.

1.2 OVERVIEW OF THE WORKS

The project requires the construction of a 30ML Reservoir, completion of the partially completed bulk water feeder line, construction of a concrete paved access road, completion of partially completed water and sewer reticulation infrastructure in Booysens Extension 4.

The description of the works contained is merely an outline of the Contract works to be undertaken and shall not limit the work to be carried out by the Contractor under this Contract. The Schedule of Quantities provide only for the type of work that may be undertaken, and the quantities are provided purely for tendering purposes and is indicative of the expected or estimated quantities.

The following are also key elements of the works:

- a) Construction of the reinforced concrete reservoir
- b) Construction of Reservoir Control buildings
- c) Completion of the Bulk Water Supply Line (steel and uPVC pipeline)
- d) Construction of Reinforced Concrete Chambers.
- e) Installation of Cathodic Protection System
- f) Completion of the Water Reticulation Pipeline.
- g) Completion of the Sewer Reticulation Pipeline.
- h) Accommodation of traffic during the construction stage.
- i) Pipe Jacking for Culverts crossing major road.
- j) Pipe Boring for pipes crossing road.
- k) Repair of leakages on water reticulation pipelines.
- l) Remedial works of sewer manholes.
- m) Construction of reinforced concrete paved access road
- n) Testing of pipelines

1.2.1 EXTENT OF THE WORKS

a) Detailed work in sections

The overall extent of construction works for the project is as follows:

1. 30ML PRECAST REINFORCED CONCRETE RESERVOIR.

The reservoir consists of clearing the area, earthworks, casting of concrete, installation of precast concrete structures and installation of a drainage system. This can be broken down to the following activities:

- 1.1 Construction of the In-situ concrete ring floor
- 1.2 Construction of the In-situ concrete ring footings
- 1.3 Construction of the In-situ concrete Column footings
- 1.4 Construction of the In-situ concrete Blinding
- 1.5 Construction of the Drainage system including, paving, kerbs, no fines concrete, storm water pipes, Rip rap and catch pit inlet
- 1.6 Supply and Installation of Pre-cast concrete columns
- 1.7 Supply and Installation of Pre-cast concrete walls
- 1.8 Supply and installation of Pre-cast concrete roof
- 1.9 Supply and installation Fencing
- 1.10 Supply and installation Interlocking Pavement
- 1.11 Supply and installation Retaining wall

2. Bulk water pipelines and ancillary works.

The bulk pipeline consists of clearing the pipe route, excavations, installation of steel and pvc pipes, cleaning and fixing of existing pipes. The bulk pipeline can be broken down into the following activities:

- 2.1 Completion of 1100mm ND steel pipes including fixing of existing pipes
- 2.2 Completion of 1000mm ND steel pipes including fixing of existing pipes
- 2.3 Completion of 900mm ND steel pipes including fixing of existing pipes
- 2.4 Completion of 800mm ND steel pipes including fixing of existing pipes
- 2.5 Completion of 700mm ND steel pipes
- 2.6 Completion of 450mm ND PVC pipes
- 2.7 Completion of 355mm ND PVC pipes including fixing of existing pipes
- 2.8 Completion of 250mm ND PVC pipes
- 2.9 Cleaning of existing pipes
- 2.10 High definition and LIDAR CCTV investigation of existing pipes
- 2.11 Welding of pipes

- 2.12 Coating and Lining of pipes
- 2.13 X-Ray scanning of steel pipes
- 2.14 Connecting into existing pipes

3. Water reticulation and ancillary works.

The water reticulation consists of clearing the pipe route, excavations, pvc pipes, cleaning and fixing of existing pipes. The water reticulation can be broken down into the following activities:

- 3.1 Construction of 200mm ND PVC pipes
- 3.2 Construction of 160mm ND PVC pipes
- 3.3 Construction of 110mm ND PVC pipes
- 3.4 Construction of valves and valve manholes
- 3.5 Construction of fire hydrants
- 3.6 Pressure Testing
- 3.7 Connecting into existing pipes

4. Sewer reticulation and ancillary works.

The sewer reticulation consists of clearing the pipe route, excavations, pvc pipes, cleaning and fixing of existing pipes as well as CCTV investigations. The sewer reticulation can be broken down into the following activities:

- 4.1 Construction of 250mm ND PVC pipes
- 4.2 Construction of 200mm ND PVC pipes including fixing of existing pipes
- 4.3 Construction of 160mm ND PVC pipes including fixing of existing pipes
- 4.4 Construction of 110mm ND PVC pipes including fixing of existing pipes
- 4.5 Construction of 1000mm-1250mm Dia Manholes
- 4.6 Construction of house connections
- 4.7 Installation of a subsoil drainage system
- 4.8 Pressure Testing and CCTV inspections
- 4.9 Connecting into existing pipes

5. Construction of 18 reinforced concrete water chambers.

The chambers consist of the following:

- 5.1 Excavations and backfilling
- 5.2 Construction of In-Situ Concrete Blinding
- 5.3 Construction of In-Situ Reinforced Concrete Floors
- 5.4 Construction of In-Situ Reinforced Concrete walls
- 5.5 Construction of cover slabs
- 5.6 Installation of Scour Valves and fittings

5.7 Installation of isolating valves and fittings

5.8 Installation of Air Valves and fittings

6. Construction of a 700m access road to the reservoir.

The access road consists of the following:

6.1 Excavations and backfilling

6.2 Box cutting and earthworks

6.3 Processing of Roadbed

6.4 Processing of Layer works including subgrade, sub-base and base layers

6.5 Casting of in-situ concrete layer

7. Construction of Pipe Jacking.

Pipe jacking consists of the following:

7.1 Excavation of launching pits

7.2 Culvert jacking and boring

7.3 Handling and Installation of 1000mm ND steel pipe through jacked culverts complete with wheel sets.

b) Particular Works

In particular the following needs to be observed and considered where estimating the cost of the works:

- Bidders shall prepare and submit the programme of works taking into consideration that the Employer may require that the services be completed in a specific order. It is expected that all components of the works will be carried out concurrently.
- The contractor shall, upon commencement, inspect the pipeline routes and inform the engineer of all obstructions to be relocated.
- A high level of superintendence is required.

1.2.2 PHASING OF THE WORKS

The works will not be phased but constructed over 3 financial years. The start and completion dates of the phased scope of works (if necessary) will be agreed with the contractor depending on the available budget.

The Contractor will commence with the Works in the 2025/2026 Financial Year.

The Employer reserves the right to:

1. Change the above descriptions of the portions of the Works and
2. To omit the implementation of any or a combination of the above portions and

3. To add additional portions to the Works.
4. Terminate the services of the contractor should it be deemed that the contractor's performance is not satisfactory.

1.3 NATURE OF THE WORKS

The employer wishes to deliver public infrastructure using labour-intensive methods and sub-contractors where possible. The works in this contract are to be executed by using both conventional construction and labour-intensive construction methods according to the Special Public Works Programme (SPWP) as prescribed in the guidelines of the Expanded Public Works Programme (EPWP).

a) Conventional construction methods

- Removal of boulders or other obstructions too large to be hand removed
- Excavation of trenches deeper than 1,5m
- Construction of retaining wall
- Construction of drainage system
- Construction of chambers
- Construction of concrete road pavement
- On-site reinforcement
- Casting of in-situ concrete

b) Labour intensive construction methods (EPWP)

Items deemed suitable for construction using labour intensive construction methods are prefixed "LI" in the schedule of quantities. The employer's further objective is to optimise labour opportunities and the contractor shall be required to construct the works accordingly. The "LI" activities, inter alia, include but are not limited to:

- Clearing of the areas for the excavation of trenches, including the removal of any trees or other impediments to the installation of new reticulation pipelines.
- Excavation of trenches not exceeding 1,5m in depth, including for all shoring and other safety methods to ensure safe working conditions;
- Excavate by hand to expose existing services and backfill;
- Bedding and laying of new reticulation pipelines;
- Backfilling of all new reticulation pipelines as specified;
- Construction of manholes, excluding the lifting of precast concrete rings;
- Construction of Interlocking Pavement
- Installation of Fencing;

- Fixing damaged fences and walls.

c) Local Emerging Contractors (LEC)

Items deemed suitable for construction using Local Emerging Contractors include but are not limited to:

- Construction of brickwork related work;
- Supply and erection of fence and gate;
- Construction of segmented block paving;
- Construction of concrete pavements;
- Construction of edge restraints;
- Construction of subsoil drains;
- Reinstatement of bitumen surfacing;
- Landscaping to facilitate good site drainage

d) SMME Development Agent for Local SMMEs

The Main Contractor will be required to appoint a SMME Development Agent to mentor, train and assist the appointed local emerging contractors and the daily activities are listed in C3.3.2 and C3.3.3.

In areas where required by the Engineer the contractor will be required to make use of local emerging contractors to execute dedicated portions of the work. Only approved tendered rates will apply for work executed and the contractor must ensure that the local emerging contractors are paid a market-related price for work done. The contractor will be compensated for the additional site supervision, management of local emerging contractors, material management, training and personal protective clothing that may be required for the local emerging contractors as a percentage value of the work done by the subcontractor.

The City of Tshwane (CoT) has a mandate and responsibility to fight poverty, build clean, healthy, safe and sustainable communities. To achieve this, the City adopted an Integrated Poverty Reduction and Community Development Strategy which requires all departments to cooperate and contribute towards poverty reduction through indigent exit programmes and projects.

Water and Sanitation is committed to utilize indigents that are registered on the CoT Indigent Register on all projects. The aim is to ensure commitment by each contractor on a

project to utilize 50% of its personnel of the indigents list provided by the CoT in order to enhance poverty alleviation and the uplifting of indigents.

The successful contractor appointed will have to make use of the Indigent Register in each area that will be provided by the CoT. 50% of all personnel on a project to be appointed from the Indigent Register provided.

The idea is to place indigents in the correct or appropriate project roles/occupations to help them achieve income capacity and/or to equip them through skills development. The contractor must provide data about the number of indigents required, qualifications, type of placement/occupation and gender before the project starts. The successful contractor appointed must accommodate students that need practical training or in-service training.

The Contractor will adopt the following structure for the selecting, training and appointing of local emerging contractor(s) for this project:

1. The Project Steering Committee (PSC) under the leadership of the ward councilor(s) will compile a list of all the local emerging contractors in the ward(s) where the project will be executed.
2. Immediately after the approval of the appointment of the principal contractor on the project, the PSC under the leadership of the ward councilor(s) will invite all the local emerging contractors in the ward(s) where the project will be executed as captured on the abovementioned list to apply for possible inclusion on the list of candidates to be appointed as local emerging contractor(s) by the principal contractor on the project.
3. The applicants will then be evaluated and a short list will be compiled by the PSC together with the appointed SMME Development Agent and the appointed principal contractor.
4. The successful candidates will then be trained by the appointed NQF accredited EPWP Training Provider on all the predetermined unit standards.
5. The successful candidate(s) will then enter into a written agreement/contract with the principal contractor.
6. The principal contractor should make provision for administration of local emerging contractors. The principal contractor must provide to the local emerging contractor(s) an SMME Development Agent to assist them with their construction work (C3.3.2 and C3.3.3). The principal contractor will be paid to provide a SMME Development Agent to the local emerging contractor(s) via the contract that will be awarded to the principal contractor. The principal contractor will price all items, except in the case of

- a nominated sub-contractor(s). These tariffs will be binding on the principal contractor if the work is executed by the principal contractor and should no local emerging contractor(s) be available.
7. The principal contractor can hold the local emerging contractor(s) responsible for the quality and quantity of work done by them through their agreement/contract, but will be ultimately responsible and liable for the work done being the principal contractor and mentor to the local emerging contractor(s).
 8. The principal contractor and consultants responsible for the site supervision will submit a performance evaluation report to the Client, the CoT, and to the CIDB for their records should the local emerging contractor(s) being registered with the CIDB, in the process of registering or planning to register with the CIDB after the completion of the construction works on the project.
 9. A register of all the trained, appointed local emerging contractor(s) and experienced emerging contractors per ward will be kept at the Water and Sanitation Department on the Management System.
 10. Ensure that each local emerging contractor(s) Health and Safety Management Plan is implemented and maintained on their portion of the Works.
 11. A monthly progress report including an annexure of the performance of local emerging contractors will be submitted on a monthly basis.

The above structure will ensure that local emerging contractors with potential to be trained and given the opportunity to be appointed as local emerging contractor(s) and to gain valuable experience under the mentorship of a SMME Development Agent.

1.4 TEMPORARY WORKS

No temporary works have been allowed for in this contract.

1.5 LOCAL ECONOMIC PARTICIPATION SPECIFICATION

A. PREAMBLE

The City of Tshwane has a long-term commitment to the protection and Participation of local business and industry, including the Participation and support of construction skills and – capacity. In addition, the municipality is committed to the provision of as many job opportunities as possible to its local communities and therefore to the consistent pursuance and achievement of the objectives of EPWP. Having regard for the specialized nature of this project, the municipality in its role as Employer requires the maximum possible level of Local Economic Participation, as defined in this contract, as well as the maximum possible level of employment of local skills and labour.

This specification therefore forms a very important aspect of this contract, which will be enforced and will require the full attention of the Contractor for the duration of the contract.

B. DEFINITIONS

“Local Sub-Contractor” means a legal business entity with its registered office and/or physical address in the City of Tshwane municipal area, duly registered with the Construction Industry Participation Board (CIDB) and with the required CIDB grading and who has actively conducted business in the City of Tshwane municipal area for a period of more than 12 months.

“Local Supplier” means a legal business entity with its registered office and/or physical address in the City of Tshwane municipal area who has actively conducted business in the City of Tshwane municipal area for a period of more than 12 months and who supplies goods or materials directly to the end user.

C. SPECIFICATION

1. LOCAL ECONOMIC PARTICIPATION (LEP) shall comprise of:
 - a. The direct participation of Local Sub-contractors in the Contract.
 - b. The direct participation of Local Suppliers and Service Providers in the Contract.
 - c. The direct employment of local labor, - semi-skilled and - skilled staff by the Contactor and Local Sub-contractors.
2. Direct Participation shall mean the engagement of resources, listed in 1 above, by the Contractor without the involvement of any other intermediary parties or agents.
3. LOCAL ECONOMIC PARTICIPATION (LEP) shall be measured by value as follows:
 - a. Where activities, as measured under LI and SC of the Bill of Quantities, are performed entirely by Local Sub-contractors at the rate in the Bill of quantities, the value of the measured item shall be deemed to be the net value of LEP in respect of that activity.
 - b. Where an activity, performed in terms of the above, is valued at a scheduled rate that includes a profit mark-up, supervision fee, administration fee or any other mark-up, the net value of the item payable to the Local Sub-contractor shall be deemed to be the net value of the LEP in respect of that activity.
 - c. Where any component of the Contract, measured in the Schedule of Quantities, being a material or plant item or service required for the completion of the Contract, is provided entirely by a Local Supplier or Service Provider, at the rate in the Schedule of Quantities, the value of the measured item shall be deemed to be the net value of LEP in respect of that component.

- d. Where a component, supplied in terms of point 'c' above, is valued at a scheduled rate that includes a profit mark-up, supervision fee, administration fee or any other mark-up, the net value of the item payable to the Local Supplier shall be deemed to be the net value of the LEP in respect of that component.
 - e. The value of local labour shall be the net value of wages and/or salaries paid to individuals, recruited from communities in the City of Tshwane municipal area, for the purpose of the Contract, by the Contractor or any of the Local Sub-contractors, appointed in terms of this Contract.
4. Tenderers shall indicate in their tenders the value (as a percentage) of Local Economic Participation (LEP) that will be achieved should he be awarded the contract. This tendered value, split between the participation of Local Suppliers and Service Providers on the one hand and Local Sub-contractors on the other shall become the Contractor's Local Economic Participation target.
The achievement of this target will be a contractual obligation, which will be enforced in terms of the provisions of this section.
5. The Contractor shall, within seven (7) days of the date of the Letter of Acceptance, submit to the Engineer a detailed plan for the achievement of his tendered Local Economic Participation (LEP) objectives and target, including a schedule of construction activities, construction components, materials, goods and services, local skills and labour etc, in which their valuation in terms of the principles of this specification is clearly indicated. This schedule shall indicate how targets will be met.
6. The Engineer shall approve this detailed plan in writing within seven (7) days of its submission by the Contractor.
7. The Contractor shall submit to the Engineer monthly progress reports, in a format approved by the Engineer, clearly indicating progress to date in respect of LEP. These reports will be in addition to monthly MIG reports required from the Contractor.
8. The Contractor shall, if requested by the Engineer at any stage of the Contact, submit within seven (7) days all necessary documentation required to confirm the accuracy of information provided in the monthly progress reports. Documentation shall include but not be limited to:
 - a. Tax invoices,
 - b. Wage sheets,
 - c. Salary Advice
 - d. Orders.
9. At the completion of the project and prior to the issue of the Performance Certificate, the Contractor shall submit audited (audited by a recognized third-party institution) figures to substantiate and confirm actual LED expenditure achieved during the implementation of the

Contract. Failure to meet the tendered target will be result in a financial penalty as described under Sub-Clause 4.10.1 of the General Conditions of Contract (as amended).

10. Failure by the Contractor to comply with any of the requirements in 4, 5, and 6 above shall be dealt with in terms of Clause 9.2 of the General Conditions of Contract.
11. The Contractor shall during the course of the Contract have the opportunity to submit revised detailed plans for the achievement of Local Economic Participation (LEP) objectives and targets, considering practical constraints encountered during the construction process and including the necessary motivation for such revised detailed plans.
12. In the event that the Contractor is prevented to comply with his implementation plan by any circumstances outside his control, he shall within seven (7) days submit to the Engineer a notice outlining such circumstances in detail and stipulating the impact of such circumstances on the Local Economic Participation in the Contract and as defined above. The Engineer shall within seven (7) days of receiving such a notice inform the Employer accordingly and who shall be obliged to:
 - a. Rectify the circumstances preventing compliance and exempting the Contractor from his obligations, in terms of his implementation plan, for the duration of the period in which the circumstances prevailed, or
 - b. Exempting the Contractor entirely from his obligations in terms of its implementation plan in so far as these are affected by the specific circumstances.
13. Any dispute arising from this specification or the implementation thereof shall be resolved in accordance with the provisions of Clause 10 of the General Conditions of Contract.
14. A payment item has been included under schedule 1 (preliminary and general charges) for all costs related to the compilation and administration of all LED-related documentation as well as the auditing of the final figures by a recognized third-party institution.

D. NON-SPECIALIST WORK LOCAL SUB-CONTRACTORS

All work measured that have been identified for construction by local sub-contractors as a minimum requirement, which does not prevent the Contractor from employing sub-contractors for other portions of work in order to achieve the tendered LEP target.

1.6 LOCATION OF SITE

BooySENS Ext 4 is located in Zandfontein, Pretoria West in Region 3, Ward 55 of the City of Tshwane Metropolitan Municipality. The informal settlement is located on Portions 45, 83, 87, R/88, 89, R/90, 98, R/99, R/101, 102, 164 and 165 of the farm Zandfontein 317-JR and Erf 287 Claremont. The beneficiaries of the BooySENS Extension 4 development are from Gomora and Malusi informal settlements. According to the approved township layout plan, the development will comprise of 492 erven of which 481 are classified as residential 5 erven.

The coordinates of the proposed development for reticulation area are -28°07'33"E latitude and - 25°42'40"S longitude. The site can also be accessed from the eastern side through Beverly Street emanating from Bremmer Street which connects to the R80 Mabopane Highway Interchange. The area for the proposed development is approximately 116 hectares in extent.



Figure 1 – Locality Aerial Photograph for Water & Sewer Reticulation.

The coordinates of the proposed development for reservoir area are -28°05'26.34"E latitude and - 25°41'18.76"S longitude. The reservoir is located on portion 140 of the farm Zandfontein 317-JR whilst the bulk water pipeline is traversing through portion 15, 16, 70, 232, R76 and 169 of the farm Zandfontein 317-JR. The area can mainly be accessed from the western side through Kenneth Street emanating from M17 (Hornsnek Road). See figure 2 Locality plan of the Reservoir and Bulk Water Feeder line section.

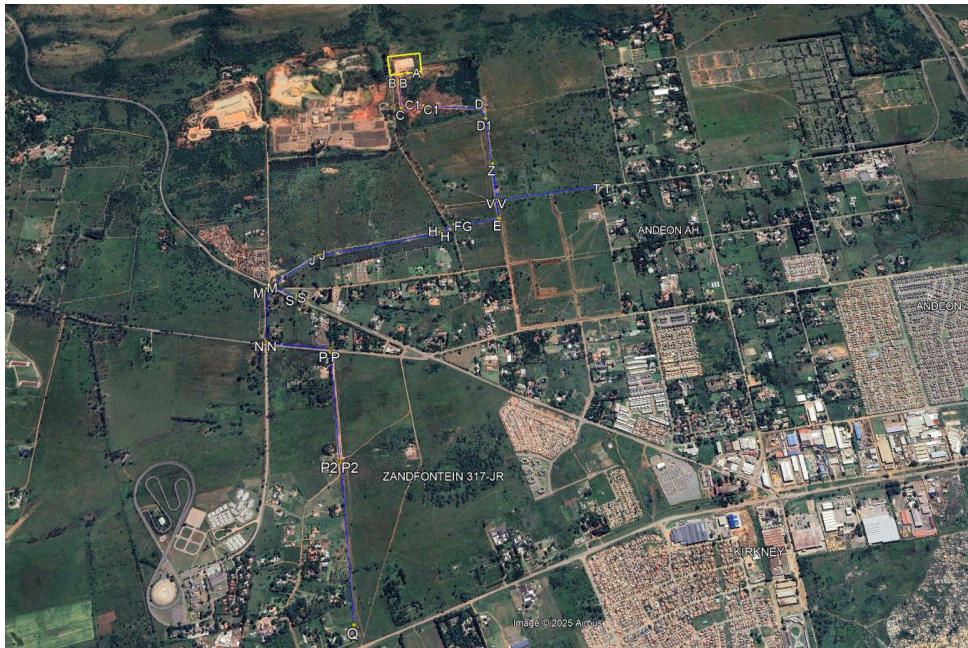


Figure 2 – Locality Aerial Photograph for Reservoir & Bulk Feeder line

1.7 GEOTECHNICAL INFORMATION

Geotechnical Investigations

Due to the vast scope of the BooySENS's project, where works spanned over various geographical plains, it was noted that several geotechnical investigations were conducted, to cover the northern bulk and reservoir area; the reservoir Access Road; as well as the southern area including investigations for the water and sewer reticulation works.

Southern Area Geotechnical Investigations (Water and Sewer Reticulation Works Area)

Knight Hall Hendry (Pty) Ltd was appointed for the geotechnical investigations for the southern area, which phase 1 was conducted September 2014, and phase 2 conducted November 2014.

The phase 1 geotechnical investigations recommended a need for further investigations, which included geotechnical investigations of the foundation conditions in terms of the NHBC guidelines. These investigations were concluded under phase 2.

Phase 2 Investigation summary indicated complex sub-surface conditions, which split the area into three zones. Each Zone displayed different characteristics.

Knight Hall Hendry Recommendations:

- Removal of top 1m of fill material over the entire area and remove to spoil or alternatively use for landscaping.
- Dynamic Compaction (DC) can alternatively be used to compact the surficial fill layers at the zone.
- Excavate shallow strip footing foundations can be excavated into the soil raft while bearing capacities is limited to 120kPa.

- Surface beds can be constructed directly onto the compacted soil raft foundation.
- Provide proper surface drainage to prevent ponding of stormwater or infiltration of rainwater near the foundations.

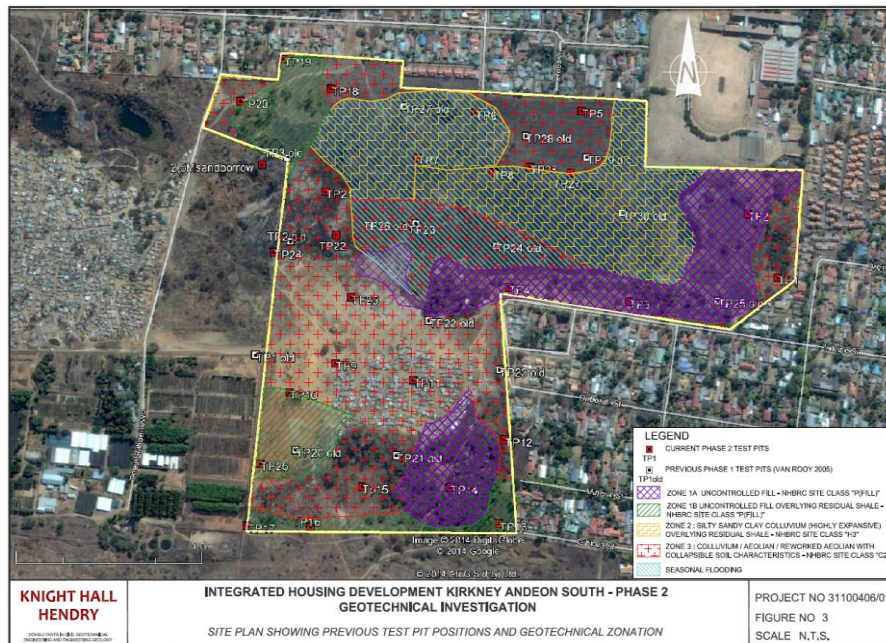


Figure 3: Southern Geotechnical Investigation Site Plan

Northern Area Geotechnical Investigations (Reservoir Access Road Works Area)

Earthinv Lab & Geotechnical Consulting (Pty) Ltd was appointed for the geotechnical investigations for the reservoir access road, which was conducted December 2022.

Earthinv Lab's Conclusions and Recommendations:

- From the available information, visual assessment and field explorations, the geotechnical conditions on site are generally poor for the proposed roads development. The investigation has shown that material on site is imported, colluvium and residual material.
- No Groundwater seepage, No refusal present in all test pits.
- During construction works, excavations should be inspected by a geotechnical engineer or engineering geologist to verify that the conditions on site are not at variance with those described in this report.

Northern Area Geotechnical Investigations (Reservoir Works Area)

The geotechnical investigations reviewed under the Northern Area for the Bulk Water and Reservoir works area, was conducted by Kimopax.

Kimopax (Pty) Ltd was appointed for the geotechnical investigations for the Hornsnek LL reservoir, which was conducted July 2018.

- Piles.
- Dynamic compaction with slab on ground.
- Deep excavations.
- Soil mattress with stiffened cellular raft.



Figure 4: Reservoir Geotechnical Investigation Site Plan

1.7 FEATURES REQUIRING SPECIAL ATTENTION

1.7.1 Existing Services

All existing services shall be indicated to the contractor where after he will assume full responsibility for maintaining these in good running order. It shall be understood that the production of the existing services shall in no way be impaired during the contract.

The wayleaves are also to be utilized to identify clashes of services with the Sewer and Water Reticulation design.

City of Tshwane Wayleaves Central was used to attain the wayleaves. Wayleaves attained to date are shown on below Table

Name of Institution	Type of Service
Eskom / Internal Distribution	Electricity
Telkom	Telecommunication
City of Tshwane	Electricity
City of Tshwane	Water and Sanitation
DFA	Fibre
Randwater	Water Pipes
Liquid Communication / Neotel	Fibre
Cell C	Fibre
City of Tshwane	Environmental Services
City of Tshwane	Roads and Stormwater
Frog Foot	Fibre
Extribx Pty Ltd T/A SAS Networks	Fibre
Link Africa	Fibre
Metro Fibre	Fibre
MTN	Fibre
Sasol	Gas Pipes
Transnet	Pipelines
Vodacom	Fibre
VumaTel	Fibre

1.7.2 Surveying and Cadastral Beacons (including Stand pegs)

The Contractor shall be held responsible for the cost incurred in replacing or repositioning of any cadastral beacons which may have been disturbed by his actions.

Under no circumstances shall cadastral beacons be replaced by unauthorized persons and the Engineer shall be informed immediately of such disturbed beacons. The Engineer shall arrange for the replacement of any beacons by a competent Land Surveyor.

1.8 SUPPLYING OF MATERIALS

All materials required for this contract shall be supplied by the Contractor. The Contractor shall take care that no delay is caused due to a shortage of material. Therefore, material required shall be ordered well in advance.

While care had been taken in calculating the quantities, the Contractor shall check the quantities before ordering. No claims for payment of excess or incorrect materials due to such shall be entertained.

1.9 QUALITY CONTROL

It is the responsibility of the Contractor to deliver work of quality and accuracy that is in accordance with the specifications and drawings, and the Contractor shall at his own cost provide a quality control system and provide experienced Engineers, Foreman, Surveyors, Technicians and other Technical Personnel together with the necessary transport, instruments and plant to ensure that proper supervision and positive control be applied on the job at all times. This also includes work done by sub-contractors, including nominated sub-contractors for specialised work or otherwise.

The cost of all supervision and control, test included, performed by the Contractor, shall be included in the relevant rates for the different items when tendering, except where separate provision has been made in the sections of the specifications.

The Contractor's attention is drawn to the stipulations of the different sections of the specifications regarding the minimum frequency of test to ensure proper quality control. The Contractor shall increase this frequency if he deems fit to ensure appropriate control.

The Contractor shall, at the completion of each part of the work and requesting approval thereof by the Engineer, submit all applicable test results, measurements and levels to indicate that it conforms with the relevant specifications.

Contract No: **HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.**

Part C3: Scope of Work

Section C3.2: Engineering

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.2 ENGINEERING

C3.2 ENGINEERING

3.2.1 STANDARDS AND CODES OF PRACTICE

The following design standards for civil engineering infrastructure will apply:

- i) *Guidelines for the provision of engineering services and amenities in residential township development* by the National Housing Board (Red book).
- ii) *General Conditions of Contract for Construction Works (2015) (Third Edition)* by the South African Institution of Civil Engineers.
- iii) *Standard Specifications for Municipal Civil Engineering Works* of the City of Tshwane (Third Edition 2005).
- iv) *SANS 10160-1 to 10160-7 (Structural Design and Loadings)*
- v) *Eurocode 2 & Eurocode 8 (Concrete & Seismic Design)*
- vi) *City of Tshwane Standard Specifications for Municipal Civil Engineering Works, Third Edition, 2005.*

3.2.2 EMPLOYER'S DESIGN

The Contractor undertakes only construction on the basis of full designs issued by the Employer. The Contractor is to follow the specification, the design and construction drawings as laid out by the Employer. The design of the Works is detailed on the drawings and described in this document.

3.2.3 DRAWINGS

The drawings issued to tenderers as part of the tender documents must be regarded as provisional and preliminary for the tenderer's benefit to generally assess the scope of work. The work shall be carried out in accordance with the latest available revision of the drawings approved for construction.

At commencement of the contract, the Engineer shall deliver to the Contractor copies of the construction drawings and any instructions required for the commencement of the works. From time to time thereafter during the progress of the works, the Engineer may issue further drawings or revisions for construction purposes as may be necessary for adequate construction, completion and defects correction of the works.

Drawings issued separately in Volume 2 will be listed hereafter. The drawings represent the total works required under this contract. The employer has developed comprehensive standardized typical details which can be obtained by the contractor from the employer.

The Contractor shall use only the dimensions stated in figures on the Drawings in setting out the Works, and dimensions shall not be scaled from the Drawings, unless required by the Engineer. The Engineer will, on the request of the Contractor in accordance with the provisions of the Conditions of Contract, provide such dimensions as may have been omitted from the Drawings.

The Contractor shall ensure that accurate as-built records are kept of all infrastructure installed or relocated during the contract. The position of junction boxes, duct ends and all other underground infrastructure shall be given by either co-ordinates, or stake value and offset. Where necessary, levels shall also be given. A marked-up set of drawings shall also be kept and updated by the Contractor. This information shall be supplied to the Engineer's Representative on a regular basis. All information in possession of the Contractor, required by the Engineer and/or the Engineer's Representative to complete the as-built/record drawings, must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.

The Drawings prepared by the Employer for the permanent Works are bound at the back of this volume. The Employer reserves the right to issue amended and/or additional drawings during the Contract

Note: All applicable Drawings are Included Under Volume 2.

C3.2.2 DESIGN & SPECIFICATIONS

C3.2.2.1 Reservoir

Reservoir Structure Design Criteria and Specifications

As per the Water Master Plan for Central Bulk and Retic - Hornsnek LL Reservoir (GLS Consulting, 2022), the Hornsnek LL reservoir shall be on the same top water elevation as the Hercules West reservoir, allowing integrated operation during emergency scenarios.

The design Static Energy Grade Level (EGL) a.s.l. that was adopted as a design of the Hornsnek LL reservoir, as verified are as follows:

- EGL 1367.36 m a.s.l.,
- Static EGL 1371.70 m a.s.l.

The levels of service that are to be based on current design guideline documents, which include the following documents, listed in table 4 below:

Table 4: Applicable Standards and Guidelines Structure Design

Reference	Design Guideline Document
A.	SANS 10100-1 & 2– The structural use of concrete: Design & Materials and execution of work
B.	SANS 10160-1 to 10160-7 (Structural Design and Loadings)
C.	Eurocode 2 & Eurocode 8 (Concrete & Seismic Design)
D.	City of Tshwane Standard Specifications for Municipal Civil Engineering Works, Third Edition, 2005.

Design Criteria

The design criteria for the reservoir structure is to be in line with the design guidelines in Ref. Table 4. The design criteria extracted from the interpretation of the applicable guidelines are presented in Table 5.

Table 5: Reservoir Structure Design Parameters

No.	Key Design Observations	
1.	Seismic Design	- The structure is in Importance Class III (critical infrastructure). - Peak ground acceleration (PGA) used: 0.075g. - Seismic loads and hydrodynamic effects of water in the tank were considered.
2.	Shrinkage & Thermal Effects	- Shrinkage differentials between walls and foundation analysed over 1407 days. - Thermal expansion coefficients and seasonal temperature variations incorporated.
3.	Load Combinations	- Ultimate Limit State (ULS) and Serviceability Limit State (SLS) combinations were applied.
4.	Crack Width	- Crack width limited to 0.2mm for water-contact surfaces and

	Control	0.3mm for roof slab.

Concrete

Description	Concrete Strength
Foundations	25Mpa
	30Mpa

Reinforcement

- Mild Steel Bars
- High Tensile Steel Bars

Leak Detection

- 32mm Diameter HDPE Perforated Pipe to 65mm Diameter

Sizing

The reservoir capacity is given in the Water Master Plan for Central Bulk and Retic - Hornsnek LL Reservoir (GLS Consulting, 2022). The Water Master Plan also gives the ultimate AADD for the area to be served by the reservoir as 36 153 MI/d. CoT has instructed that the reservoir should be designed for a capacity of 30 MI. This capacity would ensure a storage capacity of around 48 hours.

Geometry and Structural Layout

The layout of the structure is a circular reservoir to retain potable water of 30ML capacity.

The structural systems for the reservoir will be as follows:

- Roof Structure – Precast Prestressed Concrete
- Wall Structure – Precast Prestressed Concrete (vertical); Post-Tensioned (Horizontal).
- Foundation Structure – reinforced concrete

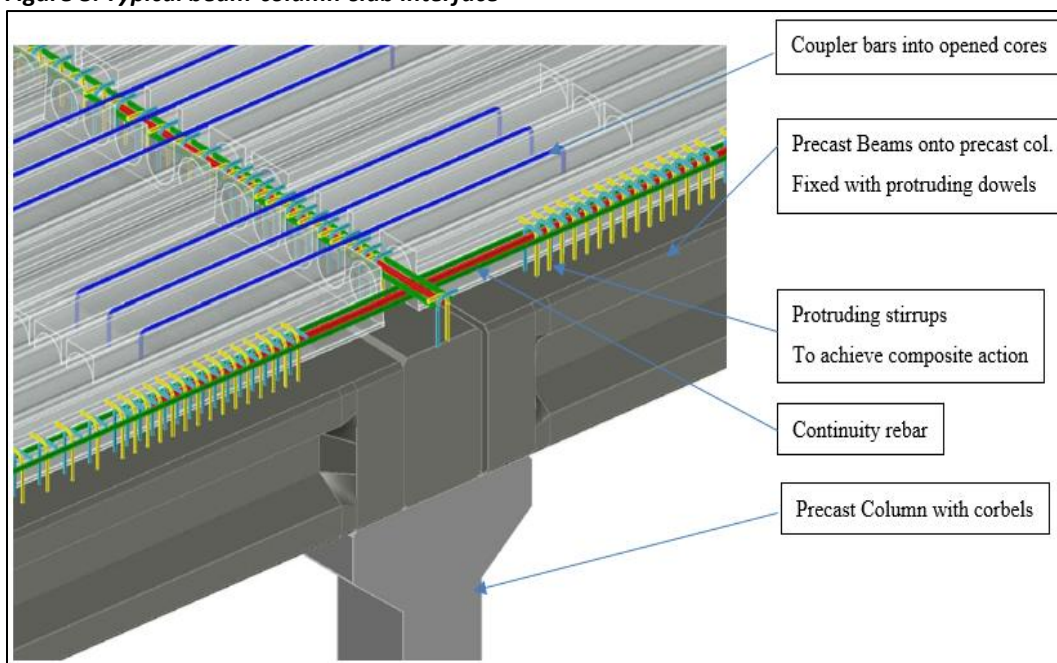
Roof Structure

The Roof Structure consists of Precast Hollowcore slabs, on Precast Beams, supported on Precast Columns. The columns are connected to the In-Situ bases by means of components cast into precast columns, referred to as “column shoes”, the columns are then bolted to the hold down bolts, as if one would for a conventional steel structure. Suspended Precast Beams are installed onto the receiving columns and secured with dowels protruding from the columns. Finally, the hollow core slabs are installed onto the beams and secured into place by means of tie steel reinforcing and cast in place concrete into opened cores of the slabs. Stirrups protruding from the precast beam, acts as mechanical interlock to form a composite mechanism with the infill concrete.

Figure 7: Structural geometry



Figure 8: Typical beam-column-slab interface



Wall Structure

The circular wall consists of Precast Prestressed concrete panels of designed required thickness. Panels are prestressed vertically during manufacturing. Cast-in sleeves for site horizontal post-tensioning consists of preformed sleeves placed strategically according to design requirements.

Wall construction/erection method as follow:

- Panels are placed in position, supported temporarily on site by anchoring the first placed panel with following panels continuing from the first supported panel. This method has the advantage of yielding an un-hindered site in terms of less prop/support work.
- Unbonded cables are pushed through the sleeves.
- Joints between panels are sealed with temporary purpose made rubber gaskets to allow the low viscosity grout to flow through all sleeves and joints. Last-mentioned grout is exclusively designed to be self-healing and to achieve strengths of up to 100mPa in a short time.
- After curing of the grout to a strength of 80MPa, cables are stressed to specified cable yield stresses via special buttress panels equally spaced along the perimeter.
- The wall is then pinned by casting a 200 - 250mm high reinforced kicker on the wall footing, both sides of the wall panels.

Figure 9: Typical precast wall joint

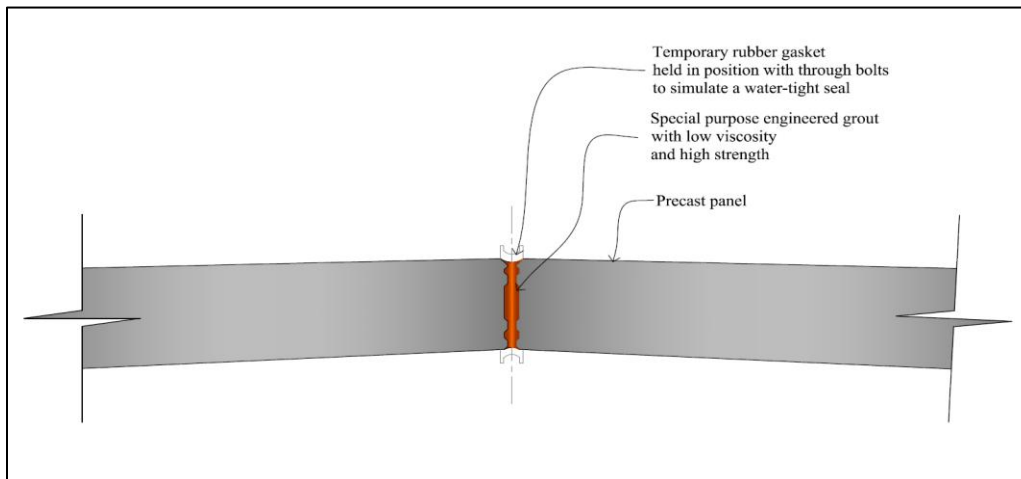


Figure 10: Buttress panel section

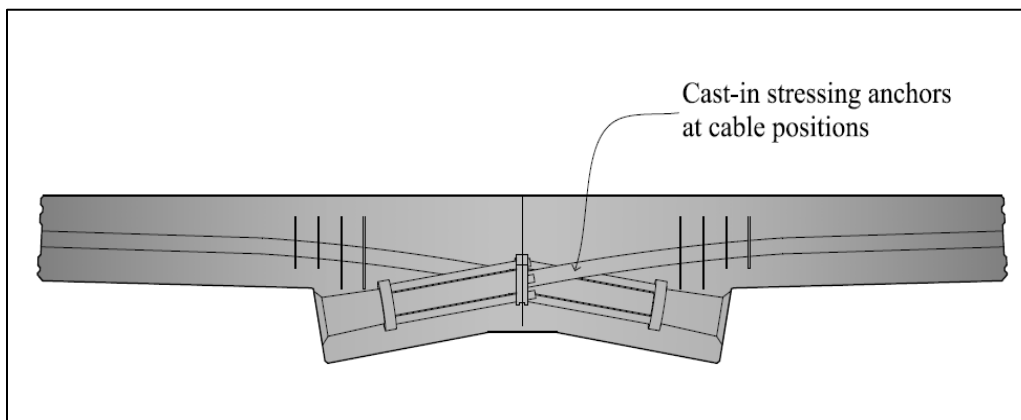


Figure 11: Typical buttress panel temporary adjustment mechanism

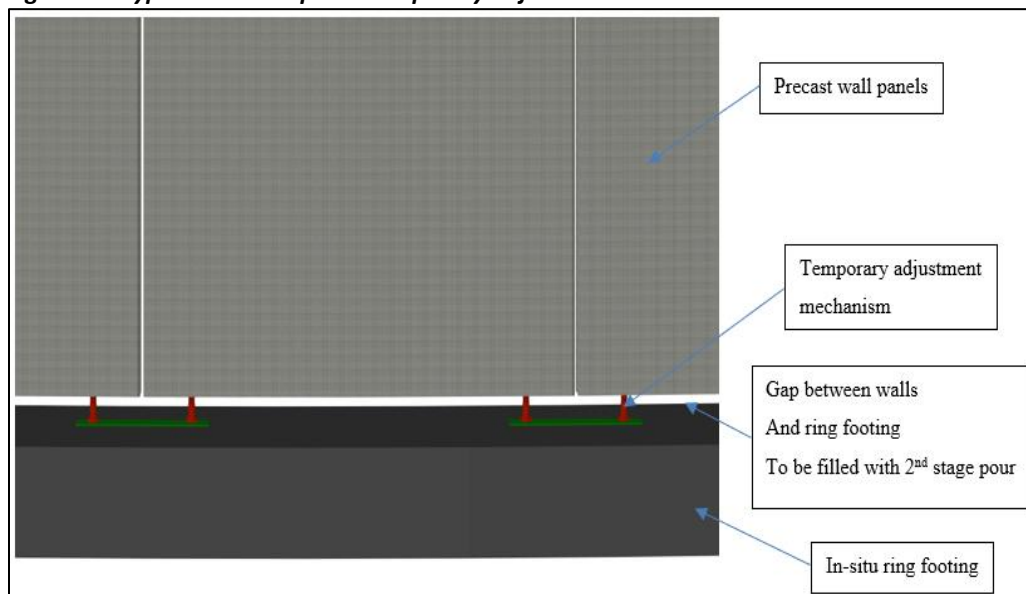


Figure 12: Typical buttress panel iso view

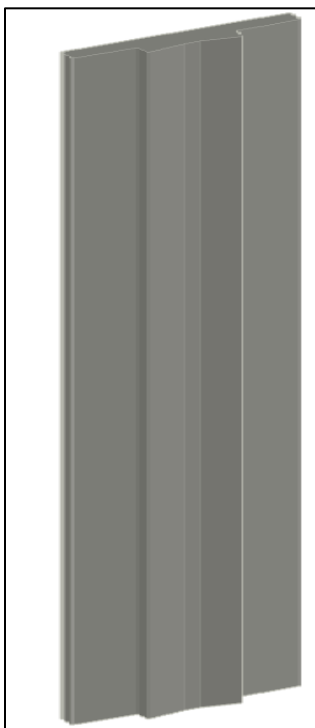


Figure 12: Typical View of Precast Walls



Foundation

The foundation shall consist of the following elements:

- a) Column Bases
- b) Wall Ring Footing

Column Bases

Various column base configurations could be implemented to meet project specific requirements as reflected in figure 13 below. Design requires a minimum safe bearing capacity of 200kPa at founding level. The preparation of the founding substrate remains the responsibility of the consultant.

Figure 13: Column base configuration

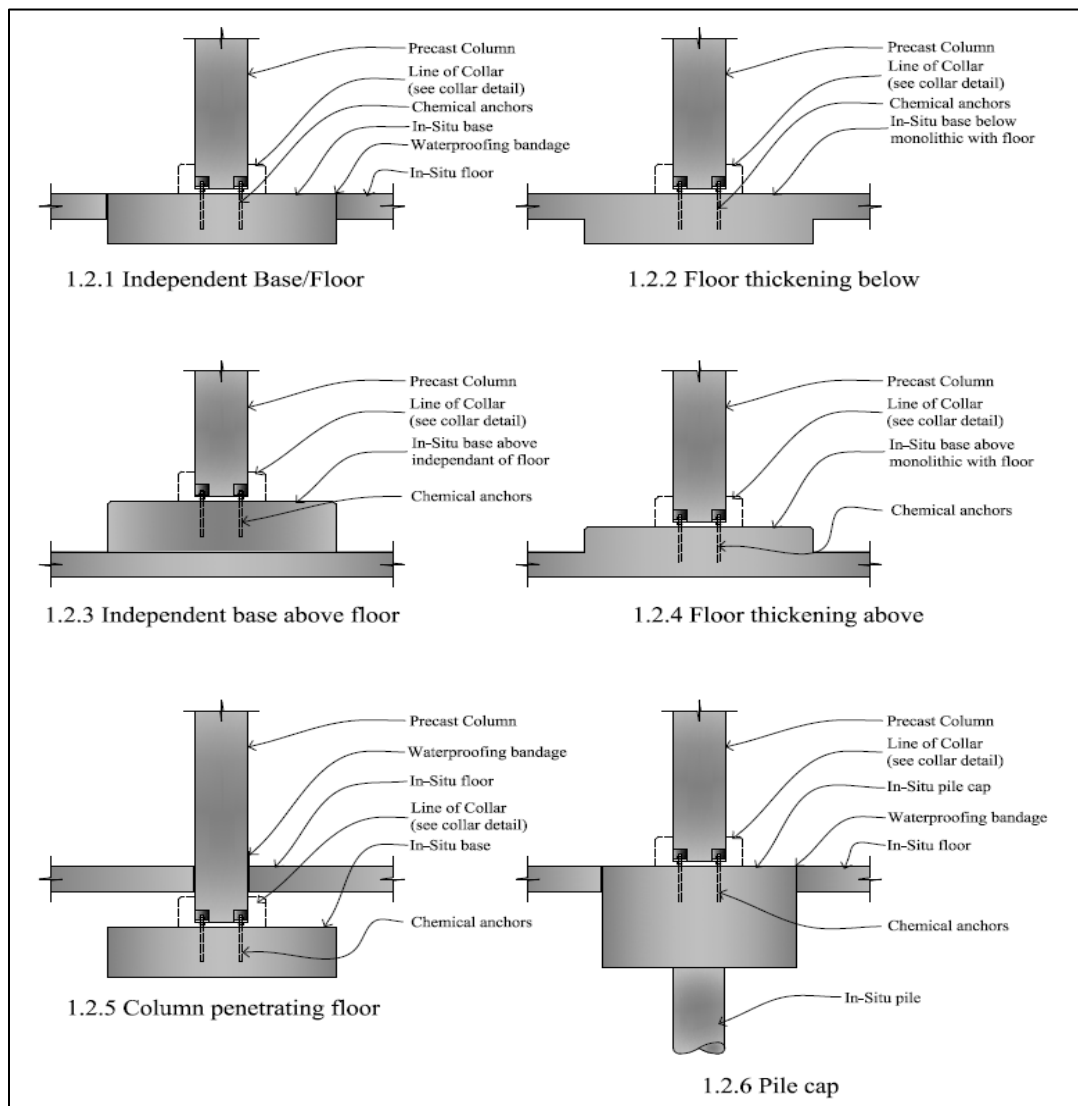
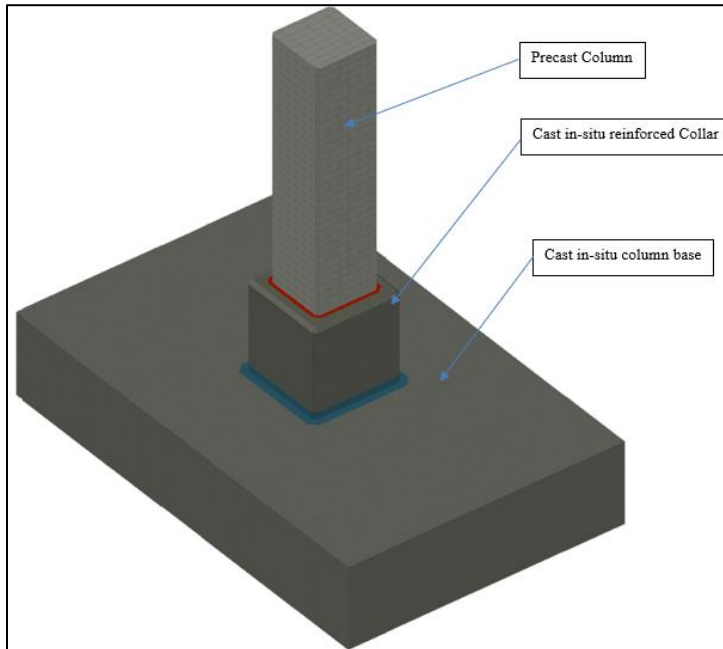


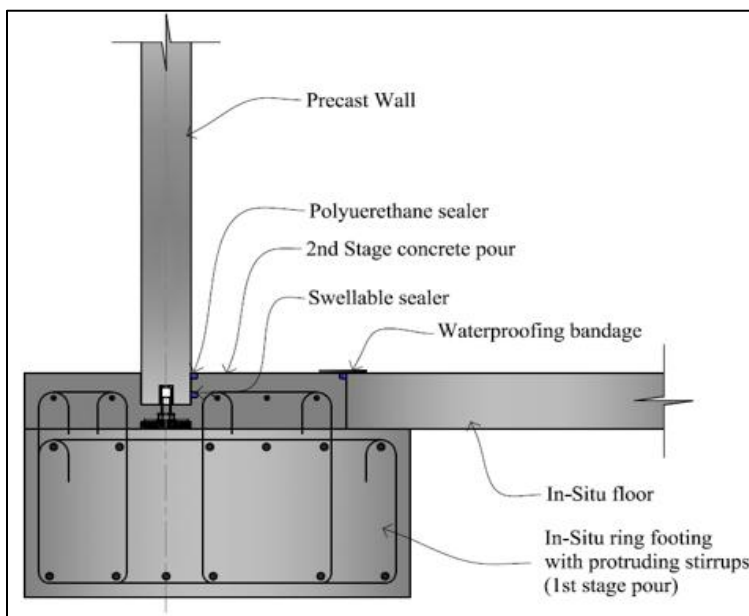
Figure 14: Column collar detail



Wall Ring Footing

The wall foundation (or ring footing) is designed to transfer vertical loads from the wall and roof to the ground, and to translate the shear force in the wall due to water pressure, into ring tension in the foundation. This tension is countered with adequate rebar cast into the wall foundation/ring footing.

Figure 15: Precast wall/Ring footing interface



Roof Waterproofing

Thermal insulation is required to ensure structural longevity, it would thus be ideal to combine insulation with waterproofing. Two approaches are available:

- Torch-on membrane with protective layer topped with 100mm stone ballast
- TPO membrane (loose laying) on top of suitable insulating material

Required thermal conductivity properties based on 100mm stone ballast are as follow:

Figure 16: Thermal conductivity requirements

Temperature profiles for stone over concrete						
Outside air temperature			30			
Radiation levels			1000			
Overall R-value			0.57			
	Thermal conductivity	Thickness	Thermal resistance	Temperatures	Air temperature	Temperature Profile
				66.00	Solair temperature	
External Surface co-efficient	25		0.04	3.23	Surface temperature	
Stone	0.8	100	0.13	10.09		
Water proofing	0.2	4	0.02	1.62		
Concrete	1.5	200	0.13	10.77		
Airspace	6.2		0.16	13.03		
Floor surface resistance			0.09	7.27		20.00
Total Resistance			0.57	20.00	Internal air temperature	
Delta T				46.00		

Specific maintenance / operational issues

Operation and maintenance manuals will be provided as part of the reservoir construction contract. These among other aspects will cover the structural aspects, flow meters, valves and telemetry. All manuals for telemetry, metering and other as may be required, must be signed off by the Electrical Support Department Head or his nominated representative.

C3.2.2.2 BULK WATER (STEEL AND PVC PIPES)**1. PVC Pipes**

Bulk Water: Class 12.5 (PN 12.5) PVC-O , SANS 16422:2007 (PVC-O 500)

Water reticulation: Class 12 uPVC pipes, SANBS 966: 1998 Part 1

Sewer Reticulation: Class 34 (PN 34) PVC-U

2. Steel Pipes

Steel pipes shall be Grade X42 in terms of API 5L. Stainless steel pipes shall be Grade 316 in terms of ASTM A312. Steel and stainless-steel pipes shall be epoxy lined and coated in compliance with SANS 1217 to a dry film thickness of 600 micron minimum.

Underground flanges shall be covered in profiling mastic and double tape wrapped.

Fittings and Specials (within valve chamber or reservoir or cast into concrete in reservoir or through valve chamber walls):

Steel pipe fittings and specials shall be Grade X42 in terms of API 5L. Stainless steel pipe fittings and specials shall be Grade 316 in terms of ASTM A312. Steel and stainless-steel pipes shall be epoxy lined and coated in compliance with SANS 1217 to a dry film thickness of 600 micron minimum.

3. Dimensional Specification of Pipes

All pipes to conform to API 5L or SANS 719.

4. CATHODIC PROTECTION

ABBREVIATION	DEFINITION	ABBREVIATION	DEFINITION
CP	Cathodic Protection	DSR	Deep Soil Resistivity
AC	Alternating Current	NACE	National Association of Corrosion Engineers
ACI	AC interference	IFs	Interference Sources
ACIM	Alternating Current Interference Mitigation	SANAS	South African National Accreditation System
CIPS	Close Interval Potential Survey	DFT	Dry film thickness
DCVG	Direct Current Voltage Gradient	LPE	Liquid Polyethylene
PCM	Pipeline current mapping	ITP	Inspection and Testing Plan

SRB	Sulphate-Reducing Bacteria	QCP	Quality Control Procedure
ICCP	Impressed Current Cathodic Protection	PQT	Procedure Qualification Trial
GPS	Global Positioning System	RPU	Rigid Polyurethane
DGPS	Differential Global Positioning System	RH	Relative Humidity
ABS	Acryl-nitrile-butadiene-styrene	AWWA	American Water Works Association
CI	Cast iron	FBMDPE	Fusion-Bonded Medium-Density Polyethylene
DCA	Die cast aluminum	ITP	Inspection and Testing Plan
FBP	Fusion-bonded Polyester	IFJR	Internal Field Joint Repairs
HDPE	High Density Polyethylene	MSEAP	Manual submerged electric arc process
ISO	International Standards Organization	ASTM	American Society for Testing and Materials
PC	Polycarbonate	SG	Spheroidal graphite
MS	Mild steel	UV	Ultraviolet
SS	Stainless steel	PVC	Polyvinylchloride

a) Background

We refer to your request for a cost proposal for the required studies, designs and implementation of a Cathodic Protection (CP) system and AC interference (ACI) mitigation measures for the BOOYSEN BULK steel pipeline as described in the scope of work document.

The pipe system that requires CP and ACIM is pipe running is traversing through portions 15, 16, 70, 232, R76 and 169 of the farm Zandfontein 317-JR. The total distance of the pipe route is about 6km. The pipeline layout is attached to the last page.

The following site surveys are required:

b) Site Surveys

The following site surveys would be undertaken:

- Combined CIPS-DCVG survey
- Pipeline current mapping (PCM)
- Current drainage testing and CP system inspection
- Stray/Interference current overnight potentials existing pipes
- Shallow soil resistivity survey (Wenner 4-pin) on pipe routes
- Soil samples for SRB (bacteria) tests
- Groundbed resistivity survey for ICCP
- Direct assessment coating at opened sites
- Overhead powerline tower survey & general line confirmation

The current drain survey will determine the required amount of CP current required for adequate corrosion protection to the existing pipe system. The different soil resistivity surveys are required for input data for the design – the whole system operation is dependent on the numerous resistance paths in the CP electrical circuit.

1.1. Combined CIPS/DCVG Survey

The survey technique is an integrated digital Close Interval Potential Survey (CIPS) with a simultaneous digital recorded Direct Current Voltage Gradient (DCVG) survey.

The CIPS data is utilized principally to characterize the cathodic protection system. The recorded DCVG data is utilized principally to characterize the coating defects. A static potential recording can be used to compensate for stray current effects on both CIPS and DCVG data if required.

The Integrated CIPS and Recorded DCVG survey is intended to provide sufficient data to accurately demonstrate the efficacy or otherwise of external corrosion control of the pipeline being surveyed, to effectively present a corrosion control audit of the pipeline external surfaces and to provide locations and relative priorities for remedial action to both cathodic protection systems and external coatings.

The survey techniques cannot provide data regarding internal corrosion of the pipeline and cannot locate corrosion or stress corrosion cracking activity under disbonded coatings. It may be possible to locate disbonded coatings by excavation and visual examination of the varying categories of coating defects detected by the survey techniques defined within this methodology.

Pipe/soil potentials for the Close Interval Potential Survey (CIPS) are measured with the reference electrode immediately over the pipeline, with a deviation from "top dead center of the pipeline", not exceeding twice the nominal burial depth to the top of pipe. Where it is necessary to exceed this offset, such as pipelines under tarred roads, this information will be recorded in the survey log and the data analysis conducted with due consideration.

Synchronized current interrupters or switchers will be inserted into all identified impressed current sources, galvanic anodes and bonds along the pipeline route.

All data sets are recorded simultaneously, and all data loggers are time synchronized, with all switchers, to an accuracy of $\pm 20\text{ms}$ between units at all times.

The data is reported such that all defects identified can be classified according to a relative risk rating, depending on whether they are experiencing cathodic protection or not.

2.1 Pipeline Current Mapping/Pipe Location

A pipeline current mapper (PCM) is used for measuring the current flowing in the pipeline. This is useful in identifying places where the current leaves or enters the pipeline (cross bonds, shorts to other structures, etc.).

In addition to providing a quantitative measurement of the current flowing in the pipe, the PCM can be used to accurately locate the pipe and to measure depth of cover. We have allowed for capturing GPS coordinates and depth of cover at 50m intervals.

2.2 Current Drainage Testing and CP System Inspection

The purpose of the current drainage testing is to determine the current requirement to provide complete cathodic protection to a pipeline.

The current drainage test is, in essence, a small-scale cathodic protection system which utilizes temporary ground beds, such as earth spikes, fences or other buried steel structures. It is not necessary to fully protect the whole pipeline during a test, provided the area protected can be identified and the drainage current is known.

Synchronized data loggers are distributed along the pipelines under consideration to record the effects on the system

while draining current at different locations. This will not only determine the current requirement of the pipelines but will also be used to identify whether continuity bonds and cross bonds between the various pipes are intact.

2.4. *Stray/Interference Current Survey*

Stray currents are detected by monitoring the pipe/soil potential over a period of time. Current entering or leaving the pipeline causes variations in the pipe/soil potential, which indicate the direction and intensity of the current.

In practice, data loggers or recorders are used to monitor the pipe/soil potential. These recordings are made over several hours in order to ensure representative results, as interference current may vary considerably over a 24hr period.

Analysis of the data recording indicates whether the CP system is successfully preventing stray current induced corrosion, or whether modifications to the system are required to ensure complete protection.

2.5. *Soil Resistivity Survey*

The soil resistivity survey will be undertaken in situ using the 4-pin Wenner Technique. Sampling will be at nominal 100m intervals along the pipeline route. Shorter intervals will be used when there are visible changes in ground conditions or significant variance between consecutive readings. The pin spacing will be at 1.6m (nominal pipe depth) along the route. All locations are recorded using sub-meter accuracy DGPS.

The results from the survey will be analyzed such that the resistivity of the pipeline route is classified to highlight regions of high risk of soil corrosion.

2.6. *Soil Sampling & Analysis*

Soil samples at nominal 1000m intervals were allowed by means of hand-auguring to nominal pipe depth (1.5-2m) to obtain the samples, which will be analyzed for sulphate reducing bacteria *in situ*. In addition, the samples will be submitted to a SANAS accredited laboratory for the following analyses: pH; conductivity; total soluble salts; total sulphates and total chlorides (using a 10% water extract of the homogenized sample). The report from the laboratory will be issued to the client.

2.7. *Groundbed Survey*

Possible suitable groundbed locations will be identified and surveyed.

2.8. *Deep Soil Resistivity Survey (If required)*

Deep soil resistivity measurements will be undertaken using the Abem Terrameter SAS4000. We have allowed 6 surveys to be undertaken.

2.9. *Direct Assessment at Excavations*

Depending on the survey findings, it would be prudent to excavate designated locations to comprehensively evaluate the condition of the coating and, on its removal, evaluate the status of the pipe itself. This will include measuring the depth of any pitting identified, determining the thickness of the steel and assessing the condition of the coating. We have allowed for the assessment of 5 locations.

Please note: The excavation of the locations as well as the coating repair and reinstatement are not included in this proposal and should be undertaken by others.

2.10. Overhead Powerline Survey

The overhead powerline tower survey is done using laser theodolite and will accurately determine the conductor geometry. The on-site verification of the powerlines will be included in this site visit.

a) AC Interference Mitigation Design

The AC interference is a safety issue (shock and electrocution) as well as an AC corrosion aspect (accelerated form of corrosion). The extent of co-location between steel pipes and overhead powerline determines the extent of the problem. In this project the overhead powerlines are somewhat distant, but sufficiently co-located to require a study to investigate.

The following general statements apply to the impact of these pipelines and powerlines

- The overhead powerlines are sufficiently co-located to justify a proper AC interference investigation,
- The electrical coupling system may be categorised as a Ve / Simple / Moderate / Complex / Very Complex analysis
- Allow for say 10x Deep Soil Resistivity (DSR) surveys

The provisional identification of powerlines in the area that would have to be considered to be included in the detailed evaluation are yet to be identified

It requires effort to obtain accurate information about the powerlines (i.e. steady state and fault current values and powerline conductor details) from the different operators. The accuracy (and consequently the cost effectiveness) of the analyses depends on the accuracy of the input.

b) Cathodic Protection Design

A comprehensive CP system design will be undertaken in accordance with SANS ISO 15589 Part 1, and a detailed CP design report complete with appropriate design calculations will be issued. The design will be overseen by a NACE Cathodic Protection Specialist, using the data obtained during the surveys.

During the detailed CP design, the engineering construction drawings will be reviewed and marked up to ensure that all buried couplings and valve chambers are provided with electrical continuity bonding. Strategic location of IFs is critical for optimal operation of a cathodic protection system, and drawings will also be reviewed to ensure that all valve actuators, flowmeters as well as the interface between buried and aboveground pipes are adequately supplied with insulation joints or IFs. Monitoring points would be required at strategic points. Cathodic protection requirements for any isolated, buried steel fittings and specials will also be considered.

c) Coating Specification

Fusion Bonded Polyethylene Coatings

The pipe coating shall be Sinta Kote II complying with all aspects of AS 1193, AS 4131 and AS 4321 of the latest

All coating materials shall be supplied complete with an original ISO 17050-1 Certificates of Conformity (COC) for the materials, clearly indicating compliance with all mechanical, physical and chemical properties of the coating, as defined in AS 4321, AS 1193 and AS 4131.

The supplier shall ensure that testing takes place as per AS 4321 Appendix A, as defined in **Table A1** for the pipeline coating at the mill. In addition to this, a detailed third-party report indicating compliance per the 5 Yearly Type Testing shall be included in the bid and shall be approved by the client in writing before production commences. The annual

testing as per **Table A1** shall also be submitted with the bid and shall be approved by the client in writing before production commences.

The minimum Dry Film Thickness (DFT) shall be 2.3 mm minimum or as per **Table 1** of AS 4321 for the different pipeline diameters as agreed by the Client. The pipeline frequency of testing during production shall be as per AS 4321.

Table 2.

The surface profile shall be angular and at least 60µ-75µ and the dust and debris level shall never exceed Class 2 ISO 8502-3 during production, the latter shall be confirmed during production on every 5th pipe and records shall form part of the hand-over pack issued to the Client. The cutback distance of the coating will be 75mm from the pipe end.

Three Layer Polyethylene (3LPE) Coatings

The 3LPE coating shall comply with ISO 21809-1, the Canadian Specification CSA Z245.20/Z245.21 is not applicable. The materials supplied as part of the 3LPE coating, including the Fusion Bonded Epoxy (FBE), Copolymer adhesive and Polyethylene (PE) outer coating shall be supplied with ISO 10474 or EN 10204 Inspection Certificates 2.1 and 2.2, giving the results of the testing of coated pipes, as supplied on the contract/purchase order and signed by a representative of the client which has been duly authorised to issue such documents, by the client in writing.

Pipeline production and coating may not take place without a client approved Inspection and Testing Plan (ITP) document providing an overview of the sequence of inspections and tests, including appropriate resources and procedures. The client shall approve the ITP and Quality Control Procedure (QCP) in writing prior to coating production commencing.

Subsequent to the approval of the documentation detailed above, a Procedure Qualification Trial (PQT) shall take place and shall be witnessed by the client or the duly appointed and authorised person appointed by the client to witness that application of the coating and subsequent inspection/testing of its properties, to confirm that the Application Procedure Specification (APS) is adequate to produce a coating with the specified properties, carried out prior to the start of production.

The 3LPE shall be Type B coating, as per ISO 21809-1 **Table 1**. The 3LPE coating shall as a minimum be as follows:

FBE	0.30 mm
Adhesive	0.20 mm
HDPE	2.00

The 3LPE shall have minimum total thickness as above, and on heavier wall pipes it shall comply with class B3, as per ISO 21809-1 **Table 2**.

The applicator shall use epoxy material that is in accordance with **Table 3**, Class B, as per ISO 21809-1 and shall test the materials/ensure compliance as detailed above in accordance with ISO 10474 or EN 10204.

The applicator shall use adhesive material that is in accordance with **Table 4**,

Class B, as per ISO 21809-1 and shall test the materials/ensure compliance as detailed above in accordance with ISO 10474 or EN 10204.

The applicator shall use PE/PP material that is in accordance with **Table 5**, Class B, as per ISO 21809-1 and shall test the materials/ensure compliance as detailed above in accordance with ISO 10474 or EN 10204.

The applicator shall provide batch certificates supplied by the manufacturer of each material and shall contain the information given in **Table 6** ISO 21809-1. The batch certificate shall state test methods and acceptance criteria. The applicator shall identify the materials and shall confirm that the certificates comply and relate to the specified materials, as well as the requirements stipulated in Clauses 8.3.2 and 8.3.3 ISO 21809-1.

Prior to the start of coating production and any specified PQT, the applicator shall prepare an APS as per Clause 9.2 ISO 21809-1.

The APS, including any client approved written revisions, shall be approved by the Client prior to the start of production and any specified PQT and they shall comply with the requirements of **Table 7**, Class B coating system. The APS shall be verified by a PQT in accordance with ISO 21809-1 **Annexure L**. The applicator shall prepare an ITP and a daily log to record quality control data in accordance with **Annexure L** of ISO 21809-1.

Prior to the commencement of the surface preparation for the coating operations, visual inspection shall be performed on the bare steel pipes in order to verify that there are no steel or weld defects (welding slag, spatter or raised/sharp edges) or contamination with oil, grease, soil, dirt and similar contaminants.

In the event that steel defects are detected they shall be rectified using a file, light grinding or any other suitable tool as stipulated in API 1104 Clause 13.10. This intervention shall not reduce the pipe wall thickness below the tolerances specified in the relevant Project Documents. In case the steel defect is of nature that simple correction of this defect cannot be performed, the pipe affected by this defect shall be quarantined until the appropriate measures are taken.

In case oil, grease, or any other residues (e.g. adhesive materials or similar contaminants) are present, then they shall be removed using a high-pressure water based detergent cleaner, and/or a suitable "solvent" as per the requirements of SSPC-SP-1 Specification. In the event of other "adherent" contaminant being present, then power tool brushes or any other appropriate method may be utilized in order to remove the contaminant from the pipe surface prior to grit blasting.

The blast cleaning abrasives shall be, at all times, kept dry, clean and free from contamination. The blast cleaning shall be performed when the following conditions are satisfied:

- The steel surface temperature is at least 3°C above the ambient dew point, which shall be checked using a calibrated hygrometer or other method approved by Client.
- The steel surface shall have no traces of moisture;

- The steel surface is protected from bad weather conditions such as rain or the strong wind which can bring contaminants such as soil, sand, dirt, salt or any other similar contaminant.

In the case that the steel surface temperature is less than 3°C above the ambient dew point or traces of moisture are detected on the steel surface, the steel surface shall be heated using induction heating until the steel surface temperature is within the range of 50°C to 60°C. This temperature shall be maintained until all of the moisture has been removed from the steel surface.

Abrasive blast cleaning shall be in strict compliance with ISO 21809-1 Clause

10.1.2 with the exception that the profile shall be measured using ISO 8503-4 (Stylus method), replica tape is not permitted.

As per ISO 8502-3, the cleanliness of the steel surface shall be measured using the ISO Form: "Preparation of Steel Substrates before Application of Paint and Related Products – Test for the Assessment of Surface Cleanliness – Part 3: Pressure Sensitive Tape Method." As prescribed, a strip of clear tension tape shall be placed, tacky side down, onto the blasted steel surface of the pipe after cleaning. The tape shall then be removed from the surface and placed on a piece of white glossy paper where it will be compared to the cleanliness levels provided in the ISO 8502-3 specification procedure. This shall not exceed a "Debris" and "Dust" level of Class/Level 2 at any given time and shall be recorded during pipe production on at least every 5th pipe to confirm compliance and records shall be kept for the client, which may be inspected at any given time.

The salt level on the bare steel pipe surface shall be measured according to ISO 8502-2 and shall be a maximum of 20 mg NaCl/m². The basic procedure of the test shall be to dampen circular piece of test paper of known area with a specified volume of laboratory water containing less than 0.1µg/cm² of salt. The test paper shall then be applied to the pipe for a period of 2 minutes, after which the test paper will be removed from the pipe and its resistivity measured. The salt content on the pipe will then be determined through the calibrated Salt Contamination Meter which uses the negative correlation between resistivity and salt content, along with empirically measured historical data to provide a reading.

If excessive salt contamination is established (≥20 mg NaCl/m²) during production testing, then the applicator shall ensure that a "Pre-Wash" system shall be employed prior to coating in order to remove the salt without causing "flash rusting" or any other "surface contamination". The "pre-wash" shall be performed and shall form an integral part of the production Pre-Qualification Testing (PQT) before acceptance of the "Pre-Wash" procedure.

The maximum time elapsed after completion of the abrasive blasting operation, pre-wash (if applicable) and the application of the P primer shall be 120 minutes if RH < 85% and 60 minutes if RH > 85%. At no time shall the steel surface temperature be allowed to drop below the dew point before application of the P Primer. Should either of these conditions apply, the surface preparation shall be re-inspected and/or the surface preparation repeated as required.

The application of the 3LPE coating shall be in accordance with the approved APS in accordance with Clauses 10.2.2.3 and 4 of ISO 21809-1.

Inspection and testing shall be carried out in accordance with the approved APS and ITP and shall meet the

minimum requirements as stipulated in ISO 21809-1 **Tables 8 and 9.**

Coating repairs shall be addressed via a client approved APS and PQT as per Clause 12 ISO 21809-1.

Pipeline marking shall be as per the Clients requirements but shall as a minimum include all aspects detailed in Clause 13 of ISO 21809-1.

Alternative Coatings

Alternative coatings which comply with the same or possess very similar coatings properties as those detailed above, may be considered by the client.

Rigid Polyurethane (RPU) coatings shall comply fully with EN 10290 and RPU suppliers shall verify compliance with an independent third party approved type testing report that is not more than 4 years old.

Toll manufactured RPU products shall also comply fully with AWWA C222 and/or EN 10290 and RPU suppliers shall verify compliance with an independent third party approved type testing report that is not more than 4 years old showing full compliance with all of those requirements defined in EN 10290 Table 4. The international “holding” company and/or overseas “registered brand” manufacturers test reports are not deemed to be acceptable, as the products are toll manufactured locally with the potential that local generic components are used. Testing of both toll manufactured and imported products is mandatory. Imported products shall be issued with an ISO 17050-1 Certificate of Conformity from the supplier (point of origin) stipulating compliance with all chemical, physical and mechanical properties of the applied product, as per ISO 10474 or EN 10204 Inspection Certificates 2.1 and 2.2 and shall comply in full with Table 4 of EN 10290 or AWWA C222 for RPU products.

The minimum mainline and FJR coating dry film thickness for the RPU system shall be 300100μ.

1. Field Joint Repairs (FJR) External Coatings

On both FBMDPE and 3LPE coatings, only Client approved DVGW Certified and or other Client approved certification materials may be used. All materials shall comply to the requirements of EN 12068 Class C HT50°C UV for both tapes and heat shrinkable sleeves (HSS).

An ISO 17050-1 Certificate of Conformity from the supplier (point of origin) stipulating compliance with all chemical, physical and mechanical properties of the applied product, as per ISO 10474 or EN 10204 Inspection Certificates 3.1.B and 3.1 shall be submitted i.e. the DVGW Type Test Report and in-house batch testing for the batch(s) to be supplied.

Pipeline FJR repairs may not take place without a client approved Inspection and Testing Plan (ITP) document providing an overview of the sequence of inspections and tests, including appropriate resources and procedures. The client shall approve the ITP and Quality Control Procedure (QCP) in writing prior any FJR

construction/production commencing.

Subsequent to the approval of the documentation detailed above, a Procedure Qualification Trial (PQT) shall take place and shall be witnessed by the client or the duly appointed and authorized person appointed by the client to witness that application of the FJR and subsequent inspection/testing of its properties, to confirm that the Application Procedure Specification (APS) is adequate to produce a FJR system with the specified properties, carried out prior to the start of construction.

For RPU mainline coatings, the same RPU material shall be utilized, once the Client has approved the APS, QCP and ITP. An ISO 17050-1 Certificate of Conformity from the RPU supplier (point of origin) stipulating compliance with all chemical, physical and mechanical properties of the applied product, as per ISO 10474 or EN 10204 Inspection Certificates 2.1 and 2.2 shall be submitted i.e. the EN 10290 Type Test Report and in-house batch testing for the batch(s) to be supplied as per EN 10290.

2. Lining Specification

The pipe lining shall be suitable for immersion as per SANS ISO 12944-2 Im1 (Immersion) and shall be SANS 241 compliant. The minimum dry film thickness shall be 600µm.

The lining shall comply fully with EN 15655/EN10339 and suppliers shall verify compliance with an independent third party approved type testing report that is not more than 4 years old.

Toll manufactured products shall also comply fully with EN 15655/EN10339 and suppliers shall verify compliance with an independent third party approved type testing report that is not more than 4 years old showing full compliance with Table 1 for the toll manufactured product. The international "holding" company and/or overseas "registered brand" manufacturers test reports are not deemed to be acceptable, as the products are toll manufactured locally with the potential that local generic components are used. Testing of both toll manufactured and imported products is mandatory. Imported products shall be issued with an ISO 17050-1 Certificate of Conformity from the supplier (point of origin) stipulating compliance with all chemical, physical and mechanical properties of the applied product, as per ISO 10474 or EN 10204 Inspection Certificates 2.1 and 2.2.

All lining products shall possess a SANS 241 Potable Water Certificate, which shall not be more than 2 years old and issued by SANS. Products without a SANS 241 Potable Water Certificate, shall be tested, and shall be based upon product supplied from the Toll Manufacturing Company, which will be inspected and collected by the client and/or client's representative from a production run. No material may be applied without the client approving in writing the SANS Potable Water Certificate.

Pipeline production and lining may not take place without a client approved Inspection and Testing Plan (ITP) document providing an overview of the sequence of inspections and tests, including appropriate resources and procedures. The client shall approve the ITP and Quality Control Procedure (QCP) in writing prior to lining production commencing.

Subsequent to the approval of the documentation detailed above, a Procedure Qualification Trial (PQT) shall take place and shall be witnessed by the client or the duly appointed and authorized person appointed by the client to witness that application of the lining and subsequent inspection/testing of its properties, to confirm that the Application Procedure Specification (APS) is adequate to produce a lining with the specified properties, carried out prior to the start of production.

The cutback distance from the pipe end will be 75 mm for pipes that can be man entered and field repaired (pipe dia larger than 500 mm), otherwise no cutback will be accepted.

3. Field Joint Repairs (FJR) Internal Linings

All completed Internal Field Joint Repairs (IFJR) shall comply with EN 15655/EN10339 and shall be potable water compliant as per the latest SANS regulations governing potable water. The materials shall be fully compatible with the main lining system and all compatibility testing as per EN 15655 / EN10339 as well as hot water soak testing at the materials maximum operating temperature (e.g. 55°C) for 15 days followed by a full reassessment of all EN 15655/EN10339 tests including adhesion testing onto the overlapped main lining, which will be undertaken by an approved independent third-party testing house, which has been approved by the Engineer and/or CoT. All proposed materials will have a proven track record with traceable project history and contactable references. All materials shall have a valid SANS 241 Certificate which shall not be more than 4 years old and, on the provision, that the material certified has not been changed or altered in anyway.

An ISO 17050-1 Certificate of Conformity from the supplier (point of origin) stipulating compliance with all chemical, physical and mechanical properties of the applied product, as per ISO 10474 or EN 10204 Inspection Certificates 2.1 and 2.2 shall be submitted as well as an in-house batch testing for the batch(s) to be supplied. The supplier's laboratory and testing facilities shall also be ISO 9001 certified and/or ISO 17025.

Pipeline IFJR repairs may not take place without a client approved Inspection and Testing Plan (ITP) document providing an overview of the sequence of inspections and tests, including appropriate resources and procedures. The client shall approve the ITP and Quality Control Procedure (QCP) in writing prior any IFJR construction commences.

In the case that the steel surface temperature is less than 3°C above the ambient dew point or traces of moisture are detected on the steel surface, the steel surface shall be heated using induction heating until the steel surface temperature is within the range of 50°C to 60°C. This temperature shall be maintained until all of the moisture has been removed from the steel surface.

Abrasive blast cleaning shall be in strict compliance with ISO 21809-1 Clause 10.1.2 to SA3 with the exception that the profile shall be measured using ISO8503-4 (Stylus method), replica tape is not permitted.

As per ISO 8502-3, the cleanliness of the steel surface shall be measured using the ISO Form: "Preparation of Steel Substrates before Application of Paint and Related Products – Test for the Assessment of Surface Cleanliness – Part

3: Pressure Sensitive Tape Method.” As prescribed, a strip of clear tension tape shall be placed, tacky side down, onto the blasted steel surface of the pipe after cleaning. The tape shall then be removed from the surface and placed on a piece of white glossy paper where it will be compared to the cleanliness levels provided in the ISO 8502-3 specification procedure. This shall not exceed a “Debris” and “Dust” level of Class/Level 2 at any given time and shall be recorded during site production on every IFJR pipe to confirm compliance and records shall be kept for the client, which may be inspected at any given time.

The salt level on the bare steel pipe surface shall be measured according to ISO 8502-2 and shall be a maximum of 20 mg NaCl/m². The basic procedure of the test shall be to dampen circular piece of test paper of known area with a specified volume of laboratory water containing less than 0.1µg/cm² of salt. The test paper shall then be applied to the pipe for a period of 2 minutes, after which the test paper will be removed from the pipe and its resistivity measured. The salt content on the pipe will then be determined through the calibrated Salt Contamination Meter which uses the negative correlation between resistivity and salt content, along with empirically measured historical data to provide a reading.

Subsequent to the approval of the documentation detailed above, a Procedure Qualification Trial (PQT) shall take place on site and shall be witnessed by the client or the duly appointed and authorized person appointed by the client to witness that application of the IFJR and subsequent inspection/testing of its properties, to confirm that the Application Procedure Specification (APS) is adequate to produce an IFJR system with the specified properties, carried out prior to the start of construction and testing shall meet all of the requirements stipulated above.

4. Field Welding General

Field welding of pipes which have been lined will only be permitted in pipes of DN 450 and larger where a man is able to enter the pipe to make good the lining after welding and testing in accordance with API 1104 Clause 12.8 has been completed. Pipes of lesser diameter may be field welded where concrete linings will be made after the pipeline has been laid and all welds have been tested and approved.

At the discretion of the Engineer, roll welding will be permitted, provided an alignment is maintained by use of skids or of structural framework to accommodate two or more lengths of pipe with an adequate number of roller dollies to prevent sag in the pipe. The entire root bead, however, shall be made with the pipe in a stationary position.

All pipes welded in the trench shall be properly laid and aligned before welding commences. Joint holes shall be excavated at all field welds. The Contractor shall not lift the pipe to provide adequate access for the welders to enable them to weld the joint.

The alignment of abutting ends shall be such that the offset will not exceed 1.5 mm. Line up clamps shall be used for joint "fit-ups". The use of "bridges and wedges" or any method that may induce unnecessary stresses will not be permitted. Both ends of coated and lined pipes shall be wrapped for a distance of at least 800 mm on either side of the weld by means of a fire-resistant plastic, rubber or other approved material mat to ensure that weld spatter or other damage is not caused to the coating and lining during the welding process. The pipe trench shall be kept free of all dirt and water in the vicinity of the weld until after all corrosion protection measures have been completed and approved.

Destructive testing as specified in API 1104 Clause 6.5 shall be carried out. The Contractor shall submit to the Engineer for approval a full procedure specification as detailed in API 1104 Clause 5.3 prior to any field welding being allowed

5. Welding Procedure and Qualification of Welders

Welding shall only be done by qualified welders who satisfy the requirements of API Std. 1104, Clause 6 and who have been tested at the Contractor's expense by an Independent Inspectorate.

Before any welding of pipeline materials commences, the qualification of welders shall have been

approved, all detailed welding procedure specifications with weld diagrams required for their completion shall have been submitted for approval in a neat form and the welding procedure qualification tests shall have been successfully concluded all in accordance with the relevant standard specifications. Each welder shall mark the pipe adjacent to the weld with the figure assigned to him.

Sufficient records shall be kept by the Contractor to ensure that all field welds can be subsequently identified with the welder concerned.

As far as practicable all out of trench welding shall preferably be done by an automatic submerged process and the Contractor shall provide all necessary plant to carry out this process. Manual submerged electric arc process (MSEAP) welding may be used where in-trench welding is done.

Pre- and post-heat treatment for welding shall be in accordance with API Std. 1104 if required by same and the Contractor shall provide an approved shield to protect the pipe joint from wind and weather during heat treatment and welding.

6. Line Up

Pipes shall be lined up in such a manner as to prevent damage thereto. If the pipe to be used has a longitudinal seam, these seams shall be staggered by not less than twenty degrees and welded sections, or single lengths, shall be assembled in such a manner that this seam shall remain in the top quadrant of the pipe during coating operations and after lowering into the trench.

7. Cleaning of Pipe Ends

Before welding, all foreign matters shall be removed from the beveled ends. If any of the ends of the pipe joints are damaged to the extent that satisfactory welding contact cannot be obtained, the damaged pipe ends shall be cut and beveled with an approved beveling machine. These field bevels of pipe ends shall be made to the satisfaction of the Engineer. Should laminations, split ends, or other defects in the pipe be discovered, the joints of pipes containing such defects shall be cropped, repaired, or removed from the line as designated by the Engineer.

8. Cleaning of Pipe Ends

Before welding, all foreign matters shall be removed from the beveled ends. If any of the ends of the pipe joints are damaged to the extent that satisfactory welding contact cannot be obtained, the damaged pipe ends shall be cut and beveled with an approved beveling machine. These field levels of pipe ends shall be made to the satisfaction of the Engineer. Should laminations, split ends, or other defects in the pipe be discovered, the joints of pipes containing such defects shall be cropped, repaired, or removed from the line as designated by the Engineer.

9. Weather Conditions

No welding shall be carried out during rain or high wind unless the welder and joint are adequately protected and sheltered, to ensure that the welding is not impaired.

10. Protection of Paintwork

Before welding commences, a suitable apron at least 800 mm wide shall be wrapped around both sides of the area to be welded to ensure that weld spatter or fallout from arc weld does not damage the paintwork.

During the welding of joints, the Contractor shall ensure that either rubber mats or other suitable material is laid in the pipe invert of epoxy lined steel pipes to protect the lining against damage by traffic or fall-out from arc welding at the joint. The mats shall be placed the full distance from the point of access up to the point of weld or weld inspection and shall be of sufficient width.

Workmen shall wear soft rubber soled shoes before entering lined pipes. Care shall be taken not to stroke arcs on the epoxy lined areas adjacent to the weld joint. Immediately before welding of joints, the protective tape between the ends of concrete or epoxy linings and coatings and pipe ends shall be removed.

11. Butt-Welding

Pipes and specials to be joined by field welding shall be supplied with ends beveled for welding. All welding of joints shall comply with API Std. 1104 and only approved type welding rods shall be used.

If backing rings are used, they shall be placed in position and wedged up or adjusted so that the pipe ends are completely circular and properly mated. The space between abutting pipe ends, when aligned for welding, shall be such as to ensure complete penetration without burn-through. For pipes having the same dimensions, the spacing shall be approximately 1,5 mm.

The alignment of the abutting pipe ends shall be such as to minimize the offset between pipe surfaces. For pipes of the same nominal wall thickness, the offset shall not exceed 1,5 mm. Internal line-up clamps shall be used wherever practicable and may be removed after the root bead is 50 % completed,

provided that the completed part of the root bead is in segments of approximately equal lengths, spaced about the circumference of the pipe. If conditions make it difficult to prevent movement of the pipe, or if the weld will be unduly stressed, the root bead shall be completed before releasing clamp tension.

External line-up clamps shall be used where it is impracticable to use internal line-up clamps. Partial root beads made when using external clamps shall be uniformly spaced about the circumference of the pipe and shall have an accumulative length of not less than 50% of the pipe circumference before the clamps are removed.

Tack-welding shall be carried out to maintain the root gap and position of the pipe ends during the welding proper. The number of tack-welds shall be kept to a minimum but shall not be less than four around the circumference of the pipe.

After proper preparation and tack-welding, the root bead shall be carried out followed by successive filler passes, and capper finish pass in accordance with the approved welding procedure.

The filler and finish beads shall be deposited by an acceptable method and each filler bead shall be approximately 3 mm in thickness. Completed welds shall have a reinforcing of not less than 0,8 mm and not more than 1,5 mm above the pipe surface around the entire perimeter of the weld, and the width of the finish or cover shall be not more than 3 mm greater than the original groove.

The number of beads required shall be governed by the wall thickness of the pipe, so that the completed weld will have the reinforcement previously specified; provided, however, that each weld shall consist of at least three beads. No two beads shall be started at the same point. No miter welds will be permitted, and all welds are to be at ninety degrees (± 5 degrees) to the axis of the pipe. All slag and scale shall be removed from each bead for visual inspection immediately after each bead is run.

In all field butt-welds where it is possible to work inside the pipe, the inside weld shall be done first. The chemical composition of weld metal and parent metal shall be similar, and the inner weld metal or reinforcement shall not extend more than 1 mm above the inside metal surface of a pipe or special, and any excess shall be removed by grinding.

Defects caused by stray welding arc flashes shall be removed by grinding, provided that the pipe wall thickness is not reduced to less than the specified minimum thickness, otherwise the portion shall be cut out and repaired.

12. Fillet Welding

Welding shall be as for butt-welding as applicable. All pipes of DN 600 and over shall be welded on both the outside and the inside.

13. Welding Alongside The Trench

The Contractor may butt-weld factory coated and/or lined steel pipes together alongside the edge of the trench to form continuous welded pipeline sections up to a maximum length of 45 m and to lower each section into the trench, provided the pipe, coating and/or lining are in no way damaged during these operations and provided furthermore that the deflection of the pipe barrel at any point during any stage of the operation does not exceed 2% of pipe outside diameter.

The linings and coatings of factory coated and/or lined pipes jointed together outside the trench shall be made good at these joints outside the trench.

14. Repair of Welds

Rectification of defective welds shall be in accordance with API Std. 1104 and to the satisfaction of the Engineer. All costs related to the repair of defective welds shall be borne by the Contractor. Defective welds shall be repaired immediately once they are found to be defective. The Engineer has the right to stop the Contractor proceeding with further pipe laying in the event of the Contractor delaying the rectification of defective welds. Furthermore, no consideration will be given to any claims arising from delays in construction resulting from such action.

15. Tests Required on Pipes

The following tests are required:

- Hydrostatic test on every pipe to a minimum of 90% of nominal yield strength.
- Radiographic, Ultrasonic and dye penetration tests on all welding.
- Check all pipes for dimensional compliance with relation to diameter.
- Tests to measure thickness of coating and lining.
- Spark test to check the uniformity and compliance of the lining and coating to ensure electrical isolation of steel material. Holiday Testing as per ASTM G62 requirements for both internal and external coatings. Any repairs to the lining and coating due to either the spark test or the thickness tests will be done in different color or be clearly identified for later reference if any failures are experienced later in the lifespan of the pipeline.
- Data packs with all of the required ISO 10750-1 Certificates of Conformity for the coating materials, as well as all of the required Quality Control Procedures (QCP) pertaining to the application and testing during production, as stipulated in the previous sections.

A report with all test results will be submitted to the client for storage and usage and when required. The report will further exactly state any repairs to each pipe, and each pipe should indicate a unique reference number traceable for future reference.

C3.2.2.2.1 CORROSION PROTECTION OF SPECIALS, VALVES AND FLOWMETERS

1. SCOPE

This specification covers the corrosion protection of specials, valves and flow meters, subjected to environments with variable corrosive tendencies.

2. INTERPRETATIONS

2.1 Definitions

Refer to the definitions and terminology detailed in SANS ISO 12944-1

Lining

Refers to the internal coating of valves and pipes.

Coating

Refers to the external coating of valves and pipes.

3. GENERAL REQUIREMENTS

4.1 Quality assurance and procedures

The production and application shall be in accordance with SANS ISO 9000, Quality System.

The Contractor shall be responsible for ensuring that he is fully conversant with the requirements of this specification, contract requirements, SANS ISO 12944-1 to 8 and the relevant coating systems.

3.1 Qualified staff

4.2.1 Application and Repairs (Factory and Site)

A high standard of workmanship is required. Only experienced personnel shall be used to carry out corrosion protection work and their qualifications shall be detailed in the relevant APS and Method Statements.

Execution and supervision of the work shall be based upon the minimum requirements stipulated in SANS ISO 12944-7 and detailed in the relevant Method Statements, APS and QCP documents.

3.1.1 Corrosion prevention

The Contractor shall ensure that the following steps are taken to minimize corrosion:

- a) If dissimilar metals are used, they need to be isolated, and the method of isolation needs to be submitted for written acceptance by the Engineer/Client.

- b) Use electrical insulators between two metals. Insulation must be complete; a bolt requires a sleeve as well as washers of an insulating material.
- c) Joints and crevices between metals shall be sealed.
- d) Where fastening is unavoidable, the fasteners shall be nobler (cathodic) than the base material. Fasteners shall be coated where possible and/or adequately electrically insulated between fasteners and the base material.

3.2 Equipment

3.2.1 Measuring equipment

The Contractor shall have the following fully calibrated measuring equipment required throughout the project duration at his shop or site at all times, so that he may comply with the relevant application standards/specifications, like EN10290 or EN10289:

- Ambient temperature gauge
- Blast profile gauge
- Dew point instrument
- Dry film thickness gauge
- Electric insulation defect detector
- Surface temperature gauge
- Relative humidity instrument
- Wet film comb

All relevant equipment and/or instruments shall be calibrated daily in order to ensure compliance with all aspects of the specification and/or contract.

3.2.2 Spray equipment

Spray equipment shall be suitable for the production of high-quality work, capable of properly atomizing the material, agitating materials as required and equipped with suitable pressure regulators and gauges.

All spray equipment shall be fitted with suitable oil and moisture traps, which will ensure that oil and water is measured as per ASTM D4285 or client approved Test Method.

3.2.3 Mixer

All equipment shall ensure full compliance with the application and/or specification and/or contract. The Contractor shall submit full details of the equipment they intend to use as part of this contract.

3.3 Handling and transport

3.3.1 Physical protection

Handling, Transport and Erection should comply with SANS ISO 12955-3 Clause 5.11 and the minimum requirements shall be stipulated by the Design Engineers and the Contractors Method Statement, shall be approved prior to implementation.

3.3.2 End covers

See Section 4.5.1 below

3.3.3 Lifting

See Section 4.5.1 below

3.3.4 Marking of valves, pipes, crates and bags

- a) Each valve, pipe and special shall be legibly, indelibly and durably marked, (in such a manner that the coating is not damaged), with the following information:
 - Contract number,
 - Project name,
 - Nominal diameter,
 - Hydrostatic test pressure,
 - Item number.
- b) The bags and crates shall be tagged using metallic tags and shall indicate the following information:
 - Contract number,
 - Project name,
 - Part numbers,
 - Description,
 - Sizes,
 - Quantities.

Each bag or crate shall have the delivery address listed on a separate metallic tag.

3.3.5 Transport Section 4.5.1.

The Site Engineer shall be notified of the delivery date and of any requirements regarding off- loading and storage at site.

3.3.6 Off-loading at site

The supplier shall be responsible for the transportation and off-loading of the equipment and other small components at the delivery site and shall take due cognizance of Section 4.5.1 above.

The final delivery inspection and acceptance of equipment supplied shall be undertaken on site after off-loading has been completed.

3.3.7 Damage

Any damage that occurs during the handling and storage of items at the Manufacturer/Contractor's works, including transportation to site, shall be repaired by the Manufacturer/Contractor at his own cost, in accordance with the specification and to the approval of the Engineer.

3.3.8 Rejection

The Engineer has the right to reject any damaged items and materials which have been delivered and off-loaded at site.

3.4 Coating systems

The final selection of all corrosion protection systems shall be submitted to the Engineer for approval before application. The QCP shall refer to the relevant system number listed in the tables below.

The following tables are abbreviated guidelines. The Contractor shall submit in writing the full specification and materials that they intend to use on this project and/or contract. The contractor's proposals must be approved in writing by the Engineer, prior to the contractor proceeding with any of the works. The systems are not listed in order of preference. Any item not listed below must be clarified in writing with the Engineer.

3.4.1 Valves and flow meters (including hand wheels)

Material	Surface	System	Minimum DFT (µm)
MS	Lining	ISO 12944-5 IM1A6.10 and SANS 241 potable water certified.	600
SG		EN 545 or ISO 2531 Epoxy / PU& SANS241	600
MS	Coating	ISO 12944-5 A5M.03 or A5M.04	400 500
SG		EN 545 or ISO 2531 Epoxy / PU	400

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

3.4.2 Gearboxes

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

Material	Surface	System	Minimum DFT (µm)
CIS G	Lining	1 EN 545 or ISO 2531 Epoxy / PU&SANS 241	600
	Coating	EN 545 or ISO 2531 Epoxy / PU	400

3.4.3 Pipe Specials

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

Material	Surface	System	Minimum DFT (µm)
MS	Lining	ISO 12944-5 IM1A6.10& SANS 241	600
	Coating	ISO 12944-5 IM3A6.10	600

- Pipe Specials Buried in Soil

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

Material	Surface	System	Minimum DFT (µm)
MS	Lining	ISO 12944-5 IM1A6.10& SANS 241	600
	Coating	ISO 12944-5 IM3A6.10	600

3.4.4 Couplings, Flange Adaptors

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

Material	Surface	System	Minimum DFT (µm)
MS	Lining	ISO 12944-5 IM1A6.10& SANS 241	600
	Coating	ISO 12944-5 IM3A6.10	600

3.4.5 Joints

Proprietary supplier corrosion protection systems shall be reviewed and assessed in line with the specified and/or stipulated corrosion protection systems, prior to being accepted.

Environment	Material	System	Minimum DFT (µm)
Flange faces	MS	EN 15655/EN10339	60 - 90

4.6.6 All SANS 62 fitting components to be Hot Dip Galvanized to SANS121 ISO 1461

4.7 Abbreviations and notes

ABS: Acryl-nitrile-butadiene-styrene: Aluminum
 CI: Cast iron -grade 220
 CS: Cast steel
 DCA: Die cast aluminum
 DFT: Dry film thickness
 FBE: Fusion-bonded Epoxy
 FBP: Fusion-bonded Polyester
 FBPE: Fusion-bonded Polyethylene
 GRP: Glass fiber reinforced Polyester
 HDG: Hot-dip galvanized
 HDPE: High Density Polyethylene
 ISO: International Standards Organization
 PC: Polycarbonate
 PVC: Polyvinylchloride
 MS: Mild steel – grade 300WA
 SG: Spheroidal graphite cast iron – grade 420
 SS : Stainless steel – grades 304, 304L, 316 and 316
 LUV: Ultraviolet 3Cr12: Corrosion resistant steel: Micrometer

The following items shall be approved by the Engineer

1. Hot-dip galvanizing

Only for pipes up to 200 mm diameter maximum and flow less than 2 m/s.

1. Pipes shall not be embedded in concrete.
2. Water analysis shall be provided.
3. Pipes over 200 mm diameter to be coated with a duplex system

2. Sealant

Interfaces of different environments shall be sealed with a Polyurethane or Polysulphide flexible sealant to be applied in accordance with the manufacturer's data sheets.

3. Un-coated stainless steel

Only to be used if no galvanic reaction and anaerobic conditions are found.

4. Pickle and passivate

- If not in contact with less noble material.
- If exposed to anaerobic conditions seal-coat all crevices with
- Elastoplastic Epoxy.
- Shall be done by the dipping process.

5. Galvanic cells

Where a galvanic cell is situated within a water path <150 mm and concrete cover <75 mm, the MS, 3Cr12 or SS shall be coated.

6. Anaerobic conditions

SS grade 316L shall be used under anaerobic and aggressive water conditions.

7. Polyurethane for color coding

Re-coat able or pure Aliphatic Polyurethane where required for color coding. Only UV resistant Polyurethane shall be used.

8. Primers

Primers shall only be used in special cases i.e. over-coating of galvanized surfaces.

9. 3CR12

In view of superior corrosion resistance, coated 3CR12 material is preferred.

10. Mild steel

Mild steel may only be used where the pipe lining can be refurbished in situ

11. Items subjected to high temperatures

Items to be manufactured out of stainless steel or coated with heat resistant paint.

12. Epoxy primer

Epoxy primer may not be required if appropriate two pack Epoxy/ Re-coatable or pure Aliphatic Polyurethane is being used.

6. MANUFACTURE AND PRE-PREPARATION

6.1 Responsibility

6.1.1 Pre-preparation

The Manufacturer or Refurbisher shall be responsible for all the pre-preparation of equipment prior to surface preparation. Pre-preparation shall be carried out to the approval of the Engineer.

6.1.2 Personnel

Pre-preparation shall be carried out by competent personnel, under the supervision of an experienced supervisor.

6.1.3 Marking

All items shall be permanently and indelibly marked to identify each individual item as specified by the Engineer.

6.2 Fabrication requirements

6.2.1 Defects

All extrusions rolled steel, and castings shall be clean and free of score marks, pits, protrusions, blisters, porosity, blowholes, cracks or any other flaws which may be detrimental and as defined in API 1104 shall be rejected and/or repaired in line with the requirements of API 1104.

The contractor shall provide full details of all defects and all defect repairs and the stipulated repair methods, detection methods and qualifications and certification of all equipment and/or personnel utilised to effect such repairs shall be submitted for written acceptance by the Engineer, before any repairs are undertaken.

6.2.2 Materials

6.2.2.1 Castings

Castings with defects exceeding the restrictions given in the latest edition of ASTM A781/781M for Steel and Steel Alloys and/or assessed in accordance with A802/A802M- 95(2010)e1 Standard Practice for Steel Castings, Surface Acceptance Standards, Visual Examination and/or A903/A903M-99(2012) Standard Specification for

Steel Castings, Surface Acceptance Standards, Magnetic Particle and Liquid Penetrant Inspection and/or A958/A958M-14 Standard Specification for Steel Castings, Carbon and Alloy, with Tensile Requirements, Chemical Requirements Similar to Standard Wrought Grades.

Small and repaired blowholes shall be tested as per the abovementioned ASTM standard to ensure materials compliance.

6.2.2.2 Corrosion resistant steels

Fabrication shall take place in dedicated areas separated from carbon steel.

All equipment used in the forming and manipulation of stainless-steel items during fabrication shall be clean and free of materials that may contaminate the metal with carbon steel.

The manufacture of items from corrosion resistant steels shall be in accordance with the SASSDA's Information Series and the guidelines of the material supplier.

Discoloration caused by welding or cutting shall be mechanically cleaned by buffing followed by pickling and passivation in accordance with the SASSDA's Information Series and the guidelines of the material supplier.

Organic contamination shall be removed by degreasing.

Iron contamination shall be removed by pickling and passivation, by the dipping process after degreasing.

All surfaces shall be tested for free iron contamination by the water or the ferroxyl test method.

6.3 Structural, Tube, Pipeline and Contract Coatings

The Manufacturer or Refurbisher shall remove excessive oil, grease or other surface contaminants with a water-soluble solvent degreaser followed by rinsing with clean, soft water before the items are dispatched to the Corrosion Protection Contractor.

ASTM	D4285	Standard Test Method for Indicating Oil or Water in Compressed Air
EN	10290	Steel tubes and fittings for onshore and offshore pipelines. External liquid applied polyurethane and polyurethane-modified coatings
EN	10339	Steel tubes for onshore and offshore water pipelines. Internal liquid applied epoxy linings for corrosion protection
EN	15655	Ductile iron pipes, fittings and accessories. Internal polyurethane lining for pipes and fittings. Requirements and test methods
SANS	241	Part 1: Microbiological, physical, aesthetic and chemical determinants
SANS	1344	Medium duty solvent detergent.
SANS	10064	The preparation of steel surfaces for coating.

SANS	8501-1	Preparation of steel substrates before application of paints and related products –visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of un-coated steel substrates and of steel substrates after overall removal of previous coatings.
SANS ISO	8504-2	Preparation of steel substrates before application of paints and related products – Surface preparation methods – Part 2: Abrasive blast cleaning.
SANS ISO	8503	Preparation of steel substrates before application of paints and related products – Surface roughness characteristics of blast-cleaned steel substrates.
SANS ISO	12944-1 to 8	Paints and varnishes — Corrosion protection of steel structures by protective paint systems —Part 1 to 8
SANS Method	5770	Cleanliness of blast-cleaned steel surfaces for painting (freedom of soluble salts).
SANS Method	5772	Profile of blast-cleaned steel surfaces for painting (profile gauge).
SANS Method	5769	Cleanliness of blast-cleaned steel surfaces for painting (freedom from dust and debris).
ISO	11125	Preparation of steel substrates before application of paints – metallic blast-cleaning abrasives.
ISO	11127	Preparation of steel substrates before application of paints – non- metallic blast-cleaning abrasives.
SANS ISO	12944-1 to 8	Paints and varnishes — Corrosion protection of steel structures by protective paint systems —Part 1 to 8
SANS Method	5770	Cleanliness of blast-cleaned steel surfaces for painting (freedom of soluble salts).
SANS Method	5772	Profile of blast-cleaned steel surfaces for painting (profile gauge).
SANS Method	5769	Cleanliness of blast-cleaned steel surfaces for painting (freedom from dust and debris).
ISO	11125	Preparation of steel substrates before application of paints – metallic blast-cleaning abrasives.
ISO	11127	Preparation of steel substrates before application of paints – non- metallic blast-cleaning abrasives.

All corrosion protection systems shall be applied as per SANS ISO 12944-7 "Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 7: Execution and supervision of paint work" with the required supervision and quality control, as defined in the said specification.

All relevant SANS ISO 12944-7 Method Statements and Quality Control Procedure(QCP) and Application Procedure Specification (APS) shall be submitted in writing by the Contractor to the Engineer/client for written acceptance and approval. It must be noted that these are the Contractors detailed documents describing procedures, methods, equipment and tools used for coating application.

The aforementioned applies to steel, cast iron, aluminum, polymer, stainless steel and/or hot- dipped galvanized steel surfaces.

The contractor shall detail protective coating and repair coatings for all applications and structures, including for any of the contractually required systems detailed above.

The standards detailed below shall also be utilised by the Contractor, to ensure compliance with the specification and/or contract and/or purchase order.

C3.2.2.2.1 VALVES

BUTTERFLY VALVES

1. GENERAL

1.1 Standards/Specification

Butterfly valves shall be in accordance with BS EN 593 /SANS 1849/SANS 1849; failure to conform will lead to disqualification.

1.2 Type

Butterfly valves shall be of the doubled flanged, full-bore and “tight shut off” type with the replaceable resilient seal. Flange drilling according to SANS1123, PN 10, 16 and PN25. For pressures up to 16 bar, the valve will be a double eccentric disc type, and for pressures higher than 16bar a triple eccentric type. Metal seated valve will also be considered. All valves will be supplied complete with matching, uncoated, flanges both ends, bolted to valve complete with Klinge rite gaskets. Valves shall be bi-directional sealing.

Gearboxes shall be of the self-locking worm/quadrant type with no backlash. Operation shall be by means of a pinion shaft driving the quadrant.

Worm shafts shall be fitted with roller bearing thrust bearings to ensure minimal operating effort and smooth rotary action of the input shafts.

End stops shall be of the travelling nut type enabling precise setting of the open/closed positions.

The enclosure shall conform to a minimum of IP67 to prevent the ingress of water and debris into the gearbox housing.

The gearbox to valve mounting flange shall have a groove from the input shaft to the edge of the flange to ensure early detection of any leakage from the valve shaft seals, if the shafts are open to the pipeline medium.

Gearboxes shall be packed with approved water resisting grease to the gearbox supplier’s specification.

Gearboxes shall in all instances be sized for fitting of actuators (Hand wheel operated valves included) on site without any additional modification. Actuator mounting flanges shall conform to ISO 5211. Hand wheel sizes will not exceed:

- 400mm diameter for PN16 valve sizes 300mm to 1000mm and
- 400mm diameter for PN25 for valve sizes 300mm and 800mm and
- 500mm diameter for valve sizes 800mm to 1000mm diameter.

Maximum rims pull, to ensure water tightness in the closed position, on the hand wheel may not exceed 300 N-m.

A fully enclosed spur gearing is required to comply with the requirement. ALL Valves

shall be LEFT HAND (counterclockwise) closing.

ALL Valves should be verified by Tests from SANS or other testing authority.

1.3 Flow rates

No cavitation in the fully open position shall be accepted. The maximum permissible flow rate at the maximum differential pressure across the valve and the head loss for the specified flow rate shall be stated in the Technical Schedule.

1.4 Operation

A butterfly valve shall close under the maximum specified head and flow rate and shall be functional in any position without variation of the blade position or flutter. Normal operation shall however be in either the fully open or fully closed position.

There shall be no interference in the water flow pattern through a valve except for the blade.

The blade shall close with a positive action with no possibility of slamming shut during any stage of the closing operation.

A butterfly valve shall be installed in a position allowing the valve to operate along the horizontal axis. The lower portion of the blade shall open towards the downstream side of the valve i.e. in the direction of flow. All valves shall be fitted with a gearbox complete with hand wheel for Left Hand Closing.

2 CONSTRUCTION AND OPERATIONAL REQUIREMENTS

2.1 Body

The hubs for the shaft-bearings and the gearbox mounting flange shall form an integral part of the valve body.

The body of the valve, and the gearbox, will be such that no studs are used to fasten the valve body to the pipe section, but bolts and nuts are to be used on all the flanges. An isolating flange with its isolating tubes can be fixed to the valve. A drawing must be provided as proof. If such drawing is not provided, the valve will not be considered.

2.2 Blade

The blade shall be a single casting or fabrication of optimum hydrofoil section with a smooth continuous surface. The maximum combined stresses in the blade shall not exceed 20% of the yield stress of the material when the design pressure is applied on any of the two sides.

2.3 Seal Retaining Ring/s

The seal retaining ring/s, manufactured from stainless steel material, shall be coated to reduce galvanic corrosion. The recess for the retaining ring/s in the blade or body shall be coated to the specified corrosion protection specification, or the seal face shall be assembled with a coat of heat fused epoxy of minimum 500 microns.

2.4 Seat and Seal

2.4.1 Soft seal butterfly valves PN 16 and 25 Bar or alternatively metal seated triple eccentric butterfly valves.

Preference shall be given to a resilient seal arrangement that is removable, replaceable and adjustable in situ from the down-stream side of the valve, without having to remove the valve from the pipeline.

A continuously molded music notes or tee type resilient seal is required and shall be fixed without the use of glue.

The edge of the seal retaining groove in the blade shall be nickel-chrome deposit welded before machining for an O-ring or music note type seal.

The resilient seal shall have non-weathering, non-sticking, long life properties and shall be compatible with the quality of potable water.

The seat profile shall be smooth and continuous and shall provide adequate "lead in" for the resilient seal to open and close on the stainless-steel seat only. The mounting flange of the removable seat in the body shall either be stainless steel deposit welded and machined level with the seat or the seat ring manufactured to cover the seat mounting flange.

The seat and seal shall be of a design preventing them from becoming loose and obviate water seepage under the seals or seats during all conditions of operation and testing.

2.4.2 Metal seated triple eccentric butterfly valves PN 25 Bar

High Performance Triple Eccentric Metal Seated Design Manufactured in accordance with BS 5155 Specification. Materials should be compatible with media and pressure requirements as per Clause 3. Valves shall have replaceable laminated seal in the body and a replaceable seat ring on the disc.

2.5 Mechanical Stops

To prevent over travel of the valve blade in the open or closed position, all valves shall have adjustable mechanical stops incorporated in the gearbox.

2.6 Shafts

Shafts shall either be continuous or of a stub-shaft design configuration. Stub shafts shall extend into the blade hubs for a distance of at least 1.5 shaft diameters and shall not protrude from the hubs i.e. exposing the shaft.

Shafts shall be attached to the blade by means of keys, dowel pins, taper pins or any combination of the three. The connection shall be designed to transmit shaft torque equivalent to at least 75% of the torsional strength of the shaft. Dowel and taper pins shall be mechanically secured.

The idle shaft cover shall be manufactured from stainless steel and secured with stainless steel fasteners.

2.7 Bearings

Self-lubricating sleeve type bearings (bronze backed, Zinc free or PTFE (Polytetrafluoroethylene) backed self-lubricating, or bushes shall be fitted in the hubs of the valve body. The bearing length will be a minimum of 1,5x shaft diameter.

Each valve shall be fitted with at least one adjustable thrust bearing or spacer disc set to hold the blade securely concentric with the body or seat if so required.

The valve stem shall be provided with two O ring seals on the shaft to protect the bearing from water seeping from the valve inside.

3. VALVE MATERIAL SPECIFICATION

Valve components, unless otherwise specified in the Project Specification, shall be constructed of the material specified in the following tables

TEST REQUIREMENTS

SIZE DN	PRESSURE RATING (kPa)	HYDRAULIC TEST PRESSURE (kPa)	
		STRUCTURAL	SEAT
300 – 1 000	1 600	2 400	1 760
300 – 1 000	2 500	3 750	2 750

MATERIAL SPECIFICATION		
COMPONENT	MATERIAL TYPE	MATERIAL SPECIFICATION
BODY	SG (Spheroidal Graphite) IRON CAST STEEL	BS 2789 Gr 420/ SANS 936 SG 42ASTM A216 WCB BS 1504-161 Gr 480/ SANS 1465 Part 1SANS 1431 Gr 300WA
DISC	SG IRON CAST STEELMILD STEEL	BS 2789 Gr 420/ SANS 936 SG 42ASTM A216 WCB BS 1504-161 Gr 480/ SANS 1465 Part 1 SANS 1431 Gr 300WA
BODY SEAT (PN16)	NICKLE-CHROME	
BODY SEAL for PN16 and PN25	STAINLESS STEEL	BS 970, SS Gr 316 LAMINATED
BLADE / SEAL (PN16)	ELASTOMER	EPDM 750 A
BLADE SEAT RING (PN16 – 25)	STAINLESS STEEL	SS Gr 304
SEAL RETAINING RING	STAINLESS STEEL	BS 970 Part 4, Gr 304 S15
SHAFTS	STAINLESS STEEL	BS 970 Part 4, Gr 431 S29
SHAFT BEARINGS/BUSHES	PHOSPHOR BRONZE SLEEVE TYPE ZINC FREE PTFE BACKED/ SELF LUBRICATING	BS 1400 PB1C (Cu, Sn10, P)BRONZE BACKED
SHAFT SEALS	RADIAL LIP SEAL / CUP SEAL / O-RING SEAL ELASTOMER	NITRILE / VITON SIMRIT NBR
IDLE SHAFT COVER	STAINLESS STEEL	BS 970 Part 4, Gr 304 S15
IDLE SHAFT THRUST BEARING/SPAC ER DISC	PHOSPHOR BRONZE	BS 1400 PB1C (Cu, Sn10, P) (for vertical installations)
EXTERNAL FASTENERS	STEEL (HOT DIP GALVANIZED) STAINLESS STEEL	SANS 1700 ASTM A193 Gr B8M, ASTM A439 Gr D2
INTERNAL FASTENERS	STAINLESS STEEL	ASTM A193 Gr B8M, ASTM A439 Gr D2

4. CORROSION PROTECTION

Damage to the corrosion protection or during testing or normal operation will not be acceptable. Valve body and closures shall be heat fused epoxy coated to a minimum of 500 microns internally and externally. Valves shall be packed and transported that no damage to the coating is possible. Any visible damage to the valves at delivery will give the client authority to reject the complete delivery of all valves.

5. COMPLIANCE TO SPECIFICATIONS

If the City of Tshwane suspects that a valve does not comply with the specifications, the contractor will appoint a registered inspector which is acceptable to the City to perform checks to ensure compliance to the specifications. The cost of this inspection will be for the appointed supplier of the valve.

AIR RELEASE AND VACUUM CONTROL VALVES

1. GENERAL

1.1 Standards/Specification

Air release and vacuum control valves shall be in accordance with DIN – DVGW examination certificate, failure to conform will lead to disqualification.

2. TYPE

Air valves shall not exhibit the characteristics of dynamic closure in exhaust and vacuum mode. The valves shall be of the triple acting type, firstly allowing large volume air intake under vacuum conditions, secondly large volume of air discharge during filling with an anti-shock surge alleviating mechanism to prevent pipeline damage under controlled filling or surge conditions, and thirdly shall have an efficient small orifice mechanism to allow the exhausting of dis-entrained air under normal pipeline operation to prevent buildup of air in the pipeline.

The large intake and exhaust orifice of air valves shall be equal to the nominal size of the valve e.g. a 200mm valve shall have a 200mm inlet and outlet orifice. The valve shall incorporate an integral anti-shock (non-slam) orifice mechanism which shall operate automatically to limit transient pressure rise or water hammer induced by closure. An inherent feature of the valve design must be to ensure that the ball or float does not close before all the air has been released.

All air valves shall be hydraulically drop tight when full of water and under pressures of between 1 metre (10 kPa) to 1,5 times the maximum operating pressure of the valve.

Valves required to isolate air valves for maintenance shall comply with the Valve Material Specification for the specific category of valves specified.

3. CONSTRUCTION AND OPERATIONAL REQUIREMENTS

3.1 Body

The valve body shall be flanged and be of a compact single chamber design. The ball or float(s) shall be easily accessible for maintenance purposes.

3.2 Float

The float guides shall be stainless steel designed to have sufficient clearance to ensure free operation and prevent any abrasion when subjected to frequent operation.

Cylindrical floats shall be manufactured from stainless steel. Floats shall not be able to adhere to the orifice sealing arrangement nor be affected by deposits on the float surface.

Floats shall not distort or suffer mechanical damage in any form when subjected to a structural strength test or conditions of frequent use.

3.3 Draining facility

Provision shall be made for the drainage of a valve, by means of a 6mm stainless steel ball valve and stainless-steel nipple, prior to removal or servicing and for the fitting of pressure gauges for testing purposes.

The stainless-steel nipple shall extend through the body to cover all the threads.

3.4 Weather covers

All air valves shall be supplied with robust, easily removable screens that will allow free discharge or intake of air but shall exclude the ingress of objects that may cause damage or malfunction of the valves.

Screens shall be manufactured from stainless steel mesh.

4. CORROSION PROTECTION

Damage to the corrosion protection or during testing or normal operation will not be acceptable. Valve body and closures shall be heat fused epoxy coated to a minimum of 500 microns internally and externally. Valves shall be packed and transported that no damage to the coating is possible. Any visible damage to the valve at delivery will give the client authority to reject the complete delivery of all valves.

4.1 Valve material specification

Valve components shall be constructed of the material specified in the following tables unless otherwise specified in the Project Specification.

Cylinder Float Type (DN 25-200)

SIZE DN (mm)	PRESSURE RATING (kPa)	HYDRAULIC TEST PRESSURE (kPa)	
25 -200	1000/1600 / 2500	STRUCTURAL	SEAT
		1500/2400 /3750	1500/2400 /3750

Material specification

COMPONENT	MATERIAL TYPE	MATERIAL SPECIFICATION
BODY/CLOSURE	SG (Spheroidal Graphite) IRON	BS 2789 Gr 420/12, GGG 40
BODY / CLOSURE SEAL		EPDM
FLOATS	STAINLESS STEEL	STAINLESS STEEL BS 970PARTY GRADE 316
EXTERNAL FASTENERS	STAINLESS STEEL CAPSCREWS	ASTM A193 GR B8M, ASTMA439 GR D2
FLOAT GUIDE	STAINLESS STEEL	STAINLESS STEEL BS970PARTY GRADE 316

Float type (DN 50-200)

SIZE DN (mm)	PRESSURE RATING (kPa)	HYDRAULIC TEST PRESSURE (kPa)	
50 - 200	1000/1600 / 2500	STRUCTURAL	SEAT
		1500/2400 / 3750	1500/2400/3750

5. COMPLIANCE TO SPECIFICATIONS

If the City of Tshwane suspects that a valve does not comply with the specifications, the contractor will appoint a registered inspector which is acceptable to the City to perform checks to ensure compliance to the specifications. The cost of this inspection will be for the appointed supplier of the valve.

RESILIENT SEAL GATE VALVES

1. GENERAL

1.1 Type

All valves shall be doubled flanged and of the resilient seal gate type, the gate of which shall be completely clear of the waterway in the fully open position. The gate valve shall be of the non- rising spindle type, fitted either with a hand wheel or cap top (type will be specified in the Schedule of Quantities). The valve shall be capable of withstanding the nominal pressure (PN) and specified test pressures from both sides. The gate shall operate satisfactorily under the specified conditions and shall be Left Hand closing.

1.2 Specifications

The valve shall be manufactured in accordance with SANS 664 and carry the SANS mark or be JASWIC listed; failure to conform will lead to disqualification. Flange drilling shall be according to SANS 1123, PN10, PN16 and PN25. The manufacturer/supplier shall have the SANS 3000 cycle test done and provide certified copies to verify that the product passed the test.

PN25 valves shall have raised face flanges.

1.4 Body

The body shall be of rigid design to minimize distortion under pressure.

1.5 Operation

The gate valve shall be able to open and close satisfactorily under the specified flow rate and pressure.

1.6 Stem and thrust bearing

Two friction washers (sizes 50mm – 200mm) and thrust ball bearings (350mm – 600mm) shall be incorporated on the thrust collar to ensure smooth spindle operation as well as to reduce opening and closing torques.

The stem thrust collar shall bear against a ball thrust bearing.

1.7 Corrosion protection

Damage to the corrosion protection or the rubber-coated gate during testing or normal operation will not be acceptable. Valve body and closures shall be heat-fused epoxy coated to a minimum of 500 microns internally and externally. Valves shall be packed and transported that no damage to the coating is possible. Any visible damage to the valve at delivery will give the client authority to reject the complete delivery of all valves.

2 CONSTRUCTION AND OPERATIONAL REQUIREMENTS

2.1 Resilient seal gate valves Body, guides and shoes

The gate shall have optimally placed guides of wear resistant plastic so as to reduce the torques as well as reduce wear between the rubber and the coating on the body.

The valve body shall incorporate a straight unobstructed body passage without pockets and shall have inclined seats and prominent gate guides to eliminate deposits in the valve body.

The guides shall be as deep and as long as possible but not protruding into the flow path to offer support in all gate positions.

The plastic antifriction shoes shall accurately fit the body guide profile to allow smooth operation of the gate with minimal shudder.

Gate

The gate shall be completely encapsulated in rubber and accurately molded to ensure drop tightness over the valve pressure range. The rubber coated gate shall be designed to offer an equal distribution of sealing pressure in all directions with a capacity to accept foreign matter up to 1mm in particle size. Documentation to prove that the rubber used for encapsulation complies with international health standards will be supplied and submitted with the tender documents, including a toxicity report with regards to toxins, taste and odour, i.e. potable water certificate.

The gate shall be a left-hand closing type.

For valves larger than 100mm the gate nut shall be a replaceable item.

Stem

A corrosion resistant stem seal arrangement shall include a scraper ring to prevent the ingress of foreign matter. A stem thrust collar shall be installed between anti-friction materials to ensure low operating forces. The stem seal arrangement shall be capable of being replaced under pressure.

Bonnet: Bolts and Gaskets

The bonnet S/S (stainless steel) cap screws shall be entirely sunk into the body casing, sealed and protected by reusable caps. Bolts will be stainless steel protected to standards in the material specification.

The valve shall have a preformed NBR (nitrile butadiene rubber) rubber gasket, O ring type, set in a recess between the Bonnet and Body. The gasket must fully encircle each bolt.

Spindle

The manufacturing of the spindle will be a cold rolled thread stainless steel type, with minimum diameter:

Valve size	80mm – 110mm	150mm – 160mm	200mm	250mm – 600mm
Min Spindle diameter	25mm	28mm	32mm	34mm

2.2 Material

Valve components shall be constructed of the material specified in the following tables unless otherwise specified in the Project specification. Material certificates will be provided on delivery of the valves.

RESILIENT SEAL GATE VALVE (DN 50-600)

TEST REQUIREMENTS

SIZE DN	PRESSURE RATING (kPa)	HYDRAULIC TEST PRESSURE (kPa)	
		STRUCTURAL	SEAT
50 – 600	1 000	1 500	1 100
	1 600	2 400	1 750
	2 500	3 750	2 750

Hydro pressure test certificates must be provided on delivery of valves.

MATERIAL SPECIFICATION		
COMPONENT	MATERIAL TYPE	MATERIAL SPECIFICATION
BODY	Ductile Iron	SANS 1034, Gr 250WA
GATE	Ductile Iron, COATED	SANS 1034, Gr 250WA, Vulcanized EPDM ozone stabilized, UV resistant
BONNET	Ductile Iron	SANS 1034, Gr 250WA

SPINDLE	STAINLESS STEEL	EN 10254-4, X17CrNi16-2, Cold Rolled Thread
GATE NUT	BRONZE	EN 12165, CW614N

MATERIAL SPECIFICATION		
COMPONENT	MATERIAL TYPE	MATERIAL SPECIFICATION
STEM BUSH	PLASTIC	
BUSH / STEM/ STUFFINGBOX SEALS	O RING	NITRILE / VITON
PROFILE / SCRAPERRING	O RING	NITRILE / VITON
FRICTION RING	PLASTIC	
HAND WHEEL	SG IRON	SANS 1034, Gr 250WA
EXTERNAL FASTENERS	STEEL (HOT DIP GALVANIZED)	SANS 1700

C3.2.2.2 PIPE JACKING

1. SCOPE

This section covers the insertion, by jacking and boring, of underground pipes without disturbing the surface.

2. APPLICATIONS

The information regarding pipe jacking contained in this section is not limited to the jacking of rectangular precast concrete culverts sections but also applies to the jacking of rectangular, square and arched precast concrete sections. Where boring is to be carried out, the Contractor shall, as is the case for jacking, make use of an approved specialist firm.

3. DEFINITIONS

For the purposes of this section, the following words and expressions shall have the meanings hereby assigned to them except where inconsistent with the context.

- a) Intermediate jacking station - A transverse joint in a jacked structure at which jacking is performed
- b) Jacking - The action of pushing a pipeline into
- c) Jacking frame - A frame on which the jacks are mounted and through which the jacking forces are transmitted.
- d) Jacking structure - An assembly comprising the jacking frame, the permanent pipes to be jacked, and the shield.
- e) Lead pipe - A pipe that has a rebated end over which the trailing end of the shield is fitted and which is intended to be the first pipe to be used in the jacking process.
- f) Pilot hole - A hole with a maximum diameter of 50 mm, drilled to ensure that a subsequently bored, larger hole, will be properly aligned
- g) Pipe boring - The work involved in boring a horizontal hole and inserting a pipe therein.
- h) Pipe boring pits - Excavations at either end of the boring operation from and between which boring and pipe installation are carried out.
- i) Reception pit - An excavated shaft located at the end of a jacked section of a pipeline, from which the shield is recovered.
- j) Shield - A device located at the leading end of the jacking structure, which is intended to provide protection for workmen at the leading end and to prevent the collapse of the face of the tunnel excavation
- k) Thrust pit - An excavated shaft at the starting point of a jacking operation, in which the jacking structure and other equipment are installed and from which the jacking operations are carried out.
- l) Thrust plate - A steel plate placed against the end of the pipe against which the jack operates, and which is intended to ensure that the jacking forces are spread uniformly over the end face of the pipe.
- m) Thrust block - A temporary structure constructed inside the thrust pit for the purpose of transferring the jacking forces to the adjacent soil.

4. MATERIALS

4.1 Pipes

Unless otherwise specified, the pipes for jacking shall be reinforced concrete pipes of the SC type and D-load designation 100D which comply with the relevant requirements of SANS 677. The actual diameters of pipes supplied shall be not less than the nominal diameters given on the Drawings or stated in the Schedule of Quantities. In addition to withstanding the specified two (or three) edge-bearing test load, the pipes shall be capable of withstanding, without being damaged, the maximum longitudinal force to be transmitted by the jacks during jacking.

4.2 Other precast-concrete sections

Any precast-concrete sections, other than pipes, to be jacked shall comply with the requirements specified in the Project Specifications and as shown on the Drawings

4.3 Intermediate jacking stations

Under certain circumstances it may be necessary to provide one or more intermediate jacking stations between the thrust and reception pits. Such stations shall consist of a pair of modified jacking culverts. In order to protect and form the joint between these pipes, the Contractor shall provide cylindrical mild steel sleeves with a wall thickness of at least 8 mm and of such length that they overlap the pipes for a distance of at least 150 mm on each side of the joint.

5. PLANT

5.1 General

The Contractor shall in the case of jacking, provide and use suitable equipment for handling pipes and placing them in position for jacking, for jacking the pipes, for the lubrication of the outer surface of the pipeline, and for excavation within the pipe and in the case of pipe boring, for boring the hole and for jointing and inserting the pipes.

5.2 Jacks

The jacks shall be fitted with a suitably calibrated pressure gauge in a good working order which will enable the actual jacking forces to be read at any time during the jacking operation. To transfer the load from the jacks to the pipes, suitable thrust plates and spacers shall be provided.

5.3 Shield

A suitable shield for fitting to the front of the lead pipe shall be provided by the Contractor to protect workmen and prevent the collapse of the face or roof of the excavation ahead of the jacked structure. The shield shall be directionally adjustable.

5.4 Lighting

The Contractor shall provide adequate lighting for the execution of the Works.

5.5 Guides

Where necessary, guides shall be provided within the thrust pit to facilitate initial directional control of the pipes.

5.6 Ventilation

Sufficient ventilation shall be provided to remove dust and to ensure safe working conditions.

6. SAFETY

6.1 General

The Contractor shall at all times observe adequate safety precautions on the Site as specified in clause 17 of section 001. Permission to proceed with the Works shall not in any way detract from the obligations and liabilities of the Contractor in regard to such safety or To the adequacy of the jacking structures and methods of working.

6.2 Safety of existing works

The pipeline shall be jacked or bored through under the relevant road, railway or other service or structure without disrupting the traffic and without disturbing the alignment or levels of the road surface, the tracks, or other relevant service or structure to an extent that may impair the safety of traffic or of the service or structure.

Jacking and boring operations shall commence at the lower level of the pipeline. Should Site conditions necessitate or permit jacking or boring to be carried out from the higher level of the pipeline, the Engineer's written approval shall be obtained before the work commences.

The Contractor shall not commence any work until the Engineer has specified, in writing, that the Contractor may proceed.

7. EXCAVATION

7.1 The appropriate requirements of sections 201 and 202 shall apply.

a) Classification of materials excavated - The materials excavated shall be classified as follows for payment purposes:

(i) Hard material:

Material which cannot be excavated efficiently except with the use of pneumatic tools, blasting or wedging and splitting and shall include boulders exceeding 0,15 m³ in volume. For pipe boring operations, the material penetrated will be classified as hard when the Contractor can prove that the work cannot be efficiently carried out by using normal boring equipment and some other method, such as rock drilling, has to be used.

(ii) Soft material:

All material not classified as hard material. Notwithstanding the above classification, all material in previously constructed fills, embankments and pavement layers and through which jacking or boring is carried out, shall be classified as soft material. The decision of the Engineer as to the classification of the material shall be final and binding, and any objection as to the classification shall be made before the pipes are jacked or, in the case of pipe boring, some method other than boring is used. Special reference shall be made to clause 16 of section 001 regarding the classification of excavated material in restricted areas.

b) Thrust and reception pits and pipe boring pit

The Contractor shall be responsible for excavating the pits in the positions indicated on the Drawings at each end of the section of pipeline or sleeve that is to be jacked. These pits shall be of dimensions at least equal to the minimum dimensions needed for the Contractor's equipment and for safe and efficient working. The approximate dimensions of the pits that the Contractor intends to excavate shall be agreed upon with the Engineer before work commences. The excavated material shall be stockpiled for later backfilling.

The sides of the pits shall be adequately supported by timbers or by other approved means. Where a pit adjoins a railway line or a heavily used road, the sides of the pit shall be shored during the entire operation to prevent any movement caused by vibration arising from rail or road traffic from occurring. The Contractor shall ensure that the pits are dewatered at all times.

c) Jacking of pipes

Excavation shall be such that overbreak is kept to a minimum. No material shall be removed in advance of the leading edge where the leading edge is in unstable or loose material. If the material at the face starts to slip or run, excavation shall be stopped immediately, and the Contractor shall take such action as may be necessary to stabilize the material before excavation is resumed.

Should any unforeseen cavities be exposed during jacking, such voids shall be filled immediately with grout in a manner approved by the Engineer. To ensure a minimum of overbreak, the first concrete pipe used shall be so rebated that the outside diameters of the shield and the pipeline will not differ substantially. The Contractor shall ensure that the head of the excavation is drained at all times. Under no circumstances will jetting be permitted.

7.2 Jacking procedure

Each pipe shall be advanced by means of hydraulic jacks of adequate capacity which bear against a suitable thrust plate so as to distribute the thrust of the jacks uniformly over the end face of the pipe. The rear end of each jack shall so bear against a suitably designed structure as to transfer the force to the surrounding material and to distribute it evenly over an area large enough to ensure that the bearing capacity of the soil will not be exceeded and that no structure in the vicinity of the thrust pit will be disturbed. The Contractor may, with the written permission of the Engineer, inject a suitable lubricant through preformed holes in the structure or in the shield. Resilient packing material shall be inserted between the faces of successive pipe units so as to distribute the thrust evenly over the circumference of the pipes. At the conclusion of a day's work, the shield shall be jacked up to the tunnel face. If intermediate jacking stations are used,

the trailing units shall be jacked forward until the jacks in the intermediate stations are in the unextended position. Spacers shall be placed between the jacking frame and the pipe with all the jacks being in the unextended position and ready to jack in an emergency.

7.3 Pipe boring

After the pits have been completed, and on the written instructions of the Engineer, a pilot hole shall be drilled using suitable equipment. After the pilot hole has been inspected and approved, it shall be enlarged by boring to the diameter required for the installation of the specified pipe.

7.4 Grouting and sealing

Before each jacking operation, the Contractor shall determine, in an approved manner, the average cross-section of the completed excavation ahead of the pipeline and shall submit his calculations to the Engineer on the same day.

These cross-sections, together with the external pipe diameter, shall be used for calculating the approximate volume of grout that will be needed after the entire jacking operation has been completed and will assist in determining whether all voids have been grouted.

When the jacked pipeline is in its final position, a sand -cement grout shall be injected to fill all voids between the jacked pipeline and the surrounding material. The grout shall have a strength equal to or better than a grout consisting of one part of cement and four parts of sand and shall have a slump of 120 mm.

Grouting shall commence at the lower end of the pipeline, and the grout shall be injected through holes drilled through walls of each pipe section.

These holes, which will also be used for checking the progress of the grout, shall be positioned in each side of the pipe on the line of its horizontal diameter, and also in the soffit of the pipe.

All holes in the pipeline shall be sealed with an approved epoxy sealant after the grouting has been completed.

The grouting of the pipes installed by means of pipe boring shall be carried out only on the written instructions of the Engineer and in a manner approved by the Engineer. The grout shall be the same as the grout specified above for jacked pipes.

7.5 Backfilling

When jacking has been completed and the jacking frame and shield have been dismantled, the thrust and reception pits shall be backfilled to the extent indicated on the Drawings or as laid down in the Project Specifications or determined by the Engineer on the Site.

The pipe boring pits shall be backfilled, only when so instructed by the Engineer, using excavated or imported material compacted to at least the density of the undisturbed surrounding material.

When the installed pipe is part of a pipeline, the boring pits will form part of the pipeline trench and as such shall be backfilled in the manner specified in sections 106, 202, 302 and 402 as applicable. Payment for such backfilling will be made under the applicable sections.

Surplus excavated materials shall be disposed of as specified in the Project Specifications or as determined by the Engineer on Site.

8. AS-BUILT DRAWINGS

If an alternative design by the Contractor has been accepted or if the structure shown on the Tender Drawings has been modified to suit the jacking method, the Contractor shall, on completion of the work and before the final payment is made, supply the Engineer with transparencies showing details of the completed structure. Each such transparency shall be certified by the Contractor to be an accurate reflection of the work as constructed.

9. TOLERANCES

Subject to any requirements of the Project Specifications imposed on account of the gradient(s) of the pipeline or in view of the purpose for which it is required, the pipes shall be positioned within the tolerances given below.

Should the difference between the actual and the specified position or alignment of the finished pipeline exceed the value of the said tolerance to an extent as to involve additional costs in respect of locating, installing, supporting or maintaining any service of which the jacked or bored pipe forms part or that has been designed to be laid through the jacked or bored structure, the Contractor shall bear such additional costs, provided that the details of the work to be done to relocate, install, or support the said service have been provided and the order for the work to be done (by the Contractor or by others) has been given by the Engineer within 30 working days of the completion of the jacking or boring operation.

Permissible tolerance limits shall be as follows:

a) Pipe jacking

(i) In plan ± 100 mm

(ii) Vertical ± 50 mm

(iii) Horizontal and vertical displacement between units at joints 10 mm maximum

Adjustment to line or level or both shall be gradual, and the manufacturer's permissible angular deflection of the pipes shall not be exceeded at any point.

b) Pipe boring

(i) In plan ± 100 mm

(ii) Vertical ± 100 mm

C3.2.2.3 WATER RETICULATION

1. uPVC Pipes

Class 12 uPVC pipes, SANS 966: 1998 Part 1 ranging from 110mmØ to 500mmØ

2. Fittings

- uPVC 90°, 45°, 22,5°, 11,25° Bends (Class 16) ranging from 110mmØ to 450mmØ
- Flanged steel end caps (including corrosion protection as specified) drilled in accordance with SABS 1123 Table 16 (epoxy powder coated) ranging from 110mmØ to 400mmØ
- Cast iron or steel flanged reducers (epoxy powder coated) ranging from 110mmØ to 450mmØ

- Cast iron flange adaptor for uPVC pipes, drilled in accordance with SABS 1123 Table 16 ranging from 110mmØ to 250mmØ
- Steel or cast-iron flange adaptor for uPVC pipes, drilled in accordance with SABS 1123 Table 16 (epoxy powder coated) ranging from 355mmØ to 450mmØ
- Cast Iron / Plastic saddles ranging from 110x40mm to 250x40mm
- Mild steel saddles (epoxy powder coated) ranging from 315mmØ to 450mmØ
- Flanged Cast iron reducing Tees ranging from 160x110mm to 250x200mm
- Flanged steel reducing Tees, flange drilled to SABS 1123 Table 1600/3 (epoxy powder coated), ranging from 160x110mm to 400x355mm
- Flanged adapters by butt welding for the following HDPE pipes (SABS 1123 Table 16) ranging from 315mmØ to 630mmØ
- Fire – Hydrants Woodlands Wdz-100 Thread To 115mm Storz D/Ward Adapt Tshwane Only

3. House Connections

The provision and installation of connections to users complete (excluding supply of water meters) as per detail drawing 7515-W206 and W207

4. Valves

- Supply and installation of Cast Iron / PVC Valve box complete for "RSV" valves as shown drawing 7515-W203 (type A)
- Supply and installation of Cast Iron / PVC Valve box complete for "RSV" valves as shown drawing 7515-W203 (type B)

5. Thrust Blocks

- Concrete 15/19Mpa

6. Bedding & Backfill Material

- Excavated Granular Material
- Imported material from sources provided by the Contractor.

C3.2.2.4 SEWER INFRASTRUCTURE

1. uPVC Pipes

Class 34 uPVC pipes, SANS 791: ranging from 110mmØ to 315mmØ

2. Bedding

Class B Bedding for flexible pipes

3. House Connections

- Type A (as per DWG 7515-S206)
- Type B (as per DWG 7515-S206)
- Type C (as per DWG 7515-S206)

4. Cleaning Eyes (Lamp Poles)

Construction of cleaning eyes (Lamp poles) (DWG 7515-S208): ranging from 1.5m depth up to 4m depth

5. Manholes

Concrete sewer manholes with ND of 1250mm for sewers 315 mm in diameter and smaller: ranging from 1.5m depth up to 5m depth

6. Manhole Covers and Frames

- SANS 558 Type 4 circular frame(LI)
- Precast concrete cover with type 4 CI frame

C3.2.2.3 ACCESS ROAD

1. SCOPE

This section covers the construction of the Access Road. The road shall be a 6m wide road, with reinforced concrete surfacing.

2. APPLICATIONS

The levels of service that are to be based on current design guideline documents, which include the following documents, are listed in table 1 below.

Table 1: Applicable Standards And Guidelines for Roads and Stormwater

Reference	Design Guideline Document
A.	Guidelines for Human Settlement Planning and Design (Red Book).
B.	City of Tshwane Standard Specifications for Municipal Civil Engineering Works, Third Edition, 2005.
C.	City of Tshwane Roads and Transport Department Standard Construction Details and Design Standards for Roads and Stormwater Drainage Infrastructure, Issue October 2014.
D.	South African Road Traffic Signs Manual (SARTSM), Volume 2 Chapter 13
E.	Colto standard specifications for Roads and Bridge Works for State Road Authorities(1998)
F.	TRH 17 - CSRA: Geometric Design of Rural Roads (1988)
G.	TRH 4 - Structural Design of Flexible Pavements for Interurban and Rural Roads

3. HORIZONTAL ALIGNMENT

The Access Road has been designed for a maximum speed of 40km/h. The minimum guidelines are indicated in the table below:

Table 2: Horizontal Alignment Guidelines for 40km/h Design Speed

	Minimum (Geometric Design Guidelines)	UTG 1
Radius (min)	55m	-
Curve Length	80m desirable	60m
Transition Length	To suit development of super elevation	To suit development of super elevation
Super-elevation	$e_{\max} = 6\%$	$e_{\max} = 6\%$

The following table provides a summary of the horizontal alignment parameters achieved for the Access Road for a maximum design speed of 40km/h:

Table 3: Horizontal Alignment: Access Road

Curve no	Name	Distance (m)	Radius (m)	Curve length (m)	Deflection D.M.S	Super-elevation	
						Left (%)	Right (%)
1	Start	0.000	-	-	-	2	-2
2	PI 1	206.15	60	48.215	-80.25.11	2	-2
3	End	1632	-	-	-	2	-2

The horizontal alignment of the roads is designed for a speed of 40km/h. The road follows the existing alignment to minimise the impact of the required road upgrade and intersection along the gravel road.

4. VERTICAL ALIGNMENT

The vertical alignment of the roads is designed for a maximum speed of 40km/h. The minimum guidelines for a speed of 40km/h are indicated on the table below:

Table 4: Vertical Alignment Guidelines for 40km/h

Description	Minimum (Geometric Design Guidelines)	UTG 1
Longitudinal Grade Maximum	6.0% (Flat)	8.0% (Flat)
	8.0 % (Mountainous)	11.0 % (Mountainous)
Longitudinal Grade Minimum	0.5 % (minimum)	0.5 % (minimum)
K-Value Crest curves	6 (minimum)	6 (minimum)
K-Value Sag curves	8 (minimum)	6 (minimum)
Stopping Sight Distance	50m (minimum)	45m (minimum)
Length vertical curves	Not shorter than design speed i.e. 60m(minimum)	60m (minimum)

The following tables provide a summary of the Vertical alignment parameters achieved on the Access

Road. The best fit of the vertical alignment to the alignment of the existing gravel access road.

Table 5: Vertical Alignment Access Road

Distance (m)	Elevation (m)	Grade (%)	C-length (m)	K-value	Crest / Sag
0	1364.264				
70	1355.896	-11.993	60	10.626	Sag
130	1350.579	-6.347	60	784.38	Sag
210	1344.628	-6.423	100	11.063	Sag
340	1344.261	2.616	80	9.337	Crest
540	1335.480	-5.952	60	9.053	Sag
701	1334.271				

5. TYPICAL CROSS SECTION

The proposed typical cross section of the Access Road has been designed. The road will be constructed with a 2% cross fall. Table 6 indicates the typical cross-section to be implemented.

Table 6: Typical Cross Section: Access Road

Access Road	
Description	Width
Surfaced Width	4.0m
Lane	2.0m
Kerbing	Edge of Road: Fig 7 kerb
Drainage	Earth Channel
Sidewalks	None
Temporary Bypasses if required by the Engineer	
Formation width for one way traffic	5,0m: The engineer may vary this width, depending on site conditions

6. PAVEMENT DESIGN

The pavement design is done in accordance with the TRH 4 (Structural Design of Flexible Pavements for Interurban and Rural Roads).

The road category and pavement class is as follow:

Road category: UD (Access Road)

Pavement class: <ES01 x 106

The envisaged road pavement for a class ES0.003 – ES1 pavement class (granular bases) is provided below.

Table 7: Pavement Design: Access Road

Access Road	
Layer	Description
Surfacing	200mm thick Reinforced Concrete Pavement
Base	150mm Stabilized natural gravel compacted to 95% Modified AASHTO density (C4).
Sub-base	150 mm Natural gravel material compacted to 90% Modified AASHTO density (G9).
Roadbed preparation	Rip and recompacting to 90% of modified AASHTO density. Where poor materials are encountered these should be removed to spoil and replaced with at least a G9 quality material which shall be compacted to 90% of modified AASHTO density.

7. STORMWATER DRAINAGE

The Stormwater drainage will be collected and conveyed in earth channels on the side of the proposed new reinforced concrete surfaced road. The road shall be equipped with type 3 concrete drifts, which shall allow for the stormwater to flow across the new surfaced road, into the existing water streams. Figure 1 below shows the existing gravel access road, with existing earth channels of sides to be lined with Armoflex lining. The typical standard detail of the type 3 concrete drift as well as the Armoflex Lining Details are included.



Figure 1: Existing Gravel Access Road

8. SERVITUDE REQUIREMENTS

The proposed road upgrade is within the existing road reserve and no servitudes are therefore required.

C3.2.2.4 PLANT & EQUIPMENT

- Tractor Backhoe Loaders (TLBs)
- Excavators
- Tipper Trucks
- Walk-behind Vibrating Drum Rollers
- Compaction Rammers
- Plate Compactor
- Pipe jacking Drilling Machine
- Horizontal Directional Drilling (HDD) Equipment
- CCTV inspection equipment
- Dewatering Equipment: (Pumps)
- Jetting and Vacuum Trucks
- Pipe Welding and Cutting Equipment:
- Safety Equipment, Personal Protective Equipment (PPE), Barricades and Shoring
- Concrete Mixers

NOTES:

1. FOR THE POSITION OF SERVICES WITHIN THE ROAD RESERVE REFER TO THE LATEST VERSION OF THE DRAWINGS OBTAINABLE FROM THE ROADS AND STORMWATER DIVISION
2. FOR WATER AND SEWER STANDARD DETAILS REFER TO THE LATEST VERSION OF THE DRAWINGS OBTAINABLE FROM THE WATER AND SEWER DIVISION

Contract No: **HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.**

Part C3: Scope of Work

Section C3.3: Procurement

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.3 PROCUREMENT

C3.3 PROCUREMENT

C.3.3.1 PREFERENTIAL PROCUREMENT PROCEDURES

C3.3.1.1 Requirements

C3.3.1.1.1 Employment of unskilled and semi-skilled labour in Labour Intensive Construction works

1. Requirements for the sourcing and engagement of labour
 - 1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.
 - 1.2 The EPWP Ministerial Determination, as revised from time to time, sets out a minimum wage and minimum conditions of employment and Contractors must comply with its requirements.
 - 1.3 Tasks by the Contractor must be such that:
 - (a) the average worker completes 5 tasks per week in 40 hours or less; and
 - (b) the weakest worker completes 5 tasks per week in 55 hours or less.
 - 1.4 The Contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.3.
 - 1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:
 - (a) where the head of the household has less than a primary school education;
 - (b) that have less than one full time person earning an income;
 - (c) where subsistence agriculture is the source of income;
 - (d) those who are not in receipt of any social security pension income.
 - 1.6 The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:
 - (a) 55% women;
 - (b) 55% youth who are between the ages of 16 and 35; and
 - (c) 2% persons with disabilities

C3.3.1.1.2 Appointment of Community Liaison Officer

C3.3.1.1.2.1 Project Steering Committee (PSC)

Section 6.1.3.1 of the Expanded Public Works Programme (EPWP) Recruitment Framework requires the Office of the Speaker, in consultation with the Ward Councillor, to hold a public meeting, and elect a Project Steering Committee (PSC).

Project Steering Committee will be limited to a minimum of four (4) members and a maximum of six (6) members, to avoid a situation of too many potential interest groups preventing the PSC from functioning.

C3.3.1.1.2.2 Community Liaison Officer

After selection of the PSC, at the same meeting indicated under item C3.3.1.1.2.1, residents and Stakeholders in attendance are to vote for poll of three (3) potential CLO's coming from the community concerned.

In the event that a PSC is not constituted by public meeting, or cannot proceed with its work, as Contemplated by section 6.1.3.5 of the Framework, the appointed PSC will nominate potential CLOs.

It is from this pool that the contractor, after interviewing the three (3) nominees and consultation with the PSC appoints the CLO.

Administrative processes for appointment of Community Liaison Officers.

- Minutes and an attendance register must be kept as evidence of the proceedings of the election meeting.
- The office of the speaker must submit the results (minutes) and attendance registrar of the community liaison officer election meeting to the chairperson of the PSC, the contractor and the Expanded Public Works Programme (EPWP) Division.
- The elected CLO will be appointed by the contractor for the duration of the project and also be remunerated by the contractor. Where the CLO is no longer available and another is appointed, the existing CLO shall cease to receive remuneration.
- An employment agreement containing the general terms and conditions of the contract, will be issued to the CLO and must be signed by the CLO before commencement of duties.
- A CLO will be appointed from the ward in which the project is executed.
- The CLO's will be remunerated according to the entry level basic salary of an Administrator Officer position of the City of Tshwane (Task Level 5 notch 1 (B1-1). No benefits will be applicable.

The CLO must have the following attributes: -

- have credibility and standing in the community.
- have a strong personality.
- be able to be firm and decisive.
- be able to facilitate in disputes.
- be able to handle conflict.
- be able to keep minutes and records in a proper and orderly way.
- have a knowledge of labour laws and industrial relations (training will be provided where necessary).
- be objective and impartial.
- be fair.

C3.3.1.2 Resource standard pertaining to targeted procurement

The Contractor shall deliver the following deliverables in terms of the relevant SANS 1914 and the associated specification data:

C3.3.1.2.1 Provide business opportunities for targeted enterprises in terms of **SANS 1914-4**

1. General

Targeted enterprises shall be engaged in the performance of the contract in accordance with the requirements of SANS 1914-4 as amended in 2

2. Amendments to SANS 1914-4

2.1 Replace the existing definitions with the following:

contract participation goal (CPG)

value of supplies, services and works for which the contractor contracts targeted enterprises exclusive of any value added tax or sales tax which the law requires the employer to pay to the contractor, expressed as a percentage of the contract amount associated with the targeting strategy that is identified in the specification data.

2.2 Add the following definitions:

contract amount

1) targeting strategy, A

financial value of the contract at the time of the award of the contract, exclusive of all allowances and any value added tax or sales tax which the law requires the employer to pay to the contractor.

2) targeting strategy B

financial value of the contract upon completion of all contractual obligations, exclusive of any value added tax or sales tax which the law requires the employer to pay to the contractor.

targeting strategy, A

a strategy which:

- a) links the granting of a preference by the employer in the evaluation of tender offers in return for the tendering of a contract participation goal or an undertaking to attain a specified contract participation goal at the time that tenders are evaluated; or
- b) requires a contractor to achieve a minimum specified goal in the performance of a contract; or
- c) involves both a) and b)

targeting strategy B

a strategy which:

- a) links the payment of an incentive bonus to a contractor for the attainment of a specified contract participation goal; or
- b) requires the contractor to record and report on the quantum of work generated for targeted labour

2.3 Replace clauses 3.11 and 3.12 with the following:

3.1.1 The contractor shall engage targeted enterprises directly or indirectly in the performance of the contract to the extent that the total monetary value of such engagements exclusive of any value added tax or sales tax required by law, is sufficient to achieve the contract participation goal provided for in the specification data.

3.1.2 The contractor shall, in the case of targeting strategy A, submit details of his plan to achieve the contract participation goal to the employer's representative on the contract participation goal implementation plan form contained in annex C, within five working days of being instructed to do so. If no such instructions are given, these plans shall be submitted before the submission of the first claim for payment.

2.4 Replace 3.2.2 with the following:

3.2.2 Contractors shall submit completed targeted enterprise declaration affidavits and, where targeting strategy A applies, letters of undertaking to act as sub-consultants, sub-contractors suppliers, manufacturers or service providers (see annex D), in respect of each and every targeted enterprise and targeted partner whose contribution shall be counted towards the contract participation goal. These documents shall, unless otherwise stated in the specification data, be submitted to the employer's representative before the submission of the first claim for payment.

2.5 Replace 4.1 with the following:

4.1 The contractor shall enter into written contractual agreements with all the targeted enterprises

and targeted partners cited in the contract participation goal implementation plan and shall, as soon as is practicable, furnish the employer's representative with copies of such agreements and the written acceptances thereof. The contract to be performed by the targeted enterprises and targeted partners shall, in the case of targeting strategy A, thereafter neither be reduced in scope, nor terminated without the prior written approval of the employer's representative, which shall not be unreasonably withheld or delayed.

2.6 Replace 4.2.1 with the following:

4.2.1 Where targeting strategy A applies and in the event that, through no fault of the contractor, a contracted targeted enterprise is found to be:

- a) unable to perform, or to perform on time;
- b) unable to produce acceptable work;
- c) unwilling to perform work required; or
- d) not fit to perform the service;

The contractor shall notify the employer's representative of the apparent necessity to reduce or terminate such a targeted enterprise's contract, citing the reasons therefore.

2.7 Replace 4.3 with the following:

Where, in the case of targeting strategy A, an enterprise under contract was initially considered to be a targeted enterprise but is later discovered not to be so, or is found not to be creditable towards contract participation goals, the employer may consider a partial waiver of the contractor's obligations towards the achievement of the contract participation goal in respect of such a targeted enterprise, should the contractor satisfactorily demonstrate that he was justified in believing the enterprise to be a targeted enterprise and that eligibility standards were not violated.

2.8 Replace 6 with the following:

In the event that, and where targeting strategy A applies, the contractor fails to substantiate that any failure to achieve the contract participation goal was due to

- a) quantitative underruns,
- b) the elimination of items contracted to targeted enterprises, or
- c) any other reason beyond the contractor's control which may be acceptable to the employer, the sanctions provided for in the contract shall apply.

2.9 Delete "net amount" in definitions and replace "net amount" with "contract amount" wherever it appears in the text.

Clause	Specification Data	
The specification data associated with SANS 1914-5 is as follows		
2.7	The employer’s representative is:	DPT Civil and Structural JV
	Target area:	Ward 55
	Target Area 1	The ward/wards in which the work package is to be performed
	Target Area 2	The ward/wards directly adjoining the ward/wards in which the work package is to be performed.
	Target Area 3	The region within which the ward/wards in which the work package is to be performed resides
	Target Area 4	The City of Tshwane Municipal area
2.17	Targeted enterprise is	Will be specified for each work package.
	The targeting strategy is	Strategy A - b)
	The contract participation goal is	The min. goal is 10% and the maximum goal is 20% (The combined goal for the contract will not exceed 30%)
	The contract participation goal may only be achieved by subcontracting work to one or more targeted enterprises to perform commercially useful functions in the performance of the contract.	
2.9	The following weightings shall apply:	
	Target Area 1	1.2
	Target Area 2	1.0
	Target Area 3	0.8
	Target Area 4	0.6

C3.3.2 SCOPE OF MANDATORY SUBCONTRACT WORK

C3.3.2.1 Scope of mandatory subcontract works

The contractor is to identify and present to the Engineer the works to be subcontracted. The contractor can however add to this scope at his discretion or if he needs such services from the local subcontractors. The following shall be subcontracted to the local subcontractors, but not limited to:

- Kerbing
- Construction of manholes
- Construction of brickwork related work;
- Supply and erection of site camp fence and gate;
- Interlocking paving
- Reservoir fence
- Replacement of bitumen surfacing

C3.3.3 PREFERRED SUBCONTRACTORS/SUPPLIERS

In terms of the Supply chain Management policy 2024/25 Section 47 states that:

SUB-CONTRACTING-

When subcontracting: The City shall obligate main contractors or service providers to engage targeted enterprises in the performance of their contracts incorporating resource specifications. These will be made a condition of the tender for the city to implement at project management level. In cases that the city decides to unbundle the tender to appoint different service providers to an extent that the contract value per service provider does not exceed 30million then the provision of sub-contracting will not be applicable.

(1) Sub-contracting must be subjected to approval by the city manager. The appointed service provider must source competent and capable service providers and where applicable be registered with the relevant body and submit a list of sub-contractors for approval to the City of Tshwane.

(2) Sub-contracting entity should have an equal B-BBEE level status or higher than the main contractor.

(3) Minimum of 30% can be sub-contracted for tenders above 30 million

(4) Local economic participation should be given priority when making a list of potential subcontractors available.

- City of Tshwane Participants with specific attention for the region in which the contract is to be executed should be given first priority and the below competent and capable designated groups should be prioritized

o An EME or QSE

- o An EME or QSE which is at least 51% Black Owned
- o An EME or QSE which is at least 51% Owned by Black youth
- o An EME or QSE which is at least 51% Black Women Owned
- o An EME or QSE which is at least 51% owned by black people with disabilities.
- o An EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships
- o A cooperative which is at least 51% owned by black people
- o An EME or QSE which is at least 51% owned by black people who are military veterans; or
- o More than one of the categories referred to in paragraphs (a) to (h).

Should subcontractors within Tshwane not be identified, the appointed service provider can extend the list of subcontractors to:

- Gauteng Participants
- National participants

(5) In relation to a designated sector a contractor must not be allowed to sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold if the appointed Service Provider scored points for Local Content and Production.

Local emerging contractors must be Black Enterprises. A black enterprise (BE) is defined as a company or economic activity that is owned by black persons and where there is substantial management control by Black People. Ownership refers to economic interest, whilst management refers to the membership of any board or similar governing body of the enterprise. The Broad-Based Black Economic Empowerment Act No. 53 of 2014, principles must apply to BE's.

Enterprises must comply with the following:

- Business must be registered within the CoT boundaries,
- Owners must reside within the CoT,
- Owners or business address must be in Region 3. Other Regions within the COT will only be considered if no suitable candidates are available in Region 3.

C3.3.4 SUBCONTRACTING PROCEDURES

The contractor shall advertise and call for competitive quotations in respect of each portion of the works that are required to be subcontracted in terms of the contract in accordance with the relevant provision of the latest edition of the CIDB Standard for Uniformity in Construction Procurement. The Contract Data in the associated procurement documents shall be based on the City of Tshwane standards and any other relevant documentation of subcontracting with minimal project specific variations and amendments that do not change their intended usage.

The Employer together with the Contractor shall evaluate the quotations received in accordance with the provision of the Standard Conditions of tender. The evaluation panel shall comprise equal representatives from the Employer and from the Contractor.

The Contractor shall without delay enter into contract with the successful tendering subcontractor based on their accepted tender submission.

The Contractor shall remain responsible for providing the subcontracted portion of the works as if the work had not been subcontracted.

- Note:**
- 1) The CIDB Best Practice Guideline D1, *Subcontracting Arrangements*, provides Guidance on the selection of a suitable form of subcontracts.
 - 2) Provision in the Pricing Data should be made for provisional sums for portions of the works that are to be subcontracted in this manner.

C3.3.5 EVALUATION CRITERIA

The bids submitted by the prospective local subcontracting companies will be evaluated by the Employer, the Main Contractor and the Engineering representative.

Contract No: **HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.**

Part C3: Scope of Work

Section C3.4 Construction

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.4 CONSTRUCTION

C3.4 CONSTRUCTION

C3.4.1 Works Specifications

The applicable "Standard Specifications" shall be the document "Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005", issued by the Executive Director: Water and Sanitation of the City of Tshwane, read together with the Particular Specifications.

Tenderers, Contractors and Subcontractors shall obtain their own copies of the document "Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005", for tendering purposes and for use for the duration of the Contract from the Procurement Advice Centre, C de Wet Centre, 175 E'skia Mphahlele Drive, Pretoria West and shall bear all expenses in this regard.

The Standard Specifications have been written to cover all types of municipal civil engineering works, and it may therefore cover work not applicable to this contract.

The Particular Specifications together with the Drawings and Bill of Quantities clearly indicate the sections of the Standard Specifications which apply to this contract.

Section C3.6 covers references to the Particular Specifications in the Standard Specifications as well as variations and additions to the Standard Specifications.

Section C3.6 covers corrections and amendments to the Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005

C3.4.2 Plant and materials

All plant and material to be supplied by the Contractor.

C3.4.3 Construction equipment

All construction equipment to be supplied by the Contractor.

C3.4.4 Contractor's employees

C3.4.4.1 Minimum employment Conditions for Conventional Construction Works

Contractors shall comply with the Basic Conditions of Employment Act (Act No 75 of 1997).

As a determination has not been made in terms of the aforesaid act for the building sector, the minimum employment conditions which will apply to this Contract shall be guided by the Amendment of Sectoral Determination 2: Civil Engineering Sector published in the Government Gazette dated 4th September 2012, as and when amended from time to time.

Contractors shall also take into consideration the clauses of the Government Gazette 39293 of 16 October 2015 regarding Bargaining Council for Civil Engineering Industry: Extension of Conditions of

Employment amending collective agreements to non-parties.

The following minimum conditions shall apply to this Contract and Contractors shall include such conditions in employment contracts.

C3.4.4.1.1 Employment contracts

The Contractor shall enter into an employment contract with every one of his/her employees, including short-term contracts i.e. contracts in which employment commencement and employment termination dates are specified. Short-term employment contracts will also apply an employee employed for only one day.

C3.4.4.1.2 Normal working hours

Normal working hours are from 07:00 to 17:00 from Monday to Friday. A tea break is taken from 09:00 to 09:15 and lunch from 12:30 to 13:00.

Actual hours to work and be paid for is 9 hours per day. If a lunch break of one (1) hour is taken then the normal working day will be as follow:

Morning work sessions from 07:00 to 12:00, lunch break from 12:00 to 13:00, and afternoon sessions from 13:00 to 17:00.

C3.4.4.1.3 Minimum wages

Minimum wages shall be according to the Government Gazetted rates for the Civil Engineering Sector for Gauteng Province (Regulation Gazette No 11796 Vol. 716). For a full day's work, the hourly rate shall be multiplied by 9. Normal 5-day week hours of work shall be 45 hours and the wage calculated according to the applicable hourly rate.

Overtime pay shall be 1.5 times the ordinary wage.

An employee shall be paid monthly.

Wages should be increased by CPI Excluding Owners' Equivalent Rent (EOER) plus two percentage point for the second and third years of the determination. The CPI to be used is the one that is published by Stats SA six weeks prior to the scheduled increment date. Below are the recommendations of the Department regarding new minimum wages levels:

Table 1: Minimum wages per hour for all employees in the Civil Engineering Sector.

TASK GRADE AND WAGE RATE TABLES			
Task Grades	YEAR 1	YEAR 2	YEAR 3
	Hourly Rate Rand Per Hour	Hourly Rate Rand Per Hour	Hourly Rate Rand Per Hour
	From the date determined by the Minister, up to 31 August 2026 (6%)	From 01 September 2026 to 31 August 2027 (5,5%)	From 01 September 2027 to 31 August 2028 (5,5%)
1.	54,06	57,03	60,17
2.	55,32	58,36	61,57
3.	56,87	60,00	63,30
4.	59,00	62,24	65,67
5.	66,80	70,48	74,35
6.	75,86	80,04	84,44
7.	86,89	91,67	96,71
8.	97,42	102,78	108,44
9.	110,11	116,17	122,56

C3.4.4.1.4 Short time (excluding short time due to inclement weather)

If for reasons which may be ascribed to the employee, e.g. arriving late for work or taking an afternoon off, the hours not worked shall be deducted from the daily wage calculation.

C3.4.4.1.5 Short time resulting from inclement weather

- i. If the Contractor informs his/her employees that no work will be done the following day due to inclement weather, no payment will be due to the employee for such a day.
- ii. If the Contractor has not informed his/her employees that no work will be done due to inclement weather and no work or less than four (4) hours of work is possible during a day, the Contractor must pay the employee for four (4) hours of work. If more than four (4) hours of work is done, the Contractor shall pay the employee for the number of hours worked.

C3.4.4.1.6 Vacation leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to 1 day's paid leave for every seventeen (17) days the employee worked or was entitled to payment.

C3.4.4.1.7 Family responsibility leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to three days paid leave in a leave cycle of thirty-six (36) months of employment:

- i. When the employee's child is born;
- ii. When the employee's child is sick;
- iii. In the event of death of the employee's spouse or life partner, parent, grandparent, child or grandchild.

The employee shall provide the required proof to the Contractor of the event, failing which the leave shall be unpaid leave

C3.4.4.1.8 Maternity leave

At least four (4) months unpaid leave.

C3.4.4.1.9 Sick leave

The employee shall be entitled to one (1) day's paid sick leave of normal wages for every twenty-six (26) days worked.

If an employee is absent for three (3) or more consecutive days, the employee shall provide a sick certificate from a registered medical practitioner to qualify for sick leave payment. If such certificate is not provided, no sick leave payment will be due to the employee.

C3.4.8.1.10 Piece work

Irrespective of the quantity of work done under a piece work system during a working week, the employee shall be entitled to a minimum of a week's wages determined as if no piece work applied.

The Contractor or employee may terminate an employment contract by giving notice of termination of not less than:

- i. On short period contracts i.e. a contract which states from which date work employment commences and on which day employment terminates, the terms of the employment contract shall apply;
- ii. One week if employee has been employed for four (4) weeks or less, unless it is a short-term project;
- iii. Two (2) weeks if employee has been employed for more than four (4) weeks but not more than one (1) year;

- iv. Four (4) weeks if employee has been employed for more than one year.

C3.4.4.2 EMPLOYMENT CONDITIONS FOR LABOUR INTENSIVE WORKS AND CONSTRUCTION

The Ministerial Determination 4, Expanded Public Works Programme (revised 2012) issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour as reproduced below, shall apply to works described in scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers. The Ministerial Determination must be read in conjunction with the Code of Good Practises for the Expanded Public Works Programme as published in Government Notice N° R64 of 25 January 2002,

This clause contains the standard terms and conditions for workers employed in elementary occupations on an Expanded Public Works Programme (EPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of an EPWP.

C3.4.4.2.1 Terminology

- (a) “department” means any department of the State, implementing agent or contractor;
- (c) “employer” means any department, implementing agency or contractor that hires workers to work in elementary occupations on an EPWP;
- (d) “workers” means any person working in an elementary occupation on an EPWP;
- (e) “elementary occupation” means any occupation involving unskilled or semi-skilled work;
- (f) “management” means any person employed by a department or implementing agency to administer or execute an EPWP’
- (g) “task” means a fixed quantity of work;
- (h) “task-based work” means work in which a worker is paid a fixed rate for performing a task;
- (i) “task-rated worker” means a worker paid on the basis of the number of tasks completed;
- (j) “time-rated worker” means a worker paid on the basis of the length of time worked.

C3.4.4.2.2 Terms of Work

- i. Workers on an EPWP are employed on a temporary basis or contract basis.

C3.4.4.2.3 Normal Hours of Work

- i. An employer may not set tasks or hours of work that require a worker to work:

- (a) more than forty hours in any week;
 - (b) on more than five days in any week; and
 - (c) for more than eight hours on any day.
- ii. An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.
- iii. A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

C3.4.4.2.4 Meal Breaks

- i. A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
- ii. An employer and worker may agree on longer meal breaks.
- iii. A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.
- iv. A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

C3.4.4.2.5 Special Conditions for Security Guards

- i. A security guard may work up to 55 hours per week and up to eleven hours per day.
- ii. A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

C3.4.4.2.6 Daily Rest Period

Every worker is entitled to a daily rest period of at least twelve consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

C3.4.4.2.7 Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

C3.4.4.2.8 Work on Sundays and Public Holidays

- i. A worker may only work on a Sunday or public holiday to perform emergency or security work.
- ii. Work on Sundays is paid at the ordinary rate of pay.
- iii. A task-rated worker who works on a public holiday must be paid –
 - a. the worker's daily task rate, if the worker works for less than four hours;
 - b. double the worker's daily task rate, if the worker works for more than four hours.
- iv. A time-rated worker who works on public holiday must be paid –
 - (a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
 - (b) double the worker's daily rate of pay, if the worker works of more than four hours on the public holiday.

C3.4.4.2.9 Sick Leave

- i. Only workers who work more than 24 hours per month have the right to claim sick-pay in terms of this clause.
- ii. A worker who is unable to work on account of illness or injury is entitled to claim one day's sick leave for every full month that the worker has worked in terms of a contract.
- iii. A worker may accumulate a maximum of twelve days' sick leave in a year.
- iv. Accumulated sick-leave may not be transferred from one contract to another contract.
- v. An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
- vi. An employer must pay a time-rated worker the worker's daily rate for a day's sick leave.
- vii. An employer must pay a worker sick pay on the worker's usual payday.
- viii. Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –
 - a. absent from work for more than two consecutive days; or
 - b. absent from work on more than two occasions in any eight-week period.
- ix. A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

- x. A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Disease Act.

C3.4.4.2.10 Maternity Leave

- i. A worker may take up to four consecutive month's unpaid maternity leave.
- ii. A worker is not entitled to any payment or employment-related benefits during maternity leave.
- iii. A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- iv. A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- v. A worker may begin maternity leave –
 - (a) four weeks before the expected date of birth; or
 - (b) on an earlier date –
 - if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - if agreed to between employer and worker; or
 - (c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- vi. A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.
- vii. A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the EPWP on which she was employed has ended.

C3.4.4.2.11 Family Responsibility Leave

- i. Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances –
 - (a) when the employee's child is born;
 - (b) when the employee's child is sick;
 - (c) in the event of a death of –
 - the employee's spouse or life partner;
 - the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

C3.4.4.2.12 Statement of Conditions

- i. An employer must give a worker a statement containing the following details at the start of employment –
 - a. the employer's name and address and the name of the EPWP;
 - b. the tasks or job that the worker is to perform; and
 - c. the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
 - d. the worker's rate of pay and how this is to be calculated;
 - e. the training that the worker will receive during the EPWP.
- ii. An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.
- iii. An employer must supply each worker with a copy of these conditions of employment.

C3.4.4.2.13 Keeping Records

- i. Every employer must keep a written record of at least the following –
 - a. the worker's name and position;
 - b. copy of an acceptable worker identification;
 - c. in the case of a task-rated worker, the number of tasks completed by the worker;
 - d. in the case of a time-rated worker, the time worked by the worker;
 - e. payments made to each worker.
- ii. The employer must keep this record for a period of at least three years after the completion of the EPWP.

C3.4.4.2.14 Payment for the Labour-Intensive Component of the Works

Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

- i. An employer must pay all wages at least monthly in cash or by cheque or into a bank account.
- ii. A worker may not be paid less than the minimum EPWP wage rate of R431.01 per day or per task. This will be adjusted annually on the 1st of September in line with the Bargaining Council for the Civil Engineering Industry, with reference to the three-year settlement agreement signed on 18 October 2021, relating to wages and conditions of employment.
- iii. A task-rated worker will only be paid for tasks that have been completed.

- iv. An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.
- v. A time-rated worker will be paid at the end of each month.
- vi. Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- vii. Payment in cash or by cheque must take place –
 - a. at the workplace or at a place agreed to by the worker;
 - b. during the worker's working hours or within fifteen minutes of the start or finish of work;
 - c. in a sealed envelope which becomes the property of the worker.
- viii. An employer must give a worker the following information in writing –
 - a. the period for which payment is made;
 - b. the numbers of tasks completed or hours worked;
 - c. the worker's earnings;
 - d. any money deducted from the payment;
 - e. the actual amount paid to the worker.
- ix. If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.
- x. If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

C3.4.4.2.15 Deductions

- i. An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.
- ii. An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.
- iii. An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.
- iv. An employer may not require or allow a worker to –
 - a. repay any payment except an overpayment previously made by the employer by mistake;
 - b. state that the worker received a greater amount of money than the employer actually paid to the worker; or
 - c. pay the employer or any other person for having been employed.

C3.4.4.2.16 Health and Safety

- i. Employers must take all reasonable steps to ensure that the working environment is healthy and safe.
- ii. A worker must –
 - a. work in a way that does not endanger his/her health and safety or that of any other person;
 - b. obey any health and safety instruction;
 - c. obey all health and safety rules of the EPWP;
 - d. use any personal protective equipment or clothing issued by the employer;
 - e. report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

C3.4.4.2.17 Compensation for Injuries and Diseases

- i. It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.
- ii. A worker must report any work-related injury or occupational disease to their employer or manager.
- iii. The employer must report the accident or disease to the Compensation Commissioner.
- iv. An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

C3.4.4.2.18 Termination

- i. The employer may terminate the employment of a worker for good cause after following a fair procedure.
- ii. A worker will not receive severance pay on termination.
- iii. A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the manager the employer in advance to allow the employer to find a replacement.
- iv. A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available of the balance for the 24-month

period.

- v. A worker who does not attend required training events, without good reason will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

C3.4.4.2.19 Certificate of Service

On the termination of employment, a worker is entitled to a certificate stating –

- a. the worker's full name;
- b. the name and address of the employer;
- c. the EPWP on which the worker worked;
- d. the work performed by the worker;
- e. any training received by the worker as part of the SPWP;
- f. the period for which the worker worked on the SPWP;
- g. any other information agreed on by the employer and worker.

C3.4.4.4 EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

C3.4.4.4.1 Requirements for the Sourcing and Engagement of Labour

- i. Unskilled and semi-skilled labour require for the execution of all labour intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour – Part 5, 1st edition, 2002.
- ii. Tasks established by the contractor must such that:
 - a. the average worker completes 5 tasks per week in 40 hours or less; and
 - b. the weakest worker completes 5 tasks per week in 55 hours or less.
- iii. The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 6.1.3.
- iv. The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:
 - a. where the head of the household has less than a primary school education;
 - b. that have less than one full time person earning an income;
 - c. where subsistence agriculture is the source of income;
 - d. those who are not in receipt of any social security pension income.
- v. The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:
 - a. 60 % women;

- b. 20 % youth who are between the ages of 18 and 35; and
- c. 2 % on persons with disabilities.

C3.4.4.4.2 Specific Provisions Pertaining to SANS 1914-5

i. Definitions

Targeted labour: Unemployment persons who are employed as local labour on the project.

ii. Contract participation goals

- a) there is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.
- b) The wages and allowances used to calculate the contract participation goal shall, with respect to both time-related and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

iii. Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

iv. Variations to SANS 1914-5

a. The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

- b. The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of formal training provided to targeted labour.

C3.4.4.4.3 Training of Targeted Labour

- i. The contractor shall provide all the necessary CETA Accredited training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.
- ii. The cost of the formal training of targeted labour, shall be measured and paid for in the schedule of quantities of this contract document.
- iii. The contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.
- iv. An allowance equal to 100 % of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of (iii) above.

- v. This training should take place as close to the project site as practically possible. The City will ensure that training arrangements for participants are in place and appointment of the training provider facilitated in time.

Proof of compliance with the requirements of (ii) to (iv) must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

C3.4.4.5 COMMUNITY LIAISON OFFICER

C3.4.4.5.1 The successful tenderer shall enter into an agreement with the Community Liaison Officer (CLO) in line with the COT Code of Good Practice To Appoint a CLO: The CLO will be responsible for the following:

- 6.3.1.1.1 A Community Liaison Officer (CLO) for liaison with the recipient community, who as part of his/her duties will also act as a Labour Desk Officer (LDO) for labour recruitment.

C3.4.4.5.2 The CLO shall attend all site and other meetings concerning the project.

C3.4.4.5.3 The CLO will be remunerated according to the entry level salary of Administrative Officer (T5-level monthly notch, B1-level) in the city of Tshwane. City will provide the Contractor with the figures accordingly.

Community Strategy

The CLO shall be available full time on site when contractor is active. Furthermore, it will be required of him to liaise any pertinent communication to the community. He/she shall attend all site and technical meetings as well as steering committee meetings as well as steering committee meetings happen after hours.

C3.4.4.5.4 Only one CLO shall be appointed per project. If the project spans over more than one Ward, the relevant Ward Councilors shall agree on one CLO to be appointed by the Contractor. Should no agreement be found as envisaged, the relevant Project Manager together with the Executive Director: Integrated Community Development, or their nominees, will interview prospective appointees and in their discretion appoint such CLO.

Notwithstanding the above, if the vastness of the project requires the use of more than one CLO, this will be permitted provided that the total monthly sum paid to all CLO's shall not exceed the amount allowed for in paragraph 5.3.

C3.4.4.5.5 Should the Contractor experience any difficulties with the community, these difficulties shall immediately be brought to the attention of the Department/Project Manager who shall arrange meeting with the relevant Ward Councilor(s) and the CLO to resolve such difficulties.

C3.4.4.5.6 The main Contractor shall ensure that any Sub-Contractor he may appoint shall adhere to these conditions but also subject to the provisos applicable to the duration of such sub-contract.

C3.4.4.5.7 Should any of the above conditions be less favorable than any Bargaining Council Agreement or Act applicable to the Contractor, the more favorable condition will apply

C3.4.5 EXISTING SERVICES

Existing services consist of existing bulk water pipelines, water and sewer reticulation pipelines, overhead and underground electrical reticulation and nominal stormwater drainage structures.

C3.4.6 SITE ESTABLISHMENT

C3.4.6.1 Contractor's Camp Site

The Contractor shall provide a suitable site for his camp and for accommodating the work force. The choice of the site for the establishment of the camp, offices and the layout thereof, shall be approved.

The camp site shall be cleared and grubbed and properly fenced with a security fence around the perimeter. The Contractor is to provide his own security at the camp or on the site if required, at his own expense.

After completion of the contract, the Contractor shall remove all his temporary buildings, plant and equipment. The site shall be made good and be left in a neat and tidy condition before a certificate of completion shall be issued.

C3.4.6.2 Water Supply

The Contractor shall make his own arrangement for potable and construction water. It shall be the responsibility of the contractor to apply for a water connection and water meter at City for his site camp. The contractor shall be responsible for payment of all water used. Water quality shall be verified before use in concrete is allowed.

C3.4.6.3 Power Supply

The Contractor shall make his own arrangements.

C3.4.6.4 Ablution Facilities

The Contractor shall, at each construction area, provide sufficient portable chemical latrine units. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the approval of the engineer. No separate payment shall be made for this requirement and the costs thereof shall be deemed to be included in the rates billed for the contractor's time-related obligations.

C3.4.6.5 Cellular Telephone

It is a requirement of the contract that the contractor shall equip his site agent(s) with a cellular telephone to allow for effective communication between the contractor's supervisory personnel and the engineer's supervisory staff. All the applicable contact details must be made available to the Employer as well as the staff on site. All costs associated with the provision of cellular telephones for the contractor's personnel shall be deemed to be included in rates billed for time-related charges.

C3.4.6.6 Site Facilities required by the Engineer

One office for site meetings for 10 – 12 people.

Two carports for the engineers' exclusive use, with solid sheeting, not shade cover.

An ablution unit for his exclusive use.

The engineer does not require a separate office for his personnel.

C3.4.6.7 Storage and laboratory facilities

The Contractor shall make his own arrangements.

C3.4.6.8 Other facilities and services

None.

C3.4.6.9 Vehicles and equipment

The Contractor shall make his own arrangements.

C3.4.6.10 Advertising rights

Not applicable.

C3.4.6.11 Notice boards

Two notice boards will be supplied by the Contractor which will be erected at the construction site as per instruction of the Engineer.

C3.4.7 Site usage

Not applicable.

C3.4.8 Permits and wayleaves

The Engineer will be responsible for the initial application of permits and wayleaves after which the contractor will be responsible for maintaining and renewing permits and wayleaves.

C3.4.9 Alterations, additions, extensions and modifications to existing works

To be carried out with the instruction from the Engineer.

C3.4.10 Inspection of adjoining properties

Adjacent buildings and properties will be inspected before commencing with the works that have the potential to damage surrounding buildings and property on the instruction of the Engineer and according to his requirements.

C3.4.11 Water for construction purposes

No natural water from rivers, streams, boreholes, pans, dams or irrigation canals shall be used for concrete or stabilised layers. Only drinking quality purified water shall be used. The Contractor must make adequate provision in his tender for all negotiations and procurement of water for construction activities and all related costs will be deemed to be included in his tendered rates.

C3.4.12 Survey control and setting out of the works

Survey controls requirements and the setting out of the works will be determined by the Engineer and will be site specific.

Contract No: HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

Part C3: Scope of Work

Section C3.5: Management

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENTT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.5 MANAGEMENT

C3.5 MANAGEMENT

1. Construction Programme

The Contractor shall submit, within the period stated in the Contract Data, a suitable and realistic construction programme for the consideration of the Engineer.

The programme shall be in the form of a Gantt chart and shall include the following details:

- A work breakdown structure, identifying the major activity groups.
- For each activity group, further details shall be provided with regard to the scheduled start and end dates of individual activities.
- The linkages between activities shall be clearly indicated and the logical network upon which the programme is based shall be separately submitted to the engineer if requested. Any constraints shall be classified as being time-related or resource-related.
- The critical path(s) shall be clearly indicated and floats on non-critical activities shall be shown.
- The Contractor shall indicate the working hours per day, night, week and month allowed for in the programme.
- Where relevant the Contractor shall state the production rates for key activities, e.g. earthworks, etc.

Together with the programme as detailed above the contractor shall submit to the engineer a cash flow projection, indicating projected monthly invoice amounts. The cash flow projection shall be updated at monthly intervals to reflect actual payments to date and anticipated further payments.

The programme will be reviewed at the monthly site meetings at which the Contractor shall provide sufficient detail that will allow the comparison of completed work per activity that has fallen behind. The updated programme shall be submitted to the Engineer at least two days prior to the monthly meetings.

If the programme has to be revised by reason of the Contractor falling behind his programme, he shall produce a revised programme showing how he intends to regain lost time in order to ensure completion of the Works within the time for completion as defined in Clause 4.2 of the General Conditions of Contract or any granted extension of time. Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit the programme or to work according to the programme,

or revised programmes, shall be sufficient reason for the Engineer to take steps as provided in Clause 9.2 of the General Conditions of Contract.

The approval by the Engineer of any programme shall have no contractual significance other than that the Engineer will be satisfied that the work is carried out according to such programme and that the Contractor undertakes to carry out the work in accordance with the programme. It shall not limit the right of the Engineer to instruct the Contractor to vary the programme if required by circumstances. The Contractor is also referred to Clause 5.6 of the General Conditions of Contract when drawing up his programme.

2. Sequence of the works

The Contractor shall supply the proposed sequence of the works.

3. Accommodation of traffic

The following contain the Employer's general requirements for accommodating the traffic during construction:

The travelling public shall have the right of way on public roads and the contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

Failure to maintain road signs, warning signs, etc, in a good condition shall constitute ample reason for the engineer to bring the works to a stop until the road signs, etc, have been repaired to his satisfaction.

The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual Volume 2 Chapter 13.

The contractor shall submit proposals in connection with directional signs to the engineer for approval prior to construction.

Sufficient signage shall be provided, erected and relocated as necessary by the contractor to reroute traffic onto the deviations.

4. Extension of time on account of abnormal rainfall

Extension of time due to abnormal rainfall shall be determined by means of Method 1 using the rainfall records below.



'AVE' represents the average rainfall for the month

'ST DEV' represents the standard deviation from the normal

$$s = \sqrt{\frac{\sum(X^2)/n - (AVE(X))^2}{n-1}}$$

'N DAY RAIN' represents the average number of rain days per month

'NUM MON' represents the number of months used in the calculation

'r1 r2' represents the average number of raindays in range r1 to r2 inclusive

'MAX R DAY' represents the maximum rainfall that occurred over a 24-hour period. (08:00-08:00)

'MAX RAIN DATE' represents the date on which the maximum 24 hour rainfall occurred

DATA FOR THE AVERAGE CALCULATION ARE NOT USED IF :

1. There are more than 5 consecutive days of accumulation
2. The data for certain days in the month unavailable
3. The accumulation period occurred at the end of a month

DATA FOR THE FREQUENCY CALCULATION ARE NOT USED IF :

1. Accumulation occurred in the month
2. The data for certain days in the month are unavailable

1981 2010 (Extracted 2025/10/23 11:45)

0513222 0 PRETORIA - MOUNTAIN VIEW ARS Lat: 25.6990 Lon: 28.1560 Height: 1272 m

MON	AVE	ST	N DAY	NUM	1	5,1	10,1	20,1	50,1	100,1	MAX R	MAX RAIN
MON		DEV	RAIN	MON	5	10	20	50	100	900	DAY	DATE
JAN	132	71,6	12,2	29	4,2	1,9	2,2	2,1	0,2	0	68,2	2006/01/15
FEB	107,6	69	8,9	28	3,1	1,5	1,9	1,3	0,3	0	75,3	1995/02/18
MAR	95,3	77	8,2	29	2,9	1,4	1,5	1,2	0,2	0	77,9	1990/03/04
APR	42,9	34,8	5,1	28	1,6	0,9	0,8	0,5	0,1	0	56,5	2005/04/05
MAY	15,4	22,1	1,9	29	0,8	0,2	0,3	0,2	0	0	41,7	2010/05/03
JUN	9,3	15,5	1,5	29	0,5	0,2	0,1	0,1	0	0	55,4	1989/06/04
JUL	3,3	9,6	0,6	29	0,3	0	0	0	0	0	50	1982/07/26
AUG	5,5	9,4	0,9	28	0,3	0,3	0,1	0,1	0	0	23	2006/08/24
SEP	14,5	20,3	1,9	30	0,9	0,4	0,2	0,2	0	0	53	2009/09/28
OCT	70,7	47,5	8,2	30	3	1,6	1,4	0,8	0,1	0	111,8	1986/10/28
NOV	98,8	55,8	10,5	30	3,6	2,1	2,1	1,3	0,1	0	69	1995/11/17
DEC	121,9	50,1	11,4	29	4,2	2,1	2,1	1,7	0,2	0	85,2	1995/12/17
YR	717,3		71,4		25,4	12,6	12,7	9,3	1,4	0		

8

Rainfall data from weather recording stations in the vicinity of the site was obtained from the South African Weather Services (SAWS) in Pretoria. The location and details of the station used are detailed in Table 3.

A 29-year term rainfall record from 1981 to 2010 was extracted (2025/10/23 @11:45) from station (0513222 0) Pretoria – Mountain View ARS located approximately 10km from the proposed site. The Mean Annual Precipitation (MAP) for the area based on this station is calculated as 717,3mm. Figure 2. shows the average annual monthly rainfall for the entire rainfall record.

STATISTICAL INFORMATION: [0513222 0] PRETORIA MOUNTAIN VIEW ARS 1981-2010		
	RAINFALL	
Month	Nn = Actual number of days during the calendar months in which a rainfall of more than Y-mm has been received	Rn Average monthly rainfall
January	3,4	132
February	3,2	107,6
March	3,4	95,3
April	1,3	42,9
May	0,5	15,4
June	0,1	9,3
July	0,0	3,3
August	0,1	5,5
September	0,3	14,5
October	1,9	70,7
November	3,3	98,8
December	4,3	121,9
TOTAL	21,8	717,3

Table 3: Weather Service Station

Station Name	Station Number	X coordinate	Y coordinate	Distance from site (km)
Pretoria Mountain view ARS	0513222 0	-25.6990	28.1560	+/-10.0

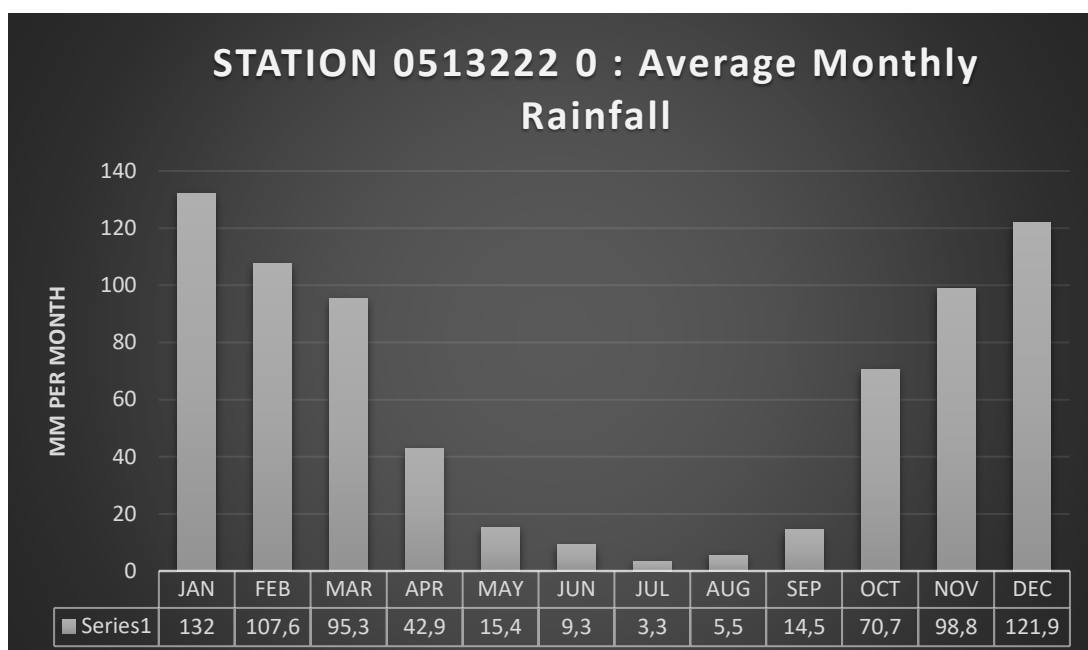


Figure 1: Average Annual Climatic Conditions

5. Community participation

Community participation for the appointment of the PSC will be as per Section 6.1.3.1 of the Expanded Public Works Recruitment Framework, in the Office of the Speaker, in consultation with ward councillors, is responsible to hold public meetings to elect a project steering committee once a development project is to commence within a ward.

The functions of the PSC will be to:

- Assist in monitoring the project.
- Ensure that the community aid the contractor to ensure that he can execute the contract in accordance with the specifications and within time.
- Encourage the community to participate in the Labour-Intensive construction.
- Identify skills, skilled personnel and suppliers in the towns.

The PSC will not have the power to:

- Give any instructions to the contractor, except through the engineer.
- Become involved in the daily operations of the contractor or interfere with the contract works.

A monthly meeting will be held with the PSC to discuss relevant matters. The site agent and resident engineer will attend the meetings. The contractor will have to report on progress, deviations from the programme, financial matters community related aspects, general problems and co-operation at the meeting. The PSC members will not receive any remuneration for attending, and they must provide their own transport.

The committee, which may be chaired by the Ward Councilors, shall consist of representatives of:

- (a) The Ward Councilors(s)
 - (b) The Client
 - (c) The Engineer
 - (d) The Contractor
 - (e) The CLO(s)
 - (f) Members of Ward Committees nominated by Ward Councilors(s)
 - (g) Local Security Company
- The Community Liaison Officer shall manage the labour desk and will have regular meetings with the Contractor where all construction and labour matters will be addressed. Some of the role players will only attend these meetings on an ad hoc basis as needed.
 - The Local Security Company shall be responsible for the safekeeping of all plant, materials, construction equipment and all personnel employed on the project, 24 hour a day, seven days a week from site handover to project completion.

The following aspects will have to be clarified by the labour desk before any person is engaged in

construction work:

- o Contract of Employment
 - o Type of Work
 - o Duration of appointment
 - o Workman's Compensation
 - o Tax deduction
 - o Insurance (UIF)
 - o Wages and bonus and overtime regulations
 - o Production pay-rate per unit of production
 - o Working hours
 - o Start and end times of a daily shift
 - o Lunch breaks
 - o Company policy regarding:
 - Rain time
 - No work no pay
 - Disciplinary policy
 - Grievance policy
 - o Method of payment and intervals
 - o Safety equipment where applicable
- The appointment of any local labour under this project will be the responsibility of the main contractor. All employee/employer issues will be ruled by the statutory labour relations' regulations

as well as per the relevant contractual clauses.

5. Construction management service requirements

The Contractor shall appoint an SMME Development Agent whose duties will be to provide construction management and materials management services to the Local Emerging Contractors in line with the employer's objective as stated in Clause 3.1.1, Description of Work.

6.1 General

The SMME Development Agent shall, in order to achieve the employer's objectives stated in Clause 3.1.1, Description of Work,

- a) comply with agreements made with the employer and the local community, if any, monitor and report on project expenditure and costs and construction progress, and co-ordinate site activities,
- b) advise, assist and train the supported contractor on the job in terms of the contract between the employer and the supported contractor and, if so required in the specification data, arrange for the supply of certain items of equipment and the supply and delivery to site of materials,
- c) remain impartial in his dealings with the employer and the supported contractor,
- d) engage, on behalf of and with the approval of the employer, specialist contractors to execute parts of the works and coordinate the work of supported contractors and the specialist contractors,
- e) cooperate with other professional service providers appointed by the employer,
- f) visit the site at appropriate intervals during the various stages of construction in order to confirm that the supported contractor is making satisfactory progress, that he shows technical competence in the execution of all aspects of the works and generally fulfils all contractual obligations,
- g) provide continuous support to the supported contractor in order to ensure that the employer's objectives are achieved,
- h) operate within any structured framework developed by the employer to enable interim payments to be made to supported contractors within relatively short time frames,
- i) provide site facilities for the employer and his agents, as provided for in the specification data,
- j) ensure the economic and efficient use of all plant and, to this end, maintain adequate records of plant usage,
- k) maintain detailed records of all costs relating to the construction of the works including those relating to the provision of construction management services, and report to the employer at intervals not exceeding one month on the financial status of the contract, and
- l) assist supported contractors in registering with a public body, if required, in terms of the specification data.

6.2 Construction stage requirements

6.2.1 General

Following the award of the contract to the supported contractor, the construction manager shall, as a minimum,

- a) attend site and coordination meetings conducted by the employer and his agents,
- b) arrange weekly or fortnightly site progress meetings with the supported contractor and record and distribute the minutes thereof,
- c) liaise with the employer at coordination meetings at regular, agreed intervals and keep him fully informed regarding all aspects of the supported contractors' contracts,
- d) confirm insurance arrangements, notify insurers of all claims and ensure that all insurance policies are maintained,
- e) bring to the attention of the employer without delay any deficiencies in materials or in work performed by the supported contractor and follow up corrective actions which might be prescribed,
- f) inspect all exposed services, report in writing any damage to the employer and, subject to the approval of the employer, take the necessary action to have the damage repaired,
- g) implement and monitor approved security arrangements and recommend and implement changes which might be necessary, where required by the employer in terms of the specification data, arrange for the supply and erection of suitable name boards,
- h) maintain and update the assets register,
- i) monitor the progress of the supported contractor and submit monthly progress reports to the employer which provide information relating to,
 - progress in relation to the programme,
 - costs incurred in respect of materials, labour, plant, transport, specialist contractors and construction management services,
 - the actual cash flow compared with the predicted cash flow,
 - expected savings or excess expenditure,
 - site meetings,
 - details of plant hired, including standing-time charges, breakdowns and reasons for the use thereof, and
 - details regarding the theft of materials issued to site,
- j) coordinate and monitor the activities of the supported contractor and others involved in the works,
- k) maintain all necessary site records and documentation including those pertaining to personnel on site, equipment, progress, deliveries of materials to supported contractors, variations to their respective contracts, quantities of work executed, etc.,

- l) ensure that the supported contractor implements a systematic testing programme,
- m) review and monitor the supported contractor's quality control systems,
- n) establish and maintain a list of defects and ensure that these are remedied,
- o) brief supported contractors on health and safety requirements, and
- p) verify claims for payment to supported contractors and other parties in accordance with the provisions of the contract.
- q) Provide a full-time **site agent**

6.2.2 Advice and assistance to the supported contractor

The SMME Development Agent manager shall, as a minimum,

- a) process and resolve supported contractors' queries regarding the interpretation of drawings, specifications and contractual matters pertaining to their respective contracts,
- b) motivate and guide supported contractors and, where necessary, recommend measures to expedite their progress,
- c) assist supported contractors with
 - the preparation and updating of a realistic and achievable programme,
 - the setting out of the works,
 - the management, administration and employment of their work forces,
 - the performance of their contracts,
 - all registrations required in terms of legislation and all applicable taxes and levies,
 - the preparation of payment certificates,
 - the handing over of the works to the employer upon completion, and
 - liaison with external organizations and the local community with regard to the works, and
- d) advise the supported contractor on safety measures which shall be implemented in order to comply with safety legislation.

6.2.3 Training

The SMME Development Agent shall, as a minimum,

- a) teach the supported contractors how to assess and order materials required for incorporation into the works,
- b) train, advise and guide supported contractors both in-house and on the job with regard to the following aspects of the contract:
 - the basic work techniques required to perform the contract;
 - the need to develop communication skills;
 - what is expected of a supported contractor;

- health and safety requirements;
 - the need to execute appropriate tasks correctly the first time;
 - how to submit claims for payments;
 - how to control and motivate their work-forces;
 - the necessity for planning;
 - how to prepare and use construction programmes;
 - the relationship between tender pricing, productivity and profit; and
 - payment procedures for payments required in terms of the law, including all applicable taxes and levies, and
- c) act generally as a mentor to the supported contractor and facilitate, when appropriate, training of the supported contractor by other organizations.

6.2.4 Tools and equipment

The SMME Development Agent shall, as a minimum,

- a) advise supported contractors regarding their hand-tool requirements and assist them with the procurement thereof,
- b) arrange for the timeous supply and cost-effective use of items of equipment and plant required for the execution of the works which supported contractors are not, in terms of their contracts, required to provide,
- c) arrange for the supply of calibrated testing equipment to supported contractors, as required, and ensure that tests are properly carried out and the results forwarded to the relevant parties that require such information, and
- d) arrange for the supply of all fuel and power required for the operation of power-driven equipment and tools.

6.2.5 Materials (where materials management services are provided to supported contractors)

The construction manager shall, where a SMME Development Agent has been appointed, as a minimum,

- a) provide the SMME Development Agent with a programme of materials requirements, based on the programmes of supported contractors, at the commencement of their respective contracts and update such programmes as necessary,
- b) review supported contractors' requests for materials, adjust quantities, if necessary, and forward orders timeously to the SMME Development Agent,
- c) arrange with the SMME Development Agent for the delivery of materials direct to the site, where necessary,
- d) where required, collect materials from the SMME Development Agent's store and deliver to the site,

- e) monitor and approve the overnight storage of unused materials on the site by supported contractors or, should such materials not be suitable for overnight storage on site, arrange for their return to the store,
- f) determine appropriate allowances for tolerances and wastage on items where such allowances are not laid down in the supported contractor's scope of work, and
- g) reconcile quantities of materials issued to supported contractors with quantities used in the works and issue a materials reconciliation certificate to supported contractors upon completion of the works.

6.2.6 Post-construction stage requirements

After the completion of the works associated with supported contractors' contracts, the SMME Development Agent shall, as a minimum,

- a) compile a completion report that includes:
 - the final cost of the works in respect of materials, labour, plant, transport, supervision and construction management services;
 - the time of completion relative to the programme;
 - the nature and extent of training received by the supported contractor;
 - details of damage to services and insurance claims;
 - details of the construction manager's staff and organizational structure, equipment purchased for the contract and establishment costs; and
 - details of actual expenditure compared with projected expenditure,
- b) monitor remedial work undertaken during the defects liability period and advise and assist the supported contractor as necessary, and
- c) return, if required, to the employer or dispose of in accordance with the employer's instructions, all items of equipment on the register of assets.

6. Materials management service requirements

7.1 General

The SMME Development Agent shall, in order to achieve the employer's objectives,

- a) procure, store and issue materials for incorporation into the works either to the construction manager, who will deliver such materials to the place of work or directly to the supported contractor,
- b) establish a stores facility which is capable, at short notice, of supplying all the materials required for the project in a reliable, efficient and cost-effective manner,
- c) establish and implement management procedures and systems for procuring, storing, issuing and

accounting for materials that

- take cognizance of specific storage requirements for individual materials,
 - comply with the employer's procurement policies and procedures,
 - provide for quality checks upon delivery,
 - provide for the processing and timeous payment of statements for materials supplied and the delivery of materials to site,
 - account for the quantities of materials that are procured, stored and issued to or on behalf of each individual supported contractor,
 - ensure that records are readily auditable and protect the employer against corruption and theft, and
 - allow the employer to be informed monthly as to the status of all aspects of the materials management,
- d) ensure that all possible trade and settlement discounts are obtained and that the most favourable prices are paid for materials, and
- e) ensure that all materials purchased and issued comply fully with the employer's specifications embodied in the scope of work of the supported contractors' contract or in the contract with the employer.

Contract No: **HS 04-2025/26 THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.**

Part C3: Scope of Work

Section 3.6: Particular Specifications and Variations and Additions to the Standard Specifications

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.6 PARTICULAR SPECIFICATIONS AND VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS

C3.6 PARTICULAR SPECIFICATIONS AND VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS

The following references from, and variations and additions to the Standard Specifications will be valid for this Contract.

The clauses and pay items in this portion of the Particular Specifications are numbered "B" followed by a number corresponding to the number of the relevant clause or pay item in the Standard Specifications. New clauses and pay items not covered by clauses or pay items in the Standard Specifications, if included here, are also designated "B" followed by a number. These numbers follow on the last clause or pay item number used in the relevant section of the Standard Specifications.

BILL O

SERIES 0: GENERAL

MEASUREMENT AND PAYMENT:

SECTION 001: GENERAL REQUIREMENTS AND CHARGES

B001.01 Preliminary and General Charge

Change the following:

"Item"	Description	Unit
B001.01.01	Fixed Charges	Lump Sum

The unit of measurements shall be lump sum over the specified contract period as set out in the contract data.

The tendered rates under sub item B001.01.01 shall represent that part of the contractor's fixed charges for the completion of the project. The number of months payable shall only be the number of months the contractor shall be employed on a project. The monthly rate will be paid per month pro-rata to the contractor's progress percentage on site.

Change the following:

"Item"	Description	Unit
B001.01.02	Time Related Charges	Months

The unit of measurements shall be in months over the specified contract period as set out in the contract data.

The tendered rates under sub item B001.01.02 shall represent that part of the contractor's fixed charges for the completion of the project. The number of months payable shall only be the number of months the contractor shall be employed on a project. The monthly rate will be paid per month pro-rata to the contractor's progress percentage on site.

B001.04.04: Provision of a SACPCMP registered safety officer (Full-time)

Change the following:

"Item	Description	Unit
B001.04.04	Provision of a SACPCMP registered safety officer (Full-time)	Lump Sum

The lump sum tendered shall include full compensation for the provision of a competent and experienced safety officer, full-time for the duration of the construction work or contract period. The appointed safety officer should be professionally registered with the SACPCMP.

The payment for a full-time safety officer will be made per month on the project.

B001.05: Community liaison officer

Add the following Sub-Items:

"Item	Description	Unit
B001.05.01	Community liaison officer appointed at Task Level 5, Level 1 notch	Prov. Sum
B001.05.02	Percentage on item B001.05.01 for charges and profit (%)	Percentage

The tendered rate shall include full compensation for the appointment of a community liaison officer for the duration of the construction works.

Payment shall be made in monthly instalments for the number of months the community liaison officer is employed. Rate will be the City of Tshwane's minimum T5 monthly level 1 notch. Annual rate increase depends on annual approved City of Tshwane salary increases.

B001.07 Protection of services that intersect or adjoin a pipe trench

Add the following items:

"Item	Description	Unit
B001.07	Protection of services that intersect or adjoin a pipe trench	
B001.07.01	(i) Concrete Driveways	Prov Sum
B001.07.02	(ii) Walls	Prov Sum
	(iii) Water house connections	Prov Sum
	(iv) Electrical House Connections	Prov Sum
B001.07.03	Contractor's charge to allow for handling costs and profit in respect of sub item 001.07	%

B001.09 Day Works

Add the following items:

"Item	Description	Unit
B001.09	Day Works	
	Provision of skilled, semi skilled and unskilled for day works	
	.01 Qualified Artisan	hr
	.02 Semi-skilled labourer	hr
	.03 Labourer	hr
	Plant Hire (use of plant already established on site for day works)	
	.01 Tipper Truck (10 ton)	hr
	.02 Flatbed truck (5 ton)	hr
	.03 Light delivery vehicle	hr
	.04 Water Tanker (large)	hr
	.05 Rammer	hr
	.06 TLB	hr
	.07 Impact Roller	hr
	.08 Smooth Roller	hr
	.09 Grader	hr

This section covers the listing of Dayworks items in accordance with Conditions of Contract Clause 6.5, for the use in determining payment for work which cannot be quantified in specific units in the schedule of quantities, or work ordered by the Engineer during construction period which was not foreseen at bid stage and for which applicable rate exist in the schedule of quantities.

No Dayworks shall be undertaken unless written authorization has been obtained from the Engineer.

The Contractor is also referred to Clause 6.5 of the Conditions of Contract regarding Dayworks.

Personnel during normal working hours

The unit rate for items B001.09.01, B001.09.02 and B001.09.03 shall be the hour for the labourer. The labour charges to be reimbursed under the Dayworks items B001.09.01, B001.09.02 and B001.09.03 in the Schedule of Quantities shall be the actual amount of wages paid to labourers, (but no foreman), employed on Dayworks with the authorisation of the Engineer. The labour charges will be paid only for the time that the workmen are actually so employed on Dayworks.

Leave pay, bonuses, subsistence, allowances, employer's contribution to medical schemes and provident funds

and the like shall not be included in the above-mentioned labour charges, but will be deemed to be covered by the percentage rate tendered by the Contractor against items Extra Over scheduled for this purpose under Dayworks in the Schedule of Quantities.

The unit rate for items B001.09.01, B001.09.02 and B001.09.03 shall be the percentage extra over for the labourer. This percentage rate shall also be deemed to allow for the use of small tools, supervision, insurances, overhead expenses, transport of workmen, housing and feeding (if the liability of the contractor), profit and any other expenses in connection with workmen employed on Dayworks and shall also include for everything else covered under the allowance as stated in Clause 6.5 of the Conditions of Contract.

Construction Plant

The unit rate for item B107.03 shall be the hour for the item of plant. The rates tendered for the hire of plant shall be applicable only to plant that the Contractor has on the site and shall be total all-inclusive unit prices which shall include, inter alia for all fuel and lubricants; for the wages of operators, equipment and everything else necessary; for all depreciation, maintenance and repair costs; for overhead expenses, profit and for everything in accordance with Clause 6.5 of the General Conditions of Contract.

The rates shall be paid only for the time that the plant is actually working on the Dayworks as authorised by the Engineer.

Transport of Construction Plant

The unit rate for item B107.04 shall be the hour for the kilometre distance that the vehicle travelled for transporting plant. The billed rate for item B107.04 shall include full compensation for the cost of the vehicle including fuel, maintenance, depreciation and running costs and all costs related to the loading and unloading of the plant onto and off the vehicle.

B001.10	1.10	Appointment of Local Security Company	Lump Sum

Add the following:

"Item	Description	Unit	
B001.10	1.10	Appointment of Local Security Company	Lump Sum

The lump sum tendered shall include full compensation for the appointment of a local security company (Grade C at night and Grade D during the day) for the duration of the project. A minimum of 1 security personnel a day and a minimum of 2 security personnel at night.

The rate tendered shall include full compensation for the appointment of a Local Security Company for the duration of the project include a 10% mark-up fee for the contractor.

Payments shall be made in equal monthly instalments, spread over the tendered completion period, upon proof of payment to the local security company. In the event of the construction period exceeding the tendered completion period and no extension of time been granted, the Contractor shall still pay the local security company the specified remuneration, but shall not be reimbursed there for.

Grade D : Access Control officers.

Advancing to Grade D, security take on more specialized responsibilities, particularly in access control. They manage entry and exits points, verify credentials and ensure that only authorized individuals gain access to specific areas. This role demands heightened vigilance and the ability to handle access control equipment effectively. Training for Grade D includes an 80-hour course that builds the basics covered the basics covered in Grade E.

Grade C: Protection Officers

Grade C officers are entrusted with safeguarding higher-risk areas and often supervise lower-grade security personnel. Their responsibilities extend to conducting searches, managing security systems, and handling basic administrative tasks. This role requires a comprehensive understanding of security protocols and the ability to respond effectively to incidents. The training for Grade C encompasses a 120-hour course, emphasizing advanced access control and supervisory skills.

B001.11 Print, supply, distributions and removal of water interruptions notice color printed

Add the following:

"Item	Description	Unit
B001.11	Print, supply, distributions and removal of water interruptions notice color printed	
B001.11.01	Color printed on A5 flyers	No.

The tendered rate shall include full compensation for the supply, printing, distributing flyers and the placing of posters on the appropriate lamp poles as requested by the Engineer. The transporting, labour and removal of posters must also be included in the tendered rates. Posters and flyers must be distributed fourteen working days prior to the water interruption and must be removed within two days after the interruption. Schools, hospitals, old age homes, retirement villages, shops and office buildings must sign for receiving this notification and proof must be submitted to the CoT before the date of interruption."

B001.12: Contract notice board

Add the following items:

Item		Unit
B001.12	Contract Notice Board	
B001.12.01	Rate to include supply, erection, maintenance and dismantling and removal of the contract notice board	No.

Payment of the rate tendered shall be in full compensation for the provision, erection, maintenance and dismantling and removing of the contract notice board.

The contractor shall supply and erect, at points to be designated by the Engineer, two name boards confirming to the City of Tshwane standard detail drawings as amended from time to time. The description of the project, name and titles of the employer, Engineer and contractor to be painted on the boards shall be as shown on this drawing. The contractor shall remove the two-name boards upon issue of a final completion certificate by the Engineer or when instructed earlier by the Engineer.

The contractor shall in addition keep the name boards in good repair for the duration of the contract or until instructed by the engineer earlier than the final completion of the contract. Eighty percent (80%) of the amount will be paid after the name boards has been erected and the remaining 20% when the contractor removes the name board, after completion of the works

B001.13 Cost of Survey in terms of the Land Survey Act

Add the following sub items:

"Item	Description	Unit
B001.13	Cost of Survey in terms of the Land Survey Act	
B001.13.01	Trigonometrical Survey and Plot boundary pegs, Verify Benchmarks and Nodes Mark and Record Critical levels During Construction and As-Built	Prov Sum
B001.13.02	Handling cost in respect of item B001.13.01	Percentage %

The Engineer will provide survey beacons (of adequate type and in sufficient quantity) as benchmarks and instruct the Contractor to appoint a professional registered land surveyor. From information provided on drawings issued by the Engineer, the Contractor shall be responsible to provide all positions and levels, of all intermediate points required for proper control of the works. As benchmarks may be disturbed during the execution of the works, all levels and setting-out pegs shall be referred to at least two benchmarks. The contractor will ensure that all works are set out from existing survey beacons by a professional registered land surveyor as instructed by the Engineer. The setting out data, including the elevation (obtain x, y, z coordinates) from these pegs shall be submitted to the Engineer evaluate final natural ground levels (NGL) prior to the commencement of excavations. The contractor shall be responsible to Mark and Record Critical levels During Construction and As-Built

Preservation and replacement of beacons and pegs will be subject to the Land Survey Act, 1927 (Act No 9 of 1927).

Item B001.13.01 shall be as per the engineer's instruction in accordance to the site instruction, the provisional sum item shall be paid in accordance with the provisions of the general conditions and pricing data.

Payment for item B001.13.01 will be inclusive costs for a professional registered land surveyor to place erf boundary pegs as instructed by the Engineer

B001.13.02 is a percentage of the actual amount spent under the provisional sum item, which shall include full compensation of the profit in connection with providing the specified service.

Add the following items:

"Item	Description	Unit
B001.14	SMME and Subcontractors Preliminary and General	
B001.14.01	Provisional Sum for subcontractor Preliminary and General	Prov sum

The provision must be made for SMME and subcontractors Preliminary and general, to assist in covering the SMMEs and subcontractors Preliminary and general

B001.14.02 (a) Handling cost in respect of item B001.14.01

The percentage tendered for handling costs and charges shall cover all additional costs for the Contractor over and above the sums paid

B003.08.01 Provision of Accredited Training for Local SMMEs

Add the following items:

"Item	Description	Unit
B003.08.01	Provision of Accredited Training for Local SMMEs	Prov Sum
	(a) Handling cost in respect of item B003.08.01	%

The provision must be made for SMME Training to benefit local SMMEs. This training must be conducted prior to individual labour commencing work on site.

Handling cost and charges for the Contractor on Item B003.08.01 percentage (%)

The percentage tendered for handling costs and charges shall cover all additional costs for the Contractor over and above the sums paid

B003.08.02	Provision of Accredited Technical Skills Training for seconded and non-seconded labour	Prov Sum
	(a) Handling cost in respect of item B003.08.02	%

The provision must be made for Accredited Technical Skills Training for seconded and non-seconded labour to benefit seconded and non-seconded labour. This training must be conducted prior to individual labour commencing work on site.

Handling cost and charges for the Contractor on Item B003.08.02 percentage (%)

The percentage tendered for handling costs and charges shall cover all additional costs for the Contractor over and above the sums paid

B003.08.03	Provision of SMME Development Agent for Local SMMEs	Prov Sum

The Engineer shall instruct the Principal Contractor to appoint an accredited SMME Development Agent to conduct SMME Development Services. A service level agreement to be provided by the Engineer or Client will be signed by the Principal Contractor and the nominated SMME Development Agent. The nominated SMME Development Agent shall be having a qualification in Civil Engineering and Registered within their organization as candidates.

The SMME Agent is to assist as follows:

The SMME Agent to produce a detailed SMME management and monitoring plan for Employer and Employer's Agent approval within 21 days of appointment by COT.

The SMME Agent shall be responsible to monitor and ensure that local SMME Contractors execute works as per the approved scope, specification and programme. The SMME Agent shall provide the CoT with monthly/bi-weekly (as per Employer's Request) progress reports clearly indicating progress and challenges affecting local SMMEs. The SMME Agent shall hold monthly/bi-weekly production meetings with the local SMME Contractors where minutes are to be kept and signed off by both parties.

The SMME Agent is to assess the skills of the SMME Contractor and provide the relevant support and training where it is necessary in order for the local SMME Contractors to complete the works to programme, budget and specification. The SMME Agent will be expected to provide on-site training to the SMME Contractors that will ensure that the SMME Contractor's staff is suitably trained to execute the works and that they receive sufficient

relevant experience on the project.

The SMME Agent will assist the SMME Contractors in all aspects to achieve safety compliance, that will include:

- Assisting the local SMME Contractors with developing their safety files, legal appointments, etc
- Assisting the local SMME Contractors with achieving safety on site.
- Having tool box talks with the local SMME Contractor's employees on a daily basis.
- Providing all safety equipment and signage.
- Providing safety training where necessary.

The SMME Agent will be expected to monitor the local SMME Contractor's works for quality compliance and provide all the necessary support to local SMME Contractors in order to achieve quality requirements. The SMME Agent is to ensure that if the local SMME Contractor's quality of works does not achieve specification the necessary corrective measures are developed and implemented to assist the SMME Contractors to achieve specification and shall not allow the works to continue until the quality requirements are achieved.

The SMME Agent is to generate monthly reports for the COT that includes the following:

- SMME Contractor resources on the site, i.e. supervisors, labour (as per EPWP reporting requirements), plant, tools and equipment
- SMME Contractor progress of works on site.
- SMME Contractor quality control on site.
- SMME Contractor expenditure on the project versus target expenditure.
- Copies of minutes of the SMME Contractor and Main Contractor progress meetings.
- Concerns and improvements to be made.
- The report shall be signed by both the Main Contractor and the local SMME Contractors

(a) Handling cost in respect of item B003.08.03 %

The percentage tendered for handling costs and charges shall cover all additional costs for the Contractor over and above the sums paid.

B003.08.04 Provision for Students Development Prov Sum

(a) Handling cost in respect of item B003.08.04 %

The percentage tendered for handling costs and charges shall cover all additional costs for the Contractor over and above the sums paid.

BILL NO 1: REMEDIAL WORKS

Section 103 OVERHAUL

Change the following items:

"Item	Description	Unit
B103.01	Overhaul on material hauled outside 15km free-haul boundaries	m ³ .km

Add the following measurement items:

"Item	Description	Unit
B810	BULK STEEL PIPELINE REMEDIAL WORK	
B810.01	Pigging services. (Cleaning, Inspection Gauging and Batching For 1100mm, 1000mm, 900mm, 800mm and 700mm pipes)	Prov Sum

B810.02	Cleaning of all foreign materials inside partially installed Steel Pipes by previous contractor,	
B810.02.01	1 100mm NB	m3
B810.02.02	1 000mm NB	m3
B810.02.03	900mm NB	m3
B810.02.04	800mm NB	m3
The unit measure is cubic meter measured inside the pipe and the rate shall include the cost for excavation for access pit establishment, cleaning irrespective of method used (jetting, hand tools, pigging, etc.) to clean the pipe of all foreign matter on the installed steel pipes by previous contractor		
B810.03	Testing of internal lining and external coating of partially installed Steel Pipes by previous contractor,	Lump Sum
B810.04	X-ray scanning of partially installed steel pipe joints by previous contractor	
B810.04.01	1100mm steel	No.
B810.04.02	1000mm steel	No.
B810.04.03	900mm steel	No.
B810.04.04	800mm steel	No.
B810.05	lidar Camera Inspection of Existing steel pipe irrespective of pipe diameter	PC sum
B810.06	Service detection along pipe route including detection of existing bulk water pipe	m
B810.07	Repair of all pipe defects of partially installed Steel Pipes by previous contractor,	PC sum
B811	<u>BULK PVC PIPELINE REMEDIAL WORK</u>	
B811.01	Repairs to water leaks on water pipes installed by the previous contractor. The rate to include excavation around the pipe to be repaired, supply of all fittings, labour and plant including backfilling and compaction to the required Mod AASHTO.	
B811.01.01	355mm NB	m
B811.01.02	450mm NB	m
B811.02	Bulk pipework cleaning	

Add the following measurement items:

"Item	Description	Unit
B811.02	Bulk pipework cleaning	
B811.03	Cleaning of all foreign materials inside partially installed uPVC Pipes by previous contractor,	
B811.03.01	1.2.7 450mm NB m	
B811.03.02	1.2.8 355mm NB m	

The unit measure is cubic meter measured inside the pipe and the rate shall include the cost for excavation for access pit establishment, cleaning irrespective of method used (jetting, hand tools, pigging, etc.) to clean the pipe of all foreign matter on the installed upvc pipes by previous contractor.

B812 **WATER RETICULATION PIPELINE REMEDIAL WORK**

Add the following items:

"Item	Description	Unit
B812.01	Repairs to water leaks on water pipes installed by the previous contractor. The rate to include excavation around the pipe to be repaired, supply of all fittings, labour and plant including backfilling and compaction to the required Mod AASHTO.	
B812.01.01	200mm NB	no.
B812.01.02	160mm NB	no.
B812.01.03	110mm NB	no.
B812.02	Hydraulic field-testing of pipelines irrespective of type or class	
B812.02.01	200mm Nominal diameter	m
B812.02.02	160mm Nominal diameter	m
B812.02.03	110mm Nominal diameter	m

B813 **SEWER RETICULATION PIPELINE REMEDIAL WORK**

B813.01	Sewer testing of manholes as per the project SANS Specification for manholes of depths;	
B813.01.01	For excavations below 2.5m deep	No.
B813.01.02	Over 2,5 m and up to 4,0 m deep	No.
B813.02	Air testing of sewers	

Add the following measurement items:

"Item	Description	Unit

B813.02	Air testing of sewers	
B813.02.01	110 mm uPVC Class 34 (LI)	m
B813.02.02	160 mm uPVC Class 34 (LI)	m
B813.02.03	200 mm uPVC Class 34 (LI)	m
B813.02.04	250 mm uPVC Class 34 (LI)	m

The unit measure is linier meter and the rate shall include the cost for excavation for access pit establishment, conducting of air test irrespective of pipe type or class, compaction and de-establishment including making good of area around which repair works was carried out.

B813.03.01 CCTV Camera Inspection

"Item	Description	Unit

Add the following measurement items:

B813.03.01	CCTV Camera Inspection	
B813.03.02	110 mm uPVC Class 34 (LI)	m
B813.03.03	160 mm uPVC Class 34 (LI)	m
B813.03.03	200 mm uPVC Class 34 (LI)	m
B813.03.08	250 mm uPVC Class 34 (LI)	m

The unit of measurement is linier meter and shall include the cost for excavation for access pit establishment, conducting of CCTV of pipelines irrespective of type or class, compaction and de-establishment including making good of area around which repair works was carried out.

B813.04	Breaking and repairing benching and channeling in existing manhole to accommodate	No.

B813.02 (LI/SC) Point repairs

B813.02.01	Point repair by replacing pipe	No.
B813.02.02	(Extra over item 302.01 if pipe is replaced during point repair as specified) B813.02.01 Point repair of backfall in new pipe	No.

"Item	Description	Unit

B813.04	Sewer pipework cleaning	

Add the following measurement item:

B813.04 Sewer pipework cleaning

B813.04.01	Removal of sand, silt, roots, etc (all causes) from sewer pipes using various rodding equipment for pipe diameter	

B813.04.01.01	a) 110mm uPVC	m
B813.04.01.02	b) 160mm uPVC	m
B813.04.01.03	c) 200mm uPVC	m
B813.04.02	Removal of sand silt, roots, etc. (all causes) using high pressure water jetting equipment at +450bar pressure diameter	
B813.04.02.01	a) 110mm uPVC	m
B813.04.02.02	b) 160mm uPVC	m
B813.04.02.03	c) 200mm uPVC	m
B813.04.03	Removal of silt, fat, etc. (all causes) using combination of vacuum jetting methods apart from high pressure equipment for sewer pipes (Vactor or similar) for pipe diameter	
	a) 110mm uPVC	m
	b) 160mm uPVC	m
	c) 200mm uPVC	m

The unit of measurement shall be the metre of each size of pipe cleaned and approved, measured centre to centre of adjacent manholes.

The tendered rate shall include full compensation, inter alia for the use of equipment as specified, or any other related and approved equipment, to clean pipes of the specified internal diameter partially or completely blocked by an cause and the removal of such material, and transportation and dumping thereof at an approved site CCTV inspections to provide proof of cleaning and any other related activity such as the filling in or reports, etc.

Add the following items:

"Item	Description	Unit
B813.05	Combination truck with a storage size of 10 kl or better, complete with high pressure washing and vacuum suction facility	day
B813.06	Sewer Manhole Cover Replacement	

Add the following measurement item:

B813.06	Sewer Manhole Cover Replacement
B813.06.01	Supply all material and equipment required for the removal of damaged sewer manhole covers and replace with new sewer manhole covers per the requirement

by the CoT Standards

No

The tendered rate shall include full compensation for the cost of material, the equipment hire, its operation, maintenance depreciation and running costs as well as disposal of the damaged material.

The above-mentioned tendered rates shall be full compensation for the various items as specified and no further profit shall be paid.

"Item	Description	Unit
B813.07	Leaking/ seeping precast concrete manholes	

Add the following measurement item:

B813.07	Leaking/ seeping precast concrete manholes	
B813.07.01	Remove sand from leaking manholes and relay with proper jointing and seal for manholes of depth:	
B813.06.01	for excavations below 1.5m deep	No
B813.06.02	Over 2.0m and up to 2,5m deep	No
B813.06.03	Over 2,5 m and up to 3m deep	No

The tendered rate for item B813.07.01 shall include full compensation for the cost of the equipment hire, its operation, maintenance depreciation, running costs and all material supply

Add the following items:

"Item	Description	Unit
B813.08	Vertical realignment of the existing installed manholes. The rate to include excavation, reinstatement of benching, labour and plant including backfilling and compaction to the required Mod AASHTO.	No

BILL NO 2: BULK STEEL WATER PIPELINE

Series 4 WATER RETICULATION & WATER MAINS

Section 402 CONSTRUCTION

Add the following sub items:

B402.02.24 Custom made Steel special to be measured, manufactured and installed (epoxy powder Coated - refer to Series 401.05) each per approved quotation

Add the following new payment clauses:

"Item	Description	Unit
B402.22	Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):	Prov sum

Payment for custom made steel specials: The Contractor shall present a Quotation that will include for the measurement, manufacturing, installing and testing of the steel special. The quotation will be approved by the Engineer and reimbursement shall be for the actual purchase cost of the steel special plus 10%. (Excluding handling, delivery or any other fees).

B402.14 Tie into existing water main

Add the following new payment clauses:

"Item	Description	Unit
B402.14	Tie into existing water main	
B402.14.01	Connection to existing PVC / AC / HDPE water	
B402.14.01.01	Connection point pipe diameter up to 200mm	No
B402.14.01.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.01.03	Connection point pipe diameter over 400mm up to 1100mm	No
B402.14.02	Connection to existing Steel water	
B402.14.02.01	Connection point pipe diameter up to 200mm	No
B402.14.02.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.02.03	Connection point pipe diameter over 400mm up to 1100mm	No

The unit of measurement for the tie in point activities shall be the number of each connection to the existing steel water mains. The rate shall include the excavation around the connection point, supply, delivery and installation of pipe fittings to the specifications including all labour plant and tools. The contractor has to notify the Engineer when done with preparatory works to joining up new pipe to existing to enable end user department to partake into the supervision of the joining up of the pipes. The rate to also include reimbursement of backfilling, compaction and remedial works associated with excavation around the tie in area, cleaning and making good of the area.

The contractor to price according to the connection point existing pipe material types denoted in Sub-clause 402.14.01 and 402.14.02 respectively. Connection point pipe sizes are denoted under Sub-clause 402.14.01 and 402.14.02 respectively.

BILL NO 3: UPVC BULK

B402.14 Tie into existing water main

Add the following new payment clauses:

"Item	Description	Unit
B402.14	Tie into existing water main	

B402.14.01	Connection to existing PVC / AC / HDPE water	
B402.14.01.01	Connection point pipe diameter up to 200mm	No
B402.14.01.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.01.03	Connection point pipe diameter over 400mm up to 1100mm	No
B402.14.02	Connection to existing Steel water	
B402.14.02.01	Connection point pipe diameter up to 200mm	No
B402.14.02.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.02.03	Connection point pipe diameter over 400mm up to 1100mm	No

The unit of measurement for the tie in point activities shall be the number of each connection to the existing steel water mains. The rate shall include the excavation around the connection point, supply, delivery and installation of pipe fittings to the specifications including all labour plant and tools. The contractor has to notify the Engineer when done with preparatory works to joining up new pipe to existing to enable end user department to partake into the supervision of the joining up of the pipes. The rate to also include reimbursement of backfilling, compaction and remedial works associated with excavation around the tie in area, cleaning and making good of the area.

The contractor to price according to the connection point existing pipe material types denoted in Sub-clause 402.14.01 and 402.14.02 respectively. Connection point pipe sizes are denoted under Sub-clause 402.14.01 and 402.14.02 respectively.

BILL NO 4: CATHODIC PROTECTION SYSTEM

SERIES 10 CATHODIC PROTECTION SYSTEM

Section B1001 FIXED CHARGE ITEMS

Add the following sub items:

"Item	Description	Unit
B1001.01	Cathodic Protection to be undertaken by sub-contractor (3 quotations to be requested from reputable service providers and approved by the client)	Prov Sum
	Overheads, charges & profits on Item B1001.01	%

A comprehensive CP system design will be undertaken in accordance with SANS ISO 15589 Part 1, and a detailed CP design report complete with appropriate design calculations will be issued. The design will be overseen by a NACE Cathodic Protection Specialist, using the data obtained during the surveys.

During the detailed CP design, the engineering construction drawings will be reviewed and marked up to ensure that all buried couplings and valve chambers are provided with electrical continuity bonding. Strategic location of IFs is critical for optimal operation of a cathodic protection system, and drawings will also be reviewed to ensure that all valve actuators, flowmeters as well as the interface between buried and aboveground pipes are adequately supplied with insulation joints or IFs. Monitoring points would be required at strategic points. Cathodic protection requirements for any isolated, buried steel fittings and specials will also be considered.

BILL NO 5: WATER RETICULATION

Section 103 OVERHAUL

Change the following items:

"Item	Description	Unit
B103.01	Overhaul on material hauled outside 15km free-haul boundaries	m ³ .km

Series 4 WATER RETICULATION & WATER MAINS

Section 402 CONSTRUCTION

Add the following items:

"Item	Description	Unit
B402.12	The provision and installation of connections to Users complete (excluding supply of water meters or saddles but including installation of water meters) as per detail drawing 7515-W206	
B402.12.01	Short single erf connection	
B402.12.01.01	0-5m single connection	No.

A single short connection is defined as a water meter connection with five (5) metres or less piping between the main supply and the meter installation, where no crossing of a public road is required.

The unit of measurement shall be the number of meter installations done. The size of the water connection refers to the size of the water meter used, which shall be connected to the next largest nominal pipe size. (For example a 80mm diameter water meter will be fitted to a 100mm diameter pipe.)

The tender rate shall include full compensation for travelling, locating existing services, excavating, supplying and laying of pipes and all necessary fittings including the valves to complete the installation as per drawing, installation of new water meter or connecting to existing water meter, the extension of the communication pipe if necessary as indicated on the drawings, the meter installation with 1,5m HDPE downstream pipe where required and all other plumbing material necessary to complete the work as indicated on the drawings, flushing of system, connecting the water supply, backfilling and compaction to 90% modified AASHTO density and the cleaning and tidying of the work place after completion of the installation. The CoT will supply all water meters. Saddles will be paid separately."

B402.12.02	Short double erf connections	
B402.12.02.01	0-5m double connection	No.

A short double connection is defined as the water meter connection where less than five (5) metres piping is required between the main supply and the installation of the two meter installations without the crossing of a public road.

The unit of measurement shall be the number of double meter installations done. The size of the water

connection refers to the size of the water meter used, which shall be connected to the next largest nominal pipe size. (For example a 80mm diameter water meter will be fitted to a 100mm diameter pipe.)

The tender rate shall include full compensation for travelling, locating existing services, excavating, supplying and laying of pipes and all necessary fittings including the valves to complete the installation as per drawing, installation of new water meter or connecting to existing water meter, the extension of the communication pipe if necessary as indicated on the drawings, the meter installation with 1,5m HDPE downstream pipe and all other plumbing material necessary to complete the work as indicated on the drawings, flushing of system, connecting the water supply, backfilling and compaction to 90% modified AASHTO density and the cleaning and tidying of the work place after completion of the installation. The CoT will supply all water meters. Saddles will be paid separately.”

B402.12.03 Long single erf connections

B402.12.03.01 5-10m single connection No.

A long single connection is defined as a water meter connection with piping more than five (5) metres up to seventeen (17) metres between the main supply and the meter installation and where the crossing of a public road is required.

The unit of measurement shall be the number of meter installations done. The size of the water connection refers to the size of the water meter used, which shall be connected to the next largest nominal pipe size. (the minimum pipe size is 40mm diameter)

The tender rate shall include full compensation for travelling, locating existing services, excavating, horizontal drilling or trenching of tarred road surfaces and resurfacing the tarred road, supplying G5 material, additional compaction, supplying and laying of pipes and all necessary fittings including the valves to complete the installation as per drawing, installation of new water meter or connecting to existing water meter, the extension of the communication pipe if necessary as indicated on the drawings, the meter installation with 1,5m HDPE downstream pipe and all other plumbing material necessary to complete the work as indicated on the drawings, flushing of system, connecting the water supply, backfilling and compaction to 90% modified AASHTO density and the cleaning and tidying of the work place after completion of the installation. The CoT will supply all water meters. Saddles will be paid separately.”

B402.12.04 Long double erf connections

B402.12.04.01 5-10m double connection No.

A long double connection is defined as a water meter connection with piping more than five (5) metres up to seventeen (17) metres between the main supply and the two-meter installations without the crossing of a public road.

The unit of measurement shall be the number of double meters installations done. The size of the water connection refers to the size of the water meter used, which shall be connected to the next largest nominal pipe size. (the minimum pipe size is 40mm diameter)

The tender rate shall include full compensation for travelling, locating existing services, excavating, horizontal drilling or trenching of tarred road surfaces and resurfacing the tarred road, supplying G5 material, additional compaction, supplying and laying of pipes and all necessary fittings including the valves to complete the installation as per drawing, installation of new water meter or connecting to existing water meter, the extension of the communication pipe if necessary as indicated on the drawings, the meter installation with 1,5m HDPE downstream pipe and all other plumbing material necessary to complete the work as indicated on the drawings, flushing of system, connecting the water supply, backfilling and compaction to 90% modified AASHTO density and the cleaning and tidying of the work place after completion of the installation. The CoT

will supply all water meters. Saddles will be paid separately.”

B402.13	The provision and installation of domestic yard Stand Pipes as per detail drawing 7515-W206	No

B402.14 Tie into existing water main

Add the following new payment clauses:

“Item	Description	Unit
B402.14	Tie into existing water main	
B402.14.01	Connection to existing PVC / AC / HDPE water	
B402.14.01.01	Connection point pipe diameter up to 200mm	No
B402.14.01.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.01.03	Connection point pipe diameter over 400mm up to 1100mm	No
B402.14.02	Connection to existing Steel water	
B402.14.02.01	Connection point pipe diameter up to 200mm	No
B402.14.02.02	Connection point pipe diameter over 200mm up to 400mm	No
B402.14.02.03	Connection point pipe diameter over 400mm up to 1100mm	No

The unit of measurement for the tie in point activities shall be the number of each connection to the existing steel water mains. The rate shall include the excavation around the connection point, supply, delivery and installation of pipe fittings to the specifications including all labour plant and tools. The contractor has to notify the Engineer when done with preparatory works to joining up new pipe to existing to enable end user department to partake into the supervision of the joining up of the pipes. The rate to also include reimbursement of backfilling, compaction and remedial works associated with excavation around the tie in area, cleaning and making good of the area.

The contractor to price according to the connection point existing pipe material types denoted in Sub-clause 402.14.01 and 402.14.02 respectively. Connection point pipe sizes are denoted under Sub-clause 402.14.01 and 402.14.02 respectively.

BILL NO 6: SEWER RETICULATION

Section 103 OVERHAUL

Change the following items:

“Item	Description	Unit
B103.01	Overhaul on material hauled outside 15km free-haul boundaries	m ³ .km

BILL NO 7 TO BILL NO 20: HORNSNEK LL RESERVOIR REINFORCED CONCRETE VALVES CHAMBERS : CHAMBER C.01 DRW NO.(2543IES-158) – CHAMBER C.18 DWG NO. (2543IES-206)

Series 4 WATER RETICULATION & WATER MAINS

Section 402 CONSTRUCTION

Add the following sub items:

B402.02. Custom made Steel special to be measured, manufactured and installed (epoxy powder coated- refer to Series 401.05) each per approved quotation

Add the following new payment clauses:

"Item	Description	Unit
B402.22	Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):	Prov sum

Payment for custom made steel specials: The Contractor shall present a Quotation that will include for the measurement, manufacturing, installing and testing of the steel special. The quotation will be approved by the Engineer and reimbursement shall be for the actual purchase cost of the steel special plus 10%. (Excluding handling, delivery or any other fees).

809.03.01 Structural Steelwork

B801.03.01.08	Strap and Pipe Support	No
	Strap and Pipe Support steel work on concrete pedestal: Refer CoT Detail Drawing No 7515-VC219. Concrete for support work measured elsewhere.	
B801.03.01.08	500mm x 500mm Sump	No
	500mm x 500mm Sump completely supplied and installed with 150mm x 110mm PVC- U Sewer Gulley with CI Grate at low point. Refer CoT Detail Drawing No 7515-VC207.	

BILL 21: ACCESS ROAD

Section 103 OVERHAUL

Change the following items:

"Item	Description	Unit
B103.01	Overhaul on material hauled outside 15km free-haul boundaries	m ³ .km

Section 501 SURFACE DRAINS AND DRAINAGE BLANKETS

Change the following items:

"Item	Description	Unit

B501.06	Polyethylene sheeting 0,15 mm thick, or an equivalent approved material, for concrete road pavement	m2

BILL 22: RESERVIOR

Section 103 OVERHAUL

Change the following items:

"Item	Description	Unit
B103.01	Overhaul on material hauled outside 15km free-haul boundaries	m ³ .km

Section 105 FENCING

Change the following items:

"Item	Description	Unit
105.01	Supply and Erect New Fencing Material	
B105.01.01	Supply and Install invisible wall perimeter fence 3305mm Wide X 2400mm High Galvanised 3mm Diameter wire with appeture size centre at 76,2mm x12,7 mm, Reinforced with Horizontal strips	m
B105.01.02	Supply and install fence topping as shown with 750 diameter ripper smart coil, or similar galvanized	m
B105.01.03	Supply and install complete 300mm anti-burrow bitumen dipped.	m
B105.01.06	Supply and Install 3m long galvanized taper locking post at 3m centre to centre complete with 400mm Wide x 400mm breath X 600mm Deep class 15Mpa Concrete bases in ground with all components fully galvanised.	No

B105.02 New Gates

Change the following sub items:

"Item	Description	Unit
B105.02	New Gates	
B105.02.02	Double Leaf Gate complete as per drawing	No

B402.02.24 Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05) each per approved quotation

Add the following new payment clauses:

"Item	Description	Unit

B402.22	Custom made Steel special to be measured, manufactured and installed (epoxy powder coated - refer to Series 401.05):	Prov sum

Payment for custom made steel specials: The Contractor shall present a Quotation that will include for the measurement, manufacturing, installing and testing of the steel special. The quotation will be approved by the Engineer and reimbursement shall be for the actual purchase cost of the steel special plus 10%. (Excluding handling, delivery or any other fees).

Section 501 SURFACE DRAINS AND DRAINAGE BLANKETS

Change the following items:

"Item	Description	Unit
B501.06	Polyethylene sheeting 0,15 mm thick, or an equivalent approved material, for concrete road pavement	m ²
SERIES 7	STRUCTURES	

Add the following items:

"Item	Description	Unit
B701.02.04	excavating in intermediate material irrespective of depth	m ³
Section 704	CONCRETE	
704.02	Manufacture of precast concrete members	

Change the following items:

"Item	Description	Unit
704.02	Manufacture of precast concrete members	
B704.02	Establishment on site for-	
B704.02.01	Precast Reservoir	Lump sum
B704.02.15	Precast HC Slabs & Copings 250mm (MS6) pre-cast concrete hollow-core slabs	m ²
B704.02.16	250mm (MS9) pre-cast concrete hollow-core slabs	m ²

Section 705 PRESTRESSING OF CONCRETE

B705.04	Prestressing tendons	
B705.04.01	Prestressing of Reservoir walls complete, including grout	Lump Sum

Section 801 CONCRETE RESERVOIRS

Add the following items:

"Item	Description	Unit
B801.06	Waterproofing of vertical grout joints (150mm wide)	m2
B801.07	Waterproofing of Roof / Thermal Insulation	m2
B801.08	Allow Provisional Sum for Electrical Supply	Prov Sum
B801.08.01	(a) Handling cost in respect of item B801.08	%
B801.09	Allow Provisional Sum for Rand Water Works	Prov Sum
B801.09.01	(a) Handling cost in respect of item B801.09	%
B801.10	Allow Provisional Sum for Telemetry System	Prov Sum
B801.10.01	(a) Handling cost in respect of item B801.10	%
809.03.01	Miscellaneous Structural steel Items	
B809.03.01	250 MANHOLE MIXMF900x900x250	No
B809.03.02	Wall Connection Components	lump sum
B809.03.03	Column to Base Connection	lump sum
B809.03.04	Beam to Column Connection	lump sum
CAST IN SITU - KICKERS G STITCHING		
B809.03.05	Kicker blocks, Roof stitching, reinforcing & benching	lump sum
B809.03.06	Non Shrink Grout	m3

BILL NO 24: TESTING

Section 903 TESTING

Add the following items:

"Item	Description	Unit
B903.03	Special tests on concrete	
B903.03.01	Compressive-strength tests on concrete cubes	Prov Sum
B903.03.02	Charge on Prime cost sum (B903.03.01)	%

Add the following items:

"Item	Description	Unit
B903.04	Special tests on welded specimens	
B903.04.01	Specimen welded connection (fillet and arch welding)	Prov Sum
B903.04.02	Charge on Prime cost sum (B903.04.01)	

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.7 SOCIO-ECONOMIC PLAN AND COMMUNITY PARTICIPATION AND UPLIFTMENT THROUGH PROJECTS

SOCIO-ECONOMIC PLAN AND COMMUNITY PARTICIPATION AND UPLIFTMENT THROUGH PROJECTS

1. SOCIO-ECONOMIC PLAN

- 1.1 The successful tenderer shall provide an economic plan which will include the job creation plan (i.e. skills required and the number for each skill). The job creation plan where applicable should include interns.
- 1.2 The successful tenderer shall provide details of all training to be provided, through on-site, accredited training and formal training for employees at all levels, to ensure that they enhance their competence, and are able to provide the required operation and maintenance skills across the various process streams. This shall also include SHEQ training.
- 1.3 The successful tenderer shall also detail the capacity building and skills transfer initiatives to be implemented so that the City can manage the facility on contract completion, in a seamless and sustainable manner.

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

**C3.8 REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE
OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS:
HEALTH AND SAFETY SPECIFICATION**

REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS: HEALTH AND SAFETY SPECIFICATION

INDEX

Item	Description	Page No
1.	SCOPE	C3.8.1
1.1	Scope of Specification	C3.8.1
1.2	Philosophy.....	C3.8.1
1.3	Consultant OHS Inspector	C3.8.2
2.	INTERPRETATIONS	C3.8.2
2.1	Supporting specifications	C3.8.2
2.2	Application	C3.8.3
2.3	Definitions	C3.8.3
2.4	Duties, responsibilities and liabilities.....	C3.8.5
3.	GENERAL REQUIREMENTS OF HEALTH AND SAFETY PLAN	C3.8.15
3.1	Outline of COVID-19 Response Plan	C3.8.15
3.2	Outline of Health and Safety Plan	C3.8.17
4.	COVID-19 RESPONSE PLAN	C3.8.19
5.	SCOPE OF WORK.....	C3.8.20
6.	LOCATION OF THE WORKS	C3.8.20
7.	RISK MANAGEMENT	C3.8.20
7.1	General.....	C3.8.20
7.2	Forms of Risk Assessment.....	C3.8.21
7.3	Methodology for the Preparation of Risk Assessments.....	C3.8.22
7.4	Elements of a Risk Assessment	C3.8.22
8.	BASELINE RISK ASSESSMENT.....	C3.8.27
8.1	Purpose	C3.8.27
8.2	Scope.....	C3.8.27
8.3	Normative Reference	C3.8.28
8.4	Baseline Risk Assessment.....	C3.8.28
9.	INCIDENT MANAGEMENT	C3.8.34

Item	Description	Page No
10.	RESOURCES.....	C3.8.34
10.1	General.....	C3.8.34
10.2	Employees.....	C3.8.35
10.3	Plant, Vehicles and Equipment	C3.8.36
11.	MEDICAL FITNESS OF EMPLOYEES	C3.8.40
12.	EMPLOYEE FACILITIES	C3.8.40
13.	MATERIALS	C3.8.40
13.1	General.....	C3.8.40
13.2	Fall Protection Equipment	C3.8.40
13.3	Scaffolding	C3.8.41
13.4	Use and temporary storage of flammable liquids on construction sites	C3.8.41
13.5	Stacking and storage	C3.8.41
13.6	Personnel Safety Equipment and Facilities	C3.8.42
13.7	First Aid, Emergency Equipment and Procedures.....	C3.8.42
14.	CATEGORIES OF WORK	C3.8.42
14.1	General.....	C3.8.42
14.2	Site Clearance	C3.8.45
14.3	Earthworks.....	C3.8.46
14.4	Concrete.....	C3.8.46
14.5	Welding, flame cutting, grinding, soldering or similar operations.....	C3.8.47
15.	IMPLEMENTATION OF CONTRACTOR'S HEALTH AND SAFETY PLAN	C3.8.47
15.1	General.....	C3.8.47
15.2	Administrative Systems.....	C3.8.47
15.3	Reporting Systems	C3.8.47
15.4	Training	C3.8.48
15.5	Safety Meetings	C3.8.48
15.6	Inspections and Monitoring.....	C3.8.48
16.	AUDITING	C3.8.49
16.1	Internal Audits	C3.8.49
16.2	Audits by Employer of Safety Agent	C3.8.50
17.	MEASUREMENT AND PAYMENT	C3.8.50
17.1	Measurement and payment	C3.8.50

ANNEXURES

Annexure 1 Appointment letters

- 1.1 Appointment of Assistant Construction Supervisor
- 1.2 Appointment of Construction Site Health and Safety Officer
- 1.3 Appointment of Construction Vehicle and Mobile Plant Inspector
- 1.4 Appointment of Subcontractor
- 1.5 Appointment of Construction Supervisor
- 1.6 Appointment of Excavation Work Supervisor
- 1.7 Appointment of Formwork and Support Work Supervisor
- 1.8 Appointment of Ladder Inspector
- 1.9 Appointment of Risk Assessor
- 1.10 Appointment of Scaffolding Supervisor
- 1.11 Appointment of Stacking Supervisor

Annexure 2 Notification Templates

- 1.1 Notification of Construction Work

Annexure 3 Identified Health and Safety Hazards

C3.8 REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS: HEALTH AND SAFETY SPECIFICATION

1. SCOPE

1.1 Scope of Specification

This specification covers the principles, duties, responsibilities, liabilities, and requirements applicable in respect of health and safety in the workplace on construction work.

This document constitutes the Employers' Health and Safety Specification as defined in Section 5(1)(b) of the Construction Regulations, 2014 of the Occupational Health and Safety Act (Act 85 of 1993).

This specification applies to tunneling although the minimum requirements for tunneling are contained in the Mines Health and Safety Act. This specification however does not apply to underground construction at this point in time as covered by the Mines Health and Safety Act, 1996 (Act 29 of 1996) as amended.

1.2 Philosophy contingencies

Some of the terms and requirements of the Occupational Health and Safety Act and its Regulations may be novel to Contractors. This specification has therefore been prepared as an instructive guideline without being prescriptive, constraining the competitive advantage or interfering with the legal obligations of the responding parties.

The Health and Safety Plan required in terms Section 7(1)(a) of Construction Regulation 2014 as well as this specification may also be novel to Contractors. This specification has therefore been prepared in such a way to allow Contractors to employ the services of specialist consultants for the preparation and implementation of the same during the construction of the Works.

Health and safety can only be assured on construction works if all stakeholders buy into the Health and Safety plan and when the health and safety of all is an integrated line accountability of all management staff and workers on site. The management systems that are provided for in this specification is to enable the performance statistics of health and safety to be regularly captured, the intention of these systems is not to achieve health and safety by policing the conduct of the Contractor's employees but rather to ensure legal and regulatory compliance.

In addition to ensuring health and safety, the intention of the management system is rather to commercially exploit the benefit of doing things right the first time that goes hand in hand with the highest standard of health and safety performance. Accidents and injuries never pay. The loss of production and the cost of injuries, however, relatively infrequent they may be, far outweigh the effort required to maintain the highest standard of health and safety on any construction project.

The specification accordingly provides for:

- 2.1 Independent periodic audits to ensure an unbiased pursuit of health and safety,
- 2.2 Follow-up audits to ensure the implementation of prescribed remedial actions,
- 2.3 The review of the efficiency and effectiveness of the Contractor's Health and Safety Plan,
- 2.4 The preparation of regular reports of inspections and accidents to enable the tracking of changes in health and safety performance,
- 2.5 The monitoring of conditions on a continuously pro-active basis to ensure that hazards are without delay identified, assessed and remedied should it threaten the health and safety of persons and property,
- 2.6 Ad hoc inspections to ensure that health and safety is pursued with dedication and not out of intimidation or coercion, and
- 2.7 Development of all aspects of the Contractor's Health and Safety Plan.

The fundamental intention of this specification is that the preservation of health and safety will become a core value of all involved during the construction of the Works.

This Specification does not require the preparation of an unduly extensive or complex risk assessment. The Contractor should rather prepare a risk assessment which takes the size of the project, the size of the Contractor's organization, the conditions of the workplace and the nature, complexity and significance of the hazards likely to be encountered during the execution of the Works into account. All risk assessments must be done in accordance with Section 9 of Construction Regulation 2014.

1.3 Consultant OHS Inspector

TMA Consulting Engineers will be representing the client/client's agent as their Occupational Health and safety agent in accordance with Section 5(6) of the Construction Regulations of 2014.

2. INTERPRETATIONS

2.1 Supporting specifications

Where this specification is required for a project, the following legislation, regulations, and specifications (as amended) shall, inter alia, form part of the contract document:

- a) Occupational Health and Safety Act, (Act 85 of 1993), and all regulations associated with the scope of works which shall include, but shall not be limited to the following:
 - α. Construction Regulations, 2014.
 - β. Regulations for Hazardous Biological Agents, 2001 read with COVID-19 OHS Directives issued under the Disaster Management Act (Act 57 of 2002).
 - χ. General Safety Regulations, 1986.

- δ. General Administrative Regulations, 2003,
- ε. Driven Machinery Regulations, 2015,
- φ. Electrical Installation Regulations, 2009,
- γ. Electrical Machinery Regulations, 2011,
- η. Environmental Regulations for Workplaces, 1987.
- ι. Facilities Regulations, 2004.
- φ. Noise-Induced Hearing Loss Regulations, 2003

- a) Clauses 4.5.2, 4.6, 4.7 and 4.8 of the Contract Data.
- b) Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005, of City of Tshwane Metropolitan Municipality.

2.2 Application

This specification contains specific clauses of various regulations that are applicable to the scope of work under the provisions of the Occupational Health and Safety Act, (Act 85 of 1993) and its Regulations, in particular the Construction Regulations, 2014 promulgated on 07 February 2014 in terms of Section 43 of the OHS Act.

2.3 Definitions

In the Contract (as defined in clause 1. (1)(e) of the Conditions of Contract) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

- b) “Assistant Construction Supervisor” means a competent person appointed in accordance with Section 8(8) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- c) “Batch Plant/Bulk Mixing Plant Supervisor” means a competent person appointed in accordance with Section 20(1) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- d) “Construction Health and Safety Officer” means a competent person appointed in accordance with Section 8(5) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- e) “Construction Supervisor” means a competent person appointed on a full-time basis in accordance with Section 8(7) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- f) “Construction Vehicles & Mobile Plant Operator” means a competent person appointed in accordance with Section 23(1)(d) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- g) “Contractor” means the natural or juristic person or partnership whose tender has been accepted by or on behalf of the Employer and, who is defined as the Principal Contractor in Section 5(1)(k) of the Construction Regulations, 2014.

- h) “Demolition Work Supervisor” means a competent person appointed in accordance with Section 14(1) of the Construction Regulations, 2014, in writing by the Contractor with written notification to the Engineer.
- i) “Employer’s Designer” means the natural or juristic person or partnership named in the Appendix to Tender or any other natural or juristic person or partnership appointed from time to time by the Employer for the design of the portion of the Permanent Works which the Employer is responsible to design in terms of this Contract.
- j) “Contractor’s Designer” means the natural or juristic person or partnership appointed from time to time by the Contractor and notified in writing to the Engineer and Employer for the design of the portion of the Permanent Works which the Contractor is responsible to design in terms of this Contract, and for the design of the Temporary Works.
- k) “Electrical Temporary Installation Inspector” means a competent person appointed in accordance with Section 24(d) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- l) “Employer” means the natural or juristic person or partnership for whom the Works are to be executed, who is named as the Employer in the Conditions of Contract and who is known as the “Client”, in the Occupational Health and Safety Act, 1993 and its regulations.
- m) “Engineer” means the natural or juristic person or partnership named as the “Employer’s Agent” in the Conditions of Contract (clause 1.1.1.16) and appointed by the Employer to act as the Engineer in terms of this Contract.
- n) “Engineer’s Representative” means the person appointed by the Engineer in terms of Clause 1.1.1.17 of the Conditions of Contract.
- o) “Excavation Work Supervisor” means a competent person appointed in accordance with Section 13(1) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- p) “Explosive Powered Tools Issuer” means a competent person appointed in accordance with Section 21(2)(g)(i) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- q) “Fall Protection Developer” means a competent person appointed in accordance with Section 10(1)(a) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- r) “Fire Extinguisher Inspector” means a competent person appointed in accordance with Section 29(h) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- s) “Temporary Works Designer” means a competent person appointed in accordance with Section 12(1) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- t) “Temporary Works Supervisor” means a competent person appointed in accordance with Section 12(2) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- u) “Hazard” means any object, action or condition that can potentially harm the health and safety of persons or property.
- v) “Hazard Identification” means the identification and documenting of existing or expected hazards.

- w) "Health and Safety Consultant" means the natural or juristic person or partnership appointed by the Contractor to assist in any matters related to health and safety on the construction site.
- x) "Health and Safety Plan" means a documented plan, prepared by the Contractor, of work procedures to mitigate, reduce or control hazards identified.
- y) "Health and Safety Specification" means a documented specification of all health and safety requirements and criteria to mitigate, reduce or control hazards identified.
- z) "Health and Safety Representative" means the person/s designated in accordance with Section 17 of the Occupational Health and Safety Act.
- aa) "Ladder Inspector" means a competent person appointed in accordance with Section 13A (1) of the General Safety Regulations, in writing by the Contractor, with written notification to the Engineer.
- bb) "Material Hoist Inspector" means a competent person appointed in accordance with Section 19(8)(a) of the Construction Regulations, 2014 in writing by the Contractor, with written notification to the Engineer.
- cc) "Method Statement" means a document detailing the key activities to mitigate, reduce or control hazards identified.
- dd) "Professional Engineer" means any person employed from time to time by either the Employer or Contractor who holds registration as either a Professional Engineer or Professional Certificated Engineer under the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- ee) "Professional Technologist" means any person employed from time to time by either the Employer or Contractor who holds registration as a Professional Technologist under the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- ff) "Risk" means the likely occurrence and impact of a hazard.
- gg) "Risk Assessment" means a program carried out to identify and evaluate the likely occurrence and impact of all hazards.
- hh) "Risk Assessor" means a competent person appointed in accordance with Section 9(1) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- ii) "Safety Agent" means a competent natural or juristic person or partnership named in the Appendix to Tender or any other person appointed from time to time by the Employer and notified in writing to the Contractor to act on behalf of the Employer for the purposes of this specification.
- jj) "Scaffolding Supervisor" means a competent person appointed in accordance with Section 16(2) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- kk) "Stacking Supervisor" means a competent person appointed in accordance with Section 28(a) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.
- ll) "Subcontractor" means the natural or juristic person or partnership who is appointed by the Contractor with prior consent of the Engineer to execute certain tasks associated with the Works and who is also an employer as defined in section 1 of the Occupational Health and Safety Act.
- mm) "Suspended Platforms Supervisor" means a competent person appointed in accordance with Section 17(1) of the Construction Regulations, 2014, in writing by the Contractor, with written notification to the Engineer.

2.4 Duties, responsibilities, and liabilities

2.4.1 Principal Parties

This section covers the duties, responsibilities, and liabilities of the following principal parties:

- (a) Employer
- (b) Employer's Safety Agent
- (c) Contractor
- (d) Subcontractor
- (e) Employer's Designer
- (f) Contractor's Designer

The duties and responsibilities of the various principal parties are briefly summarized below (the numbers indicated correspond to the applicable regulation number in the Construction Regulations, 2014). The intention of the summary is not to replace the Regulations but is included for indicative purposes. The liabilities of each party are also shown.

- Employer

In addition to the duties, responsibilities and liabilities specified in the Conditions of Contract, the Employer shall have the following duties and responsibilities to ensure compliance with the Construction Regulations, 2014:

5.(1) A client must –

- a) prepare a baseline risk assessment for an intended construction work project;
- b) prepare a suitable, sufficiently documented and coherent site-specific health and safety specification for the intended construction work based on the baseline risk assessment contemplated in paragraph (a);
- c) provide the designer with the health and safety specification contemplated in paragraph (b);
- d) ensure that the designer takes the prepared health and safety specification into consideration during the design stage;
- e) ensure that the designer carries out all responsibilities contemplated in regulation 6;
- f) include the health and safety specification in the tender documents;
- g) ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures;
- h) ensure that the principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely;
- i) take reasonable steps to ensure co-operation between all contractors appointed by the client to enable each of those contractors to comply with these Regulations;
- j) ensure before any work commences on a site that every principal contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993);

- k) appoint every principal contractor in writing for the project or part thereof on the construction site;
- l) discuss and negotiate with the principal contractor the contents of the principal contractor's health and safety plan contemplated in regulation 7(1), and must thereafter finally approve that plan for implementation;
- m) ensure that a copy of the principal contractor's health and safety plan is available on request to an employee, inspector or contractor;
- n) take reasonable steps to ensure that each contractor's health and safety plan contemplated in regulation 7(1)(a) is implemented and maintained;
- o) ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
- p) ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;
- q) stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site;
- r) where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely; and
- s) ensure that the health and safety file contemplated in regulation 7(1)(b) is kept and maintained by the principal contractor.

In terms of Clause 4.6 of the Contract Data, the Contractor accepts sole liability as mandatory for due compliance in accordance with Section 37(2) of the Occupational Health and Safety Act, (Act 85 of 1993) and all regulations associated with the scope of work for which the contractor have been appointed. The Employer will be responsible for the duties imposed on the Employer in terms of the OHS Act and relevant regulations.

(a) Employer's Safety Agent

Where the Employer decides to appoint an agent in accordance with either Section 5(5) or Section 5(6) of the Construction Regulations, 2014, the duties and responsibilities as imposed by these regulations upon the Employer shall as far as reasonably practicable apply to his Safety Agent.

b) Contractor

In addition to the duties, responsibilities and liabilities specified in the Conditions of Contract, the Contractor shall have the following duties and responsibilities to ensure compliance with the Construction Regulations, 2014:

Only some sections of the Construction Regulations 2014 have been highlighted here but it does not mean that the Contractor does not have to comply with the sections not highlighted here.

- 4(1) Notify the provincial director in writing (Annexure 2 or similar form) 7 days prior to the commencement of the intended construction works. Ensure that a copy of the notification letter is kept on site for inspection on request as well as proof of its receipt by the Department of Labour.
- 7(1)(a) Prepare a Health and Safety Plan which addresses hygiene on site, based on the Employer's health and safety specifications.
- 7(1)(a) Implement the Health and Safety Plan from the Commencement Date until completion of the Works.
- 7(1)(b) Open and keep on site a health and safety file which must include all documentation required by the OHS Act and the associated regulations as well as the Employers health and safety specifications, which shall be made available on request of an Inspector, the employer or employers' agent.
- 7(4) Ensure co-operation between all contractors to enable each to comply with the provisions of Construction Regulations.
- 7(1)(c)(i) Provide any Tenderer or Sub-Contractor with copies of the Employer's health and safety specifications.
- 7(1)(c)(v) Appoint each Sub-Contractor in writing for their part of the project.
- 7(1)(c)(vi) Ensure that each Subcontractor's Health and Safety Management Plan is implemented and maintained on their portion of the Works.
- 7(1)(c)(vii) Ensure that periodic site audits and document verification is done at regular intervals as agreed between Principal Contractor and Sub-Contractor not exceeding 30 days in between.
- 7(1)(c)(viii) Stop any Sub-Contractor from executing Works, not in accordance with, the Employers Health and Specifications and/or the Principal Contractors Health and Safety Plan or which poses a threat to the health and safety of persons.
- 7(1)(c)(ix) Ensure that sufficient health and safety information and appropriate resources are made available where applicable, to the Sub-Contractor when changes are brought about to the design of the Works.
- 7(1)(c)(iv) Ensure that his Sub-Contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works.
- 7(1)(c)(ii) Ensure that his Tenderers have made provision in their tenders for the cost of health and safety measures during the construction of the Works in line with the requirements of the Employers Health and Safety Specification and his Health and Safety Management Plan.
- 7(1)(c)(x) Discuss and negotiate the contents of his Sub-Contractor's Health and Safety Plan, to ensure compliance with the Employer's Health and Safety Specification and consistent with the Contractors Health and Safety Management Plan.
- 7(2)(a) Approve his Sub-Contractor's Health and Safety Plan for implementation and to keep records of all such approvals on site for auditing purposes.
- 7(2)(a) On request, make available a copy of his and his Sub-Contractor's Health and Safety Plan to an employee, inspector, contractor, the Employer or the Employer's Safety Agent.
- 7(2)(b) Open and keep on site a health and safety file which must include all documentation required by the OHS Act and the associated regulations as well as the Employers health and safety specifications and the Principal Contractors Health and Safety Plan, which shall be made available on request of an Inspector, the employer or employers' agent and the Principal Contractor or its agent.
- 7(e) Hand over a consolidated health and safety file to the employer upon completion of the Works.
- 7(f) Ensure that a comprehensive and updated list of all his Sub-Contractors (including their respective sub-contracting agreements) are included in the health and safety files.
- 7(c)(iii) Satisfy himself on the competencies and resources of the Sub-Contractor he intends appointing.

- 7(5) Ensure that all employees undergo health and safety induction prior to permitting each employee access to the Works. The Contractor shall ensure that proof of such is available on site for auditing purposes.
- 7(6) Ensure that all visitors undergo health and safety induction and are provided with the necessary personal protective equipment. The Contractor shall ensure that proof of such is available on site for auditing purposes.
- 7(7) Ensure that every employee is in possession and carries at all times his proof of health and safety induction training.
- 8(5) The Contractor shall after due consideration of the complexity, size and potential hazards and associated risks as well as controls towards the mitigation of risks, appoint a safety officer in writing. The contractor shall submit a detailed CV of the envisaged Safety Officer appointment for final acceptance thereof by the Employer or his Safety Agent.
- 8(6) Satisfy himself with the competencies and resources of the construction safety officer he intends appointing.
- 8(7) Appoint a construction supervisor.
- 8(8) Appoint assistant construction supervisors if required by an inspector.
- 8(10) Appoint individual construction supervisors for individual construction sites.
- 9(1) Perform a risk assessment prior to the commencement of any construction work.
- 9(2) Analyze ergonomic related hazards and address the same in the risk assessment.
- 9(3) Ensure that all employees are informed, instructed and trained regarding any hazard and the related work procedures before any work commences. The contractor shall ensure that proof of such is available on site for auditing purposes.
- 9(4) Ensure that all Subcontractors are informed regarding any hazard as stipulated in the risk assessment. Further that Subcontractors conduct their own risk assessments as and when required
- 9(5) Consult with the health and safety committee on the development, monitoring and review of the risk assessment.
- 9(6) On request, make available copies of the risk assessments.
- 11(1)(a) Prevent the uncontrolled collapse of any structure which may become unstable due to the carrying out of construction work.
- 11(1)(b) Ensure that no structure is loaded in an unsafe manner.
- 11(1)(c) Ensure that all construction drawings are on site and available on request by an inspector, contractors, Employer, the Employer's Safety Agent or employee.

In terms of Clause 4.6 of the Contract Data, it shall be deemed that the parties to this Contract have agreed in writing in terms of Section 37(2) of the Occupational Health and Safety Act, 1993 that the Contractor accepts sole liability for due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures imposed by the Occupational Health and Safety Act, 1993 and all its regulations, including the Constructions Regulations, 2014, for which he is liable as mandatory.

c) Sub-Contractor

To ensure compliance with the Construction Regulations, the Subcontractor shall:

- 7(2)(a) Demonstrate a Health and Safety Plan based on the Employer's health and safety specification.
- 7(2)(a) Apply his Health and Safety Plan from the Commencement Date and until completion of the Works.

- 7(2)(c) Satisfy himself on the competencies and resources of any Sub-Contractor he intends appointing.
- 7(2)(e) Provide the Contractor with any information which might affect the health and safety of any person or which might justify a review of the Health and Safety Plan.

In addition to the above items, the Sub-Contractor shall, to ensure compliance with all regulations associated with the scope of work for which he was appointed.

d) Duties of Designer (Employer's Designer or Contractor's Designer)

To ensure compliance with the Construction Regulations, 2014, the Designer (as defined in Section 6 of the Construction Regulations, 2014) shall:

- 6(1)(c)(i) Make available to the Employer all relevant information affecting the pricing of the Works.
- 6(1)(c)(iii) Ensure that information relating to geo-sciences, designs loads, and the methods and sequencing of construction processes are made available to the Contractor in a report.
- 6(1)(d) Inform the Client/Employer of any hazards relating to the Works.
- 6(1)(d) Make available all information required for the safe execution of the Works.
- 6(1)(e) Not include dangerous procedures or hazardous materials in the structure's design which could be avoided.
- 6(1)(f) Make provision in the design of the Works for hazards likely to be encountered during its subsequent maintenance.
- 6(1)(g) Carry out inspections of the construction work during the construction period to ensure compliance with the designs.
- 6(1)(h) Stop any contractor from executing works not in accordance with the designs.
- 6(1)(i) Conduct a final inspection of the completed Works prior to its commissioning.
- 6(1)(i) Issue a completion certificate to the Contractor subsequent to a successful final inspection.
- 6(1)(j) Ensure that cognizance is taken of ergonomic design principles in order to minimize related hazards.

The Employer's Designer shall only accept responsibility to comply with the Construction Regulations, 2014 for that portion of the Permanent Works which the Employer is responsible to design in terms of the Contract.

The Contractor's Designer shall accept sole responsibility and liability to comply with the Construction Regulations, 2014 for that portion of the Permanent Works for which the Contractor is responsible to design in terms of the Contract as well as the design of the Temporary Works.

2.4.2 Secondary Parties

This section covers the duties, responsibilities, and liabilities of the following secondary parties:

- e) Construction Manager
- f) Construction Health and Safety Officer
- g) Contractor's Employees
- h) Fall Protection Developer
- i) Health and Safety Consultant
- j) Health and Safety Representative

k) Risk Assessor

- Construction Manager CR 8(1)

The Principal Contractor shall appoint in writing a full-time competent person as the Construction Manager for the intended project, with the duty of managing all the construction work on a single site, including the duty of ensuring that all occupational health and safety requirements are adhered to. In the absence of the Construction Manager an alternate person (assistant Construction Manager) shall be appointed under Section 8(2) of the construction Regulations 2014.

a) Construction Health and Safety Officer CR 8(5)

The Principal Contractor must appoint a Construction Health and Safety Officer with proof of registration with the statutory body approved by the chief inspector SACPCMP and the appointed person must be available full time on site.

Principal Contractor must appoint a Construction Health and Safety Officer with proof of registration with the statutory body approved by the chief inspector SACPCMP and the appointed person must be available full time on site.

The Contractor is responsible for the development of the position outcomes descriptors for the Construction Health and Safety Officer. This documentation shall be available on site for auditing purposes.

The Construction Health and Safety Officer shall if given an opportunity, provide an input into the Contractor's Health and Safety Plan in terms of CR 8 for the management and supervision of construction work.

b) Contractor's Employees

All employees will be responsible for safety on the construction site and the workplace as prescribed in Section 14 of the Occupational Health and Safety Act, (Act 85 of 1993) which is briefly summarized as follows:

- c) Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts,
- d) Co-operate with his employer with regards to health and safety to ensure that his employer complies with requirements imposed on him,
- e) Obey the health and safety rules and procedures laid down by his employer,
- f) Report any unsafe or unhealthy situation to his employer or to the health and safety representative for his workplace,
- g) Immediately report any incident including near miss incidents, in which he was involved, or which has caused an injury to himself or others, and
- h) Assist in inquiries and incident investigations.

No employee shall intentionally or recklessly interfere with, damage or misuse anything which is in the interest of health and safety.

- Fall Protection Developer CR 10(1)(a)

The Fall Protection Developer will be responsible for the preparation and maintenance of a fall protection plan to be implemented by the Contractor, in such a manner to ensure compliance with Section 10 of the Construction Regulations, 2014.

- d) Health and Safety Consultant CR 5(6)

The Health and Safety Consultant shall assist the Contractor in any health and safety matters on the Works for which he is appointed.

- e) Health and Safety Representative Section 17 of the OHS Act

The Health and Safety Representative shall fulfill the duties as set out in Section 17 of the Occupational Health and Safety Act, (Act 85 of 1993). A health and safety representative shall not incur any civil liability by reason of the fact only that he failed to do anything which he may do or is required to do in terms of the Act.

- f) Risk Assessor CR 9(1)

The Risk Assessor shall facilitate the risk assessment process of the Contractor or Sub-Contractor. The Risk Assessor shall be responsible for the compilation and implementation of a management plan towards the continuous mitigation of identified risks to as low as is reasonably practicable. All risks shall be managed in accordance with Section 9 of the Construction Regulations 2014.

2.4.3 Supervisors, Inspectors and Issuers

This section covers the duties, responsibilities and liabilities of the following Supervisors, Inspectors, and Issuers likely to be found on the Works:

- g) Construction Supervisor CR 8(7)

The Construction Supervisor shall be responsible for supervising the construction work inclusive of the implementation and maintenance of safe work practices on the construction site.

- a) Construction Vehicle & Mobile Plant Inspector CR 23(1)

The Construction Vehicle and Mobile Plant Inspector will ensure the safety of all construction vehicles and plant in such a manner to ensure compliance with Section 23 of the Construction Regulations, 2014. The inspector will also be responsible for the regular inspection of all vehicles and plant and the recording of his findings. The Contractor shall ensure that proof of such is available on site for auditing purposes.

- b) Demolition Work Supervisor CR 14(1)

The Demolition Work Supervisor will supervise and control all demolition work on the Works in such a manner to ensure compliance with Section 14 of the Construction Regulations, 2014. The supervisor will be responsible for all administration related to the demolition works. The Contractor shall ensure that proof of such is available on site for auditing purposes.

c) Electrical Temporary Installation Inspector CR 24(d)

The Electrical Temporary Installation Inspector will control all temporary electrical installations on the Works to ensure compliance with Section 24 of the Construction Regulations, 2014, the Electrical Installations Regulations, 1992 and SANS 0142. The Contractor shall ensure that proof of such is available on site for auditing purposes.

d) Excavation Work Supervisor CR 13(1)(a)

The Excavation Work Supervisor will supervise all excavation work on the Works in such a manner to ensure compliance with Section 13 of the Construction Regulations, 2014 and shall ensure that every excavation is inspected:

- e) On a daily basis before each shift,
- f) After every blasting operation,
- g) After an unexpected fall of ground,
- h) After substantial damage to supports, and
- i) After rains.

The Contractor shall ensure that proof of such is available on site for auditing purposes.

• Explosive Power Tools Issuer CR 21(2)(g)(i)

The Explosives Power Tools issuer will control the issuing and collection of explosive tools, cartridges and nails or studs to ensure compliance with Section 21 of the Construction Regulations, 2014. The Contractor shall ensure that proof of such is available on site for auditing purposes.

f) Fire Extinguisher Inspector CR 29(h)

The Fire Extinguisher Inspector will be responsible for the operation and inspection of all firefighting equipment on the Works to ensure compliance with Section 29 of the Construction Regulations, 2014. The Contractor shall ensure that proof of such inspections is available on site for auditing purposes.

g) Ladder Inspector GSR 13A(1)

The Ladder Inspector will be responsible for the regular inspection and recording of his/her findings of all ladders on the Works and to ensure compliance with Section 13A of the General Safety Regulations. The Contractor shall ensure that proof of such is available on site for auditing purposes.

h) Material Hoist Inspector CR 19(8)(a)

The Material Hoist Inspector will be responsible for the daily inspection of material hoists or similar machinery and to ensure Works to ensure compliance with Section 19 of the Construction Regulations, 2014. The inspector must have experience pertaining to the erection and maintenance of all hoists on the Works. The inspector must be able to determine the serviceability of the entire material hoist including guides, ropes and their connections, drums, sheaves or pulleys and all safety devices. The Contractor shall ensure that proof of such is available on site for auditing purposes.

i) Scaffolding Supervisor CR 16(1)

The Scaffold Supervisor will be required to supervise all scaffolding work operations carried out on the Works and to ensure compliance with Section 16 of the Construction Regulations, 2014 as well as ensure compliance with applicable SANS 10085-1:2014 Standards. The Contractor shall ensure that proof of such is available on site for auditing purposes.

j) Stacking and Storage Supervisor CR 28(a)

The Stacking Supervisor shall supervise the stacking and storage of all articles on site and shall be responsible to ensure compliance with Section 28 of the Construction Regulations, 2014.

k) Suspended Platform Supervisor CR 17(1)

The Suspended Platform Supervisor will supervise all suspended platform work operations carried out on the Works and to ensure compliance with Section 17 of the Construction Regulations, 2014. The supervisor will also see to it that all suspended platform erectors, operators, and inspectors are competent to carry out their work. The Contractor shall ensure that proof of such is available on site for auditing purposes.

3. GENERAL REQUIREMENTS OF HEALTH AND SAFETY PLAN & HAZARDOUS BIOLOGICAL AGENTS

l) Hazardous Biological Agents

It will be expected for the contractor to include in his safety plan a response plan to address the protection of employees and people on site against Hazardous Biological Agents as outlined in the Regulations for Hazardous Biological Agents 2022. The plan will outline how the contractor will in the event of an outbreak (such as any contagious illnesses) and or contact with biological waste (such as toilet waste, sewer waste) protect employees from exposure. The plan will also provide details on any critical information such as safety tips, hygiene protocols, the use of protective equipment etc.

Contractors should describe how their safety management systems will work and what control procedures they plan on using to ensure safety on the construction site

The following generic aspects should be covered in their safety plan

- 3.1 What administrative procedures the Contractor envisages to use in the implementation and maintenance of the safety plan with reference to the construction site
- 3.2 How continuous assessment of the safety plan will be assessed and implemented with respect to construction site
- 3.3 What control systems the Contractor envisages to implement on site to support his safety program
- 3.4 How the Contractor will ensure that he adheres to the construction regulations in respect of competent persons for appointments
- 3.5 What external resources the Contractor envisages on using to ensure successful implementation and sustainability of the safety plan
- 3.6 What training to employees the Contractor envisages and how he would go about to execute it?
- 3.7 The Contractor should indicate which competent persons he plans on employing

During the tendering phase it will be expected from the tenderer to briefly explain how the abovementioned will be accomplished.

Once a successful tenderer has been appointed, the Contractor shall supply a detailed Health and Safety Plan for review by the Employer, prior to site mobilization, to ensure compliance with the Construction Regulations, 2014. Mobilization shall be dependent upon the acceptance of the Contractor's Health and Safety Management Plan by the Employer. The Contractor's Health and Safety Plan should include, but not be limited to, those sections indicated in Section 3.2 of this specification.

- **Outline of Health and Safety Plan**

The Contractor's Health and Safety Plan prepared in accordance with this specification shall consist of at least the following sections and sub-sections:

- Aim and Scope of Plan,
- Hazardous Biological Agents,
- Scope of Work:
 - Main Construction Work,
 - Construction/Completions of 30ML water reservoir
 - Completion of the Bulk Water Supply Line, Steel and uPVC Pipeline
 - Construction of Reservoir Control Buildings
 - Construction of Reinforced Concrete Chambers.
 - Installation of Cathodic Protection System
 - Completion of the Water Reticulation Pipeline.
 - Completion of the Sewer Reticulation Pipeline.
 - Traffic accommodation during the construction stage.
 - Pipe Jacking for Culverts crossing major road.
 - Pipe Boring for pipes crossing road.
 - Construction and remedial works of sewer manholes.
 - Construction of reservoir control buildings.
 - Construction of reinforced concrete paved access road

- Excavations,
 - Demarcation of excavations,
 - Access and Egress,
 - Shoring,
 - Inspections,
 - Public Access,
 - Bulk Earthworks,
 - Clearing and Grubbing,
 - Stockpiling,
 - Borrow pits,
 - Transporting,
 - Environmental Management Plan
 - Temporary Works,
 - Formworks,
 - Support Works,
 - Road Works,
 - Traffic Accommodation Plan
- Location of the Works
- Risk Management,
 - Alternative Forms of Risk Assessment,
 - Methodology of Risk Assessment,
 - Elements of Risk Assessment,
 - Scope of assessment,
 - Risks Identified,
 - Risk Analysis,
 - Risk Evaluation,
 - Risk Treatment,
 - Monitoring and reviewing,
- Incident Management,
 - Incident Management Procedures,
 - Reporting of Incidents,
 - Incident and Accident Investigations,
- Resources,
 - Health and Safety Staffing Organogram,
 - Supervisors, Inspectors, and Issuers,
 - Employees,
 - Sub-Contractors inclusive of their scope of work and their core resources,
 - Training,
 - Plant,
 - Vehicles,
 - Equipment
- Medical Fitness of Employees
 - Entry Medical
 - Medical Surveillance of employees

- Exit Medicals
- Employee Facilities,
 - Facilities Management
 - Hygiene
- Materials,
 - Temporary Materials
 - Permanent Materials
- Categories of Work
- Implementation of Health and Safety Plan,
 - Administrative systems,
 - Training,
 - Reporting,
 - Monitoring,
 - Inspections,
- Auditing,
 - Internal audits,
 - Follow-up audits,
- Financial Aspects,

4. Hygiene

This section of the specification provides guidelines to the Contractor in addressing hygiene on site.

Every employer is responsible for providing a clean and healthy environment for their employees. The contractor's safety plan must address the provision of ablution facilities for workers, and maintenance of such facilities. The contractor must also address the provision of clean drinking water during shift, the provision of sheltered eating/rest area for workers.

5. SCOPE OF WORK:

The scope of work must highlight all construction activities as well as associated works on the project and physical elements of the project.

Under each of the construction activities and associated works the contractor must provide a clear description of how the activities shall be managed.

Where management plans are required, the contractor is to provide a brief description of the plan, the purpose of the plan as well as the implementation process and shall attached to the health and safety a copy of the relevant management plan. E.g., Traffic Accommodation Plan etc.

6. LOCATION OF THE WORKS

Under this section the contractor must provide all the information pertaining to exactly where the project is situated.

The contractor must also make reference to the size of the project, site boundaries, reference beacons or landmarks as well as any area that shall be used outside of the site boundaries which shall be used as site camps, site offices, stockpiles and spill sites, borrow pits, laydown areas as well as areas used to provide early warning systems e.g., Road Closures

• RISK MANAGEMENT

7.1 General

This section of the specification provides guidelines for the Contractor in preparation of risk assessments in order to ensure compliance with Section 9 of the Construction Regulations, 2014. This section highlights the principles related to the preparation of suitable and sufficient risk assessments. Contractor Staff intending to prepare risk assessments should be trained and suitably experienced in the application envisaged.

A suitable and sufficient risk assessment is an assessment which:

- Accounts for risks that are likely to arise during the construction of the Works,
- Enables the development and implementation of systems to manage the risks,
- Remains valid for a reasonable period of time,
- Provides a basis for training of employees, and
- Improves working procedures and introduce long term controls.

The requirements of the Construction Regulations, 2014, will not be satisfied by a single risk assessment exercise that holds good for all time. The risk assessment process on the Works is an ongoing process, and the contractor should have a risk assessment review plan in place.

The objectives of risk assessments are to:

- 3.2 Identify risks on the project,
- 3.3 Eliminate risks on the project, and where risk elimination is not feasible, Identify the various options for risk mitigation or reduction,
- 3.4 Identify the risks that require careful ongoing management, and
- 3.5 Identify the nature of the required ongoing attention.

1. Forms of Risk Assessment

In order to ensure compliance with the Construction Regulations, 2014, the Contractor will be required to carry out the following three forms of risk assessment:

i. Baseline or datum risk assessments

The Contractor will be required carry out a risk assessment before the commencement of construction activities on the Works. This “baseline” or “datum” risk assessment will form part of the Contractor’s Health and Safety Plan. The risks and hazards to which persons, plant, vehicles and facilities may be exposed during the construction of the Works should be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined, and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

4. Issue based risk assessments

The Contractor will be required to carry out separate risk assessments during construction of the Works when methods and procedures are varied, for example when:

- Designs are amended,
- New machines are introduced,
- Plant is periodically cleaned and maintained,
- Plant is started-up or shut-down,
- Systems of work change or operations alter,
- Incidents or near-misses occur, or
- Technological developments invalidate prior risk assessments.

- Continuous risk assessments

The Occupational Health and Safety Act specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk-free environment on an ongoing basis. This is achieved by continuous risk

assessments, the most important form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Regular inspections and audits,
- Maintaining general hazard awareness,
- Pre-work risk assessment,
- Daily Safety Task Instructions (DSTI's),
- Planned Task Observations,
- Post Task Observations,
- SLAM Reports (Stop, Look, Assess, Manage)

- **Methodology for the Preparation of Risk Assessments**

The Contractor shall in the preparation of his risk assessments, follow the following general principles:

- Employ a team of suitably qualified individuals with appropriately varied and relevant experience in risk assessment,
- The appointed risk assessor shall lead the risk assessment,
- Provide the team with background data, scope of work, potential hazards and underlying causes, and
- Where necessary employ experts for complex risk assessments and aspects of risk assessments that require experiential judgment,
- Institute an ongoing system of identifying aspects of the work that require risk assessment, and
- Conduct risk assessments in workshops of the team or by individual members of the team under guidance of the leader as appropriate to the situation.

7 Elements of a Risk Assessment

• *General*

The process of carrying out a risk assessment consists of a number of well-defined steps. These steps improve decision-making by providing a greater understanding of the risks and their impacts. The main steps or elements of the risk assessment process are as follows:

- Consider scope and nature of risks involved, determine purpose and physical and legal bounds of assessment and define risk evaluating criteria,
- Systematically identify risks,
- Analyze risks with regard to causes, likelihood of occurrence and possible consequences against the background of existing controls and its effectiveness,
- Evaluate risks in terms of pre-established criteria to determine need and priority for attention,
- Treat risks through a process of risk elimination, substitution, controlling risk at source, risk mitigation such as training and as far as risk remains, provide personal protective equipment (PPE),
- The mitigation methods must focus the 4 T's of risk management.
7.2 Terminate the risk entirely at the source through engineering controls.

7.3 Treat the risk through a combination of engineering controls and Safe Work Procedures.

7.4 Transfer the risk to someone (company) more suited to handle the specific types of risks.

7.5 Tolerate the risk depending on the type of risk as well as the residual risk factor only after the implementation of engineering controls and/or safe work procedures and the use of personal protective equipment.

Bear in mind that Personal Protective Equipment (PPE) shall only be identified as a last resort in the mitigation of risks.

7.2.1 Monitor and review progress and performance in terms of management system, and

7.2.2 Communicate and consult.

The following sections 4.4.2 to 4.4.7 deal with items (2) to (7) above. These items form the continuing process of the risk assessment as indicated in Figure 1, below.

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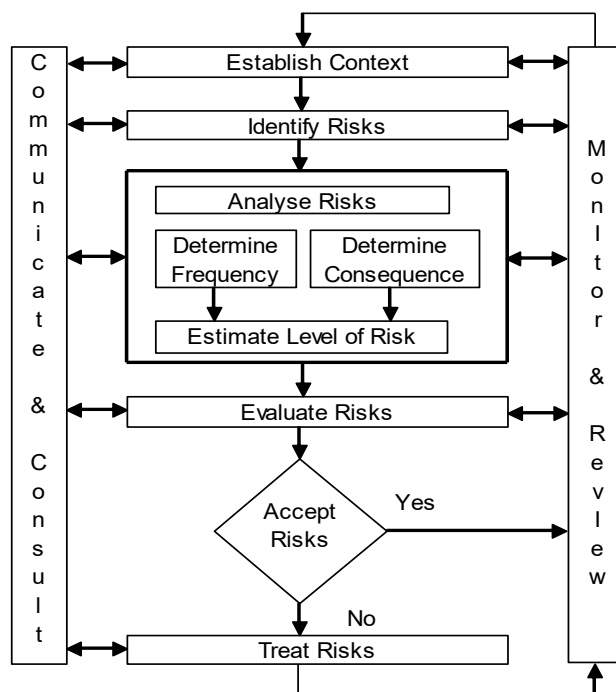


Figure 1: Risk Management Process

The Contractor shall ensure that the risk assessment compiled as part of his Health and Safety Plan contains at least these items.

7.2.2 Risk Identification

The Contractor should regard this step of the risk assessment as the most important. Subsequent analysis and evaluation of risks and the development of risk control measures are wasted if the risks or hazards on the Works are not carefully identified.

The Contractor should bear the following principles in mind when identifying the risks:

- Systematically address all risks or hazards on the Works,
- Review all aspects of the work, but consider only those that have a potential to cause harm,
- Rank the risks identified in order of importance and then use appropriately advanced techniques to deal with major risks,
- Deal mainly with major risks and don't obscure these with unimportant information, especially minor risks,
- Address what actually happens in the workplace during the work activity
- Consider all persons that may be affected,
- Highlight those groups and individuals who may particularly be at risk, and
- Review the adequacy and effectiveness of existing safety controls and measures

7.2.3 Risk Analysis

In this step, the Contractor will be required to analyze the risks identified by determining each risks frequency and magnitude or severity of the consequence of the risk or hazard.

The frequency of occurrence of a hazard may be expressed as the number of times that it may occur in a year, decade, lifetime, century, or longer period, according to comparative human experience. The magnitude of the likely consequence of a hazard may be expressed in terms of the degree of incapacitation, number of people or costs involved. The frequency of occurrence of a hazard and the magnitude of its consequence may be compounded as the risk that it poses as shown in the "risk matrix" in Figure 2 below.

Frequency of Occurrence of Hazard	Severity of Consequences of Potential Hazard					
	1 Medically treatable injury	1 Compensable injury	10 Compensable injuries	1 Permanently disabling injury	1 Fatality	10 Fatalities
Frequent; 1 or more occurrences per year	Medium	High	Very high	Severe	Severe	Severe
Several times during a career; 0.1 occurrences per year	Medium-low	Medium	High	Very high	Severe	Severe
Unlikely, but possible during a career; 0.01 occurrences per year	Low	Medium-low	Medium	High	Very high	Severe
Very unlikely during a career; 0.001 occurrences per year	Low	Low	Medium-low	Medium	High	Very high
Barely credible; 0.0001 occurrences per year	Low	Low	Low	Medium-low	Medium	High

Figure 2: Compounded Risk Matrix

The columns in the table represent the likely consequence of the hazard and the rows, the frequency of occurrence. The scales for both quantities represent consistent progressions, able they qualitative. The risks evidently range from low to severe. Note that diagonals in the matrix represent the risks of the identified hazards, taking the effectiveness of controls into consideration.

The table represents a typical risk matrix that need not necessarily be adopted by the Contractor. The Contractor may use an alternative risk matrix provided that it is approved as part of his Health and Safety Plan.

The Contractor must describe in full the method of risk evaluation as well as provide and describe the Risk Formula used to determine the risk factor

- *Risk Evaluation*

In this step the Contractor will be required to compare the assessed risk with similar risks previously experienced for the purpose of deciding how to treat the risk. A useful systematic approach for this purpose is as follows:

7.3 If the assessed risk exceeds similar risks that have occurred in the past and that are considered to be unacceptable, the assessed risk will require treatment depending upon its magnitude as discussed in Section 4.4.5, or

- If the assessed risk exceeds similar historical risks that are acceptable, treatment of the assessed risk will depend on the extent by which it exceeds the historical risks, or

7.4 If the assessed risk is less than historical risks that are unacceptable, treatment of the assessed risk will depend on the extent by which it is less than the historical risks, or

7.4.1 If the assessed risk is less than historical risks that are acceptable, the assessed risk would also be acceptable and would not require any treatment.

1) *Risk Treatment*

In this step, the Contractor will select and implement appropriate measures for dealing with risk. Typically measures comprise the following:

- a. Elimination by changing designs, procedures, management methods, etc, applicable to high frequency–high consequence risks, or
- b. Reduction by changing designs, procedures, management methods, etc, applicable to high frequency–high consequence risks, or
- c. Minimization by changing designs, procedures, management methods, etc, applicable to high frequency–low consequence risks, or
- d. Transfer or share whole or part of the risk to another party by insurance, contractual arrangements or organizational structures, applicable to low frequency–high consequence risks, or
- e. Control to ensure that risks do not increase, applicable to low frequency–high consequence risks, or
- f. Retention together with provision of monitoring and personal protective equipment, applicable to low frequency–low consequence residual risks after reduction, or
- g. Acceptance without particular action other than provision of personal protective equipment, applicable to low frequency–low consequence risks.

The following principles enable the optimum treatment to be determined:

- 7) Avoid risks altogether, if possible, by using different approaches, substances or methods of work,
- 8) Combat risks at source rather than by adopting secondary measures,
- 9) Adapt work to the individual rather than the individual to the work, that is, in the design consider the people and their attributes that will operate the system
- 10) Take advantage of technological and technical progress,
- 11) Risk prevention measures must be part of a coherent policy and approach to safety management that involves performance measurement, goal setting, feedback, and analysis,
- 12) Give preference to measures that protect the whole work force,
- 13) Ensure that those for whom protection is provided understand what they need to do to make sure that the protection works, and
- 14) Ensure that measures to control risks are an accepted part of an active health and safety culture supported by all levels of the organization; single risk reduction initiatives invariably fail.

7.4.2 *Reporting and Recording*

The Contractor shall ensure that the risk assessment process is recorded in the form of a report and included in his Health and Safety Plan. The report should be easily accessible to the Contractor's employees, their representatives, to inspectors, the Employer or his Safety Agent and the Engineer. The essential contents of the report should be as follows:

- i) Objectives and expected outcomes,

- ii) Description of the Works under assessment,
- iii) Summary of context of study
- iv) Composition of risk assessment team, (including qualifications and relevant experience),
- v) Approach used to systematically identify risks,
- vi) Identified risks (ranked in order of priority),
- vii) Method adopted for assessing frequencies and consequences of risks,
- viii) Consequences (ranked in order of magnitude),
- ix) Identification of individuals and groups who may be affected by major hazards and risk and who may especially be at risk,
- x) Basis for defining safety standards to be achieved,
- xi) Contractor's resources devoted to risk assessment,
- xii) Actions proposed to reduce unacceptably high risks,
- xiii) Review effectiveness of existing safety measures to control risks, and
- xiv) Implementation program of selected treatments (including controls to manage unacceptably high risks).

7.4.3 *Monitoring and Review*

It is necessary to monitor risks, the effectiveness of the risk treatment plan and the strategies and management system set up to control implementation. Control of the risk management program entails the setting of standards, monitoring actual performance, comparing the performance with the standards, and correcting any deviations from the standard. Risks and the effectiveness of the control measures need to be monitored to ensure changing circumstances do not alter risk priorities. Few risks remain static.

Ongoing review is essential to ensure that the management plan remains relevant. Factors that affect the likelihood and consequences of an outcome may change, as may factors that affect the suitability or cost of the various treatment options. If an accident occurs, or if more is learnt about the hazards in the workplace, the risk assessment may need to be reviewed or modified. Hazards may be observed that have not been anticipated or previously identified and which may require appropriate measures to be taken. After an accident has occurred, it is important to determine whether it was predicted, whether preventive measures were identified, and if so, why they did not work, whether the risk assessment is still suitable and sufficient if it failed to predict the accident, whether the decision to accept a predicted risk as tolerable is still valid, why the accident occurred and what should be done to prevent similar accidents occurring again. It is therefore necessary to regularly repeat the risk management cycle, the time between reviews being dependent on the nature of the risks and the degree of change likely to take place in the work activity. Review is an integral part of the risk management treatment plan.

7.4.4 *Communication and Consultation*

The Contractor will be required to communicate and consult with internal and external stakeholders during each step of the risk assessment process. Stakeholders will include the Employer and his Safety Agent, the Engineer and the Contractor's employees and consultants.

Effective communication will ensure that those responsible for implementing the risk management process and those with a vested interest, understand the basis on which decisions are made and why particular actions are taken. It will also ensure that the perceptions of all those involved are noted and accommodated during the process.

8. BASELINE RISK ASSESSMENT

- **Purpose**

The purpose of this Baseline Risk Assessment (BRA) is to ensure that the Principal Contractor and Contractors are taking the highlighted risks and hazards in consideration when they develop their site-specific health and safety plans for the project.

It is to further ensure that the client has advised and inform the Principal Contractor, Contractor and the Department of Labour of the prevailing risk and hazards associated with the project before commencement with the work on site.

To ensure that the Principal Contractor, Contractor identify, analyse, evaluate, and establish control measures to eliminate, mitigate before issuing Personal Protective Equipment of clothing to the workers or any other person affected by activities on site.

- **Scope**

This Baseline Risk Assessment (BRA) apply to the above-mentioned project and for the application of Construction work permit as well as for the Principal Contractor & Contractor appointed for the Project.

- **Normative Reference**

Section 8(2)(d) of the Occupational Health and Safety Act

Section 5(1)(a) & Section 9 of the Construction Regulation 2014.

Section 6 of Regulations for Hazardous Biological Agents read with COVID-19 OHS Directives.

- **Baseline Risk Assessment**

In terms of Construction Regulation 5(1)(a), a client is required to prepare a baseline risk assessment of the intended construction project. This Baseline Risk Assessment has been developed in order to ensure that risks and hazards are identified, analysed and evaluated in order to eliminate, mitigate and reduce the exposure to such risk.

Effort shall be made to identify more site-based risks and hazards and possible solutions as far as is reasonably practicable to prevent exposure to such risks and hazards, a task-based risk assessment shall have conducted on site.

In the table below are some of identified baseline risks to be taken into consideration when preparing the health and safety plan for the project:

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
1.	Access control	Public access to site	Injury & Damage to property	Medium	Protection of site (Barricade and fence); Controlled access point; Secure; Signage (Information, Warning & Prohibition signs); Traffic management; Notifications and planning & Identification of high risk areas & Location.
2.	Transportation	Transportation of worker & Material	Road accident; Overloading;	Medium	Training; Inspection of equipment; Competent person; Safe work and operating procedures; Personal Protective Equipment & Clothing
3.	Traffic Accommodation	Traffic movement	Accident	Medium	Protection of the road (Barricade, barriers, speed humps); Road traffic control; access point; Signage (Information, Warning & Prohibition signs); Traffic management; Notifications and planning & Identification of high risk areas & Location.
4.	Site Establishment	Plant, Equipment Machinery; workers and environment	Injury; damage to property & Environmental impact	Low	Supervision; Prevent exposure; Substitution; Engineering controls;

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
					Training; Inspection of equipment; Competent person; Safe work and operating procedures; Personal Protective Equipment & Clothing
5.	Underground Services & Overhead powerlines	Water/Sewage/gas pipes & Electrical cables	Injury; Electrocution; damage to property & Environmental impact	Medium	Supervision; Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent & qualified person; Safe work and operating procedures; Lockout & Tag; Personal Protective Equipment & Clothing
6.	Redirecting Isolation and disconnecting Services	Electricity, Water/Sewage/gas pipes; Excavation	Electrocution; damage to property & Environmental impact	Medium	Supervision; Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent & qualified person; Safe work and operating procedures; Lockout & Tag; Personal Protective Equipment & Clothing
7.	Storage of flammable material and liquids	Fuel storage; gas bottles; Smoking; spark	Fire; explosion; damage to property; Environmental impact	Medium	Management & Control of exposure; Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment;

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
					Competent person; Safety Symbolic signs (Information, Warning & Prohibition); Safe work and operating procedures; Personal Protective Equipment & Clothing
8.	Temporary Electrical Installation	Electricity	Electrocution; Fire; explosion damage to property	Low	Supervision; Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent & qualified person; Safe work and operating procedures; Lockout & Tag; Personal Protective Equipment & Clothing
9.	Bulk Earthworks (surface works) and stockpile including excavations deeper than 1.5 metres	Underground Services; Plant, Equipment Machinery; Excavation; workers and environment	Injury; Electrocution; damage to property; ground collapse& Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Rescue plan Personal Protective Equipment & Clothing
	Bulk Earthworks (excavations) and excavations deeper than 1.5 metres	Underground Services; Plant, Equipment Machinery; Excavation; workers and environment	Injury; Electrocution; damage to property; ground collapse& Environmental impact	Medium	Locating of underground services; Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person;

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
					Safe work and operating procedures; Rescue plan Personal Protective Equipment & Clothing
10.	Mobile plant and construction equipment	Plant, Equipment Machinery; workers and environment	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Personal Protective Equipment & Clothing
11.	Demolition work	Wall, concrete slab, Steel work	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Rescue plan Personal Protective Equipment & Clothing
12.	Temporary works (Formwork and support work) including reinforcement and shutters.	Scaffolding; Shatters; Beams; Reinforcement; Concrete works	Injury; damage to property & Environmental impact	Low	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Fall protection; Rescue plan Personal Protective Equipment & Clothing
13.	Bulk mixing plant (Batch plant)	Cement; sand; fly ash; concrete stone; pumps	Injury; damage to property &	Low	Prevent exposure; Substitution; Engineering controls;

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
			Environmental impact		Training; Inspection of equipment; Competent person; Safe work and operating procedures; Dust suppression; Personal Protective Equipment & Clothing
14.	Working close to water	Reservoirs; Wastewater dams; Pits and water channels	Injury; damage to property & Environmental impact	Low	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Rescue plan Personal Protective Equipment & Clothing
15.	Confined space	Manholes, channels; Silos	Injury; damage to property & Environmental impact	Low	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Rescue plan; Personal Protective Equipment & Clothing
16.	Electrical Equipment and hand tools	Jack hammers; grinders; impact drillers; concrete cutter etc.	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Fall protection; Rescue plan

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
					Personal Protective Equipment & Clothing
17.	Working at heights	Lifting Equipment; Crane; Scaffold; Ladder; Rope access work	Falling; Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Fall protection; Rescue plan Personal Protective Equipment & Clothing
18.	Pressure Equipment	Compressor air	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Personal Protective Equipment & Clothing
19.	Enabling & Builders work	Concrete work; Brick work; Joinery; plumbing; Drainage	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Substitution; Engineering controls; Training; Inspection of equipment; Competent person; Safe work and operating procedures; Fall protection; Personal Protective Equipment & Clothing
20.	Covid-19	Hazardous biological agents (Contaminated areas, surfaces & equipment, tools); (Contaminated	Injury; damage to property & Environmental impact	Medium	Prevent exposure; Decontaminating; Sanitisation; Screening & testing; Isolating and quarantining;

ITEM	ACTIVITY ISSUE	HAZARD	RISK	RISK RATING (High/Med/Low)	MINIMUM CONTROL
		Personal Protective Equipment & Clothing)			Engineering controls; Training& information; Safety symbolic signs; Provision of hand washing facilities & soap; Inspection of equipment; Competent person; Safe work and operating procedures; Personal Protective Equipment & Clothing

9. INCIDENT MANAGEMENT

Under this section the contractor must provide a clear description on how he intends to manage all types of incidents that may occur during the works based on the scope of work.

It shall furthermore include the reporting of all reportable incidents in accordance with Section 24 of the Occupational Health and Safety Act.

The contractor shall also provide for the investigation of incidents and/or accidents and how similar incidents/accidents shall be avoided.

10 RESOURCES

10.1 General

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993, Regulation 6 for Hazardous Biological Agents and all its Regulations and related incorporated standards with regards to the resources and facilities intended for use on the temporary and permanent Works.

7.4.5 Employees

10.2.1 Inspectors, supervisors and Issuers

The Contractor shall provide in his Health and Safety Plan his intended Staffing Organogram for the Works. The organogram should include those inspectors, supervisors and issuers as envisaged in the Construction

Regulations, 2014 required for the Works and any additional supervisory staff members as the Contractor (having taken the scope of the Works into account) considers necessary.

Copies of the supervisory staffs' curriculum vitae or portfolio of evidence and their appointment letters should be appended to the Contractor's Health and Safety Plan.

The Contractor's Health and Safety Plan should in addition cover at least the following aspects:

- The number of unskilled, semi-skilled and skilled (including Foreman, Charge hands, Artisans, Operators, Drivers, Clerks, Storeman and Team Leaders) employees he intends employing on the Works,
- The health and safety training to be provided to the Contractor's employees,
- The programme of the health and safety training,
- Systems for the review of the effectiveness of the training provided, and
- Systems to determine further training requirements throughout the construction period.

In preparing his Health and Safety Plan, the Contractor shall ensure compliance with Clause PS 22 in Section 4.2 of the Project Specifications.

Pro-forma letters of appointment for the various inspectors, supervisors and issuers as contemplated in the Construction Regulations, 2014 are included in Annexure 1 to this specification for use by the Contractor. The Contractor shall ensure that he includes in his Health and Safety Plan the appointment letters for all his inspectors, supervisors and issuers appointed for the Works.

- *Subcontractors*

The Contractor shall with reference to the use of subcontractors on the Works and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 7.4.6 The steps intended to ensure that his Subcontractors prepare, implement and maintain Health and Safety Plans,
- 7.4.7 How health and safety information will be made available to his Subcontractors when changes are brought about to the design,
- 7.4.8 How he intends determining that his Subcontractors are registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works,
- 7.4.9 How he intends determining if his Subcontractors have made provision in their tenders for the cost of health and safety measures during the construction of the Works,
- 7.4.10 How he intends satisfying himself on the competencies and resources of Subcontractors he intends appointing, and
- 7.4.11 How he intends ensuring that his Subcontractors perform risk assessments prior to commencing their respective portions of the Works.

- *Competencies*

The Contractor shall establish if a person is competent to perform a certain duty or be appointed in a certain capacity by requesting all candidates to supply the required certificates of competency. Where certificates of competencies cannot be delivered, the Contractor shall request a portfolio of evidence from the respective candidates.

Contractors should do enquiries at the South African Qualifications Authority (SAQUA) relating to the qualifications required for appointment of competent persons.

7.4.7 Physical and Psychological Fitness

Were required by the Occupational Health & Safety Act and its regulations the contractor shall ensure that his employees are in possession of a valid medical certificate of fitness to work in such an environment.

In terms of Section 7(8) of the Construction Regulations 2014 - A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

7.4.8 Plant, Vehicles and Equipment

8.1 Suspended platform

The Contractor shall with reference to Section 17: Suspended platforms of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 8.2 How he intends complying with SABS 1808 and SABS 1903,
- 8.3 What systems he intends using to ensure the safety of all suspended platforms,
- 8.4 What tests will be performed to establish the safety of suspended platforms,
- 8.5 How he intends maintaining suspended platforms being used, and
- 8.6 How he will document the design, testing, maintenance and inspections of the suspended platforms.

a. Rope Access Work

The Contractor shall with reference to Section 18: Rope Access Work of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 8.4 Explain what systems he intends using to ensure the safety of employees,
- 8.5 Explain how he intends maintaining the different types of equipment to be use,
- 8.6 What tests will be performed to establish the durability and safety of the equipment, and

- 8.7 How he will document the design, testing, maintenance and inspections of all rope access works.

10.2 *Material hoists*

The Contractor shall with reference to Section 19: Materials Hoist, of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends confirming the construction stability of the material hoists,
- What systems he intends using to ensure the safety of all material hoists,
- What tests will be performed to establish the safety of all material hoists,
- How he intends maintaining the material hoists being used, and
- How he will document the design, testing, maintenance and inspections of all material hoists and
- What safety procedures and precautions are envisaged to ensure safe operation of the materials hoists.

10.2.2 *Batch Plants/Bulk Mixing Plants*

The Contractor shall with reference to Section 20: Bulk Mixing Plant of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- What systems he intends using to ensure the safety of all batch plants,
- How he intends maintaining the batch plants in use, and
- How he will document the design, testing, maintenance and inspections of batch plants in use.

10.2.3 *Explosive Actuated Fastening Devices*

The Contractor shall with reference to Section 21: Explosive actuated fastening devices, of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.2.4 How he intends controlling the issuing of explosive powered tools,
- 10.2.5 How he intends implementing safety procedures prior to use of explosive powered tools, and
- 10.2.6 What safety measures will be required during the use of explosive powered tools.

10.3 *Cranes*

This section of the specification shall be read in conjunction with the provisions of the Driven Machinery Regulations, 1988.

The Contractor shall with reference to Section 22: Cranes, of the Construction Regulations, 2014 and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.3.1 How will environmental factors be considered in respect to the use of cranes,
 - 10.3.2 What systems he intends using to ensure the safety of all cranes in use,
 - 10.3.3 How he intends maintaining cranes in use,
 - 10.3.4 What tests will be performed to establish the safety of all cranes in use,
 - 10.3.5 What safety procedures and precautions are envisaged to ensure the safe operation of all cranes in use,
 - 10.3.6 How he will document the design, testing, maintenance and inspections of all cranes in use, and
 - 10.3.7 The contractor shall prove compliance of the Driven Machinery Regulation, 1988, with reference to the lifting machinery and tackle being used.
- *Construction vehicles and mobile plant*

The Contractor shall with reference to Section 23: Construction vehicles and mobile plant of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 3. How he intends to ensure that construction vehicles and mobile plant are:
 - 10.3.2 Of acceptable design and construction,
 - 10.3.3 Maintained and in good working order,
 - 10.3.4 Used according to design specifications, and
 - 10.3.5 Are protected from falling into excavations, water or areas lower than the working surfaces,
 - 4. How he intends to ensure that workers are trained, authorised and physically fit to operate construction vehicles and mobile plant,
 - 5. What traffic arrangements and safety precautions will be implemented to ensure safe operation of construction vehicles and mobile plant on the Works, and
 - 6. How he intends safeguarding employees against construction vehicles and mobile plant moving on the construction site.
- *Electrical Installation and Machinery on construction sites*

This section of the specification shall be read in conjunction with the provisions contained in the Electrical Installation Regulations, 2009.

The Contractor shall with reference to Section 24: Electrical Installation and machinery on construction sites of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.3.3 How he intends safeguarding employees against electrical cables or apparatus under, over or on site, and
 - 10.3.4 How he will ensure that electrical installations are of adequate strength to withstand working conditions on a construction site.
- *Ladders*

The Contractor shall with reference to Section 13A of the General Safety Regulations and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.3.4 How he intends ensuring that ladders used are safe and constructed of materials approved for its intended use, and
- 10.3.5 What precaution will be made to ensure the stability of ladders in use.

11. MEDICAL FITNESS OF EMPLOYEES

In this section the contractor shall with reference to Section 7(8) of the Construction Regulations, 2014, be required to describe the procedures by which employee's status of their health is determined (Entry Medicals).

The contractor shall also provide in detail the procedures by which the health of employees is monitored through a Medical Surveillance procedure.

The contractor must also provide for exit medicals in order to determine if the health of an employee have deteriorated during his/her duration of employment.

12. EMPLOYEE FACILITIES

In this section the contractor shall with reference to the Facilities Regulations 2004, as well as Section 30 of the Construction Regulations 2014, be required to provide employees with the required facilities.

The contractor shall indicate exactly what facilities shall be provided.

The contractor shall also indicate how the facilities shall be maintained (cleaning and sanitizing)

Emphasis must be placed on the provisioning of toilet facilities, the maintenance services thereof and the provisioning of drinking water

• MATERIALS

13.1 General

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its regulations and related incorporated standards with regards to the design, supply, storage and erection of materials used for the temporary and permanent Works.

13.2 Fall Protection Equipment

The Contractor shall with reference to Section 10: Fall Protection Equipment of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

10.3.5 Compilation of a fall protection plan,

10.3.6 How the fall protection plan will be implemented and maintained,

10.3.7 How employees will be screened and declared medically fit to work in areas where fall protection equipment is needed,

- 10.3.8 How the safeguarding of persons, plant, vehicles, equipment and facilities on the construction site is contemplated,
- 10.3.9 Training of staff working at heights and in the use of fall protection equipment,
- 10.3.10 How a continuous assessment of the situation will be executed,
- 10.3.11 How fall protection equipment will be inspected for safety, and
- 10.3.12 How corrective actions will be implemented
- 10.3.13 Emergency plans and procedures for treatment of incidents relating to falls from height.

- **Scaffolding**

The Contractor shall with reference to Section 16: Scaffolding of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.3.6 How compliance with SABS 085 will be ensured,
- 10.3.7 How scaffolding in use will be maintained,
- 10.3.8 What systems are intended to ensure the safety of scaffolding used, and
- 10.3.9 What tests will be performed to establish the safety of scaffolding used
- 10.3.10 Training plan for scaffold erectors and inspectors.

- **Use and temporary storage of flammable liquids on construction sites**

This section of the specification shall be read in conjunction with the provisions for the use and storage of flammable goods as determined in the General Safety Regulations.

The Contractor shall with reference to Section 25: Use and temporary storage of flammable liquids on construction sites of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- 10.3.7 How flammable liquids will be stored to minimize the risk of fire or explosions,
- 10.3.8 How the contractor will identify a flammable store
- 10.3.9 What safety precautions will be employed if ventilation of the flammable store is not possible,
- 10.3.10 How access to flammable stores will be controlled,
- 10.3.11 How empty vessels used for the storage of flammable liquids will be disposed of,
- 10.3.12 What quantity of flammable liquids will be stored on the construction site,
- 10.3.13 What systems are intended to ensure the safe storage of flammable liquids, and
- 10.3.14 What retaining methods will be used to prevent the spreading of any spillage.

- **Stacking and storage**

This section of the specification shall be read in conjunction with the provisions for the stacking of articles contained in the General Safety Regulations.

The Contractor shall with reference to Section 28 Stacking and storage on construction sites of the Construction Regulations, 2014, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

10.3.8 Who will supervise the stacking and storage of materials on site, and

10.3.9 What systems are intended to ensure the safe stacking and storage of materials on the site

- **Personnel Safety Equipment and Facilities**

The Contractor shall comply with Section 2 of the General Safety Regulations and shall in particular provide all necessary personnel protective equipment for his personnel for the duration of the construction period. To this end the Contractor shall without limiting his obligations indicate in his Health and Safety Plan:

10.3.9 Identify training requirements in the Contractors Training plan in the use and maintenance of personal protective equipment,

10.3.10 The type of personnel safety equipment he will provide,

10.3.11 How he intends issuing it to his employees, and

10.3.12 How he will maintain the personnel safety equipment issued.

- **First Aid, Emergency Equipment and Procedures**

The Contractor shall comply with Section 3 of the General Safety Regulations regarding first aid, emergency equipment and procedures.

14. CATEGORIES OF WORK

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its regulations and related incorporated standards with regards to the execution of the following categories of work.

13. General

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

- *Construction welfare facilities*

Contractors will be required to adhere to Section 30: Construction welfare facilities of the Construction Regulations, 2014.

This regulation must be read in conjunction with the provisions of the Facilities Regulations, 2004 (as amended) and SANS 0400.

The Contractor must discuss the following in detail in his safety plan:

- 13.3 How will the Contractor establish the amount of facilities required for employees to shower, change, eat and attend to sanitary needs
- 13.4 What measures will the employer take to house employees on site who lives far from their residences or for the provision of transport

- *Environmental regulations for workplaces*

The Contractor shall comply with the Environmental Regulations for Workplaces, 1987, and shall address the following aspects as described in the regulations in his Health and Safety plan:

- 13.4 Thermal requirements,
- 13.5 Lighting,
- 13.6 Windows,
- 13.7 Ventilation,
- 13.8 Housekeeping,
- 13.9 Noise and hearing conservation,
- 13.10 Precautions against flooding, and
- 13.11 Fire precautions and means of egress.

- *Housekeeping on construction sites*

Contractors will be required to adhere to Section 27: Housekeeping on construction sites, of the Construction Regulations, 2014.

This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Contractor must discuss the following in detail in his safety plan:

- 13.5 How will contractors ensure the neatness of construction sites
- 13.6 What measures does the Contractor envisage to
 - a. Store and/or stack materials,
 - b. Remove debris from site,
 - c. Prevent unauthorized entrance to the site
 - d. Protect employees or passers-by from falling objects

- *Fire precaution on construction sites*

Contractors will be required to adhere to Section 29: Fire precautions on construction sites, of the Construction Regulations, 2014.

This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Contractor must discuss the following in detail in his safety plan:

- 13.6 How the Contractor will minimize the risk of fire on the site
 - 13.7 How the Contractor will identify potential fire hazards
 - 13.8 What prohibitions the Contractor will implement to manage risk areas
 - 13.9 How many employees the Contractor will train in fire fighting
 - 13.10 What organization the Contractor envisage to combat fires on sites
 - 13.11 What precautions and procedures will be followed to evacuate employees in the case of a fire
- *Water Environments*

The Contractor will be required to adhere to Section 26: Water Environments, of the Construction Regulations, 2014.

The Contractor must discuss the following in detail in his safety plan:

- 13.7 What precautions will the Contractor take to identify dangers where employees may fall into water
- 13.8 What safety procedures and equipment will the Contractor implement to safeguard employees working at water environments

14.1 Structures

The Contractor will be required to adhere to Section 11: Structures, of the Construction Regulations, 2014.

The Contractor must discuss the following in detail in his safety plan:

- 14.1.1 Explain what controls, test or precautions will be made to prevent structures from collapsing during construction,
- 14.1.2 The Contractor shall indicate what steps will be taken and implemented to ensure that structures or parts thereof will not be loaded in such a manner that it may collapse, and
- 14.1.3 What procedures does the Contractor envisage to implement in order to obtain all relevant data on structures before commencement of construction work.

- *Hazardous Chemical Substances*

The Contractor will be required to adhere to the Regulations for Hazardous Chemical Substances 1995 as amended in the handling and storage cement of and other hazardous chemical substances.

The Contractor must discuss the following in detail in his safety plan in respect of each hazardous chemical substance that will be used in the works:

- 1. Storage of substance
 - 2. Handling of substance
 - 3. Protective clothing and other devices to be used while handling the substance
 - 4. Medical surveillance.
- *Hazardous biological agents (Contaminated areas, surfaces & equipment, tools); (Contaminated Personal Protective Equipment & Clothing)*

The Contractor will be required to adhere to Regulations for Hazardous Biological Agents read with COVID-19 OHS Directives.

The Contractor must discuss the following in detail in his safety plan in respect of each hazardous biological agents:

- 14.1.3 Prevent exposure
- 14.1.4 Decontaminating
- 14.1.5 Sanitisation;
- 14.1.6 Screening & testing;
- 14.1.7 Isolating and quarantining;
- 14.1.8 Engineering controls;
- 14.1.9 Training& information;
- 14.1.10 Safety symbolic signs;
- 14.1.11 Provision of hand washing facilities & soap;

- 14.1.12 Inspection of equipment;
- 14.1.13 Competent person;
- 14.1.14 Safe work and operating procedures;
- 14.1.15 Personal Protective Equipment & Clothing

- **Site Clearance**

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

14.1.4 Demolition work

Contractors will be required to adhere to Section 14: Demolition work, of the Construction Regulations, 2014.

The Contractor shall discuss the following in detail in his safety plan:

- Briefly explain how he will safeguard people and property during and after demolition works
- Briefly explain how he will protect staff from dangerous situations
- Discuss the methods proposed to safeguard the public and property against harm during demolition works
- Discuss what type of equipment he envisages to use during demolition work
- How will the Contractor ensure the safety of equipment used during demolition work
- What steps will the Contractor deem necessary to take where hazardous materials is encountered
- Dust control measures
- Noise control measures

1. Earthworks

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

- *Excavation work*

Contractors will be required to adhere to Construction Regulation 13: Excavation work, of the Construction Regulations, 2014.

The Contractor must discuss the following in detail in his safety plan:

- 14.1.6 How will the Contractor establish the stability of ground prior to excavations,
- 14.1.7 What steps will the Contractor follow to ensure that bolstering, shoring and bracing is sufficient to ensure the safety of the excavation, and

14.1.8 What steps will the Contractor follow to ensure the equipment used to safeguard an excavation is sufficient and safe.

- **Concrete**

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

14.1.7 Welding, flame cutting, grinding, soldering or similar operations

The Contractor shall comply with Section 9 of the General Safety Regulations, with regards to the welding, flame cutting, grinding, soldering or similar operations associated with pipework.

15. IMPLEMENTATION OF CONTRACTOR'S HEALTH AND SAFETY PLAN

- **General**

The Contractor shall describe in his Health and Safety Plan how he intends implementing his plan.

The Contractor shall indicate the methods he intends using to ensure accurate record keeping of all critical elements identified in his risk assessment and covered in his Health and Safety Plan.

The Contractor shall indicate how internal audits will be carried out, how shortcomings will be addressed, how he intends to review the safety plans, how he would train staff and how he would implement the findings and recommendations of internal audits or inputs of employees.

1. Administrative Systems

The Contractor's administrative system shall without limiting his obligations, cover the following:

- Up-keep of a safety file on site,
- Maintenance of his Health and Safety plan,
- Procedures to follow for the appointment of competent persons,
- Application of construction work permits or Notification of construction work
- Submit the Notification of Construction to the provincial director
- Provide a valid Letter of Good Standing
- Procedures to follow for notifications,
- Injury on duty [IOD] administration,
- Recording of minutes of safety meetings,
- Recording of checklists,

- Safe keeping of checklists, and
- Internal audits.

The Contractor shall in particular ensure that a copy of the Occupational Health and Safety Act, 1993 and its Regulations is available on the site and is easily accessible by employees.

14.2 Reporting Systems

The Contractor shall comply with Section 9 of the General Administrative Regulations, 2003 and shall in particular (in accordance with section 12) furnish an inspector with information relating to health and safety on the construction site, when requested to do so.

The Contractor shall notify the Employer of any investigations, complaint or criminal charge which may arise as a consequence of the provision of the Occupational Health and Safety Act, (Act 85 of 1993) and its Regulations, pursuant to work performed in terms of this Contract.

14.2.1 Training

The Contractor shall train all his employees in accordance with the requirements of section 13 of the Occupational Health and Safety Act, 1993. The Contractor shall ensure that every employee is informed of the following:

- The hazards of any work he must perform or plant machinery or equipment he is permitted to use, and
- The precautionary measures which should be taken regarding the above.

The Contractor shall, without limiting his obligations, indicate in his Health and Safety Plan how he intends:

- 14.3 Identifying the training needs of the personnel he intends employing, and
- 14.4 Implementing the training identified
- 14.5 What proof of induction training will be carried by his employees (e.g., laminated type identification card)?

14.3.1 Safety Meetings

The Contractor shall conduct at least one formal safety meeting per month with his employees to ensure safety awareness and shall maintain appropriate records of attendance and meeting content. Such records shall be made available to the Employers Safety Agent. Such meetings shall address at least the following:

- Accident / safety incidents

- Hazardous conditions
- Hazardous biological agents
- Hazardous materials / substances
- Job or work projections
- Work procedures
- Protective clothing / equipment
- Housekeeping
- General safety topics

15.6 Inspections and Monitoring

The Contractor shall be required to inspect each workplace prior to works commencing to ensure that all protective equipment is in place and that by entering the workplace no person will be exposed to any hazard which could affect his health or safety. The Contractor shall without limiting his obligations, indicate the following in his Health and Safety Plan:

- 14.4 The inspection and monitoring procedures he intends employing to determine the safety of workplaces, and
- 14.5 Who will be responsible for the checking of each workplace at the commencement of each shift.

The Contractor shall include in his Health and safety Plan all the checklists he intends using during the inspection and monitoring of the implementation of his Health and Safety Plan.

The Contractor can expect inspections of the works by any of the following parties:

- 14.5 The Employer or his Safety Agent,
- 14.6 The Employer's Occupational Safety Officer, or
- 14.7 The designated officer serving in the Department of Manpower and appointed by the Minister as Chief Inspector or his representative.

In addition to site inspections performed by the Employer or his safety agent they shall also do audits and assess the safety situation at the works and investigate incidents. Follow-up inspections will be performed to ensure compliance to recommendations done.

The Employer, his Safety Agent or his Occupational Safety Officer may stop the work at any time under the following conditions:

- 15.1 If the Contractor is not compliant with his Health and Safety Plan
- 15.2 Imminent threat to the health and safety of any person on site
- 15.3 Continuous non-conformance to corrective action requests.

Inspections by the Chief Inspector or his representative will be by appointment and the purpose would be to investigate complaints received by the Inspector or to investigate serious incidents.

The Chief Inspector or his representative may issue prohibition notices to stop the activities at the works until the situation investigated has been resolved or he may issue an improvement notice whereby the Contractor will have a period to rectify any hazard identified by the inspector.

16. AUDITING

15.2 Internal Audits

CR

The audits contemplated in CR 5(1)(o) of the Construction Regulations, 2014 will be carried out by the Employer or his appointed Safety Agent.

The intervals for the audits shall be agreed between the Contractor and the Employer or his Safety Agent during the preparation of the Contractor's Health and Safety Plan, but shall be carried out at least once every month or at such shorter interval that an inspector may require. The Employer or his Safety Agent shall provide at least 7 calendar days' notice prior to the conducting of an audit.

The findings of each audit will be made known to the Contractor and the Employer in a report prepared by the Employer or his Safety Agent and will be submitted to all parties within seven working days of the respective audit being completed. Any shortfalls identified will be documented in the audit report together with the Contractor's proposals to rectify the same. All audit reports will be filed in the Health and Safety File.

A date for a follow up audit will be negotiated with the Contractor to verify the implementation of all actions to rectify shortfalls as identified in the audit report.

The Contractor will ensure that the same arrangement detailed above be implemented with his Contractors to ensure his compliance with the Construction Regulations as contemplated in Section 7

- **Audits by Employer or Safety Agent**

The Employer or Safety Agent will be entitled to carry out additional audits or follow-up audits, as the case may be, at any time during the construction period provided that:

15.3 The audit or follow-up audit are carried out during ordinary working hours, and

15.4 The Employer or Safety Agent gives the Contractor at least 24 hours' notice of his intention to carry out such audits.

The Contractor's employees will be present during any audit carried out by the Employer or his Safety Agent.

15.4 MEASUREMENT AND PAYMENT

- **Measurement and Payment**

17.1.1 The scheduled items for health and safety will be as specified in clause 31 of section 001 of the Standard Specifications.

- The Contractor shall price all items scheduled in this section of the schedule of quantities to enable the Employer to comply with clause 4.1.(h) of the contract. Failure by the Contractor to price these items will force the Employer to reject the Contractor's tender in terms of clause 4.(4) of the contract.

ANNEXURE 1

APPOINTMENT LETTERS



Company Name

Company Address

Company Address

Code

Attention: **(Assistant Construction Supervisor's Name)**

APPOINTMENT OF THE ASSISTANT CONSTRUCTION SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 8(8)

I, **(contractor's name)** hereby appoint **(assistant construction supervisor's name)** as the assistant supervisor responsible for **(site address)** to carry out the construction work of **(description of construction work and area of responsibility)**.

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all persons are aware and understand the hazards attached to the work being carried out;
3. That the required risk assessments are carried out;
4. That precautionary measures are identified and implemented;
5. That discipline is enforced at the construction site at all times;
6. That all identified statutory requirements are met; and
7. That any other interest in terms of health and safety with respect to the responsible area is met.
8. You will accept the duties of the Construction Supervisor in his absence.

You are required to report any deviations of the above-mentioned instruction to **(construction supervisor's name)** and in his absence to the contractor's representative.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

You shall submit a written weekly report any non-compliance with the construction Regulations, 2014.

Contractor's Representative full name

Signature

Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(assistant construction supervisor)** understand the implications of the appointment as detailed above and confirm my acceptance.

Assistant construction supervisor's
full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: (**Safety Officer's Name**)

APPOINTMENT OF THE CONSTRUCTION HEALTH AND SAFETY OFFICER IN TERMS OF CONSTRUCTION REGULATION 8(5)

I, (**contractor's name**) hereby appoint (**safety officer's name**) as the Construction Health and Safety Officer responsible for (**site address**) to manage all the health and safety issues as required in terms of the Act by establishing a health and safety program with elected health and safety Representatives.

You shall ensure that all the requirements in terms of the Act and in particular in terms of the Construction Regulations, 2014 are met. You shall also ensure that all appointed sub-contractors comply with the requirements as stipulated in the Construction Regulations, 2014.

You shall further ensure that all records, registers and required lists are maintained and shall stop construction work upon identifying any non-compliance by any contractor; this includes stopping any work should the competency of the person carrying out such work be questionable.

This appointment is valid from (**date**) to the completion of the stipulated construction work.

Contractor's Representative full name

Signature

Date

.....

Kindly confirm your acceptance of this appointment by completing the following:

I, (**construction health and safety officer's name**) understand the implications of the appointment as detailed above and confirm my acceptance.

Construction Health & Safety Officer's full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: **(Construction Vehicle and Mobile Plant Inspector)**

APPOINTMENT OF THE CONSTRUCTION VEHICLE AND MOBILE PLANT INSPECTOR IN TERMS OF CONSTRUCTION REGULATION 23(1)(k)

I, **(contractor's name)** hereby appoint **(construction vehicles and mobile plant inspector's name)** as the construction vehicles and mobile plant inspector responsible for **(site address)** to inspect on a daily basis all construction vehicles and mobile plant, as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to construction vehicles and mobile plant that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2014 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name

Signature

Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction vehicles and mobile plant inspector's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction vehicles and mobile plant
inspector's full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: (**Sub-Contractor's Name**)

APPOINTMENT OF SUB-CONTRACTOR IN TERMS OF THE CONSTRUCTION REGULATION 7(1)(c)(v)

I, (**contractor's name**) hereby appoint (**sub-contractor's name**) as the sub-contractor responsible for (**site address**) to carry out the construction work of (**description of construction work**).

You shall ensure that you meet all the requirements in terms of the Act and in particular in terms of the section 37(2) agreement and the Construction Regulations, 2014. You shall also ensure that all contractors appointed by yourself and reporting to you comply with the requirements as stipulated in the Construction Regulations, 2014.

You shall also ensure that all the information and specifications to ensure that the construction work is carried out in a safe manner are carried over to all contractors appointed and reporting to you.

You shall further ensure that all records, registers and required lists are maintained and that all persons appointed to carry out tasks as stipulated by these regulations are competent and have the necessary resources to complete their tasks effectively in such a manner that health and safety is not in any manner compromised.

This appointment is valid from (**date**) to the completion of the stipulated construction work.

You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

Contractor's Representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, (**sub-contractor's name**) understand the implications of the appointment as detailed above and confirm my acceptance.

Sub-Contractor's Representative full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: **(Construction Supervisor's Name)**

APPOINTMENT OF THE CONSTRUCTION SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 8(7)

I, **(contractor's name)** hereby appoint **(construction supervisor's name)** as the Supervisor responsible for **(site address)** to carry out the construction work of **(description of construction work and area of responsibility)**.

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all statutory appointments have been completed;
3. That, where required, health and safety committees are established and that meetings are accordingly held;
4. That all persons are aware and understand the hazards attached to the work being carried out;
5. That the required risk assessments are carried out;
6. That precautionary measures are identified and implemented;
7. That discipline is enforced at the construction site at all times;
8. That all identified statutory requirements are met; and
9. That any other interests in terms of health and safety with respect to the responsible area is met.
10. You will in writing delegate your duties to the Assistant Construction Supervisor while absent from site.

You are required to report any deviations of the above-mentioned instructions to **(contractor's name)**. This appointment is valid from **(date)** to the completion of the stipulated construction work. You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

Contractor's Representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction supervisor)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction Supervisor's full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: (**Excavation Work Supervisor's Name**)

APPOINTMENT OF THE EXCAVATION WORK SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 13(1)(a)

I, (**contractor's name**) hereby appoint (**excavation work supervisor's name**) as the excavation work supervisor responsible for (**site address**) to supervise and carry out all the necessary inspections in terms of all excavation work as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to excavation work that that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met.

This appointment is valid from (**date**) to the completion of the stipulated construction work.

Contractor's representative full name Signature Date

Kindly confirm your acceptance of this appointment by completing the following:

I, (**excavation work supervisor's full name**) understand the implications of the appointment as detailed above and confirm my acceptance.

Excavation Work Supervisor full name Signature Date



Company Name

Company Address

Company Address

Code

Attention: **(Ladder Inspector's Name)**

APPOINTMENT OF THE LADDER INSPECTOR IN TERMS OF GENERAL SAFETY REGULATIONS 13A(1)

I, **(contractor's name)** hereby appoint **(ladder inspector's name)** as the ladder inspector responsible for **(site address)** to manage ladders on site. You should inspect the ladders as per the checklist at least once a week.

You shall ensure that when becoming aware of any health and safety hazards in respect to ladders that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2014 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(ladder inspector's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Ladder inspector's full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: **(Risk Assessor's Name)**

APPOINTMENT OF THE CONSTRUCTION SITE RISK ASSESSOR IN TERMS OF CONSTRUCTION REGULATION 9(1)

I, **(contractor's name)** hereby appoint **(risk assessor's name)** as the construction site risk assessor responsible for **(site address)** to carry out risk assessments prior to the commencement of construction work and any other risk assessment that may be required for the duration of the construction work.

You shall ensure that all risks are identified and analyzed and that safe working procedures are drafted and implemented to reduce, mitigate or controls the hazards that were identified.

You will at least use the risk evaluation program with the provided checklists.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction site risk assessor's name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction site Risk Assessor's
full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: **(Scaffolding Supervisor's Name)**

APPOINTMENT OF THE SCAFFOLDING SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 16(1)

I, **(contractor's name)** hereby appoint **(scaffolding supervisor's name)** as the scaffolding supervisor responsible for **(site address)** to supervise and carry out all the necessary inspections in terms of all scaffolding work. (Whether newly erected, altered or moved as per the provided checklist)

You shall ensure that when becoming aware of any health and safety hazards in respect to scaffolding work that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2014 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(scaffolding supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Scaffolding Supervisor's full name

Signature

Date



Company Name

Company Address

Company Address

Code

Attention: **(Stacking and Storage Supervisor's Name)**

APPOINTMENT OF THE STACKING AND STORAGE SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 28(a)

I, **(contractor's name)** hereby appoint **(stacking and storage supervisor's name)** as the stacking and storage supervisor responsible for **(site address)** to manage all stacking and storage on site.

You shall inspect all new stacking and there after as often as needed according to the checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to stacking and storage that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met. On identifying any shortfalls or hazards convey such information in writing to the construction supervisor.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name

Supervisor

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(stacking and storage supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Stacking and Storage Supervisor's
full name

Signature

Date

ANNEXURE 2

NOTIFICATION TEMPLATES



Company Name

Company Address

Company Address

Code

Attention: The Provincial Director
The Department of Labour
[Postal Address*]

NOTIFICATION OF CONSTRUCTION WORK ON CONTRACT [NUMBER]
[CONTRACT DESCRIPTION]

In terms of regulation 4. (1) of the Construction Regulations, 2014 promulgated on 07 February 2014 in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), we hereby notify you of our intention to commence construction works on the abovementioned contract, which:

- 15.5 Includes the demolition of a structure exceeding a height of 3 meters,
- 15.6 Includes the use of explosives to perform the construction work,
- 15.7 Includes the dismantling of fixed plant at a height greater than 3 meters,
- 15.8 Will exceed 30 days or will involve more than 300-person days of construction,
- 15.9 Includes excavation work deeper than 1 meter, or
- 15.10 Includes working at a height greater than 3 meters above ground or a landing.

1. Parties involved on the Contract

- 1.1 The Principal Contractor is: [Contractor's Name]
[Contractor's postal address]
[Contractor's postal address]
Att: [Contractor's contact person and telephone number]
- 1.2 The Client (Employer) is: [Employer's Name]
[Employer's postal address]
Att: [Employer's contact person and telephone number]
- 1.3 The Client's Safety Agent is: [Safety Agent's Name]
[Safety Agent's postal address]
Att: [Safety Agent's contact person and telephone number]

1.4 The Contractor's Construction Supervisor is: [Contractor's Construction Supervisor's name and telephone number]

2. Details of the construction works

2.1 The physical address of the works is: [Physical address of works]

[Physical address of works]

- The nature of the construction works is: [Provide a description of the works].
- The expected commencement date of the Works is : [Insert expected commencement date]
- The expected completion date of the works is : [Insert expected completion date]
- The estimated maximum number of persons on the construction site:

16.1 A total of _____ contractors will be accountable to the Principal Contractor on the construction site during the execution of the Works. The names of the contractors already chosen are as follows: [Provide a list of the Contractor's subcontractors already appointed]

3. Other details

16.2 The Principal Contractor's compensation registration number is: _____

i) Keep a copy of this notification of construction on site for inspection.

We trust the above is in order.

Yours faithfully,

Signature

Date

* Postal Address of Provincial Director as indicated in regulation 1 of the General Administrative Regulations, 1996.

ANNEXURE 3

IDENTIFIED HEALTH AND SAFETY HAZARDS

ANNEXURE 3: IDENTIFIED HEALTH AND SAFETY HAZARDS

In terms of Regulation 9(1) (b) of the Construction Regulations 2014 the following hazards anticipated with the scope of work have been identified.

NOTE: The list of potential hazards is by no means intended to be all inclusive and is not limited to this list, and it remains the responsibility of the Contractor to identify all possible hazards with regards to his scope of work and to put measures in place to mitigate, reduce or control these hazards.

Potential Hazards

17. Commissioning of new installations
18. Confined space entry
19. Demolition/breaking into existing structures
20. Excavation shoring / brazing
21. Excavations been flooded during rainy season
22. Explosives
23. Hazardous material handling / storage / management
24. Heat stress
25. Loading and offloading vehicles
26. Manual handling of materials
27. Plant and equipment integrity
28. Public and traffic safety
29. Requirements for plant isolations
30. Safe usage and storage of Oxygen, Acetylene and LPG cylinders
31. Scaffolding
32. Stacking and storage of equipment / materials
33. Tie-ins into existing equipment
34. Usage of compressed air and equipment
35. Work involving radioactive sources
36. Working in operational areas
37. Working in or near sewer lines
38. Working with paints, concrete, toxic chemicals and corrosive substances
39. Working on live electrical installations / sub-stations / MCC rooms
40. Working on moving equipment.
41. Contaminated areas, surfaces & equipment, tools; Contaminated Personal Protective Equipment & Clothing

CITY OF TSHWANE
HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION 4 FOR A PERIOD OF 36 MONTHS.

C3.9 REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE ENVIRONMENTAL MANAGEMENT PLAN

C3.9 REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE ENVIRONMENTAL MANAGEMENT PLAN

1. INTRODUCTION

The EMP will address the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to achieve this a number of environmental specifications/recommendations are made. These are aimed at ensuring that the Contractor maintains adequate control over the project in order to:

Minimize the extent of impact during construction,
Ensure appropriate restoration of areas affected by construction.
Prevent long term environmental degradation.

The contractor must be made aware of the environmental obligations that are stipulated in this document, and declares himself/herself to be conversant of all relevant environmental legislation. The Contractor should also be aware that the Engineer will monitor the implementation of the procedures.

2. POLICY STATEMENT

The construction will be to the best management practices as identified to minimize the environmental impact of activities associated with the development.

3. OBJECTIVES OF THE EMP

The EMP has the following goals:

- Identifying those construction activities that may have a detrimental impact on the environment;
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation;
- Establishing the reporting system to be undertaken during the construction.

The EMP also serves to highlight specific requirements that will be monitored during the development and should the environmental impacts not have been satisfactory prevented or mitigated, corrective action will have to be taken. The document should, therefore, be seen as a guideline that will assist in minimizing the potential environmental impact of activities.

4. DESIGNATED ENVIRONMENTAL OFFICER

For the purpose of the EMP, a nominated representative of the Contractor should be the designated environmental officer for the project. The nominated representative of the Contractor will therefore be responsible for ensuring that the provisions of the EMP are complied with. The Engineer will be

responsible for issuing instructions to the Contractor where environmental considerations call for action to be taken.

The environmental officer will submit monthly reports to the Engineer on site who will verify the information.

5. LEGAL REQUIREMENTS

Under normal circumstances and EMP would be the end result or the final stage in the EIA procedure. However, a working agreement was negotiated between the National Department of Environmental Affairs and Tourism (DEAT) and the City of Tshwane Metropolitan Municipality. The agreement stipulates the project types the City of Tshwane Metropolitan Municipality need to submit to DEAT for approval and those project types the City of Tshwane Metropolitan Municipality do not need to submit for approval. For those actions that do not need approval, the City of Tshwane Metropolitan Municipality undertook to compile generic EMP's to assist to minimizing degradation to the area. The following project types fall in this non-approval category: periodic maintenance, special maintenance, rehabilitation and specific upgrades.

6. MITIGATION MEASURES

In setting mitigation measures, the practical implications of executing these measures must be borne in mind. With early planning, both the cost and the impacts can be minimized.

6.1 Establishment of site offices

6.1.1 Site plan

The Contractor shall provide the Engineer on site with a plan detailing the layout of site offices facilities, such as chemical toilets, areas for stockpiling of material, storage of hazardous materials and provision of containers. The site offices should not be sited in close proximity to steep areas as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the site, and in particular the ablution facilities, aggregate stockpiles and hazardous material stockpiles are located as far away as possible from any water course as possible.

The site plan shall be submitted before the site hand over meeting. Read with Standard Specifications for Municipal Civil Engineering Works: Section 001 and 002.

6.1.2 Vegetation

The vegetation surrounding the site offices is to be left as intact as possible and vegetation planted at the site should be indigenous. Only trees directly affected by the works and such others as may be indicated by the Engineer in writing, may be sawn off/removed.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien invader plant shall be cleared by hand before seeding. Read with Specifications: 104 – Landscaping and grassing.

6.1.3 Rehabilitation

The site offices will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas are to be removed from the site on completion of the contract. Read with Specifications Sections 001, 002 and 104.

6.1.4 Water for human consumption

Water for human consumption must be tested and treated in accordance with recommendations.

6.2 Sewage treatment

Adequate toilet facilities are to be provided. Use of the veld for this purpose shall not, under any circumstances, be allowed. The Contractor shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer. Latrines shall be positioned within walking distance from wherever employees are employed on the works.

Save and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak aways, dry composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a subcontractor. The type of sewage treatment will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets is to be done in consultation with the Site Engineer.

Read with Specifications 104.

6.3 Waste management

Waste management and waste minimization must be implemented at the outset of the contract.

6.3.1 Litter

No littering by construction workers are allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site is to be kept free of litter. Read with Specifications Sections 001 and 002.

6.3.2 Removal of solid waste

Solid waste is to be stored in an appointed area for collection and disposal. A refuse control system must

be established for the collection and removal of refuse to the satisfaction of the Engineer. Disposal of solid waste will be in a Department of Water Affairs and Forestry (DWAF) licensed landfill site.

6.3.3 Hazardous waste

Hazardous waste such as bitumen, tar, oils, etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care must be taken when using tar products such as tar prime or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

6.4 Soil management

6.4.1 Topsoil

The contract provides for the stripping and stockpiling of topsoil from the site for later reuse. Topsoil is considered to be of a minimum thickness of ± 300 mm of the natural soil, including all the vegetation and organic matter. The areas to be cleared of topsoil shall include the storage areas. Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding. Soils contaminated by hazardous substances shall be disposed of in an approved Department of Water Affairs and Forestry waste disposal site.

6.4.2 Borrow material

The Contractor's attention is drawn to the requirements set forth by the Department of Mineral and Energy Affairs in terms of the submission of EMPR's for establishment, operation and rehabilitation of borrow pits and quarries. The cost of complying with the requirements shall be deemed to be included in existing rates in the schedule of quantities. Read with the Specification Section 203.

6.5 Discovery of archaeological sites, artifacts or graves

6.5.1 Archaeological site

If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Engineer of such discovery. The National Monuments Council must be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. Read with General Conditions of Contract.

6.5.2 Graves

If a grave on site is uncovered, work in the immediate vicinity must be stopped and an undertaker as well as the National Monuments Council should be contacted. The undertaker will place advertisements

in the newspapers concerning the grave. He will also provide for the relocation of bones, should it be necessary. Read with General Conditions of Contract.

6.6 Stockpiled material

The Contractor shall so plan his activities that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material must be indicated and demarcated on the site plan and approved in writing by the engineer.

The area chosen shall be devoid of indigenous trees and shrubs. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. After the stockpiled material has been removed, the site shall be reinstated as closely as possible to its original condition. All areas affected by stockpiling shall be landscaped, top soiled and grassed to the Engineer's approval and at the Contractor's cost.

Material milled out of the existing road surface that is temporarily stockpiled within the road reserve shall:

- be stockpiled so as to be as inconspicuous as possible
- be prevented from contaminating water courses,
- be cleared of weeds.

In all cases, the areas for stockpiling and disposal of construction rubble shall be approved by the Engineer before such operation commences.

Read with Series 2: Earthworks – Section 203.

6.7 Fuel, diesel and other hazardous materials

6.7.1 Hazardous materials

All hazardous materials i.e. bitumen binders shall be stored in an appointed area that is fenced and has restricted entry. Storage of bituminous products shall only take place using suitable containers to the approval of the Engineer.

Under no circumstances shall the spoiling of bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected bituminous products shall be taken to the supplier's production plant. No spillage of bituminous products shall be allowed on site. Affected areas shall be promptly reinstated to the satisfaction of the Engineer.

6.7.2 Fuel

Should any fuel storage tank be required on site, the Contractor shall ensure that he has complied with the necessary legal requirements for the erection of such tanks. Leakage must be avoided. The fuel and diesel must be stored in a bunded area with adequate containment (at least 1,5 times the volume of the fuel) for potential spills and leaks.

6.7.3 Oil, grease

Oil, grease and cleaning materials from the maintenance of vehicles and machinery shall be collected in a sump and sent back to the supplier or, otherwise disposed of at a registered site.

6.7.4 Cooking oil

The Contractor should ensure that sufficient fuel is available for heating and cooking purposes should this be necessary.

6.7.5 Spillages

Streams, rivers and dams must be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products. In the event of a spillage, prompt action must be taken by competent instances to clear the affected area.

6.8 General considerations

Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a designated register and the response noted with the date and action taken. This record must be submitted with the monthly reports.

Any avoidable non-compliance with the above-mentioned measures may be considered sufficient ground for withholding payment of part or all amounts to be paid for the said item.

7. MEASUREMENT AND PAYMENT

The Contractor shall not be separately reimbursed or compensated in respect of his compliance with the provisions of this part of the Scope of Works. All costs so incurred shall, save and except to the extent provided for the schedule of quantities under SECTION 001: GENERAL REQUIREMENTS AND CHARGES, be deemed to be included in the rates tendered for the various items of work listed in the schedule of quantities.

TABLE 1 SUMMARY OF MITIGATION MEASURES

ENVIRONMENTAL COMPONENT	ACTIVITY	MITIGATION	RELEVANT SECTION IN SPECIFICATIONS
<i>Establishment of site offices</i>	<i>Siting of offices</i>	<i>Preferred areas would be flat areas along the route. Avoid steep areas as soil erosion could increase. Avoid water courses</i>	001 002.02.01
	<i>Site Plan</i>	<i>Contractor will provide engineer detail of layout of site facilities within two weeks of moving to the site i.e. chemical toilets, the demarcation of areas for stockpiling of materials, storage of hazardous materials and the provision of containers. The offices shall be fenced. The site plan will be submitted before the site hand over meeting.</i>	001 002
<i>Site rehabilitation</i>	<i>Cleanup</i>	<i>All construction material is to be removed from the site on completion of the contract.</i>	001 002 104
<i>Vegetation</i>	<i>On site</i>	<i>Vegetation planted on the site should be indigenous. Only trees directly affected by works as indicated in writing by Engineer, shall be sawn off/removed</i>	104
	<i>Weeds</i>	<i>Clearance of weeds must be done by hand before seeding.</i>	104
	<i>Grass cover</i>	<i>The grass cover surrounding the construction site is to be left as in tact as possible or restored to its original condition.</i>	104
<i>Water</i>	<i>Available for human consumption</i>	<i>Water for human consumption must be tested and treated in accordance with recommendations.</i>	
<i>Soil management</i>	<i>Topsoil</i>	<i>The topsoil ($\pm$ 300 mm) of any excavation shall be removed and stockpiled separately from underlying material in an appointment area</i>	203 104

ENVIRONMENTAL COMPONENT	ACTIVITY	MITIGATION	RELEVANT SECTION IN SPECIFICATIONS
	<i>Borrow material</i>	<i>EMPR's for borrow pits to be submitted to the Department of Mineral and Energy Affairs for approval</i>	201 203
<i>Archaeological & Cultural sites</i>	<i>Discover of archaeological sites of artefacts</i>	<i>If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately and an archaeological consultant must be contacted. Work may only resume once clearance is given in writing by the archaeologist.</i>	GCC
<i>Graves</i>	<i>Discovery of graves</i>	<i>If a grave on site is uncovered, work in the immediate vicinity must be stopped and an undertaker should be contacted</i>	GCC
<i>Waste management</i>	<i>Solid & Construction waste</i>	<i>Solid waste is to be stored in an appointment area for collection and disposal. Disposal of waste will be in a DWAF licensed landfill, and no waste may be burnt on site.</i>	
	<i>Litter</i>	<i>The site is to be kept free of litter</i>	001
<i>Sewage treatment</i>	<i>Toilet facilities</i>	<i>Adequate toilet facilities are to be provided, and the siting of chemical toilets is to be done in consultation with the site engineer. Use of the veld for this purpose shall not be allowed.</i>	001 002
<i>Fuel, diesel & hazardous materials</i>	<i>Hazardous Materials</i>	<i>All hazardous materials i.e. bitumen binders will be stored in an appointed area that is fenced and has restricted entry. No spoiling of bituminous products on site, over embankments, in borrow pits or any burning. No spillage of bituminous products shall be allowed on site.</i>	
	<i>Fuels</i>	<i>All fuel tanks will be stored in an appointed area. Leakage will be avoided.</i>	

ENVIRONMENTAL COMPONENT	ACTIVITY	MITIGATION	RELEVANT SECTION IN SPECIFICATIONS
	<i>Cooking fuel</i>	<i>The Contractor should ensure that sufficient fuel is available for heating and cooking purposes should this be necessary.</i>	
	<i>Oil, grease</i>	<i>Oil, grease and cleaning materials from maintenance of vehicles shall be collected in a sump and sent back to supplier.</i>	
	<i>Spillages</i>	<i>Streams, rivers or dams must be protected against spillages of pollutants mentioned in 6.7 (e). In the event of a spillage, prompt action must be taken to clear the affected area.</i>	
<i>General considerations</i>	<i>Lines of authority</i>	<i>A nominated representative of the contractor will be the designated environmental officer for the site.</i>	RELEVANT SECTION IN SPECIFICATIONS
	<i>Reports</i>	<i>The environmental officer will submit monthly reports to the Engineer who will verify the information</i>	
	<i>Complaints</i>	<i>Complaints received regarding activities on the construction site pertaining to the environment should be recorded in a designated register, and the response noted with the date and action taken. This record must be submitted with the monthly report</i>	

ANNEXURE

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

Contract No: HS 04-2025/26

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION FOR A PERIOD OF 36 MONTHS.

Part C4: Site Information

Section C4.1: Locality Plan

CITY OF TSHWANE

HUMAN SETTLEMENTS DEPARTMENT

CONTRACT NO: HS 04-2025/26

THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION FOR A PERIOD OF 36 MONTHS.

C4 SITE INFORMATION

C4.1 SITE INFORMATION

LOCALITY

BooySENS Ext 4 is located in Zandfontein, Pretoria West in Region 3, Ward 55 of the City of Tshwane Metropolitan Municipality. The informal settlement is located on Portions 45, 83, 87, R/88, 89, R/90, 98, R/99, R/101, 102, 164 and 165 of the farm Zandfontein 317-JR and Erf 287 Claremont. The beneficiaries of the BooySENS Extension 4 development are from Gomora and Malusi informal settlements. According to the approved township layout plan, the development will comprise of 492 erven of which 481 are classified as residential 5 erven.

The coordinates of the reticulation area are $-28^{\circ}07'33''\text{E}$ latitude and $-25^{\circ}42'40''\text{S}$ longitude. The site can be accessed from the eastern side through Beverly Street emanating from Bremmer Street which connects to the R80 Mabopane Highway Interchange. The area for the proposed development is approximately 116 hectares in extent.



Figure 1 – Locality Aerial Photograph for Water & Sewer Reticulation.

The coordinates of the reservoir area are $-28^{\circ}05'26.34''\text{E}$ latitude and $-25^{\circ}41'18.76''\text{S}$ longitude. The reservoir is located on portion 140 of the farm Zandfontein 317-JR whilst the bulk water pipeline is traversing through portion 15, 16, 70, 232, R76 and 169 of the farm Zandfontein 317-JR. The area can mainly be accessed from the western side through Kenneth Street emanating from M17 (Hornsnek Road). See figure 2 Locality plan of the Reservoir and Bulk Water Feeder line section.



Figure 2 – Locality Aerial Photograph for Reservoir & Bulk Feeder line

GEOLOGY

Due to the vast scope of the BooySENS's project, where works spanned over various geographical plains. It was noted that several geotechnical investigations were conducted, to cover the northern bulk and reservoir area; the reservoir access road; as well as the southern area including investigations for the water and sewer reticulation works.

Southern Area Geotechnical Investigations (Water and Sewer Reticulation Works Area)

Knight Hall Hendry (Pty) Ltd was appointed for the geotechnical investigations for the southern area, which phase 1 was conducted September 2014, and phase 2 conducted November 2014.

The phase 1 geotechnical investigations recommended a need for further investigations, which included geotechnical investigations of the foundation conditions in terms of the NHBRC guidelines. These investigations were concluded under phase 2.

Phase 2 Investigation summary indicated complex sub-surface conditions, which split the area into three zones. Each Zone displayed different characteristics.

Knight Hall Hendry Recommendations:

- Removal of top 1m of fill material over the entire area and remove to spoil or alternatively use for landscaping.
- Dynamic Compaction (DC) can alternatively be used to compact the surficial fill layers at the zone.
- Excavate shallow strip footing foundations can be excavated into the soil raft while bearing capacities is limited to 120kPa.

- Surface beds can be constructed directly onto the compacted soil raft foundation.
- Provide proper surface drainage to prevent ponding of stormwater or infiltration of rainwater near the foundations.

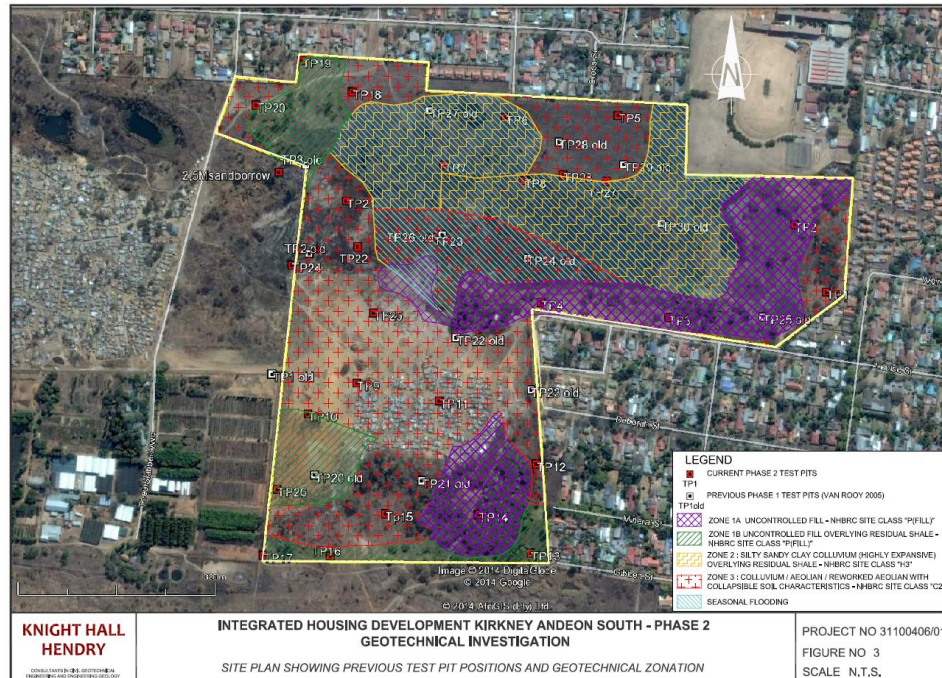


Figure 3: Southern Geotechnical Investigation Site Plan

Northern Area Geotechnical Investigations (Reservoir Access Road Works Area)

Earthinv Lab & Geotechnical Consulting (Pty) Ltd was appointed for the geotechnical investigations for the reservoir access road, which was conducted December 2022.

Earthinv Lab's Conclusions and Recommendations:

- From the available information, visual assessment and field explorations, the geotechnical conditions on site are generally poor for the proposed roads development. The investigation has shown that material on site is imported, colluvium and residual material.
- No Groundwater seepage, No refusal present in all test pits.
- During construction works, excavations should be inspected by a geotechnical engineer or engineering geologist to verify that the conditions on site are not at variance with those described in this report.

Northern Area Geotechnical Investigations (Reservoir Works Area)

The geotechnical investigations reviewed under the Northern Area for the Bulk Water and Reservoir works area, was conducted by Kimopax.

Kimopax (Pty) Ltd was appointed for the geotechnical investigations for the Hornsnek LL reservoir, which was conducted July 2018.

The investigation was to provide the subface conditions of the proposed reservoir foundation, as well as proposed development recommendations.

Kimopax Foundation Conclusion and Recommendations:

The soil profiles and the borehole profiles indicate that the site is underlain by soft cohesive soils which present poor founding conditions to a depth of 24 m. The allowable bearing capacity of the materials varies between 50kPa and 150kPa from 2m below ground level.

It was therefore recommended that the foundations below may be considered for proposed development:

- Piles.
- Dynamic compaction with slab on ground.
- Deep excavations.
- Soil mattress with stiffened cellular raft.



Figure 4: Reservoir Geotechnical Investigation Site Plan

EXISTING INFRASTRUCTURE

Southern Area (Reticulation Works Area)

There are structures of various forms built in the area, including informal and formal homes, creches, and shopping centres, within BooySENS Ext 4 settlement. The area has newly installed electrical, water and sanitation infrastructure.

Northern Area (Reservoir & Bulk Works Area)

On the Northern area side for Zandfontein there are no structures of any form built, such as modular homes, schools, shopping centre, etc, within the area. No water and sanitation reticulation infrastructure has been constructed to date. However, there is a Randwater line that runs through the area under study. There are also electrical poles traversing the site. A bulk water supply pipeline with diameters ranging from 1100mm to 800mm has been installed. It should be noted that the bulk line has not been completed as yet.

Most of the actual site's natural vegetation fairly is undisturbed with a combination of thick bush and plantation, light bushes, isolated trees, tree shrubs and grass lands.

There are surfaced roads running parallel on the eastern boundary (Renet Avenue and Holtman Avenue) and southern boundary (Kenneth Street). The existing services may cause construction constraints for the infrastructure developments. Wayleaves from all servitude occupants will be handed over to the Contractor prior any commencement of works/excavation to acquire consent and exact depths of wayleaves from the Service Owners, to avoid services interruption.

The wayleaves are also to be utilised to identify clashes of services with the sewer and water reticulation design. City of Tshwane Wayleaves Central was used to attain the wayleaves. Wayleaves attained to date are shown on below Table 1.

Table 1: Services Information

Name of Institution	Type of Service
Eskom / Internal Distribution	Electricity
Telkom	Telecommunication
City of Tshwane	Electricity
City of Tshwane	Water and Sanitation
DFA	Fibre
Randwater	Water Pipes
Liquid Communication / Neotel	Fibre
Cell C	Fibre
City of Tshwane	Environmental Services
City of Tshwane	Roads and Stormwater
Frog Foot	Fibre
Extribx Pty Ltd T/A SAS Networks	Fibre
Link Africa	Fibre
Metro Fibre	Fibre
MTN	Fibre
Sasol	Gas Pipes
Transnet	Pipe Lines
Vodacom	Fibre
VumaTel	Fibre

Attaining the above information will also assist in knowledge of future developments planned (if any), to avoid clashing of development or infrastructure related to the proposed water and sewer reticulations.

CLIMATE AND HYDROLOGY

Rainfall data from weather recording stations in the vicinity of the site was obtained from the South African Weather Services (SAWS) in Pretoria. The location and details of the station used are detailed in Table 2.

A 29-year term rainfall record from 1981 to 2010 was extracted (2025/10/23 @11:45) from station (0513222 0) Pretoria – Mountain View ARS, which is located approximately +/-10km from the proposed

site. The Mean Annual Precipitation (MAP) for the area based on this station is calculated as 717,3mm.

Figure 5. shows the average annual monthly rainfall for the entire rainfall record.

Table 2: Weather Service Station

Station Name	Station Number	X coordinate	Y coordinate	Distance from site (km)
Pretoria Mountain View ARS	0513222 0	-25.6990	28.1560	+/-10.0

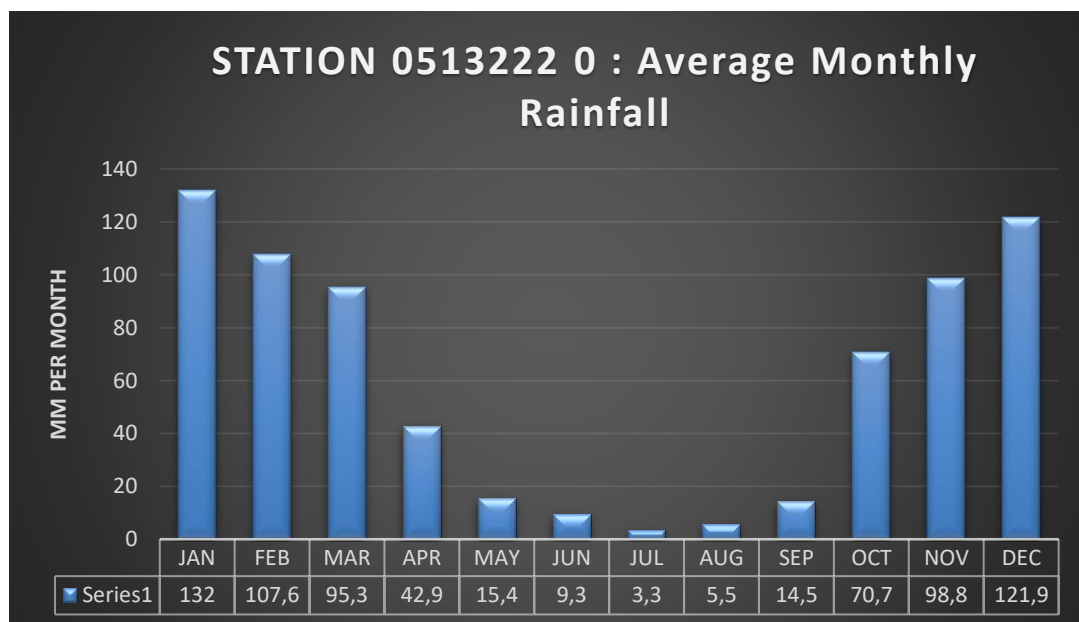


Figure 5: Average Annual Climatic conditions

The rainy season starts earnestly in October and lasts until April with the average maximum rainfall between February to April. Winters are dry and cold during the months of June to August which are also the driest months.

- Relative humidity: 80-100 %
- Site Altitude: 1190 m
- Mean Temperature: 19.2 °C
- Maximum Temperature: 32 °C
- Minimum Temperature: -2 °C

Climate Data indicates that construction would be better suited between the months of May and September, as there is less rain which can hamper a construction program. The months of June, July and August are in particular favourable as there is very little or no rain.

TOPOGRAPHY AND DRAINAGE PATTERN

The general altitude in the project area is 1300m above sea gently sloping east. The surface topography, for extension 4, is relatively flat at a gradient of 1:80 to the north and vegetation cover consists predominantly of veld grass, a few small shrubs, and trees on the site.

The surface topography where the reservoir is located, is at an elevation of 1375m above sea level, with a gentle steep slope of 1:10 to the south. The study area is gently sloping from the northern towards the southern direction, with average slopes of 2.4% throughout the study. The highest elevation is at the northern portion of the study area at 1343 m above mean sea level while the lowest point is at the southern portion of the study area at 1296 m above mean sea level. Figure 6 below shows a topographical map extracted from Pretoria topographic maps.



Figure 6: Topographic Map

C4.2 LIST OF DRAWINGS

DRAWING DESCRIPTION	DRAWING NUMBER
INDEX	
Locality Plan	2025-AND-LM-01
LAYOUT PLANS	
Construction of sewer services in Booysens Ext 4: General Sewer Layout Sheet 1 of 1	2025-AND-S-01U01
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 1 of 8	2025-AND-S-04U01
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 2 of 8	2025-AND-S-04U02
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 3 of 8	2025-AND-S-04U03
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 4 of 8	2025-AND-S-04U04
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 5 of 8	2025-AND-S-04U04
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 6 of 8	2025-AND-S-04U06
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 7 of 8	2025-AND-S-04U07
Construction of sewer services in Booysens Ext 4: Sewer Layout Sheet 8 of 8	2025-AND-S-04U08
Construction of sewer services in Booysens Ext 4: Coordinates Table Sheet 1 of 2	2025-AND-S-04U09
Construction of sewer services in Booysens Ext 4: Coordinates Table Sheet 2 of 2	2025-AND-S-04U10
Construction of water services in Booysens Ext 4: General Water Layout Sheet 1 of 1	2025-AND-W-01U01
Construction of water services in Booysens Ext 4: Water Layout Sheet 1 of 6	2025-AND-W-04U01
Construction of water services in Booysens Ext 4: Water Layout Sheet 2 of 6	2025-AND-W-04U02
Construction of water services in Booysens Ext 4: Water Layout Sheet 3 of 6	2025-AND-W-04U03
Construction of water services in Booysens Ext 4: Water Layout Sheet 4 of 6	2025-AND-W-04U04
Construction of water services in Booysens Ext 4: Water Layout Sheet 5 of 6	2025-AND-W-04U05
Construction of water services in Booysens Ext 4: Water Layout Sheet 6 of 6	2025-AND-W-04U06
Construction of Water Services in Booysens Ext 4: Coordinates Table 1 of 2	2025-AND-W-04U07
Construction of Water Services in Booysens Ext 4: Coordinates Table 2 of 2	2025-AND-W-04U08
LONGITUDINAL SECTION	
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 1 of 38	2025-AND-S-04L01
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 2 of 38	2025-AND-S-04L02
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 3 of 38	2025-AND-S-04L03
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 4 of 38	2025-AND-S-04L04
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 5 of 38	2025-AND-S-04L05
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 6 of 38	2025-AND-S-04L06
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 7 of 38	2025-AND-S-04L07
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 8 of 38	2025-AND-S-04L08
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 9 of 38	2025-AND-S-04L09
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 10 of 38	2025-AND-S-04L10
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 11 of 38	2025-AND-S-04L11
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 12 of 38	2025-AND-S-04L12
Construction of sewer services in Booysens Ext 4: Sewer Layout and Long-section Sheet 13 of 38	2025-AND-S-04L13
Construction of sewer services in Booysens Ext 4: Sewer Layout and Long-section Sheet 14 of 38	2025-AND-S-04L14
Construction of sewer services in Booysens Ext 4: Sewer Layout and Long-section Sheet 15 of 38	2025-AND-S-04L15
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 16 of 38	2025-AND-S-04L16
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 17 of 38	2025-AND-S-04L17
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 18 of 38	2025-AND-S-04L18
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 19 of 38	2025-AND-S-04L19
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 20 of 38	2025-AND-S-04L20
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 21 of 38	2025-AND-S-04L21
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 22 of 38	2025-AND-S-04L22
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 23 of 38	2025-AND-S-04L23

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSSENS EXTENSION FOR A PERIOD OF 36 MONTHS.

Part C4: Site Information

Section C4.2: List of Drawings

DRAWING DESCRIPTION	DRAWING NUMBER
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 24 of 38	2025-AND-S-04L24
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 25 of 38	2025-AND-S-04L25
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 26 of 38	2025-AND-S-04L26
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 27 of 38	2025-AND-S-04L27
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 28 of 38	2025-AND-S-04L28
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 29 of 38	2025-AND-S-04L29
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 30 of 38	2025-AND-S-04L30
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 31 of 38	2025-AND-S-04L31
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 32 of 38	2025-AND-S-04L32
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 33 of 38	2025-AND-S-04L33
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 34 of 38	2025-AND-S-04L34
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 35 of 38	2025-AND-S-04L35
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 36 of 38	2025-AND-S-04L36
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 37 of 38	2025-AND-S-04L37
Construction of sewer services in Booysens Ext 4: Sewer Long-section Sheet 38 of 38	2025-AND-S-04L38
STANDARD DRAWINGS	
Construction of sewer services in Booysens Ext 4: Schematic Connection Detail Sheet 1 of 3	2025-AND-W-04D01
Construction of sewer services in Booysens Ext 4: Schematic Connection Detail Sheet 2 of 3	2025-AND-W-04D02
Construction of sewer services in Booysens Ext 4: Schematic Connection Detail Sheet 3 of 3	2025-AND-W-04D03
CHAMBER & BULK FEEDER LINE	
BULK DISTRIBUTION NETWORK - CHAMBER C.03 & C.04	2543IES-196
BULK DISTRIBUTION NETWORK - CHAMBER C.05	2543IES-197a
BULK DISTRIBUTION NETWORK - CHAMBER C.06	2543IES-197b
BULK DISTRIBUTION NETWORK - CHAMBER C.08, C.08 & C.09	2543IES-198
BULK DISTRIBUTION NETWORK - CHAMBER C.10	2543IES-199
BULK DISTRIBUTION NETWORK - CHAMBER C.11	2543IES-200
BULK DISTRIBUTION NETWORK - CHAMBER C.12	2543IES-201
BULK DISTRIBUTION NETWORK - CHAMBER C.13	2543IES-202
BULK DISTRIBUTION NETWORK - CHAMBER C.14	2543IES-203
BULK DISTRIBUTION NETWORK - CHAMBER C.15 & C.16	2543IES-204
BULK DISTRIBUTION NETWORK - CHAMBER C.17	2543IES-205
BULK DISTRIBUTION NETWORK - CHAMBER C.18	2543IES-206
RESERVOIR & ACCESS ROAD	
HORNSNEK LL RESERVOIR - GENERAL NOTES	S001
HORNSNEK LL RESERVOIR - FOUNDATION & FLOOR	S100
HORNSNEK LL RESERVOIR - WALL PANEL LAYOUT	S200
HORNSNEK LL RESERVOIR - ROOF SLAB LAYOUT	S300
HORNSNEK LL RESERVOIR - BEAM LAYOUT	S301
HORNSNEK LL RESERVOIR - TYPICAL DETAILS	S400
HORNSNEK LL RESERVOIR - EARTH WORKS DETAIL	S500
HORNSNEK LL RESERVOIR - SUBSOIL DRAINAGE DETAIL	S501
HORNSNEK LL RESERVOIR - SUBSOIL DRAINAGE DETAIL	S600
HORNSNEK LL RESERVOIR - RESERVIOR LAYOUT	2543IES-151
HORNSNEK LL RESERVOIR - STANDARD DETAILS	2543IES-160
HORNSNEK LL RESERVOIR - DRAINAGE SYSTEM PLAN	2543IES-162
ACCESS ROAD - LAYOUT AND LONGITUDINAL SECTION PLAN	HS 03-2004 1
ACCESS ROAD - CROSS SECTIONS	HS 03-2004 2
ACCESS ROAD - CROSS SECTIONS	HS 03-2004 3
ACCESS ROAD - CROSS SECTIONS	HS 03-2004 4
ACCESS ROAD - ACCESS ROAD - DRIFT DETAILS	HS 03-2004 5
ACCESS ROAD - TYPICAL ROAD CROSS SECTION	HS 03-2004 6
ACCESS ROAD - CONCRETE PAVEMENT DETAILS FOR ROAD CONSTRUCTION	HS 03-2004 7

Contract No: **HS 04-2025/26**

TENDER FOR THE CONSTRUCTION OF A 30ML RESERVOIR AND THE COMPLETION OF A BULK WATER FEEDER LINE, WATER RETICULATION AND SEWER RETICULATION IN BOOYSENS EXTENSION FOR A PERIOD OF 36 MONTHS.

Part C4: Site Information

Section C4.2: List of Drawings

DRAWING DESCRIPTION	DRAWING NUMBER



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PROPOSED INTEGRATED HOUSING DEVELOPMENT ON PORTION 87, REMAINDER
OF PORTION 88, PORTION 89, REMAINDER OF PORTION 90, PORTION 98,
REMAINDER OF PORTION 99, REMAINDER OF PORTION 101, REMAINDER OF
PORTION 102, PORTION 164 & PORTION 165 OF THE FARM ZANDFONTEIN 317 JR
(KIRKNEY / ANDEON SOUTH): CITY OF TSHWANE METROPOLITAN MUNICIPALITY

GDARD REFERENCE NUMBER: GAUT002/14-15/0127

ENVIRONMENTAL MANAGEMENT PROGRAMME

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TABLE OF CONTENTS

SECTION A: INTRODUCTION	3
SECTION B: GENERAL TERMS AND ABBREVIATIONS	5
SECTION C: MANAGEMENT OF ENVIRONMENTAL IMPACTS	6
RECOMMENDATIONS RELATING TO THE PHYSICAL ENVIRONMENT, THE BIOLOGICAL ENVIRONMENT AND THE SOCIAL ENVIRONMENT:	7
ENVIRONMENTAL ASPECTS	8
RECOMMENDED MITIGATION MEASURE (S)	8
1. Soil.....	8
Exposed soil surfaces, surface and vegetation disturbance:	8
2. Traffic.....	9
3. General storage.....	9
Stockpiles and general storage of construction material & equipment	9
4. Waste Management	12
5. Vehicle maintenance	16
6. Construction camp.....	19
7. Air quality.....	22
Dust suppression:	22
8. Noise.....	23
9. Heritage resources	24
10. Social Impacts.....	25
11. Water quality.....	27
12. Concrete batching plant.....	28
13. Vegetation.....	30
14. Faunal life.....	30
15. Existing Infrastructure.....	30
SECTION D: REHABILITATION OF CONSTRUCTION AREAS	31
SECTION E: MONITORING PLAN (S)	32
SECTION F: COMPLIANCE BY CONTRACTORS	34
SECTION G: ADDRESSING EMERGENCY EVENTS	35
SECTION H: SUMMARY OF IMPORTANT MITIGATION MEASURES	37
SECTION I: SPECIALIST RECOMMENDATIONS.....	40
CONCLUSIONS.....	60

SECTION A: INTRODUCTION

Environmental Management Programme (EMPR) Objectives:

The EMPR has a main objective to address potential impacts during the construction and operational stages. It should be acknowledged that during the final planning and even during construction stages, some minor adaptations and alterations may occur where necessary, to improve impact mitigation measures and to bring forward more detail on physical actions to be taken. The EMPR remains a dynamic document with measures and rules.

The careful implementation and management of activities on site, during the entire process of project construction and operation, is highly important. It is now essential that certain steps be implemented on site that will ensure that the environmental conditions are not harmed in such a manner that it would have an adverse affect on the environment, especially during the construction stage and during the later operational stages of the project. Although a Scoping & Environmental Impact Assessment process has been followed, the real input on protection of the environment is reflected in the measures contained in the EMPR for the full construction stages of the proposed development.

The measures and principles are provided to assist placing impacts identified in another perspective – more towards the firm potential of mitigating the impacts during the development and implementation of the project. But this, as already mentioned, also implies that during the course of the project certain adaptations can be made or will be eminent during the construction implementation period. These adaptations will be the result of the EMPR monitoring exercise that is planned to take place during the construction period. The EMPR subsequently is an on-site working and dynamic document.

The management of environmental impacts is firmly based on the issues that have been identified in the EIA process.

It is recommended by the Environmental Practitioner that an Environmental Control Officer (ECO) be appointed by the applicant. The ECO will be the person involved with the development of the project and also be responsible for the monitoring of the implementation of the Environmental Management Programme. It may be different parties during the different phases of the project.

This person (ECO) may be appointed by the appointed engineer or indirectly by the applicant/client. It must, however, be a person with adequate technical and environmental knowledge to understand and implement this Management Programme.

The ECO may not be someone appointed by the contractor.

The ECO must report to the applicant on a regular basis or frequency.

The ECO has the authority to stop works during construction if in his opinion there is a serious threat to, or impact on the environment caused directly from the construction operations. This authority is to be *limited to emergency situations* (see definitions) where consultation with the engineer or developer is not immediately possible. In all such work stoppage situations the ECO is to inform the engineer and developer of the reasons for the stoppage as soon as possible.

Upon failure by the contractor or his employees to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

SECTION B: GENERAL TERMS AND ABBREVIATIONS

Audit	Regular inspection and verification of implementation of the EMPR
Bund	A sealed enclosure under or around a storage facility to contain any spillage
Batch plant	Concrete or plaster mixing facility and associated equipment and materials
Contractor	Principal persons or company undertaking the construction of the development
Development site	Boundary and extent of development works and infrastructure
Engineer	Person who represents the client and is responsible for enforcing the technical and contractual requirements of the project
ECO	Environmental Control Officer: - Person tasked with monitoring implementation of the EMPR during construction (* Refer to below)
Emergency situation	An incident, which potentially has the ability to significantly impact on the environment, and which could cause irreparable damage to sensitive environmental features. Typical situations amongst others are: -Large spills of petroleum products and lubricants on site, -Potential damage, erosion and slumping of unstable slopes, indiscriminate dumping of construction waste on site, and accessing exclusion zones.
RE/PM	Resident Engineer/Project Manager: - Person representing the Engineer on site

SECTION C: MANAGEMENT OF ENVIRONMENTAL IMPACTS

CONSTRUCTION STAGE:

This stage represents the period immediately after site hand over.

The contractor must be made aware of the contents of the EMPR, even if there are sections in the tender documentation which referred to Environmental Impact Management measures to be budgeted for and implemented.

The following “**rules**” must be implemented to make the document relevant and handy on site:

- ❖ **The EMPR shall not be removed from the site office.**
- ❖ **The EMPR shall be updated when necessary.**
- ❖ **The EMPR shall be readily available to the Resident Engineer/Project Manager, and the site manager.**
- ❖ **The ECO shall monitor the state/condition of the document and how it is kept on site. He will provide new printed copied when the EMPR is updated or adapted.**
- ❖ **The EMPR shall be available on site to any Interested and affected party but shall not be removed or copied to such a party or person.**

The “**Environmental Policy**” that can be put forward for the PROPOSED INTEGRATED HOUSING DEVELOPMENT ON PORTION 87, REMAINDER OF PORTION 88, PORTION 89, REMAINDER OF PORTION 90, PORTION 98, REMAINDER OF PORTION 99, REMAINDER OF PORTION 101, REMAINDER OF PORTION 102, PORTION 164 & PORTION 165 OF THE FARM ZANDFONTEIN 317 JR (KIRKNEY / ANDEON SOUTH): CITY OF TSHWANE METROPOLITAN MUNICIPALITY should read as follow and should be pinned up at the Construction office.

The objective and aim of the final product of this development is the creation of an environmentally sound transport facility that will be seen and function as an environmental asset in biophysical and socio-economic terms. The objective will be achieved through careful implementation of all measures pertaining to the protection of the environment during construction and operational stages of the project.

RECOMMENDATIONS RELATING TO THE PHYSICAL ENVIRONMENT, THE BIOLOGICAL ENVIRONMENT AND THE SOCIAL ENVIRONMENT:

The main environmental aspects to manage during construction that are pivotal in ensuring sound environmental practises are listed as follows:

- 1. Soil**
- 2. Traffic safety**
- 3. General storage**
- 4. Waste Management**
- 5. Vehicle maintenance**
- 6. Construction camp/ site office**
- 7. Air quality**
- 8. Noise**
- 9. Communication and Education**
- 10. Heritage resource**
- 11. Water quality**
- 12. Concrete Batching Plant**
- 13. Vegetation**
- 14. Faunal life**
- 15. Existing infrastructure**

ENVIRONMENTAL ASPECTS	RECOMMENDED MITIGATION MEASURE (S)
1. Soil	Exposed soil surfaces, surface and vegetation disturbance: •No informal, additional or random routes should be developed in the vicinity of the construction area. Only planned and marked routes must be used. It will be imperative that as limited as possible disturbances should be allowed to the surroundings. The designated routes for vehicular movements are imperative to reducing dust levels as well. •During the preparation of areas for construction, the areas to be cleared of natural vegetation should be kept as small as possible to limit the impact of clearing. •Removal of any indigenous grass vegetation, where it may occur along areas where construction actions take place must be limited to absolutely only what is spatially required. This is particularly important at the point of crossing of the natural drainage way. •In essence it will be important that the ECO in conjunction with the Contractor delineate and marked out a corridor of disturbance where no disturbance should be allowed beyond that. •Overburden material may not be dumped in a random manner. Specific sites must be agreed upon and adhered to by the construction team. This overburden material is expected to be utilized in landscaping or fill where required.

2. Traffic	The following elements are important: • Vehicular movement to and from the site must be adequately sign posted and adhered to. The following are important recommendations: Adequate and correct signage and road marking. Monitoring of dust levels on those paths “<u>off</u> the link roads” which heavy vehicles will cross, will be essential. Increased dust levels will impair the vision of passing vehicles. It is recommended that the Resident Engineer should discuss construction times and schedules with the relevant Emergency Services and local authority as well as the relevant traffic department and SAPS. The movement of workers in the area must be monitored closely to prevent loitering and subsequent crime. The labour force during construction must be well administered and full ID records must be kept on file for all workers. Blasting operations on site are not foreseen to occur extensively, but if blasting needs to be done for founding or other reasons, the necessary safety measures must be implemented by the blasting contractor. Large construction vehicles might impact on road safety circumstances. It is the duty of the contractors to ensure that safety measures are implemented and adhered to and the drivers are aware of the patterns of the traffic movement in the surrounding area.
3. General storage	Stockpiles and general storage of construction

	material & equipment •No equipment should lie in undesignated areas as this will contribute to soil compaction and even the spreading of weeds. •Temporary material storage areas and/or vehicle and equipment parking areas may not be established close to water courses – perennial or non-perennial. •Stock piles take up natural area space and it is therefore recommended that stock pile areas and building material storage facilities not be established in the areas where surface disturbance is to be limited. •Stockpiles of over burden material and topsoil should be protected during heavy rainfalls. Topsoil should not be allowed to be washed away. Topsoil as a growth medium for vegetation must be protected at all costs. This topsoil must be used during the rehabilitation of disturbed sections. Protection of topsoil can be enhanced by grass seeding of topsoil stockpiles. A grass cover over the topsoil stockpiles will stabilize the slopes and will put organic material and grass seed back into the soil prior to being used as topsoil on the terrain. •All stockpile and equipment storage areas, if this is not part of the Site office and construction camp, must be fenced. The “protection of stockpiled topsoil must be done as follows: •Place sand bags along the toe lines of the stock pile areas. •Top soil stripping in windy or rainy conditions must be

	avoided as far as possible. • The handling of topsoil should be limited as far as possible. Although it is preferable for the topsoil to be handled as little as possible, it cannot be guaranteed that it will not be handled more than twice. Topsoil handling will be determined by practical considerations and actions on site as the project progresses. • Soils from different zones should be kept separate and distinguishable. • Stockpiles will be cleared from alien vegetation before being re-introduced. • The storage of aggregate must comply with the following: • Fine aggregate shall be stored on a compacted earth platform. • The contractor shall ensure so that no excessive amount of fine aggregate is washed from the storage area onto the rest of the site with the use of barriers designed to the satisfaction of the RE. Coarse aggregate shall be stored, as a minimum, on a surface of compacted inert sub-base material. In terms of fill and layer works material the following must be implemented: The stockpiled area is to be ripped and re-vegetated upon removal of stockpiled material. Clearly defined borders for the stockpiling of material shall be stipulated by the Project Manager and the contractor shall contain stockpile within these boundaries.

4. Waste Management	Disposal and management: The service agreement for disposal of waste must be obtained from the Local Municipality (City of Tshwane Metropolitan) for disposal of both domestic and construction waste. The uncontrolled disposal of construction waste and litter must strictly be prevented during the construction period. Waste related to construction includes the following (this inventory must be expanded upon as the construction period progresses). Solid waste: Plastic and rubber packaging material, Plastic tubing, Concrete slabs, Concrete piping, Metal tubing, Metal brackets, Batteries of all types and sizes, Fence wires, Corrugated iron, Food packaging – paper, carton and polystyrene, Beverage tins and plastic bottles, Plastic containers of all sized and uses, Glass material e.g. glass sheets and glass bottles or other containers, Paper waste e.g. office waste paper, Paper packaging material – e.g. empty cement bags, Metal drums or other smaller containers, e.g. for paints and resins or other solvents, Bricks and mortal, Waste or broken computer hardware and Cables and wires. Liquid waste: Sewage waste from chemical toilets, Waste water for washing of equipment, Sanitation water for general cleaning of facilities and workers, Used lubricants and hydraulic fluids and Grey water

	generated at the construction camp that will be contained in conservancy tanks and may then used be to undertake dust suppression activities on site. •Uncontrolled disposal of waste near any site of construction activities must be communicated to all the workers to be unacceptable. Special attention must be paid to the occurrence of empty cement bags. These bags may not be left to lie around and litter the environment. The cement bags must be placed in a central collection point and removed from the site. •Waste generated by the workers that reside on site may not be allowed to lie around. The construction workers must be instructed to keep their surroundings clean and to dispose of their litter in designated areas only. Contravention of such actions should result in a fine being issued along with disciplinary action. The person responsible for each contractor must be informed of the strict rules in this regard. The money collected from any fines issued to contractors is to be put towards the ongoing rehabilitation and protection of the small streams along the route. •The collection of waste at a central collection facility(s) must be arranged. This must include collection points for solid as well as all liquid waste, which would include mechanical fluids disposed of during vehicle maintenance. Waste must be disposed of at the nearest licensed municipal site. In the case of oils it is important to import the services of an oil recycling company to collect used oil. •Waste must be collected regularly from these collection points and disposed of at municipal waste sites that are licensed to handle waste of this sort. All waste material

	associated with the construction period must be removed from the terrain. The frequency of waste removal depends on the varying intensity of waste generation. This matter will be monitored closely by the ECO. The specific steps that will be imposed and implemented are: •The placement of a sufficient number of large wastes skips at key points on the development terrain. The waste skips (not to be metal drums) must be provided by one of the reputable waste contractors. •The waste skips must be removed from the site once their full capacity has been reached. The waste skips will typically contain a mixture of domestic and construction waste. No liquid waste will be placed in these skips. •Separate waste containers to be provided by the waste contractor for liquid waste other than liquid sanitation waste e.g. oils, paints, lubricants etc. •Full record must be kept of the collections and collection dates and frequency. •Proof of all disposal at the municipal waste site, be it a general waste site or a hazardous waste site must be provided to the Resident engineer and filed for auditing. •Chemical toilet/ sanitation systems for workers will be serviced by the provider of the service and proof of such service with all the necessary details will be provided to the Resident engineer and filed for auditing.

	•Toxic and hazardous waste material (of which an inventory will be compiled as construction progresses) will be stored in separate drum containers in a covered and enclosed area to protect it from the elements and scavengers. Bins and containers should be reusable but should not be rinsed or washed on site. •Typical toxic waste usually generated on a residential construction site will be: paints and solvents such as thinners and additives, resins and fibre glass and used batteries. •Waste containers must be transported from the site by the responsible waste contractor to be appointed by the contractor if the contractor is not in the position to remove waste from the site. •Waste material of a fine/dusty nature or containing a fine/dusty component, to be transported on trucks must be covered. In terms of sanitation, a sufficient number of <u>chemical toilets</u> should be established by the contractor and no French drain systems must be installed. At least <u>eight workers per chemical toilet</u> are recommended. These toilets should be monitored for any leakages. No person is allowed to use any area other than the chemical toilets. Toilet systems must be located within walking distance from work areas. No chemical toilets must be placed closer than 60m from any drainage way or places where storm water may accumulate. Targets and objectives in construction waste management: The target and objective in the waste management is to store types of construction waste which are not potentially hazardous to the environment in waste skips provided by a waste contractor.

5. Vehicle maintenance	• Vehicles may not be serviced within 200 m of the wetland area. Servicing must be limited to designated areas within the construction camp only. These designated areas must be identified as least sensitive. No temporary fuel storage tanks or containers will be erected closer than 200m from a drainage course and refuelling should be done by means of fuel bowers. Note: The storage of fuel on the site must not exceed 30 000 litres in total to avoid a new application for authorization. • One workshop area has to be established. This must be situated in the construction camp. The workshop area should be able to handle minor servicing, while major servicing should take place at the applicable agents. If major servicing of heavy equipment needs to take place on the site, personnel or contractors specializing in this field will service the vehicles on site. This action will be strictly monitored by the ECO. Fuel storage areas should be bunded effectively and all applicable safety standards have to be adhered to. Bunding should in containment volume be 110% of the total volume of the storage tanks. Bunding must be done by building a plastered double brick wall round the tanks. • In the unlikely event of soil being severely contaminated by oil, fuel or chemical leakages shall be removed and disposed of at a waste disposal site identified by the RE. • All major servicing of plant and vehicles will be done off site, at the contractor's premises. • All used oil shall be retained and disposed of by recycling at a recycling centre or disposal in any other manner

	approved by the ECO. The contractor shall educate workers on the appropriate methods for workshop maintenance and fuel points to prevent fuel and oil being washed out of the containment areas. The ideal situation would be to have only one fuel point, but the size of the terrain makes it highly impractical for this measure to be practically applicable. Approximately two refuelling points will be required, but this may change in future to three when the final phase is constructed. These will all be adequately bunded. Mobile or tanker refuelling must take place only where there are sufficient bunding structures in place. •The contractor will provide a concave concrete floor slab to prevent erosion and infiltration of the ground water by petroleum products. •The slab shall drain into the temporary oil skimming tank. •The contractor shall provide double layered brick bunded walls around the maintenance area. These walls must be kept well maintained to prevent storm water flow through the bunded areas. •Where the drain passes through or across the bund wall the contractor shall provide a means of preventing flow so that in the event of a leak or overflow from the skimming tank all liquids can be contained by the bund walls. •All major spillage of oil onto concrete surfaces shall be controlled by the use of an approved absorbent material. •Toxins and oil recovered shall be collected in drums and disposed of in the same manner as for used vehicle oil.

	•All servicing must take place at the contractor's premises. Minor services to take place at the permanent camp. •Wash bays for construction vehicles must drain into catch pits, separation tanks and into a sealed compartment from where the treated water can be used for dust suppression. All drainage systems associated with the wash bays should be cleaned every two weeks or when required.

6. Construction camp

The location of the construction camp must be determined only after consultation between the Resident Engineer and the project manager. The process of choosing the correct site must be done with great care taking environmental factors into consideration. Construction camp sites may only be erected in an area identified as least sensitive, but which is still very safely accessible.

The layout and locality of the construction camp must be planned by the applicant in conjunction with the project manager, the resident engineer and the appointed Environmental Control Officer (ECO). When looking at the terrain it is recommended that the site office and construction camp (including the workshop) should not be placed in a terrain where natural vegetation is still dominant. ***The best option is always to choose a site where there is an existing homestead or farmstead with a disturbed yard.***

The principles followed are that the construction camp must be located as centrally as possible on site in order to limit the movements of workers and vehicle movements, and where it will not be placed close to any sensitive area on terrain and particularly not close to any natural drainage way.

Temporary accommodation for workers must as far as possible be by means of prefabricated units or containers to reduce surface impact and easing the rehabilitation and clean-up after construction.

The number of workers who may reside on-site should be kept to a minimum. Those workers present at night should be on site only to look after construction equipment and register must be taken for workers present to eliminate

	crime in the area. A control system of workers residing on the site will have to be kept in place to prevent workers squatting on the land. • The construction camp must be fenced. • Fires for cooking purposes must be in cooking screens and gas stoves as energy source must be promoted. • The making of open fires on the construction site cannot be fully prohibited. But it needs to be stressed that may cause veldt fires in the drier months. The rules for this must be as follows: – Hot ash must not be disposed of among vegetation or any flammable substance – All fires must be extinguished once the food preparation or heating is completed. – An open fire must be made on a piece of corrugated iron sheet. <u>Other General measures associated with the camp and site office area:</u> All aboveground petroleum product (diesel, oil and petrol) storage tanks shall be placed in bunds with sumps. The minimum bund capacity will be at least 110% of the storage capacity. In the event of a spill, pumping of the product, either for recovery or for disposal must be done as quickly as possible to reduce the amount of vapours being released into the environment. All drainage from fuel storage areas shall be diverted to

	the separating facilities and settling ponds. Oils shall be stored in sealed drums in a bunded area. Used oils shall be stored similarly and shall be recycled by private dealers identified by the developer or disposed of in a manner approved by the ECO. Cement shall be delivered in sound and properly secured bags or in approved bulk containers. Cement products in bags shall be stored in an enclosed storage area underlain by a concrete platform with the bags themselves raised off the ground with the use of pallets. The storage facility and surrounding area shall be swept and cleaned regularly as required to ensure that cement products do not enter the surrounding environment. Where cement silos are used in temporary camps, the ground cover surrounding the silo and dispatch area is to be a well graded compacted surface to allow easy cleaning in the event of a spill.

7. Air quality	Dust suppression: The management of dust generation to curb dust pollution during construction is of particular importance as a section of the construction site is closer to residential and commercial land uses. Therefore dust suppression, as a normal daily practice, is important. Roads used for transport purposes by construction vehicles, should be sprayed wet with water on a regular basis, as conditions allow. This practise should obviously be avoided with heavy rains, since excessive wetting of the surfaces will lead to greater erosion problems. Confining vehicular movement to designated routes only, will reduce dust levels substantially. It is not possible for the ECO to monitor on a daily basis this problem. This issue must be strictly and wilfully monitored and implemented by the Resident Engineer. The monitoring of dust will be done visually by the ECO. The actual dust fall out measures in gram per cubic meter will not be measured. Please note: Dust suppression will be important but more so in the region where actions will take place close to residential land use.

8. Noise

- The following noise mitigation measures as a result of construction actions should be considered:
- Construction should take place during daylight hours. The management and control of construction noise should be implemented especially in areas closer to the residential farms.
- No construction activities should take place during public holidays and Sundays.
- Well oiled and maintained machinery will impose a lesser sound intrusion to the surroundings than heavy machinery which is not regularly serviced. Silencers must be well maintained in the working machines as surrounding land owners may object to the increased noise levels.

Construction activities should only take place as follows:

Saturdays 6am to 13:00 pm

Mondays to Fridays 6:00am to 18:00pm

Summer 7:00am – 18:00pm

Winter 7:30am – 17:00pm

9. Heritage resources

There are no visible restrictions or negative impacts in terms of heritage associated with the site. In terms of heritage this project can proceed.

“Should any human remains be disturbed, exposed or uncovered during excavations for the proposed project, these should immediately be reported to the Gauteng Heritage Resources Agency. Burial remains should not be disturbed or removed until inspected by the archaeologist.

Site clearing and preparation activities must be monitored for the occurrence of any other archaeological material (Stone Age tools, Iron Age artefacts, historic waste disposal sites etc) and similar chance finds and an archaeologist should be asked to inspect the area when this has reached an advanced stage in order to verify the presence or absence of any such material.

Please refer to the Heritage assessment attached to the EIR for more details on the heritage resources.

10. Social impact	Communication and education A well-established communication process and structure during the construction period is important. Communications on matter are internal as well as external communication. It is recommended that an Environmental Control Officer be appointed to monitor environmental matters on site. Alternatively the Resident Engineer to the project can act in this role. The internal communication process on environmental management matters will conceptually involve the following: ✓ The Environmental Control Officer (ECO) / resident engineer conducts a once weekly site inspection and report in writing to the project manager when issues have been identified that need immediate action. ✓ The project manager communicates the issues in the monitoring report to the Resident Engineer. ✓ The Resident Engineer communicates on its turn to the Contractor through a site instruction. ✓ The ECO monitor, with the assistance of the Resident Engineer if the issue or matter was resolved on site. ✓ The ECO again report to the Project manager the results. The external communication on environmental matters will involve the following: ✓ External communication on environmental matters will only be implemented if concerns are raised by the surrounding community or the local authority.

	✓ Streamlined communication is essential. The purpose is to address any issues that arise during construction which directly or indirectly affect the day-to-day activities on site. In terms of educating the work force of the contractor on environmental protection the following process will be embarked upon: ✓ A site hand-over meeting will be held which was attended by contractors prior to any start of activity on site. ✓ The ECO will attend the meeting and affords an opportunity to convey principles contained in the EMPR. ✓ Regular meetings will be held to ensure effective communication from the developer via the project manager to the contractors. Through the processes indicated above, the different contractor teams that will gradually get involved in the construction process will be educated based on the contents of the all the relevant aspects of the EMPR. The education will be conducted by the ECO which will educate the section leaders. The section leaders will then be responsible for re-communicating the environmental management principles to their workers.

11. Water quality	Monitoring: •Water quality monitoring would have been important if construction camp occurred closer than 150m to the natural stream. If the construction camp is more than 150 m separated from the stream embankment no regular water quality monitoring will be necessary. This will only apply under the condition that the construction camp and site office is not placed closer to the stream. •If construction camp and site office is placed closer to the stream, water quality monitoring will be necessary. But as a precautionary measure, a baseline water sample, testing for hydrocarbons (oil and solvents) must be taken before any construction takes place. This is to determine the current status of the water quality up stream and down stream of the point of crossing of the stream. The stream is non-perennial and pollution is not seen as significant risk. •The wetland area must be fenced off before the construction phase as requested by GDARD. •No infrastructure must be built on buffer areas of the wetland unless if approved by GDARD.

12. Concrete batching plant

- The concrete plant shall be located on a compacted earth platform.
- Concrete shall only be mixed in areas which have been specifically demarcated and established for this purpose.
- Any large quantity of concrete spilt shall be promptly removed by the contractor to an approved disposal site or saved for possible later use.
- After mixing is complete all waste shall be removed from the batching area. The contractor should first seek means of reducing the waste through re-use on site e.g. rubble or recycling. Disposal at an approved disposal site should only be a last resort.
- No storm water shall be permitted to flow through the batching site.
- All water left over from the concrete batching operation or surface run-off from batching area will be channelled to evaporation ponds. These ponds will be cleaned at least twice per year.
- The batching plant shall be enclosed by a bunded wall with divisions and dedicated compartments for the various types of materials. Any concrete batching in the construction camp will be conducted on a well-graded un-compacted surface.
- The batching area is to be bordered by temporary earth bunds, which will contain any large spills. In the event of a spill, the contaminant must be removed as thoroughly as possible while it is still fluid. Contaminated soil must be removed.

	• Proper screening around the batching plant(s) to prevent fly dust is essential. Monitoring of these dust levels can be considered, using the services of the occupational hygienist. The occupational health and safety officer on site must make the judgement call on this matter in specific circumstances where he considers such monitoring to be necessary. • Concrete batching areas to be kept to an absolute minimum. Temporary concrete batching areas must have adequate storm water protection measures installed.

13. Vegetation	•The management of impact on natural vegetation cover is important to keep the overall impact on the natural environment and current ecological conditions as low as possible. •The prevention and control of weed growth must be implemented by the contractor in the early summer between September and January. •The growth of weeds will become prominent at all localised areas where surface disturbances will take place during construction. Such areas typically are stock pile areas, fringes of the site office terrain, and fringes of temporary access roads. •No open fires will be allowed under the trees. A Vegetation Study was conducted and the recommendations are included in this programme.
14. Faunal life	•The ECO must be alerted to the fact that the snaring or hunting of wild animals often takes place in the vicinity of construction sites. This must be punished if there is proof that such a practice is conducted by members of the construction team. A Faunal Study was conducted and the recommendations are included in this programme.
15. Existing infrastructure	•The impact on existing infrastructure must be managed carefully. Additional infrastructure is required to accommodate the proposed development but some of the existing infrastructure will need to be upgraded before new infrastructure is built. Careful analysis around this is required.

SECTION D: REHABILITATION OF CONSTRUCTION AREAS

Rehabilitation will be necessary in the following areas:

- Wetland area.
- Concrete and compacted earth platforms.
- Excavations for various purposes.
- Access roads running into and through the camp.

Concrete platforms will need to be broken up and rubble taken to an approved waste disposal site. No new borrow pit will have to be established for the project. The exposed surface must be checked for contaminants and if any is found, the contaminated soil is to be removed along with the concrete to a site acceptable to the ECO and the RE. The re-vegetation process described below must then be followed.

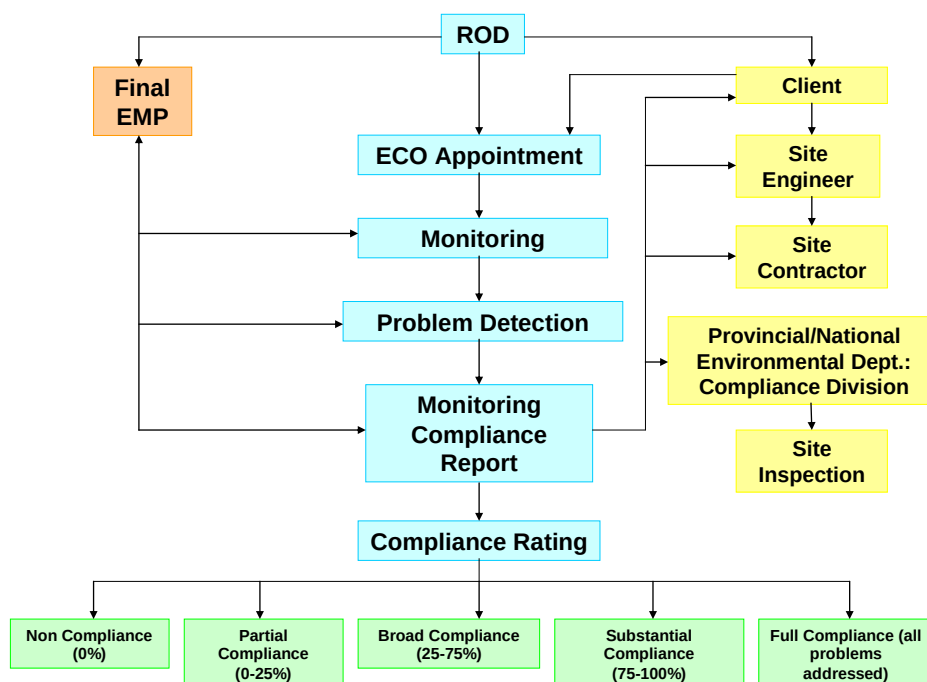
Soil containing contaminants in the compacted earth platforms is to be removed according to the method described above. The re-vegetation process is then to be followed.

Access roads running into and through the camps and any other well-used thoroughfares (whether pedestrian or vehicular) which have subsequently been compacted, must be checked for any substantial spillage of contaminants including oils and fuels. The area is to be ripped and top soiled if necessary.

Compacted and un-compacted earth platforms will be rehabilitated according to the method described above. Access roads will also be rehabilitated according to the method described above.

Rehabilitation of all areas disturbed resulting from the construction process will be implemented. Stabilization of slopes will be done through grass seeding prescribed in the tender document to the contractor.

SECTION E: MONITORING PLAN (S)



Definition of terms that will be used during monitoring:

Detection:

A small or potential problem that might not, in the judgment of the Auditor, be a serious to detrimental impact to warrant the raising of the non-compliance, but is serious enough to state on record.

Non-compliance:

A non-reaction or the non-fulfilment of specified requirements and requests made by the Auditor.

Major Non-compliance:

Any non-compliance that has the potential to result in a large environmental impact and/or was not addressed from previous requests from the Auditor.

Compliance with the EMPR will be rated according to the system detailed below:

SCORE	COMPLIANCE RATING	DEFINITION
4	Full Compliance	All requirements and conditions have been addressed.
3	Substantial Compliance	Between 75 and 100% met
2	Broad Compliance	Between 25 and 75% met
1	Partial Compliance	Less than 25% met
0	Non Compliance	None of the requirements and conditions has been addressed.

Monitoring plan:

Clear line of communication will be essential and the details and communication mechanism will be decided upon at the start of the project and revised at the start of each sub project.

The usual line of communication during monitoring is as follows:

- ✓ The appointed ECO must notify the project manager of a site inspection;
- ✓ The appointed ECO inspects the terrain where actions are taking place. (If there are important issues to be addressed, it is discussed with the project manager).
- ✓ Less serious issues that can be rectified on site are taken up with project manager in order to address the matter.
- ✓ The issue is however noted to be included in the Environmental Monitoring Report. This is to take record and ensure that issues are addressed.
- ✓ The urgent matters **MUST THEN** be communicated via e-mail to the project manager on an immediate basis to be addressed.
- ✓ A monitoring sheet will be compiled. This sheet will serve as the basis for the compilation of the **Environmental Monitoring Report to be compiled and submitted to the project manager on a monthly basis.**
- ✓ **Monitoring of construction site will be conducted by the appointed ECO twice a month.** The Compiled EMPR will form the basis against which the monitoring will be conducted.

SECTION F: COMPLIANCE BY CONTRACTORS

Fines for non-compliance to environmental management measures put forward in the EMPR will be imposed, under the control of the project manager.

A fining structure has been formulated by the project manager, where the fine is determined as per environmental management measure not complied with by the contractor. In simple terms, fines are to be imposed.

Fines are to be imposed on contractors for spills, pollution, burying of waste, moving in conservation areas, not stockpiling properly, leaking vehicles, not recycling where applicable, and other offences already mentioned in the EMPR.

The following actions will be fined.

Contravention of EMPR Stipulation:
Spillages of hazardous chemicals or substances
Un-bunded fuel storage areas
Any unauthorized entry into open veldt area by construction workers and/or vehicles
Any unnecessary removal of, or damage to, natural vegetation
The poaching of natural fauna on site
The storage of materials and equipment in areas other than the designated areas within the construction camp
The servicing of vehicles in areas other than the designated areas within the construction camp
Failure of the contractor to ensure that domestic waste is disposed of in the appropriate manner suggested in the EMPR
Failure to carry out adequate dust suppression activities on site
Burying or burning of any waste materials
Leaking vehicles
Wash bays which do not function properly causing pollution
<i>Further discretions may come to light with the progression of the project</i>

SECTION G: ADDRESSING EMERGENCY EVENTS

Emergency event	Mitigation	Responsible parties
1. Spillage of oil, fuel or solvents on concrete slabs or on soil surfaces or other carbohydrates. This also includes the leaking and/or spillage of the contents of chemical toilet systems. It includes spill events causing pollution of any surface water.	- Prompt placement of suitable absorbent material e.g. wood shavings or fine sand. Mopping up of the surface. In case of significant spillage on open soil surface of grassy areas, the contaminated soil cover must be removed to a depth of 20cm and disposed of at the nearest hazardous waste disposal site. - In the unlikely event of any type of spillage or soil contamination within 20m from the drainage courses or lines, sandbags must be placed between the stream course and the area of spill while cleaning up is taking place. - If a spill event occur and pollutes surface drainage, such contaminated surface water must be pumped into containers and removed from the site to be disposed of at the nearest hazardous waste disposal site. The name and contact details of such a contractor must be kept in the site office at all times.	The project manager and the contractor responsible of that particular part of the site actions.

2. Fire occurrences	- In the event of fire of the open veldt or at any other place on the terrain, the Fire Department must be called in. It is also important that local fire fighting equipment be ready and available at the site office. Such equipment includes a water cart and booster pipe and hose to fight minor veldt fires or fires at equipment or buildings. The contact details of the local fire brigade and emergency services will be kept available at the site office at all times.	Project manager and Site manager
3. Spillage events of sewage	- Spill events will be cleaned-up by pumping sewage into bin or drum containers, preferably plastic containers to be removed from the site to the closest municipal water treatment works, The Health Department of the local authority must be notified of the event. - Arrangement must be made for the use of emergency clean up equipment and assistance in the disposal of spill at their facility. The necessary technical steps such as the closing of valves must be conducted in an event of a spill.	Project manager and site manager.

SECTION H: SUMMARY OF IMPORTANT MITIGATION MEASURES

1. All the specialist recommendations included in this EMPR must be adhered to.
2. The **Wetland Rehabilitation Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
3. The **Ecological & Invasive Management Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
4. The **Storm Water Management Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
5. **The Implementation Plan for formalisation of Informal Settlement** (addressing Relocation & Beneficiary issues) by Human Settlements Department must be considered during the relocation processes of any informal settlement or for beneficiaries of the project. All other guidelines must also be taken into consideration e.g. National Housing Policy for Social and Rental housing.
6. No clearing of vegetation should be allowed within any 1:100 year flood line or wetland area.
7. All invasive, weedy and / or alien species should be eradicated where found in and around the study site, in order to prevent their spread.
8. Where possible, mature indigenous trees naturally growing on the site should be included in the landscaping of the proposed development. Measures should be implemented to ensure the survival of such trees.
9. Innovative landscaping of the site towards the end of the construction stage will contribute significantly to the visual and aesthetic attractiveness of the site and will also solve the problems associated with the removal of vegetation cover, including soil erosion, dust generation and the flourishing of weeds and/or other unwanted exotic species in the long term.
10. Topsoil should be stockpiled separately from subsoil.

11. If any blasting activities occur on site, the blasted rocks and heavy rock material must be transported to an external venue.
12. The movement and maintenance of construction vehicles may only take place in pre-determined and delineated areas.
13. Workers and residents should be oriented on how to react when a *P. natalensis* is discovered on the site, and should be able to access contact details of a qualified snake handler that can remove the specimen from the property. The likelihood of this occurring is very low if a wall is built around the site.
14. Soil contamination during construction vehicle maintenance or as a result of fuel storage on site is easily prevented, but in the event of such an accident, the spill should immediately be cleaned up by absorbing the worst of the fluid with saw dust and then disposing of the saw dust and the first bit of the soil layer.
15. Old oil, dirty diesel and hydraulic oil shall be stored in a demarcated area under cover on a bunded concrete floor.
16. The temporary storage of construction material and especially fuel must be carefully monitored by the site contractor to prevent the risk of accidental spillage or disposal of any such material that will contaminate soil surfaces, surface and subsurface water.
17. Proper sign posting and traffic control measures along the routes utilised by these vehicles is crucial throughout the construction period; to warn motorists of the presence of these vehicles and potentially dangerous situations. It is necessary to warn motorists of slow moving vehicles to and from the site to reduce the risk of accidents. The access points especially are high risk areas for accidents. Therefore, well posted warning signs are essential.
18. It is crucial to implement strict and effective waste control and waste management procedures during the construction phase. No littering by any personnel is permissible. The site manager/contractor should conduct regular site clean-ups to keep the site litter free – as litter is not only aesthetically displeasing, but it is also harmful to the environment. All domestic solid waste produced must be disposed of in waste bins situated on site. The bins should be emptied into a covered skip (for storage) on a

regular basis, until its collection and removal to a municipal waste disposal site (preferably on a weekly or bi-weekly basis).

19. The emissions from run down, old machinery will greatly pollute the air. Therefore, well serviced machinery and heavy vehicles that are maintained in a good working order should be used.
20. Regular wetting (dampening) of working areas (especially during the dry and windy periods) is required at least twice a day to minimise the amount of dust generated. When necessary, these working areas should be damped down every 3 – 4 hours.
21. It is recommended that equipment and vehicles on the site should be equipped with noise suppressing measures and kept in proper working order. Construction should be limited to normal working hours, which is stipulated to be from 6h00 to 17h00, Monday to Friday and 6h00 to 13h00 on Saturdays. No work should be allowed on Sundays and Public Holidays, except in extreme emergencies and with the prior approval of the Environmental Control Officer, which will require notifications to directly surrounding residents. Adjacent tenants should also be informed if any unusually noisy activities are planned.
22. Unskilled labour should be used during the construction process, and it is recommended that labour intensive construction methods be employed as far as possible, with an adequate transfer of skills. Local unskilled labour (women included) should be used as far as possible during the construction period.
23. Implementation of an Occupational Health and Safety management system should be required of contractors. Safety measures and work procedures to be communicated to construction workers. First aid facilities should be on hand at all times. Medical screening of employees is important.
24. Ensuring the implementation of an efficient Storm Water Management Plan – in accordance with Local Municipality's guidelines is required.
25. It is recommended that monthly monitoring by an ECO is implemented during the construction period to ensure that the recommended impact mitigation measures are implemented. A monitoring report should be written each month, after 2 site visits have taken place and should then be forwarded to the appropriate or relevant authority.

SECTION I: SPECIALISTS RECOMMENDATIONS

ENGINEERING SERVICES:

- ❖ SEWER – There are multiple connection points to existing Municipal sewer system in the Booyens area. The new development would be able to flow on a gravity system. However; albeit feasible to connect the new development onto the system, once the final layout is developed, the City of Tshwane will need to be consulted to determine the capacity in the said pipes and which/if any of the pipes will need to be upgraded.
- ❖ STORM-WATER MANAGEMENT - Comprehensive storm-water plans will need to be developed in consultation with other experts (geohydrology, EIA, wetland, etc.), the Town Planners and the City of Tshwane. This is to take into account the existing wetland, the impact of development of hard surfaces, runoff and future drainage. A preliminary report has been included in this EI report.
- ❖ WATER SUPPLY – There is a 700mm diameter network water pipe feeding the nursery and Booyens area in the north from the Hercules West reservoir. There will be sufficient pressure to supply the new development with a connection to the 700 diameter network pipe.
- ❖ ELECTRICITY – An Electrical Engineer will assess the capacity needs once the township layout has been finalised. A services investigation to determine current capacity will be conducted in due course.

WETLAND

- ❖ A buffer of 30 meters (for inside the urban edge) must be applied to the natural wetland found on the study site. It must be clearly noted that any development on the study site will have an impact on the aquatic ecosystems and must be authorised in terms of section 21 of the National Water Act (Act 36 of 1998).

The following general mitigation measures are proposed in the Wetland delineation report:

- ❖ An alien vegetation eradication programme should be implemented on the site to remove the alien vegetation from the wetland areas.

- ❖ An environmental control officer (ECO), specialising in aquatic systems (AECO) must be appointed throughout the project to ensure the longevity of the impacted aquatic system.
- ❖ The use of cement lined channels must be avoided at all costs and lining must be done with Loffel stones (or Amourflex stones) or similar products. This is to prevent the loss of habitat to aquatic organisms living in the system.
- ❖ The ramps for the in- and out flows from the construction site must be lined with Reno mattresses and or gabions to prevent structure undermining and to ensure flow is dispersed and mitigated. Vertical steps should not exceed 200 mm, to ensure aquatic fauna movement and migration.
- ❖ The use of gabion structures, well keyed into the surrounding bank walls and secured to the ground is recommended.
- ❖ If any construction activity must occur within the riparian areas then it must commence from upstream proceeding downstream with proper sedimentation barriers in place to prevent sediments and pollution moving downstream from the site. This includes non-perennial systems.
- ❖ The removal and translocation of impacted hydrophytes must be done prior to construction commencing.
- ❖ Due to the perennial nature of the system, construction should preferably commence during the dry months.
- ❖ All sensitive areas together with the associated buffer zones should be fenced during the construction phase to prevent any human activity from encroaching onto these areas. Monitoring of the fences is of paramount importance to ensure no infringement of the fences occurs.
- ❖ Removal of debris and other obstructing materials from the site must take place and erosion-preventing structures must be constructed. This is done to prevent damming of water and increasing flooding danger.
- ❖ Removed soil and stockpiling of soil must occur outside the extent of the watercourse to prevent siltation and increased runoff during construction. This includes the buffer zones and 1:100 year flood lines.
- ❖ Proper toilet facilities must be located outside the sensitive areas: The impact of human waste on the system is immense. Chemical toilets must be provided which should

always be well serviced and spaced as per occupational health and safety laws, and placed outside the buffer and 1:100 year flood lines.

- ❖ Spill kits must be stored on site: In case of accidental spills of oil, petroleum products etc., good oil absorbent materials must be on hand to allow for the quick remediation of the spill. The kits should also be well marked and all personnel should be educated to deal with the spill. Vehicles must be kept in good working order and leaks must be fixed immediately on an oil absorbent mat. The use of a product such as Sunisorb is advised.
- ❖ No plant machinery may be stored or left near the aquatic areas, when not in use.
- ❖ Frequent inspection of the site must be done to ensure that no harmful practices occur on site.
- ❖ A photo collection must be taken from fixed demarcated spots to detect changes in the construction area over time. These photographs must be dated and should include the entire site.
- ❖ No construction personnel are allowed to collect, harvest or kill any species of fauna and flora on the site.
- ❖ Any species of fauna encountered during the construction phase should be moved to a safe location where no harm can be bestowed on the species.
- ❖ If water is sprayed on the construction surface for any reason during the construction process, utmost care must be taken to ensure the runoff water does not pollute the system or any of the associated catchment areas. A storm water cut-off drain should be constructed between the construction area and the aquatic system to ensure that storm water flowing through the construction area cannot flow into the aquatic system. The water from the cut-off drain must be collected in a sedimentation pond before entering the aquatic system.
- ❖ Any new erosion gullies must be remediated immediately.
- ❖ Construction should commence during the dry season or when flows are at their lowest where reasonably possible.
- ❖ Regular inspection of erosion preventing devices is needed.
- ❖ Construction camps: Plant parking areas and material stockpiles must be located outside the extent of the wetland.

- ❖ Access routes should be demarcated and located properly so that no damage to the system can occur. These roads must be adhered to at all times. A large turning place must be provided for larger trucks and machinery. No grading of temporary access roads is allowed as this will create dust and water runoff problems.
- ❖ Increased runoff due to removal of vegetation and increased soil compaction must be managed to ensure the prevention of siltation and the maximum stream bank stability.
- ❖ The velocity of storm water must be attenuated and spread. As far as possible the link between the stream and the local environment must be maintained. This is to ensure water movement into the soils and ensuring the survival of associated vegetation.
- ❖ Storm water leaving the site downstream must be clean and of the same quality as in situ before it enters the construction site (upstream). Preconstruction measures must be in place to ensure sediments are trapped.
- ❖ The overall alluvial characteristics of the drainage line (balance between sand, gravel, and stone) must be similar to before construction to ensure natural systems of flooding and sedimentation deportation and conveyance occur.

RIDGE

The following general mitigation measures are proposed by the specialist:

- ❖ Where possible, trees naturally growing on the site should be retained as part of the landscaping on the site. Measures to ensure that these trees survive the physical disturbance from the proposed development should be implemented. A tree surgeon should be consulted in this regard.
- ❖ The ridge on site must be fenced off and no domestic animals (including cats and dogs) must be allowed to enter this area.
- ❖ A proper storm water management plan must be developed and detail designs provided and authorised that ensure that increased hard surfaces and storm water does not erode the slope of the ridge, causing visual scars and potential collapse of the slope in the future.

The following mitigation measures were developed by GDARD (Directorate of Nature Conservation, 2012) and are applicable to the study site:

- ❖ An appropriate management authority (e.g. the body corporate) that must be contractually bound to implement the Environmental Management Plan (EMP) and Record of Decision (ROD) during the operational phase of the development should be identified and informed of their responsibilities in terms of the EMP and ROD.
- ❖ The sensitive areas should be fenced off prior to construction commencing (including site clearing and pegging). All construction-related impacts (including service roads, temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment/building materials/vehicles or any other activity) should be excluded from the sensitive areas. Access of vehicles to these areas should be prevented and access of people should be controlled, both during the construction and operational phases. Movement of indigenous fauna should however be allowed (i.e. no solid walls, e.g. through the erection of palisade fencing).
- ❖ Only indigenous plant species, preferably species that are indigenous to the natural vegetation of the area, should be used for rehabilitation purposes.

FLORA/ VEGETATION

- ❖ An Alien and Invasive Plant Species Management Plan should be drafted, in order to control the invasive species onsite, as per the requirements of NEMBA for the 26 different NEMBA species identified on and around the site.
- ❖ An ecological open space management plan should be drafted, in order to detail the actions necessary to conserve / manage biodiversity within the study site. The management plan should comply with the requirements of GDARD and must include the Alien invasive Plant Management plan as stipulated above.
- ❖ A wetland study should be conducted, in order to determine the true extent of the wetland and buffer zones to the wetland, as well as the need for water-use licences and other permit requirements.

- ❖ A rehabilitation plan should be drafted that pertains to the rehabilitation of degraded areas and should include the prevention of illegal dumping, clean-up of dumping sites, establishment of vegetation onsite and prevention of the spread of alien / invasive plant species.
- ❖ Areas marked as sensitive on the sensitivity map should be conserved as far as possible.
- ❖ Removal of protected tree species can only be done through the proper permit process.

FAUNAL HABITAT ASSESSMENT

Mammal Habitat Assessment:

It is recommended that excavated material is hauled away or utilized as filling.

- ❖ The site is vulnerable to hunting/trapping by construction workers. Harassing and hunting by construction workers could be expected. Education of the construction staff about the value of wildlife and environmental sensitivity must be done.
- ❖ Restrict access to the suitable and sensitive habitats (ridge and wetland) of faunal species.
- ❖ The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- ❖ Natural open spaces should be left in their undeveloped state and any existing or new exotic vegetation that is present on the site be removed and eradicated.
- ❖ Remove all exotic, invasive vegetation and implement a monitoring and eradication plan to keep the site free from invasive plants. Open areas can be planted with indigenous ground cover to act as sumps in the case of storm floods.
- ❖ If lighting is to be deemed necessary, it should be designed to minimize impacts on fauna. All outside lighting should be directed away from sensitive areas. Fluorescent and mercury vapour lighting should be avoided and sodium vapour (yellow) lights should be used wherever possible.

Avifaunal Habitat Assessment:

The following mitigation measures are proposed by the specialist:

- ❖ No development should be allowed on the slopes of the Daspoortrant/Witwaterberg Mountain range as well as within the wetland areas and these areas should be regarded highly sensitive in terms of avifaunal biodiversity and must be kept free from any form of disturbance.
- ❖ The Daspoortrant must be fenced off from the proposed development to ensure that none of the residents enter the ridge area and disturb the sensitive avifaunal species.
- ❖ Where possible, **work should be restricted to one area at a time**, as this will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- ❖ Where possible the construction of the proposed development should take place during the winter months during the time when most avifaunal species are not breeding.
- ❖ **No vehicles should be allowed to move in or across the wet areas or drainage lines and possibly get stuck.** This leaves visible scars and destroys habitat, and it is important to conserve areas where there are tall reeds or grass, or areas where there is short grass and mud.
- ❖ The contractor must ensure that no fauna is disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- ❖ It is suggested that where work is to be done close to the drainage lines, these areas **be fenced off during construction**, to prevent heavy machines and trucks from trampling the plants, compacting the soil and dumping in the system.
- ❖ During the construction phase, noise must be kept to a minimum to reduce the impact of the development on the fauna residing on the site.
- ❖ Alien and invasive plants must be removed.

The specialist also concluded that the largest portion of the study site is disturbed and has been transformed by past and present human activities and does not offer suitable habitat for the Red Data avifaunal species.

Herpetofaunal Habitat Assessment:**Protection of the Wetland/Stream:**

Every effort should be made to retain the linear integrity, flow dynamics and water quality of the wetland/stream.

The following mitigation measures are proposed by the specialist:

If a Southern African python, giant bullfrog or any herpetological species are encountered or exposed during the construction phase, they should be removed and relocated to natural areas in the vicinity.

- ❖ The contractor must ensure that no herpetofaunal species are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- ❖ Alien and invasive plants must be removed.
- ❖ An Ecological Management Plan is required. It is suggested that application of this plan is audited on an annual basis by a specialist registered in terms of the Natural Scientific Professions Act (No. 27 of 2003) in the field of Ecological Science.
- ❖ During the construction phase there will be increased surface runoff and a decreased water quality (with increased silt load and pollution). Completing construction during the winter months would mitigate the environmental impact.

The following mitigation measures were developed by GDARD (Directorate of Nature Conservation, 2014) and are applicable to the study site.

- ❖ An appropriate management authority (e.g. the body corporate) that must be contractually bound to implement the Environmental Management Programme (EMPR) and Environmental Authorization during the operational phase of the development should be identified and informed of their responsibilities in terms of the EMP and ROD.
- ❖ All areas designated as sensitive in a sensitivity mapping exercise should be incorporated into an open space system. Development should be located on the areas of lowest sensitivity. (The wetland and a 32 meter buffer zone are considered as sensitive and should thus be treated as an open space system.)

- ❖ The open space system (the water ways) should be managed in accordance with an Ecological Management Plan that complies with the Minimum Requirements for Ecological Management Plans and forms part of the EMP.
- ❖ The open space system should be fenced off prior to construction commencing (including site clearing and pegging). All construction-related impacts (including service roads, temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment/building materials/vehicles or any other activity) should be excluded from the open space system. Access of vehicles to the open space system should be prevented and access of people should be controlled, both during the construction and operational phases. Movement of indigenous fauna should however be allowed (i.e. no solid walls, e.g. through the erection of palisade fencing).
- ❖ The appropriate agency should implement an ongoing monitoring and eradication program for all invasive and weedy plant species growing within the servitude.
- ❖ Rehabilitation of natural vegetation should proceed in accordance with a rehabilitation plan compiled by a specialist registered in terms of the Natural Scientific Professions Act (No. 27 of 2003) in the field of Ecological Science.
- ❖ Any post-development re-vegetation or landscaping exercise should use species indigenous to South Africa. Plant species locally indigenous to the area are preferred. As far as possible, indigenous plants naturally growing along the route, that would otherwise be destroyed during construction, should be used for re-vegetation / landscaping purposes

TRAFFIC IMPACT ASSESSMENT

The following has been proposed in terms of traffic:

- ❖ Provision of sidewalks along the Class 4 roads.
- ❖ Upgrading of the intersection between Bremer Road and Louise Street.
- ❖ Upgrading and signalisation of the intersection between Van der Hoff Road and Theo Slabbert Avenue.

GEOTECHNICAL INVESTIGATION (PHASE 2)

- ❖ The site is underlain by sedimentary rocks of the Silverton Formation, Pretoria Group, of the Transvaal Supergroup. The strata of the Pretoria Group dips northwards by between 18° to 30° (locally up to 60°). The Pretoria Group sedimentary rocks have been intruded along strike by several dolerite sill intrusions, while dykes generally cut almost perpendicular across strike. The southern portion of the site is covered by thick windblown sands. The most southern portion of the site is in close proximity of the quartzite belonging to the Daspoort Formation of the Pretoria Group.
- ❖ A total of 28 test pits (TP1 to TP28) was excavated on site with a TLB to refusal depth or maximum reach of the machine on 28 and 29 August 2014. No test pits could be excavated at the waterlogged area located at the north-eastern portion of the site, due to access limitations.
- ❖ The site is characterized by three geotechnical zones, viz. Zone 1 to Zone 3. Zone 1 is divided into Zone 1A and Zone 1B, while Zone 1A contains uncontrolled fill comprising mostly gravel, cobbles and boulders with thicknesses of between 3m and 5m with dense Saringa trees at the south-eastern portion of the site. Zone 1B contains finer uncontrolled fill materials with thicknesses of 0,4m to 2,9m, which overlies residual shale. Groundwater seepage was only encountered in TP4 at 2,1m depth.

ZONE 1:

Zone 1 is characterized by thick layers of uncontrolled fill (Zone 1A) and uncontrolled fill overlying residual shale (Zone1B). Zone 1A is mostly covered by fill with occasional occurrences of transported material, such as colluvium, ferruginous colluvium, talus and aeolian soils. The fill generally comprises gravels, cobbles and boulders with a medium dense consistency and a minimum thickness of 1,1m to 2,7m. The bearing capacity of this material is at most 120kPa.

The transported materials have a consistency of generally medium dense/firm with scattered areas of dense and loose soils. The allowable bearing capacity of these materials may vary between less than 80kPa and 100kPa. It is anticipated that the fill thickness may vary between 3m and 5m and that the material density and material type continuity is uncertain at Zone 1A.

The following generic or general foundation option is therefore regarded feasible in Zone 1A:

- ❖ Use an impact roller to compact the entire surface area of the zone. Impact compaction can be described as the process whereby high levels of energy are imparted into the ground, to achieve higher degrees of compaction at greater depth than would be possible with traditional compaction equipment.
- ❖ The depth of influence of these machines may exceed 5m in certain materials, but it is anticipated that a depth of at least 2m might be obtainable in this zone. The energy transfer is obtained by using heavy masses with out-of-round profiles that are drawn across the area to be compacted with special dedicated power units at speeds greater than twice the speed of conventional compaction equipment.
- ❖ Unlike conventional compaction, large parcels of energy are imparted at high amplitude and a low frequency (up to two blows per second). The largest of impact compactors imparts 25kJ of energy to the ground per blow.
- ❖ Compaction using the high parcels of energy imparted by the impact compactors ensures that the maximum amount of void reduction occurs, if sufficient number of passes is applied. This increases the density and stiffness of the material.
- ❖ The depth of influence is a function of the contact pressure and the geometry of the roller. The huge contact areas of the drum allows for improvement down to depths of 5.0m. The contact stress measured during impact range from 300kPa to 1.2Mpa depending on the soil type and moisture conditions.
- ❖ Decelerations during impact may measure up to 20g's, which equates to a dynamic load of 250 tonnes or an equivalent contact pressure of 1.2Mpa.
- ❖ Dynamic Compaction (DC) can alternatively be used to compact the surficial fill layers at the zone.
- ❖ After the fill material has been compacted, it is recommended to import G5 quality material to a height that corresponds to 0,7m above ground surface level in order to construct a soil raft foundation. Properly compact the imported soil in 200mm maximum thickness layers to a density of to at least 95% of modified AASHTO maximum dry density at optimum moisture content. The ferruginous colluvium at the site tested as G6/G7 quality material and might be used for structural backfilling if it is stabilized with 2% cement (by volume). C4 quality material might be achieved when the stabilization tests are done, but will have to be confirmed by laboratory testing.
- ❖ Excavate shallow strip footing foundations into the soil raft, while the bearing pressures should not exceed 120kPa.

- ❖ Surface beds can be constructed directly onto the compacted soil raft foundation.
- ❖ Provide proper surface drainage to prevent ponding of storm water or infiltration of rainwater near the foundations.

In Zone 1B, fill material occurs as silty sand to silty clayey sand with soft shale gravel layers and has a thickness of between 0,4m and 2,9m. The soil layer has a general consistency of loose to medium dense with an allowable bearing capacity of at least 50kPa. Talus was only encountered in TP3 below the fill at a depth of 1,2m and had a medium dense soil consistency. Very dense residual shale occurred only in TP19 at 2,5m depth while very soft rock shale was found at 1,1m and 1,5m depth in TP19 and TP20 old respectively. The allowable bearing capacity of the very dense residual shale and very soft rock shale is at least 180kPa and 450kPa respectively. The south-western portion of Zone 1B contains numerous large Saringa trees, which may contain large tree roots underground and will decompose if some of the trees are removed. This will have an impact on the proposed foundation and will therefore have to be mitigated.

The following generic or general foundation option is therefore regarded feasible in Zone 1B:

- ❖ Remove the top 1m of fill material over the entire area of Zone 1B and remove to spoil or alternatively use for landscaping.
- ❖ In situ densify the base of the excavation to at least 95% modified AASHTO dry density at optimum moisture content.
- ❖ Backfill must be done as discussed in Zone 1A.
- ❖ Shallow strip footing foundations can be excavated into the soil raft while bearing capacities is limited to 120kPa.
- ❖ The same recommendations for surface beds and ponding of surface water apply as for Zone 1A.

ZONE 2:

- ❖ Zone 2 is characterized by highly expansive colluvium which overlies residual shale. The consistency of the colluvium and residual shale varied from soft to firm or firm to stiff depending on the amount of soil moisture content. Shale bedrock was encountered in isolated areas at a depth of between 1,1m and 2,7m depth.
- ❖ Foundation recommendations for Zones 1 to 3 are made and the following have been noted for Zone 2:
 - ✓ Development in a large area of Zone 2 (approximately 72ha) is not recommended due to the area being waterlogged.
 - ✓ Zone 2 is covered by silty sandy clay colluvium (highly expansive) overlying residual shale and classifies as site class “H3” according to the NHBRC soil classification.
 - ✓ Fill occurs in 30% of the test pits to a depth of 0,2m to 0,5m, while most of the site is covered by highly expansive colluvium with a thickness of 0,2m to 1,6m.
 - ✓ The clayey colluvium has variable consistencies which depend on the soil moisture content. The saturated soils had soft to firm consistencies, whereas the soils with lower water content had firm to stiff consistencies.
 - ✓ The allowable bearing capacities of the soft to firm colluvium are at least 75kPa, whereas the firm to stiff soils have a value of approximately 100kPa.
 - ✓ Clayey residual shale underlies the colluvium from 0,2m to 1,6m depth and also has the same variable consistencies (soft to firm or firm to stiff) and allowable bearing capacities depending on the water content of the soils.
 - ✓ Very soft rock shale with an allowable bearing capacity of 450kPa was only encountered in TP28 and TP27 old between 2,7m and 1,1m depth.
 - ✓ A very large portion of Zone 2, located at the northern half portion of the site, is waterlogged and development in this area is not recommended. This area measures approximately 480m in length (west to east) and 150 in width (north to south) equalling 72ha.
 - ✓ Disturbed areas in the form of old diggings and soil heaps occurred in some places at the site. These areas will have to be rehabilitated with suitable material and all rubble and waste material should be removed from site.
 - ✓ It is recommended to construct a terrace platform as foundation type for the new buildings at Zone 2.

The terrace should be constructed as follows:

- ✓ With box cut the foundation footprint area to a depth of 1m below natural ground level following the slope of the site.
- ✓ Remove the excavated highly expansive colluvial and/or fill soil layers to spoil. The outer excavation slopes of the box cut excavation should be 1V:2H or flatter. Rip and compact the floor of the excavation by means of a sheepfoot roller in order to achieve at least 93% of modified AASHTO dry density.
- ✓ Backfill the excavation as discussed in Section 8.2 while the minimum thickness of the soil raft should not be less than 2m, i.e. 1m above the natural ground surface level. This must be done in order to stay well clear from ponding surface water during the wet season.
- ✓ Excavate shallow strip footings into the soil raft and limit the safe bearing pressure to 120kPa.
- ✓ Surface beds can be constructed on the soil raft foundation.
- ✓ Proper surface drainage must be provided to prevent ponding near structures.
- ✓ Subsurface soil drains should be installed around the perimeter of the terrace to prevent seepage water from entering the terrace platform and ultimately the foundations.

ZONE 3:

Zone 3 is characterized by generally thick transported material with collapsible soil characteristics. Loose to medium dense fill and topsoil materials occur in only a few of the test pits to a maximum depth of 0,4m. Colluvium and ferruginous colluvium occur in many of the test pits and generally has a medium dense consistency with a thickness of 0,5m to 2,3m and an allowable bearing capacity of 80kPa.

The ferruginous colluvium has a dense consistency. Aeolian/reworked aeolian (surficial layer) occurs in 57% of the test pits and has a pinhole voided soil structure with a general consistency of loose to medium dense or soft to stiff. The material comprises silty sand to sandy clay and has a minimum layer thickness of between 1,9m and 3,0m. The allowable bearing capacity of this layer may vary between 50kPa and 80kPa. This material showed low cohesion characteristics due to collapse of test pit sidewalls in some of the test pits.

Residual shale underlies the transported materials at depths of between 1,6m and 2,2m below surface. This layer is reworked and ferruginised in some of the test pits. The consistency of the materials varies between medium dense to dense or firm to stiff and an allowable bearing pressure of at least 80kPa should be possible. Soft rock shale occurred in TP20 at 2,0m depth, whereas very dense ferruginous colluvium occurred at 1,45m in TP23 old.

Groundwater may be encountered at depths of between 1,0m and 2,4m.

The following foundation options are therefore recommended:

- ❖ Excavate strip footing foundations to a depth and width of at least 1,5m times the width of the strip footing and remove the excavated material to spoil. Remove all large tree roots if they are encountered in the excavations.
- ❖ In-situ densify the excavation floor to 95% of modified AASHTO maximum dry density.
- ❖ Stiffened strip footings can be placed directly onto the densified excavation floor, while bearing pressures are limited to 80kPa.
- ❖ For surface beds construction, it is recommended to strip the surficial 0,3m and in situ densify the floor to at least 95% of modified AASHTO dry density. Backfill the excavation with G6/G7 quality ferruginous colluvium, properly compacted in 100mm maximum thickness layers to a density of 95% of the modified AASHTO maximum dry density at optimum moisture content to surface level. The surface beds can then be placed on the compacted backfill.
- ❖ Subsurface soil drains is also recommended.
- ❖ Provide proper surface drainage to prevent ponding of storm water or infiltration of rainwater near the foundations.

GEOHYDROLOGICAL INVESTIGATION

- ❖ The surface water flow directions on the proposed development site are altered by manmade channels which divert water on at least 5 areas of the total development portion.
- ❖ The general surface water flow (sheet wash) is still in a north north-eastern direction.
- ❖ The groundwater flow direction is not noticeably altered by the sand borrowing operations of the past.
- ❖ Groundwater flow directions are in a north north-eastern direction and mimic the surface topography to a large degree.
- ❖ Surface water and groundwater generated on this specific development portion is in a north north–eastern direction and does not contribute surface water or groundwater towards the central wetland area.
- ❖ The development of this portion will therefore have an insignificant impact on the groundwater regime of the wetland area.

STORM WATER MANAGEMENT

The storm water management report indicates that piped network will be designed to carry the 1 in 5 year storm, while the road and piped network will carry the 1 in 20 year storm with kerb overtopping.

The following have been recommended in terms of storm water drainage:

Drainage philosophy:

- ❖ New Storm water infrastructure will be required to drain the developed site. The design will attempt to minimize the effect of the increased runoff from the new development and thus the impact thereof on the wetland. The site will be split into three portions.
- ❖ The Southern section falls to the existing wetland. The philosophy will be to attenuate the increased run-off from the site before entering the wetland, such that the post development run-off is equal to or less than the pre development run-off. This will be done by draining the site to a new attenuation pond and controlling the outlet into the wetland. Due to the position of the proposed attenuation pond and the natural fall of the site, a portion of this catchment will not be able to be attenuated in the pond. This portion will only consisted of residential I housing, and it is recommended that no underground

pipes are installed on this section and the drainage remains surface drainage as not to concentrate the flow into the wetland at one location.

- ❖ The attenuation will however be sized as if it was attenuating the entire southern portion as to compensate for the area which isn't attenuated. The Northern section of the site falls away from the wetland and towards Van Der Hoff Street. Van Der Hoff Street has a bulk storm water system which can cater for the envisaged flow. It is therefore recommended the new development in the northern section is drained with underground pipes to connect to the existing infrastructure in Booyens. The connections will need to be upgrade to the connections with the build system on van Der Hoff Street.

Hydrological data and storm water run-off:

- ❖ The Storm water run-off was calculated using the rational method to determine the peak flow at the time of concentration. Based on the size of the catchments, the longest water course and slope of the area.

Design standards:

- ❖ All designs are in accordance with the Tshwane design standards.
- ❖ The piped network will be designed to carry the 1 in 5 year storm, while the road and piped network will carry the 1 in 20 year storm without kerb overtopping.

Southern Portion:

All even greater than 1500m² will be provided with an underground storm water connection. Storm water run-off will be managed on the surfaced roads. At the points where the storm water exceeds the capacity that can be managed by the roads and/or at low points on the roads, kerb inlets will be constructed to catch the storm water runoff. The kerb inlets/catch pits are sized based on the flow and the slope of the road. The sizing of the upstream catch pit and downstream lengths are according to Tshwane guidelines. From the kerb inlets storm water will be managed inside pre-cast concrete pipes. The majority of the storm water run-off generated will run via the concrete pipes and connect to the new Attenuation pond.

Northern Portion:

Storm water will be managed as surface drainage from the Erven onto the roads. Storm water run-off will be managed on the surfaced roads. At the points where the storm water exceeds the capacity that can be managed by the roads and/or at low points on the roads, kerb inlets will be constructed to catch the storm water run-off.

The kerb inlets/catch pits are sized based on the flow and the slope of the road. The sizing of the upstream, catch pit and downstream lengths are according to Tshwane guidelines. From the kerb inlets storm water will be managed inside pre-cast concrete pipes. The majority of the storm water run-off generated will run via the concrete pipes and connect to existing systems.

Storm water Attenuation:

A attenuation pond is planned to control the increased runoff from the southern portion of the site and attenuate the flow such that the 1 in 20 year post development flow from the site entering the wetland is less than or equal to the pre development 1 in 5 year flow.

A portion of municipal land in the north eastern corner of the site has been allocated for the attenuation pond. A total storage of 7 000 m³ is required for the attenuation, the size of the site is approximately 11 000 m². The Exact depth and dimensions of the storage pond will be finalized in the detailed design.

The Attenuation pond was preliminary sized 5000 m² with a maximum depth of 1.5m (total storage approximately 7500m³) and modelled with the a triangular inflow hydrograph for the 1 in 20 year post development run off controlled by one 450mm diameter pipe as the outflow.

In conclusion, the Storm water report further recommended that sustainable urban drainage systems are implemented in the individual developments to further mitigate the effect of the development (for example; rainwater harvesting). It further proposed that a silt trap and litter trap is installed in the attenuation pond to assist with the prevention of pollution in the wetland; however this will required periodic maintenance from council.

HERITAGE IMPACT ASSESSMENT

- ❖ The proposed site does not contain any surface archaeological deposits. The possibility of sub-surface findings always exists and should be taken into consideration in the Environmental Management Programme. If sub-surface archaeological material is discovered work must stop and a heritage practitioner preferably an archaeologist contacted to assess the find and make recommendations.
- ❖ The site does not contain any marked graves or burial sites. The possibility of graves not visible to the human eye always exists and this should be taken into consideration in the Environmental Management Programme. It is important to note that all graves and cemeteries are of high significance and are protected by various laws. Legislation with regard to graves includes the National Heritage Resources Act (Act 25 of 1999) whenever graves are 60 years and older. Other legislation with regard to graves includes those when graves are exhumed and relocated, namely the Ordinance on Exhumations (no 12 of 1980) and the Human Tissues Act (Act 65 of 1983 as amended). If sub-surface graves are discovered work should stop and a professional preferably an archaeologist contacted to assess the age of the grave/graves and to advice on the way forward.

SOCIAL IMPACT ASSESSMENT

Based on the findings of the SIA the following recommendations are made:

- ❖ That the mitigation measures as set out in this report be actively pursued to enhance the positive impacts and limit the negative impacts of the development.
- ❖ That the construction phase be implemented over the shortage period in time to limit residual negative impacts for beneficiaries and damage / vandalism to new infrastructure and buildings. The possibility of illegal occupation of stands cannot be ignored should there be a time delay between construction and the legal occupation of houses.
- ❖ That the beneficiary screening and identification phase be transparent and that the majority of beneficiaries be identified from Ward 55, without discrimination or prejudice against any racial group. This would minimise negative impacts on existing social and cultural networks, infrastructure and services and population changes.
- ❖ That the City of Tshwane recognise their role and responsibilities and put a strategy in place for the:

- ❖ Relocation of individuals and households through a Relocation Action Plan;
- ❖ Maintenance of open areas and sport fields;
- ❖ Administration and management of the rental blocks / units (financial, infrastructure, etc.); and
- ❖ Possible reinvasion of land and the illegal occupation of stands.
- ❖ In terms of the township layout and housing typologies, it is recommended that the City of Tshwane clarifies the layout with the beneficiaries in advance, the advantages and disadvantages of the housing sizes and designs and ensures that no false expectations are created.
- ❖ Malusi community leaders indicated that traditionally Black people are not in favour of two and three-storey flats, as certain cultural practices could be disruptive for neighbours and old people are unable to climb the stairs. Bedrooms in fully subsidized houses are often unrealistically small and problematic for the community members.
- ❖ Insufficient and unsafe parking at rental blocks and flats are often a concern and should be addressed by the Planners.
- ❖ The need for both a primary and secondary school in the new development has been voiced, as the existing local schools would in all likelihood not be able to accommodate an influx of new learners. In addition to this, the existing local schools do not offer other language mediums than Afrikaans and English, which is problematic for the Black population.
- ❖ Although not located on the project site, the possible impacts of the proposed development on Malusi 1 and *vice versa* have to be considered. Possible community mobilisation and subsequent negative community actions against the housing development has to be considered should residents of Malusi 1 feel that they do not receive a fair opportunity to register as beneficiaries and become part of the project.
- ❖ No socio-economic impacts or “hot spots” that would prevent the project from being implemented have been identified.

PLEASE TAKE NOTE OF THE FOLLOWING (VERY CRITICAL):

- ❖ The **Wetland Rehabilitation Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
- ❖ The **Ecological & Invasive Management Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
- ❖ The **Storm Water Management Plan** must be fully implemented during construction and operational phases and must be added as an addendum to this EMPR.
- ❖ **The Implementation Plan for formalisation of Informal Settlement** (addressing Relocation & Beneficiary issues) by Human Settlements Department must be considered during the relocation processes of any informal settlement or for beneficiaries of the project. All other guidelines must also be taken into consideration e.g. National Housing Policy for Social and Rental housing.
- ❖ **All municipal bylaws and other relevant policies and legislation must be taken into consideration during the implementation of the project.**

CONCLUSIONS

The above impact management measures as part of this EMPR form a firm basis for the Resident Engineer and contractors to operate in such a manner that the environment is protected against severe impacts. The Environmental Management responsibility to implement this EMPR lies with the project manager and Resident engineer.

Please ensure that a copy of the EMPR is kept on site and must be available at the site office at all times.

The control on the implementation of the EMPR is the responsibility of the Resident Engineer. The monitoring on site of EMPR implementation **MUST** be through an independent ECO (Environmental Control Officer) to be appointed by the applicant.

The EMPR can be refined as the construction process progresses and should still be viewed as being somewhat flexible.