



BID SPECIFICATION

INVITATION FOR BIDS

APPOINTMENT OF A SERVICE PROVIDER FOR THE UPGRADE OF INFRASTRUCTURE AT MDALA NATURE RESERVE – PHASE 2: CONSTRUCTION OF BULK WATER PIPELINE

BID NUMBER:	MTPA/20262027/PMU/03
NAME OF THE BIDDER	
TOTAL BID AMOUNT	R
TENDER LEVY	R300.00
CLOSING DATE:	10 SEPTEMBER 2026
CLOSING TIME:	11h00 AM
BID REQUIREMENT	ONLY BIDDERS WITH A CIDB GRADE 5ME/CE (4ME/CE PE) AND ABOVE WILL BE CONSIDERED
BID DOCUMENT DELIVERY ADDRESS:	SUPPLY CHAIN MANAGEMENT UNIT PROCUREMENT OFFICE HALLS' GATEWAY, MATAFFIN MTPA FINANCE BLOCK E MBOMBELA, 1200
BID VALIDITY PERIOD:	90 DAYS (COMMENCING FROM THE ADVERT CLOSING DATE)



Private Bag X11338, Mbombela, 1200
M4 National Road, Halls' Gateway, Mataffin, Mbombela, Mpumalanga
+27 (0)13 065 0859/0860 | Email: info@mtpa.co.za
Reservations: +27 (0)13 065 0865 | reservations@mtpa.co.za

Report Fraud, Theft and Corruption and Save the MTPA
Tip-Offs Anonymous 0800 214 775 | 0800 204 625



TECHNICAL RELATED QUERIES	Sibusiso.Mabunda@mtpa.co.za 013 065 0888
SCM RELATED QUERIES	Priscilla.Gwebu@mtpa.co.za 013 065 0639
DESCRIPTION OF THE BID	APPOINTMENT OF A SERVICE PROVIDER FOR THE UPGRADE OF INFRASTRUCTURE AT MDALA NATURE RESERVE – PHASE 2: CONSTRUCTION OF BULK WATER PIPELINE

Bidders should ensure that bids are delivered timeously to the correct address. If the bid is late, it will not be accepted for consideration.

Bidders shall submit proposal responses in accordance with the prescribed manner of submissions as specified above. Bids received after the time stipulated shall not be considered.

Bidders are not allowed to contact any other MTPA staff in the context of this BID other than the indicated officials under SBD 1 or as indicated above.

NB: No proposal shall be accepted by MTPA if submitted in any manner other than as prescribed above.

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (MPUMALANGA TOURISM AND PARK AGENCY)

BID NUMBER:	MTPA/20262027/PMU/03	CLOSING DATE:	10 September 2026	CLOSING TIME:	11:00 AM
DESCRIPTION	APPOINTMENT OF A SERVICE PROVIDER FOR THE UPGRADE OF INFRASTRUCTURE AT MDALA NATURE RESERVE – PHASE 2: CONSTRUCTION OF BULK WATER PIPELINE				

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)

SUPPLY CHAIN MANAGEMENT UNIT, PROCUREMENT OFFICE (MTPA FINANCE BLOCK E)

N4 NATIONAL ROAD, HALL'S GATEWAY MATAFFIN

1200

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO

TECHNICAL ENQUIRIES MAY BE DIRECTED TO:

CONTACT PERSON	Priscilla Gwebu	CONTACT PERSON	Sibusiso Mabunda
TELEPHONE NUMBER	013 065 0639	TELEPHONE NUMBER	013 065 0888
FACSIMILE NUMBER	N/A	FACSIMILE NUMBER	N/A
E-MAIL ADDRESS	Priscilla.Gwebu@mtpa.co.za	E-MAIL ADDRESS	Sibusiso.Mabunda@mtpa.co.za

SUPPLIER INFORMATION

NAME OF BIDDER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	

FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No: MAAA
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES OFFERED?	☐ Yes ☐ No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS				
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?			☐ YES ☐ NO	
DOES THE ENTITY HAVE A BRANCH IN THE RSA?			☐ YES ☐ NO	
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?			☐ YES ☐ NO	
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?			☐ YES ☐ NO	
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?			☐ YES ☐ NO	
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.				

PART B

1. BID SUBMISSION:

- 1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
- 1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.
- 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
- 1.4. THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).

2. TAX COMPLIANCE REQUIREMENTS

- 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
- 2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
- 2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 2.6 WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
- 2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

(Proof of authority must be submitted e.g. company resolution)

DATE:

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....
.....

¹ the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

- 2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?
YES/NO

- 2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium¹ will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.5 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.6 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.7 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of

¹ 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.

administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of bidder

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

(delete whichever is not applicable for this tender).

- a) The applicable preference point system for this tender is the **90/10** preference point system.
- b) The applicable preference point system for this tender is the **80/20** preference point system.
- c) Either the **90/10 or 80/20 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.
-

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

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

- 1.5 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.
- 1.6 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).

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

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

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 allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
HDI		6		
Youth		4		
Gender (Women)		5		
Disability		5		

In order for the points to be allocated to a bidder, the ownership status must at least be equals to or above 50 + 1% on any of the above specific goals.

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

- (e) forward the matter for criminal prosecution, if deemed necessary.

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME:

DATE:

ADDRESS:

.....

.....

.....

EVALUATION CRITERIA

Note: 80/20 preference point system will be used.

(ONLY BIDDERS WITH A CIDB GRADE OF 6ME/CE (5ME/CE PE) OR ABOVE MUST APPLY)

FUNCTIONALITY	POINTS										
Company Experience In Terms of Value Evaluation shall be based on the highest value of a single completed project related to the construction of water reticulation networks. Schedule of company experience to be attached together with appointment letters, signed client completion letters or acceptance certificates on client letterhead, and client letters with contactable references. Failure to submit such will result in zero (0) points allocated. <table border="1"> <tr> <td>Highest value of a similar project exceeding R 7 000 000</td><td>30</td></tr> <tr> <td>Highest value of a similar project R 5 000 000 to R 7 000 000</td><td>20</td></tr> <tr> <td>Highest value of a similar project R 3 000 000 to R 5 000 000</td><td>15</td></tr> <tr> <td>Highest value of a similar project R 1 000 000 to R 3 000 000</td><td>10</td></tr> <tr> <td>Highest value of a similar project less than R 1 000 000</td><td>0</td></tr> </table>	Highest value of a similar project exceeding R 7 000 000	30	Highest value of a similar project R 5 000 000 to R 7 000 000	20	Highest value of a similar project R 3 000 000 to R 5 000 000	15	Highest value of a similar project R 1 000 000 to R 3 000 000	10	Highest value of a similar project less than R 1 000 000	0	30
Highest value of a similar project exceeding R 7 000 000	30										
Highest value of a similar project R 5 000 000 to R 7 000 000	20										
Highest value of a similar project R 3 000 000 to R 5 000 000	15										
Highest value of a similar project R 1 000 000 to R 3 000 000	10										
Highest value of a similar project less than R 1 000 000	0										
Company experience in similar projects in bulk water supply or water reticulation This will take into consideration similar contracts successfully completed (in bulk water supply or water reticulation) by the bidder. NB: Proof of similar projects completed must be attached (Practical or Final Completion certificate). Failure to provide proof will result in zero (0) points allocated.	20										



FUNCTIONALITY			POINTS
4 or more similar assignments / projects	20 points		
3 similar assignments / projects	15 points		
2 similar assignments / project	10 points		
1 similar assignments / project	5 points		
0 projects	0 points		
Key Personnel			20
Item	Designation	Points	
	Contracts/Project Manager Minimum Bachelors (BSc) or B-Tech in Civil or Mechanical Engineering		
	Minimum 8 years' experience in the built environment industry.	8	
	Minimum 5 years' experience in the built environment industry.	6	
	Minimum 3 years' experience in the built environment industry.	4	
	Site Agent Minimum National Diploma in Civil or Mechanical Engineering		
	Minimum 5 years' experience in the built environment industry.	5	
	Minimum 3 years' experience in the built environment industry.	3	
	Foreman N4 in Civil or Mechanical Engineering field		

FUNCTIONALITY			POINTS
	Minimum 5 years' experience in the built environment industry.	3	
	Minimum 3 years' experience in the built environment industry.	2	
	Construction Health and Safety Officer National Diploma in Safety Management or Environmental Health		
	Minimum 5 years' experience in the built environment industry.	4	
	Minimum 3 years' experience in the built environment industry.	2	
Note: • Proof of Experience of the Contracts Manager, Site Agent, Foreman and Occupational Health and Safety officer be in the form of a CV and certified copies of qualifications, certified within 3 months. • The service provider to provide appointment letters and completion certificates with contactable references from previous completed projects. • All qualifications must be SAQA compliant.			
Schedule of Plant and Equipment This will be assessed against a minimum number of different types of plant and equipment required to successfully complete the project within the stipulated construction period as determined by the Employer's Agent. Access to plant may be in a form of ownership, hire or leasing arrangements, orders etc. A letter of intent from hiring or leasing companies stating the number and type of plant and equipment on which arrangement has been made must be submitted. NB. 10 points will be allocated to equipment leased/hired.			10

FUNCTIONALITY		POINTS												
<table><tr><th>Plant and equipment required</th><th>Point Allocation</th></tr><tr><td>Tipper Truck (6 – 10m3)</td><td>2</td></tr><tr><td>TLB (4X4)</td><td>2</td></tr><tr><td>Delivery Vehicle (1 ton or equivalent)</td><td>2</td></tr><tr><td>Concrete Mixer Engine 800L</td><td>2</td></tr><tr><td>Compactor / Plate Compactor</td><td>2</td></tr></table>	Plant and equipment required	Point Allocation	Tipper Truck (6 – 10m3)	2	TLB (4X4)	2	Delivery Vehicle (1 ton or equivalent)	2	Concrete Mixer Engine 800L	2	Compactor / Plate Compactor	2		
Plant and equipment required	Point Allocation													
Tipper Truck (6 – 10m3)	2													
TLB (4X4)	2													
Delivery Vehicle (1 ton or equivalent)	2													
Concrete Mixer Engine 800L	2													
Compactor / Plate Compactor	2													
NB. Proof of ownership or letter of intent to lease equipment indicated above must be submitted with the bid document.														
Proof of Residence • Within Thaba Chweu and Bushbuckridge Local Municipality 10 points • Within Mpumalanga Province will be 5 points • Outside the province of Mpumalanga 3 points • If proof is not attached 0 points. <table><tr><th>Location</th><th>Points</th></tr><tr><td>Dr JS Moroka Local Municipality</td><td>5</td></tr><tr><td>Nkangala District Municipality</td><td>3</td></tr><tr><td>Elsewhere in Mpumalanga</td><td>2</td></tr><tr><td>Outside Mpumalanga</td><td>0</td></tr></table> (Proof must be attached)		Location	Points	Dr JS Moroka Local Municipality	5	Nkangala District Municipality	3	Elsewhere in Mpumalanga	2	Outside Mpumalanga	0	10		
Location	Points													
Dr JS Moroka Local Municipality	5													
Nkangala District Municipality	3													
Elsewhere in Mpumalanga	2													
Outside Mpumalanga	0													
Liability indemnity cover		10												
<table><tr><th>Requirement</th><th>Points</th></tr></table>	Requirement	Points												
Requirement	Points													

FUNCTIONALITY		POINTS
Liability Cover below R5 million	5	
Liability Cover R5 million or above	10	
(Proof must be attached)		
TOTAL		100

NB: Bidders who scores less than **70 points** of the 100 points will not be considered for further evaluation.

Price: 80%

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

Where:

P_s = points scored for competitive price of bid under consideration

P_t = comparative price of bid under consideration

$P_{\min}$ = comparative price of lowest acceptable bid

PREFERENCE POINTS

Preference points (**20**) will allocated utilizing the below specific goals;

SPECIFIC GOALS	POINTS ALLOCATED
Historically disadvantaged by unfair discrimination on the basis of race,	6
Gender (Women)	5
Disability	5
Youth	4



An Entity of the Department of Economic Development and Tourism

CAPACITY OF BIDDER

WORK CAPACITY: (The Bidder is requested to furnish the following full particulars, attach additional pages if more space is required. Failure to furnish the particulars may result in the Tender being disregarded.)

[illegible]

QUALIFICATIONS AND EXPERIENCE OF PROPOSED SITE SUPERVISION TEAM FOR THE

Bidder to provide name(s), key qualifications and experience of site supervision team that will supervise the project on behalf of the Contractor.

PROJECT

PARTICULARS OF COMMITMENTS WHICH THE BIDDER HAS PREVIOUSLY COMPLETED AND PRESENTLY ENGAGED WITH:

Current projects:

Project	Place (town)	Reference / Contact person	Contact Tel. No.	Contract amount	Contract period	Date of commencement	Scheduled date of completion
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

PREVIOUS PROJECTS:

[illegible]

PRICING PROPOSAL AND SPECIFIC CONTRACT DETAILS.

1. Bids must be submitted in South African Rand, Fixed price and inclusive of VAT.
2. Bidder must provide a detailed pricing schedule indicating each activity's unit price and duration thereof.
3. MTPA reserves the right to negotiate price with the preferred bidder.
4. Bidders must provide details of all evaluation criteria information so that the Agency can properly evaluate and assess capacity to complete this task.
5. **ONLY BIDDERS WITH A CIDB GRADE OF 5ME/CE (4ME/CE PE) OR ABOVE MUST APPLY**
6. MTPA is not bound to accept any of the proposals submitted and reserve the right to call for best and final offers from short-listed bidders before final selection.
7. MTPA reserves the right to call for interviews with short-listed bidder before final selection.
8. MTPA reserve the right to contact all references without informing the bidder.
9. The lowest or any bid will not be accepted and the Agency reserves the right to accept the whole or part of any bid.
10. Bidders who score less than the 70 points of the 100 points on functionality will be disqualified.
11. Copy right of the document remain the product of the Agency.
12. The service provider will have to provide own admin support staff with their qualifications and experience attached.
13. No alternative offers are permissible
14. Unit prices / lump sums should be inclusive of resources and materials required under the item.

5. **COMPULSORY RETURNABLE SCHEDULES (CERTIFIED COPIES/ORIGINALS OF THE FOLLOWING DOCUMENTS)**

- Service providers must be registered on Central Supplier Database.
- Duly signed bid documents including all the attached SBD forms
- Record of Addenda to Tender Documents (where applicable)
- Legal Joint Venture Agreement (in case of a JV)
- Each partner of the joint venture must be separately registered, and the lead partner must have a contractor grading designation not lower than one level below the required grading designation.
- Certified copies of Identity documents of Owners / Directors / Members / Shareholders
- Contractor Registration for Incorporation or of Company Registration documents
- Bidder Must be Vat Registered (VAT certificate from SARS must be attached and be valid on closing date)
- Shareholders' Agreements / Share Certificates / Memorandum of Association for Companies.
- Valid Letter of Good Standing from the Department of Labour or Proof of Compensation for Occupational Injuries and Diseases Act, 1963 (No. 130 of 1993) (Letter for Tender purposes will not be accepted)
- Complete SBD 1, SBD 4, SBD 6.1, BOQ, and GCC Contract Data

- Valid CIDB Registration certificate on closing **ONLY BIDDERS WITH A CIDB GRADE OF 5ME/CE (4ME/CE PE) OR ABOVE MUST APPLY**
- Signed Terms of Reference.(Initial each page)

Other documents required only for Bid evaluation purposes

- Proof of relevant experience
- CV and proof of relevant qualifications
- Proof of residence
- Proof of plant and equipment
- Proposed Amendments and Qualifications
- Environmental Management plan, SHEQ, Risk Management plan

6. COMPULSORY BRIEFING SESSION

The will be a compulsory briefing, the briefing date and time will be as per the advert.

PART C1: AGREEMENT AND CONTRACT DATA

C1.1 Form of Offer and Acceptance

Offer

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of:

APPOINTMENT OF A SERVICE PROVIDER FOR THE UPGRADE OF INFRASTRUCTURE AT MDALA NATURE RESERVE – PHASE 2: CONSTRUCTION OF BULK WATER PIPELINE

The tenderer, identified in the offer signature block, 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 authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the Service Provider under the Contract including compliance with all its terms and conditions according to their true intent and meaning for remuneration to be determined in accordance with the conditions of Contract identified in the Contract Data.

The offered price for **PHASE 2: CONSTRUCTION OF BULK WATER PIPELINE**, inclusive of value added tax, is

R (in figures)

.....

..... Rands (in words)
Should there be a discrepancy between the amount in figures and the amount in words, then the amount in words shall govern.

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 Service Provider in the conditions of Contract identified in the Contract Data.

THIS OFFER IS MADE BY THE FOLLOWING LEGAL ENTITY: (cross out block which is not applicable)

Company or close corporation:

.....
.....

and: whose registration number is:

.....
and: whose income tax reference number is:

.....

OR

Natural person or partnership:

.....
.....

whose identity number(s) is/are:

.....

whose income tax reference number is/are:

.....

AND WHO IS (if applicable):

.....

Trading under the name and style of:

AND WHO IS:

Represented herein, and who is duly authorised to do so, by:

Mr/Mrs/Ms:

In his/her capacity as:

Note:

A resolution / power of attorney, signed by all the directors / members / partners of the legal entity must accompany this offer, authorising the representative to make this offer.

SIGNED FOR THE TENDERER:

Name of representative	Signature	Date

WITNESSED BY:

Name of witness	Signature	Date

The tenderer elects as its *domicilium citandi et executandi* in the Republic of South Africa, where any and all legal notices may be served, as (physical address):

.....
.....

Other contact details of the Tenderer are:

Telephone no: Cellular phone no:

Fax no:

Postal address:

Banker: Branch:

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 Service Provider the amount due in accordance with the conditions of Contract identified in the Contract Data. Acceptance of the tenderer's offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the Contract that is the subject of this agreement.

The terms of the Contract are contained in:

- Part C1 Agreements and Contract Data, (which includes this agreement)
- Part C2 Pricing Data
- Part C3 Scope of Services

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

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto as 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 set documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of Contract identified in the Contract Data. 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, if sent by registered post, 4 days from the date on which it was posted, if delivered by hand, on the day of delivery, provided that it has been delivered during ordinary business hours, or if sent by fax, the first business day following the day on which it was faxed. Unless the tenderer (now Service Provider) within seven working days of the date of such submission notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

For the Employer:

Name of signatory	Signature	Date

Name of Organisation:	

Witnessed by:

Name of witness	Signature	Date

Schedule of Deviations

Notes:

1. The extent of deviations from the tender documents issued by the Employer before 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.

1.1.1. Subject:
Detail:
1.1.2. Subject:
Detail:
1.1.3. Subject:
Detail:
1.1.4. Subject:
Detail:
1.1.5. Subject:
Detail:
1.1.6. Subject:
Detail:

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 and amendments to the documents listed in the Tender Data and addenda thereto as listed in the tender schedules, as well as any confirmation, clarification or changes 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 in writing, 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.

C1.2 Contract Data

Contract Data Provided by the Employer

GENERAL CONDITIONS OF CONTRACT

The following standardised General Conditions of Contract:

General Conditions of Contract for Construction Works (Third Edition, 2015)

Prepared by the South African Institution of Civil Engineering (SAICE) shall apply to and from the General Conditions of Contract for this contract. Copies of these Conditions of Contract are obtainable from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1 685, Tel: (01 1) 805 5947, Fax: (01 1) 805 5971,

Copies of the General Conditions of Contract are available for inspection and scrutiny at the offices of the Engineer or the Employer.

The General Conditions of Contract 2015 makes references to the Contract Data for specific data which, together with these conditions, collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Specific Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the General Conditions of Contract.

The General Conditions of Contract shall be read in conjunction with the variations, amendments and additions set out in the Contract Specific Data below. Each item of data given is cross-referenced to the Clause in the General Conditions of Contract to which it mainly applies.

The following contract specific data are applicable to this Contract:

Clause	
1.1.1.7	The Principle Agreement of the General Conditions of Contract for Construction Works (2015), plus a signed full bid document, SANS 2001 standard(s) for construction works and signed Service Legal Agreement will act as a full legal document.
1.1.1.13 5.14.5.2	The Defects Liability Period is 365 days after final completion per project unless stated otherwise in the request for quotation document.
1.1.1.14 5.14.1	The time for achieving Practical Completion is Six (06) months .

1.1.1.15 1.2.1.2	The Employer is MPUMALANGA TOURISM AND PARK AGENCY , represented by such person or persons duly authorised thereto by the Employer in writing, and the legal successors in title of this person and is referred to in this Contract Document as "Employer."
1.1.1.16	The name of the Employer's Agent is MTPA
1.1.1.18	The time for obtaining final completion certificate is 365 calendar days after completion date per project unless stated otherwise in the request for quotation document.
1.1.1.26	The Pricing Strategy is Re-measurement Contract.
1.1.1.28	Replace with the following: "Scope of Work" means the document(s) containing the Standard Specifications, the Project Particular Specifications and the Drawings, that specify and describe the Works which are to be provided, and any other requirements and constraint relating to the manner in which the work is to be carried out.
1.1.1.34	Add the following Clause after Clause 1.1.1.34 1.1.1.35 "Drawings" means all drawings, calculations and technical information (other than information contained in the Specifications) and any modifications thereof or additions thereto from time to time approved in writing by the Engineer or delivered to the Contractor by the Engineer.
1.2.1.2	The address of the Employer is: Address (physical): Hall's Gateway on the N, 4 National Highway, Mbombela, 1200 Address (postal): Private Bag X11338 Contact person: Mr Themba Betuel Telephone: 013 065 0888 Facsimile: N/A e-mail: Themba.Betuel@mtpa.co.za
1.2.1.2	The address of the Employer's Agent is: Address (physical): Hall's Gateway on the N, 4 National Highway, Mbombela, 1200 Address (postal): Private Bag X11338 Contact person: Mr Themba Betuel Telephone: 013 065 0888 Facsimile: N/A e-mail: Themba.Betuel@mtpa.co.za

1.3.5	Add the following to Clause 13.5: No part of any document or drawings issued with this enquiry may be copied, photographed or repeated in any manner or by any process without the written consent of the Engineer. Copyright is reserved on all designs, specifications, patents and patentable designs, systems and processes contained in the documents and drawings. The person, firm, or body to whom these documents are issued or made available shall be held jointly and severally responsible in their personal and corporate capacities for any contravention of the requirements of Clause 1.3.5. The recipients of these documents shall treat the documents as well as the details contained herein as private and confidential.
3.2.3	The Engineer is required to obtain the specific approval of the Employer before executing any of the following functions or duties: 1. The reduction of a penalty for delay in terms of Clause 5.13.2. 2. The issuing of a variation order in terms of Clause 6.3.2. 3. Issuing of instructions to carry out work on a day work basis in terms of Clause 6.4.1. 4. The determination of additional or reduced costs arising from changes in legislation in terms of Clause 6.8.4. 5. The agreeing of the adjustment of the sums for general items in terms of Clause 6.11. 6. The inclusion of credits in the next payment certificate in terms of Clause 10.1.5.2.
3.2.2	Delete and replace with: "Whenever the Employer's agent intends, in terms of the contract, to exercise any discretion, or make or issue any ruling, contract interpretation or price determination, he shall first consult with the employer and the contractor in an attempt to reach agreement. Failing agreement, the Employer's agent shall advise the Employer on contractual issues where after the Employer will make a final decision based on the advice of the Agent. Only then will the Agent be allowed to issue a final instruction to the contractor."
3.2.3	Add the following: "The Employer's agent shall obtain written permission from the Employer for all variation orders where such variation order may have an impact on the contract duration, project cost, job creation or other legal implications related to the contract."

4.5	Variations to the Conditions of Contract are: Add the following at the end of sub clause 4.5: "4.5.3 The Employer and the Contractor hereby agree, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Amendment Act, 1993 (Act 85 of 1993), hereinafter referred to as 'the Act', that the following arrangements and procedures shall apply between them to ensure compliance by the Contractor with the provisions of the Act: i. 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 of the Act. ii. The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and Regulations on the Contractor will be fully complied with. iii. The Contractor accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and Regulations and expressly absolves the Employer from himself being obliged to comply with any of the aforesaid duties, obligations and prohibitions, with the exception of such duties, obligations and prohibitions expressly assigned to the Employer in terms of the Act and its associated Regulations. iv. The Contractor agrees that any duly authorized officials of the Employer shall be entitled, although not obliged, to take such steps as may be necessary to monitor that the Contractor has conformed to his undertakings as described in paragraphs (i) and (ii) above, which steps may include, but will not be limited to, the right to inspect any appropriate site or premises occupied by the Contractor, or any appropriate records or safety plans held by the Contractor. v. The Contractor shall be obliged to report forthwith to the Employer and Engineer any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the Act and Regulations, pursuant to work performed in terms of this Contract, and shall, on written demand, provide full details in writing, to the Employer and Engineer, of such investigation, complaint or criminal charge.
5.2. I	Add the following: "The commencement date will be the date on which the site is handed over to the contractor by the Employer's agent, after been instructed by the Employer.
5.3. I	The documentation required before commencing with the Works are: a) Health and Safety Plan (Refer to clause 4.3) b) Initial Programme (Refer to clause 5.6) c) Initial cash flow projection linked to the programme (Refer to clause 5.6.2.6) d) Security (Refer to clause 6.2) e) Insurance (refer to clause 8.6)
5.3.2	The time to submit the documentation required before commencement with Works execution is 14 days.

5.4	Add the following clause after Clause 5.4.3: 5.4.4 The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site. The Contractor shall also provide at his/her own cost any additional facilities outside the Site required by him/her for the purposes of the Works.
5.5.1	The Works shall be completed within the time frame stipulated during the allocation of work to the Contractor by the Employer, exclusive of the special non-working days and the year-end break and inclusive of the 28 day period referred to in Clause 5.3.1 above.
5.6.1	The Contractor shall deliver the programme of work within 14 days of the Commencement Date. The programme shall clearly show the order in which the Contractor proposes to carry out the work, including the critical path, the proposed rate of progress and a linked cash flow forecast. The programme shall be updated monthly.
5.6.2	The programme shall contain the following activities and or items as a minimum requirement: a) Testing and acceptance control b) As-built levels and drawings c) Date for Practical Completion d) Date for Completion e) Health & Safety Compliance Audits f) Environmental Compliance Audits
5.8.1	The non-working days are Sundays. The special non-working days are the official public holidays of the Republic of South Africa (which shall include public holidays set aside for voting purposes) and the industry year end break with effective dates published by the South African Forum of Civil Engineering Contractors (SAFCEC).
5.12.2	Regardless of the cause of any delay an extension of time will only be considered if it can be shown that the activity delayed is on the critical path indicated on the Programme of Works (Clause 5.6.1)

	No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal Climatic Conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time shall be granted in accordance with the provisions of that Clause. The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts work on the critical path. <table><tr><td>January 7 days</td><td>February 6 days</td><td>April 3 days</td><td>May 2 days</td></tr><tr><td>June 1 days</td><td>September 3 days</td><td>July 2 days</td><td>August 3 days</td></tr><tr><td>October 6 days</td><td>November 7 days</td><td>December 7 days</td><td></td></tr></table> Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced. Should an extension of time be granted by the Engineer such extension of time will be added to the Time for Completion or set against any overprovision that may have occurred in the abovementioned schedule. It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for an other reason will be entertained.	January 7 days	February 6 days	April 3 days	May 2 days	June 1 days	September 3 days	July 2 days	August 3 days	October 6 days	November 7 days	December 7 days	
January 7 days	February 6 days	April 3 days	May 2 days										
June 1 days	September 3 days	July 2 days	August 3 days										
October 6 days	November 7 days	December 7 days											
5.13.1	The penalty for failing to complete the Works at the Due Completion Date is 0.05% of the contract value per day. The Contractor is to note that delay penalties, in addition to monies still owed to the Contractor (including retention monies) and the Guarantee, shall effectively be used to address additional costs incurred by the Employer, such as the Employer's Agent's construction monitoring fees and other service providers' fees and wayleave extension costs, as a result of the Works not being completed at the Due Completion Date.												
5.14.1	The requirements for achieving Practical Completion are all those for the Works to reach a state of readiness, fit for the intended purpose and occupation without danger or undue inconvenience to the Employer.												
5.16.3	The latent defect period is 10 years.												
6.2.1	The security to be provided by the Contractor shall be a Performance Guarantee of 10% of the Contract Sum and 10% Retention will be deducted on each interim certificate, of which 5% will be returned at reaching Completion. The Performance Guarantee is to be worded as per the document included in C1.3.												
6.5.1.2.3	The percentage allowance to cover overhead charges and profit shall not exceed 10%.												

6.8.2	The tenderer is to submit a fixed price tender (not subject to contract price adjustment)
6.8.3	Price adjustments for variations in the costs of special materials are not allowed.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%.
6.10.3	The limit of retention money is 10% of the Contract Sum, to a maximum of 5% of the contract amount of which 5% will be returned at reaching completion.
8.6.1	The Contractor shall provide the insurances required in terms of clauses 8.6.1.1, 8.6.1.2 and 8.6.1.3 of the General Conditions of Contract.
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is 20% of the Contract Sum.
8.6.1.2	Special Risks Insurance issued by SASRIA is required.
8.6.1.3	The Contractor is to indemnify the Employer against any liability in respect of damage to, or physical loss of the property of any person, or injury to or death of any person due to non-compliance with the Occupational Health and Safety Act (Act 85 of 1993) 2003."
8.6.1.5	The Contractor is to provide all additional insurances including for, but not limited to, his own employees, vehicles and equipment and plant not incorporated into the Works.

PART C2: PRICING DATA

C2.1 Pricing Assumptions

1. General

The Pricing Assumptions must be read in conjunction with the General Conditions of Contract for Construction Works (GCC 2015, 3rd Edition), the Scope of Work, and the Bill of Quantities. The documents are complementary and mutually explanatory.

2. Pricing Strategy and Basis of Measurement

- The contract is structured as a re-measurement contract (or fixed-price contract as defined in the Contract Data under Clause 1.1.1.26). For re-measurement contracts, quantities set out in the Bill of Quantities are estimated and provisional, and the Contractor shall be paid based on the actual quantities of work executed, multiplied by the rates provided.
- All work shall be measured in accordance with the specific provisions and methods set out in the Pricing Data and applicable standard specifications (e.g., SANS 1200 / COLTO).

3. Rates and Prices

- Except where specific contract adjustments (such as inflation/contract price adjustment or authorized variations) are expressly permitted, the rates and prices stated in the Bill of Quantities are final and binding for the duration of the contract.
- The unit rates and lump sums entered in the Bill of Quantities shall be fully inclusive of all the Contractor's obligations, labour, plant, material, overheads, profit, transport, temporary works, establishment, and compliance with health, safety, and environmental requirements.
- Percentage allowances specified in the Bill of Quantities for Dayworks are deemed to cover all charges for profit, timekeeping, clerical work, insurance, and superintendence.

4. Valuation of Variations and Additional Work

- Variations involving work of a similar character and carried out under similar conditions to work priced in the Pricing Data shall be valued at such rates and/or prices (including General Items) contained therein as may be applicable.
- Where work is not of a similar character or is not carried out under similar conditions, the rates and/or prices in the Pricing Data shall be used as the basis for valuation as far as may be appropriate.
- Omitted work (which is a form of Variation Order) shall be valued using the rates and/or prices in the Pricing Data according to the same principles as other variations.
- Percentage allowances in respect of the remuneration of workmen and the cost of materials shall be applied as stated in the Contract Data in accordance with Clause 6.5.1.2.3 (typically applicable to Dayworks).

C2.2 Bills of Quantities

RISING MAINS BOQ							
ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1	1200 A		SECTION A : PRELIMINARY AND GENERAL CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS				
1.1	8.2.1		Contractor's General Obligations				
1.1.1			(a) Fixed obligations	Sum	1		
1.1.2			(b) Value-related obligations	Sum	1		
1.1.3			(c) Time-related obligations	Month	6		
1.1.4			(d) Contract name boards (2 No.) complete	Sum	1		
1.2	8.2.2		Contractor's Establishment				
1.2.1		LI	(a) Establishment on Site	Sum	1		
1.2.2		LI	(b) Removal of establishment from Site on completion	Sum	1		
1.3	8.2.3		SUMS STATED PROVISIONALLY BY THE ENGINEER				
1.3.1			(a) Community Liaison Officer (CLO)	Prov. Sum	R	38 000.00	
1.3.2			(b) Environmental Control Officer (ECO)	Prov. Sum	R	45 000.00	
1.3.3			(c) Occupational Health and Safety Officer	Prov. Sum	R	45 000.00	
1.3.4			(d) Monthly Occupational Health and Safety Audits	Prov. Sum	R	180 000.00	
1.3.5			(e) Monthly Environmental Audits	Prov. Sum	R	180 000.00	
1.3.6			(f) Independent Materials Testing Laboratory	Prov. Sum	R	50 000.00	
1.3.7			(g) Specialist geotechnical investigations where instructed	Prov. Sum	R	50 000.00	
1.3.8			(h) Specialist survey work where instructed	Prov. Sum	R	50 000.00	
1.3.9			(i) Overheads, charges and profit on Provisional Sums (Items a-h)	%	R	638 000.00	
1.4	8.2.4		Health, Safety and Environmental Compliance				
1.4.1			(a) Preparation and Implementation of Health and Safety Plan	Sum	1		
1.4.2			(b) Environmental Management Programme (EMP) Implementation	Sum	1		
1.4.3			(c) First Aid facilities and emergency preparedness	Sum	1		
1.4.4			(d) Compliance with Construction Regulations and OHS Act	Sum	1		
1.4.5			(e) Environmental protection, dust suppression and pollution control	Sum	1		
1.5	8.2.5		Temporary Facilities and Services				
1.5.1			(a) Temporary water supply	Sum	1		
1.5.2			(b) Temporary electricity supply	Sum	1		
1.5.3			(c) Temporary sanitation facilities	Sum	1		
1.5.4			(d) Temporary access roads and working areas	Sum	1		
1.5.5			(e) Security, fencing and protection of the Works	Sum	1		
1.6	8.2.6		Survey, Quality Assurance and Handover				
1.6.1		LI	(a) Setting out and survey control	Sum	1		
1.6.2			(b) Preparation of Quality Control documentation	Sum	1		
1.6.3			(c) Record drawings (As-built drawings)	Sum	1		
1.6.4			(d) Operation and Maintenance Manuals	Sum	1		
1.6.5			(e) Commissioning records and completion documentation	Sum	1		
1.6.6			(f) Final cleaning of Site and demobilisation	Sum	1		
TOTAL SECTION A CARRIED TO SUMMARY							

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SPRING 2019

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RISING MAINS BOQ						
ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	AMOUNT
4	1200 DB		SECTION D : EARTHWORKS (PIPE TRENCHES)			
			PIPE TRENCH EXCAVATION			
4.1	8.3		Excavation of Pipe Trenches			
4.1.1			(a) Excavate pipe trenches in soft material	m³	152	
4.1.2			(b) Excavate pipe trenches in intermediate material	m³	15.2	
4.1.3			(c) Excavate pipe trenches in hard rock	m³	30.4	
4.1.4			(d) Extra over excavation exceeding 1.5 m deep	m	15.2	
4.2	8.3		Control of Water			
4.2.1			(a) Dewatering of trench excavations	Sum	1	
4.3	8.3		Preparation of Trench Bottoms			
4.3.1		LI	(a) Hand trim trench bottoms	m	362	
4.3.2			(b) Remove unsuitable material from trench bottoms	m³	36.2	
4.4	8.3		Backfilling			
4.4.1			(a) Backfill trenches with approved excavated material	m³	120	
4.4.2			(b) Imported selected backfill	m³	32	
4.4.3			(c) Compact backfill	m³	152	
4.5	8.3		Disposal			
4.5.1			(a) Dispose of surplus excavated material	m³	30	
4.6	8.3		Reinstatement			
4.6.1		LI	(a) Reinstale disturbed natural ground	m²	Rate Only	
4.6.2			(b) Reinstale gravel surfaces	m²	Rate Only	
4.7	8.3		Existing Services			
4.7.1		LI	(a) Hand excavation around existing services	m²	Rate Only	
4.7.2			(b) Temporary support to exposed services	No.	Rate Only	
TOTAL SECTION D CARRIED TO SUMMARY						

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RISING MAINS BOQ							
ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
6	1200 H		SECTION F : REINFORCEMENT				
			PIPE SUPPORT PEDESTALS				
6.1	8.2		Pipe Support Pedestals				
6.1.1			(a) High tensile Y16 reinforcement	kg	538		
6.1.2			(b) High tensile Y10 reinforcement	kg	453		
6.1.3			(c) Mild steel R8 links	kg	113		
			VALVE CHAMBERS				
6.2	8.2		Air Valve Chambers (10 No.)				
6.2.1			(a) High tensile reinforcement to base slabs	kg	265		
6.2.2			(b) High tensile reinforcement to cover slabs	kg	265		
6.3	8.2		Gate Valve Chambers (4 No.)				
6.3.1			(a) High tensile reinforcement to base slabs	kg	38		
6.3.2			(b) High tensile reinforcement to cover slabs	kg	38		
6.4	8.2		Scour Valve Chambers (5 No.)				
6.4.1			(a) High tensile reinforcement to base slabs	kg	133		
6.4.2			(b) High tensile reinforcement to cover slabs	kg	133		
			THRUST BLOCKS				
6.5	8.2		Thrust Blocks				
6.5.1			(a) High tensile reinforcement where shown on the drawings	kg	75		
TOTAL SECTION F CARRIED TO SUMMARY							

RISING MAINS BOQ							
ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7	1200 H		SECTION G : STRUCTURAL STEELWORK				
			NAME BOARDS				
7.1	8.2		Name Boards				
7.1.1			(a) Supply, fabricate and erect complete project information name board including steel posts, SHS frame, steel plate, painting, concrete foundations, excavation, backfilling and all fittings complete	No.	2		
			PIPE SUPPORTS				
7.2	8.2		Pipe Support Assemblies				
7.2.1			(a) 30 x 10 mm galvanised mild steel pipe straps	No.	334		
7.2.2			(b) M12 x 150 mm galvanised anchor bolts	No.	334		
7.2.3			(c) M12 galvanised hexagonal nuts	No.	334		
7.2.4			(d) M12 galvanised flat washers	No.	334		
7.2.5			(e) M12 galvanised spring washers	No.	334		
7.2.6			(f) Galvanised steel saddles complete	No.	334		
			MISCELLANEOUS STEELWORK				
7.3	8.2		Miscellaneous Steelwork				
7.3.1			(a) Touch-up cold galvanising to damaged galvanised surfaces	L	5		
7.3.2			(b) Stainless steel identification plates	No.	20		
TOTAL SECTION G CARRIED TO SUMMARY							

ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8	1200 L		SECTION H : STAINLESS STEEL PIPELINE, VALVES AND FITTINGS				
			STAINLESS STEEL PIPELINE				
8.1	8.2		Stainless Steel Rising Main				
8.1.1			(a) Supply, deliver and install 100 mm diameter stainless steel pipe	m	1810		
8.1.2			(b) Lay, align and secure pipeline on supports	m	1810		
8.1.3			(c) Field welding of pipe joints	No.	302		
8.1.4			(d) Radiographer/RT Testing of welds	No.	302		
			FLANGED JOINTS				
8.2	8.2		Flanged Connections				
8.2.1			(a) Stainless steel flanges	No.	604		
8.2.2			(b) Flange gaskets	No.	302		
8.2.3			(c) Flange bolts, nuts and washers	Set	1		
8.3	8.2		Couplings and Disconnecting Joints				
8.3.1			(a) Stainless steel couplings	No.	10		
8.3.2			(b) Disconnecting joints	No.	19		
			VALVES				
8.4	8.2		Air Valve Assemblies				
8.4.1			(a) 100 mm double orifice air valves complete	No.	10		
8.4.2			(b) Isolation valves to air valves	No.	10		
8.5	8.2		Gate Valve Assemblies				
8.5.1			(a) 100 mm raised seated gate valves	No.	4		
8.6	8.2		Scour Valve Assemblies				
8.6.1			(a) 100 mm scour valve assemblies complete	No.	5		
			FITTINGS				
8.7	8.2		Stainless Steel Fittings				
8.7.1			(a) 100 mm equal tees	No.	15		
8.7.2			(b) 100 mm concentric reducers	No.	2		
8.7.3			(c) 100 mm = 11.25° bends	No.	4		
8.7.4			(d) 100 mm = 22.5° bends	No.	10		
8.7.5			(e) 100 mm = 45° bends	No.	12		
8.7.6			(f) 100 mm = 90° bends	No.	8		
			PIPE SUPPORTS				
8.8	8.2		Pipe Support Assemblies				
8.8.1			(a) 30 x 10 mm galvanized steel straps	No.	302		
8.8.2			(b) M12 galvanized anchor bolts	No.	604		
8.8.3			(c) M12 galvanized rods	No.	604		
8.8.4			(d) M12 galvanized flat washers	No.	604		
8.8.5			(e) M12 galvanized spring washers	No.	604		
8.8.6			(f) 3 mm rubber seats	No.	604		
			MARKER POSTS				
8.9	8.2		Pipeline Markers				
8.9.1			(a) Pipeline marker posts complete	No.	20		
			TESTING AND COMMISSIONING				
8.10	8.2		Pipeline Testing				
8.10.1			(a) Hydrostatic pressure testing	m	1810		
8.10.2			(b) Flushing and cleaning	m	1810		
8.10.3			(c) Disinfection and commissioning	Sam	1		

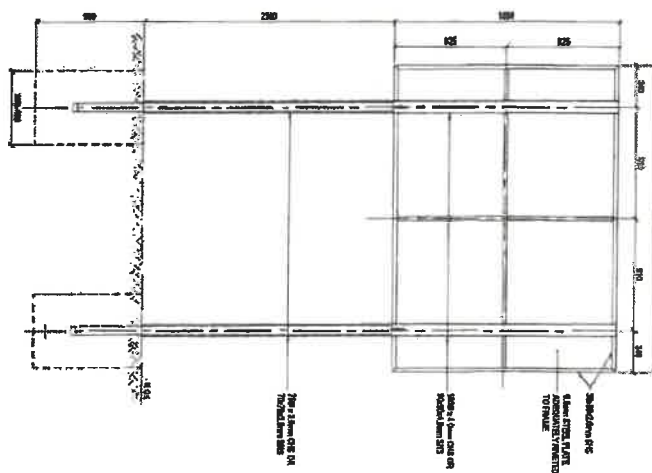
TOTAL SECTION H CARRIED TO SUMMARY

RISING MAINS BOQ							
ITEM	PAYMENT	LI	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9	1200 L		SECTION I : TESTING AND COMMISSIONING				
			PIPELINE TESTING				
9.1	8.2		Hydrostatic Testing				
9.1.1			(a) Hydrostatic pressure testing of 100 mm diameter stainless steel rising main complete, including temporary end caps, blank flanges, pumps, gauges, test water, recording of results and all incidentals	m	1 810		
9.2	8.2		Pipeline Flushing				
9.2.1			(a) Flushing and cleaning of pipeline including disposal of flushing water	m	1 810		
9.3	8.2		Disinfection				
9.3.1			(a) Disinfection of pipeline including supply of disinfectant, soaking period, neutralisation and disposal of chlorinated water	m	1 810		
9.4	8.2		Pressure Testing				
9.4.1			(a) Repeat pressure testing after rectification of defects where required, including all labour, plant and equipment	Sum	1		
9.5	8.2		Commissioning				
9.5.1			(a) Commissioning of the complete rising main, including operational checks, valve operation, inspection, submission of test certificates and handover documentation	Sum	1		
9.6	8.2		Documentation				
9.6.1			(a) Preparation and submission of hydrostatic test reports, disinfection certificates, commissioning certificates and completion records	Sum	1		
TOTAL SECTION I CARRIED TO SUMMARY							

RISING MAINS BOQ						
ITEM	PAYMENT	U	DESCRIPTION	UNIT	QUANTITY	AMOUNT
10	PS		SECTION J : PARTICULAR SPECIFICATIONS			
10.1	PS-01		Corrosion Protection			
10.1.1			(a) Protective wrapping and coating to buried stainless steel pipework at transitions and fittings	Sum	1	
10.1.2			(b) Petroleum tape system to flanges, valves and buried fittings	Sum	1	
10.1.3			(c) Densso paste and primer	Sum	1	
10.2	PS-02		Pipeline Identification			
10.2.1			(a) Stainless steel identification plates	No.	20	
10.2.2			(b) Directional markers	No.	20	
10.3	PS-03		Solar Powered Level Control System			
10.3.1			(a) Solar powered reservoir level monitoring system complete	No.	1	
10.3.2			(b) Ultrasonic/radar level transmitter	No.	1	
10.3.3			(c) High level float switch (backup)	No.	1	
10.3.4			(d) Low level float switch	No.	1	
10.3.5			(e) Solar panel complete with mounting brackets	No.	1	
10.3.6			(f) Battery and charge controller	No.	1	
10.3.7			(g) Wireless telemetry equipment complete	No.	2	
10.3.8			(h) PLC programming, commissioning and testing	Sum	1	
10.4	PS-04		Instrumentation			
10.4.1			(a) Pressure gauges	No.	4	
10.4.2			(b) Air release monitoring points	No.	10	
10.4.3			(c) Flow meter (electromagnetic) complete	No.	1	
10.5	PS-05		Pipe Supports			
10.5.1			(a) Neoprene rubber pads (3 mm)	No.	151	
10.5.2			(b) Stainless steel anti-seize compound for bolts	kg	5	
10.6	PS-06		Cleaning and Passivation			
10.6.1			(a) Cleaning and passivation of stainless steel welds	No.	302	
10.6.2			(b) Pickling and passivation gel	L	25	
10.7	PS-07		Documentation			
10.7.1			(a) Operation and Maintenance Manuals	No.	3	
10.7.2			(b) As-built drawings	Sum	1	
10.7.3			(c) Training of Employer's operating personnel	Day	2	
TOTAL SECTION J CARRIED TO SUMMARY						

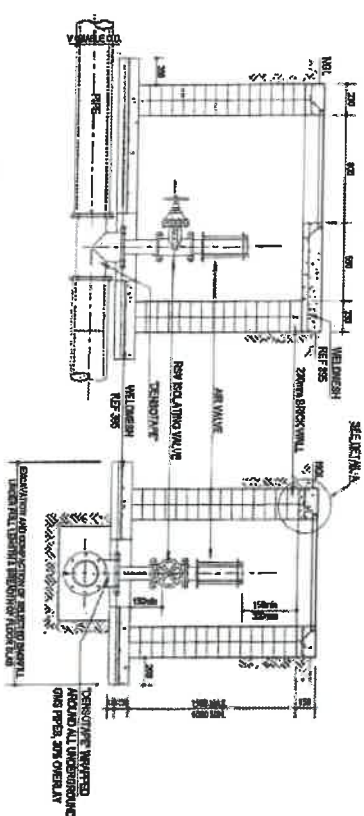
RISING MAINS BOQ SUMMARY

SECTION	DESCRIPTION	TOTAL
1	SECTION A : PRELIMINARY AND GENERAL	
2	SECTION B : SITE CLEARANCE	
3	SECTION C : EARTHWORKS (VALVE CHAMBERS)	
4	SECTION D : EARTHWORKS (PIPE TRENCHES)	
5	SECTION E : CONCRETE WORKS	
6	SECTION F : REINFORCEMENT	
7	SECTION G : STRUCTURAL STEELWORK (NAME BOARDS)	
8	SECTION H : STAINLESS STEEL PIPELINE, VALVES AND FITTINGS	
9	SECTION I : TESTING AND COMMISSIONING	
10	SECTION J : PARTICULAR SPECIFICATIONS	
	SUBTOTAL (A)	
	ADD 10% CONTINGENCIES	
	SUBTOTAL (B)	
	VAT (15%)	
	TOTAL CARRIED FORWARD TO FORM OF TENDER	



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FOUR 120

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SCALE 12A

SCALE 12



SCALE 1:

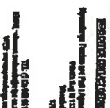


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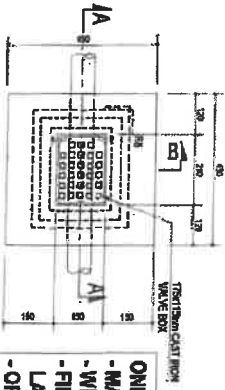
8291172

REVISION	DATE	BY	TO	REVISION
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3	10/1/00	10/1/00	10/1/00	10/1/00
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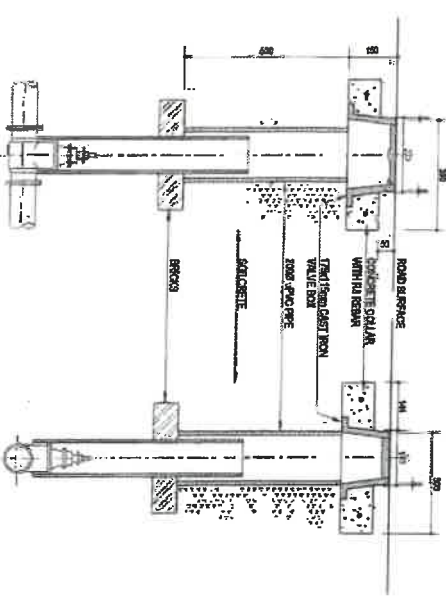
BENDING SCHEDULE

Type & Size	Qty	Cut Length (mm)	Form Code	A (mm)	B (mm)	Area (sq)
#8	1	1 400	40	300	300	0.250

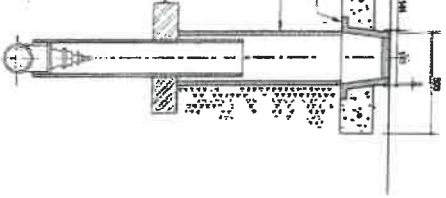


PLAN: CAST IRON/PVC VALVE BOX
SCALE 1:10

ONLY TO BE USED FOR:
- MAINTENANCE
- WITHIN ROADWAY (CI ONLY)
- FIRE HYDRANT CONNECTIONS
- LARGER THAN 200mm Ø
- OR IF SPECIFIED BY ENGINEER

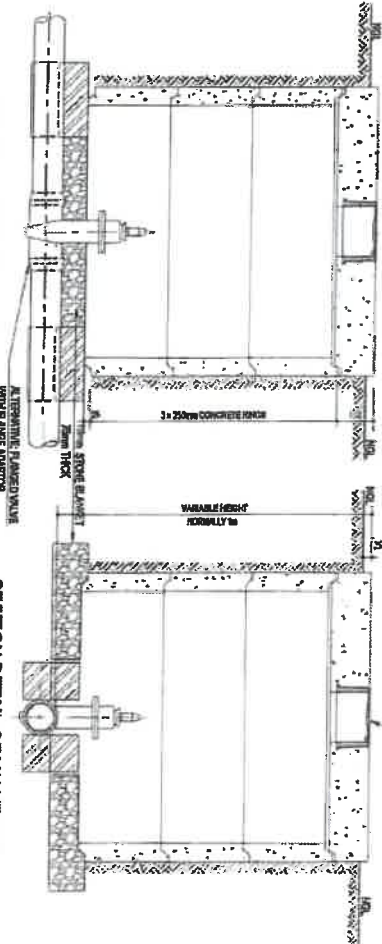


SECTION A-A
SCALE 1:10

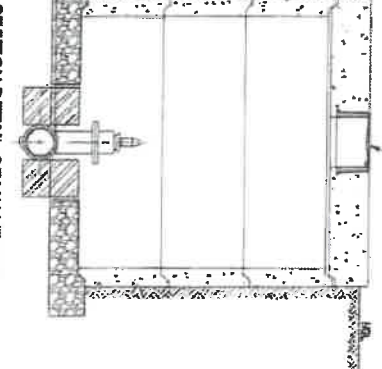


SECTION B-B
SCALE 1:10

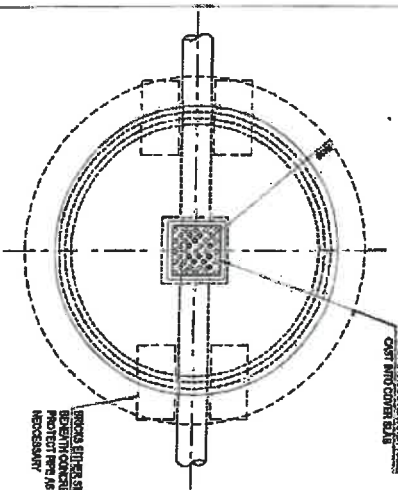
TO BE USED WITHIN SIDE WALKS
OR IF SPECIFIED BY ENGINEER



SECTION DETAIL OF VALVE BOX
SCALE 1:10

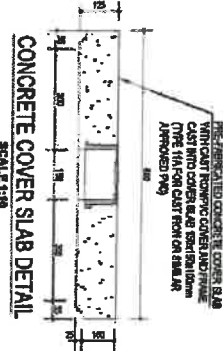


SECTION DETAIL OF VALVE BOX
SCALE 1:10



PLAN: CONCRETE VALVE BOX
SCALE 1:10

BAR #	SPACING	LENGTH	THICKNESS	WELL	OUTER Ø
#8	200	1000	50	Ø80	Ø80



CONCRETE COVER SLAB DETAIL
SCALE 1:10

1. PREPARE
2. CHECK
3. CHECK
4. CHECK
5. CHECK
6. CHECK
7. CHECK
8. CHECK
9. CHECK
10. CHECK

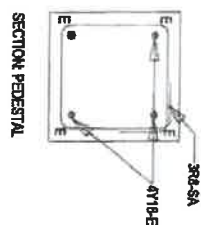
NO.	REVISION	BY	TO	DATE
1	REVISION	BY	TO	DATE



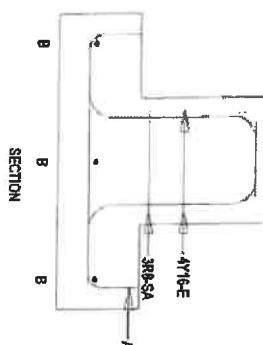
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NO.	REVISION	BY	TO	DATE
1	REVISION	BY	TO	DATE



SECTION: PEDESTAL



SECTION

Cover:
Bot:75 mm
Sides:50 mm
Top:50 mm
Cols:30 mm

MEMBERS	NO OF MEMBERS	BOOKS ORA	LENGTH	TOTAL NINA. BSR	MARK	S C	SENDING				
							A	B	C	D	ET
1	3	Y10	808	3 A	35	600					
	3	Y10	800	3 B	35	600					
	4	Y16	700	4 E	54	188					
	3	PR	1100	3 SA	60	240					
							400	(188)			

	8	10	12	18	20	25	27	48	TOT
R									1
Y	1	3		4					7
TOT	1	3		4					8

SHAPE CODE TABLE

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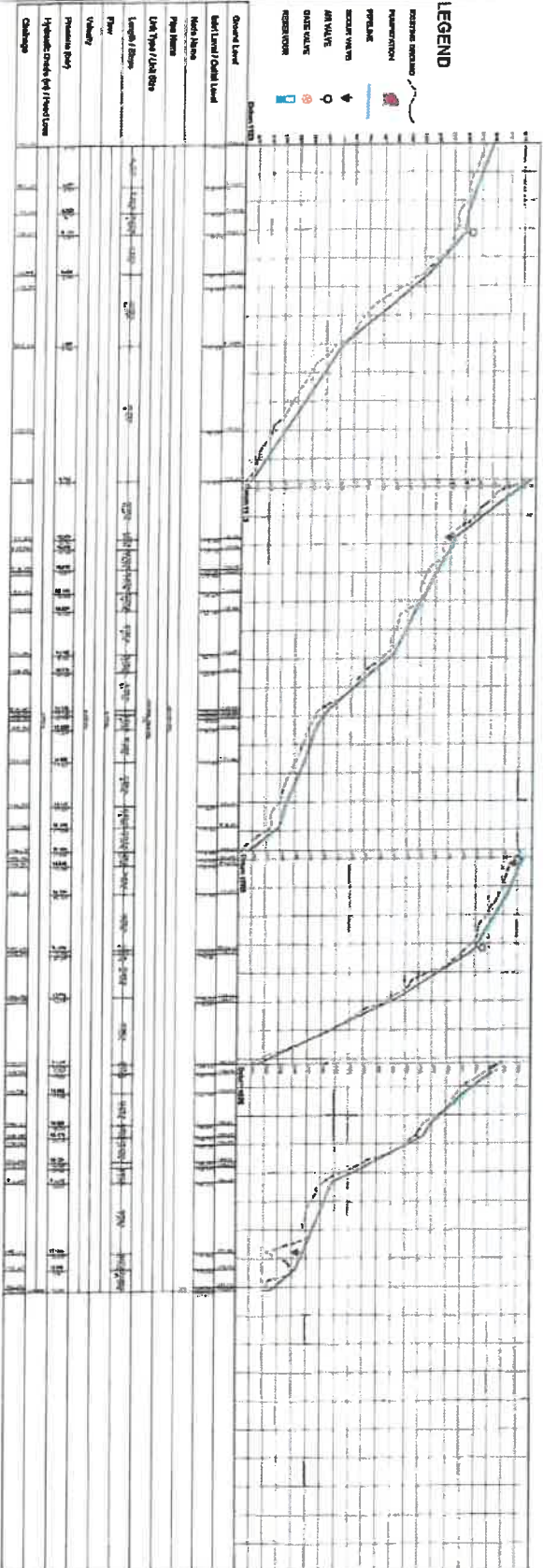
S415 33-2014 EDITION 5.1 SPECIAL SHAPE CODES

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Rising Main Conveyance Plan-CH+000 TO CH+800



Rising Main Conveyance Long Section-CH+000 TO CH+800

- REVISIONS**
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REVISIONS

NO.	DESCRIPTION	DATE	BY	CHKD.
1	REVISED	10/1/2011	10/1/2011	10/1/2011
2	REVISED	10/1/2011	10/1/2011	10/1/2011
3	REVISED	10/1/2011	10/1/2011	10/1/2011
4	REVISED	10/1/2011	10/1/2011	10/1/2011
5	REVISED	10/1/2011	10/1/2011	10/1/2011
6	REVISED	10/1/2011	10/1/2011	10/1/2011
7	REVISED	10/1/2011	10/1/2011	10/1/2011
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10	REVISED	10/1/2011	10/1/2011	10/1/2011

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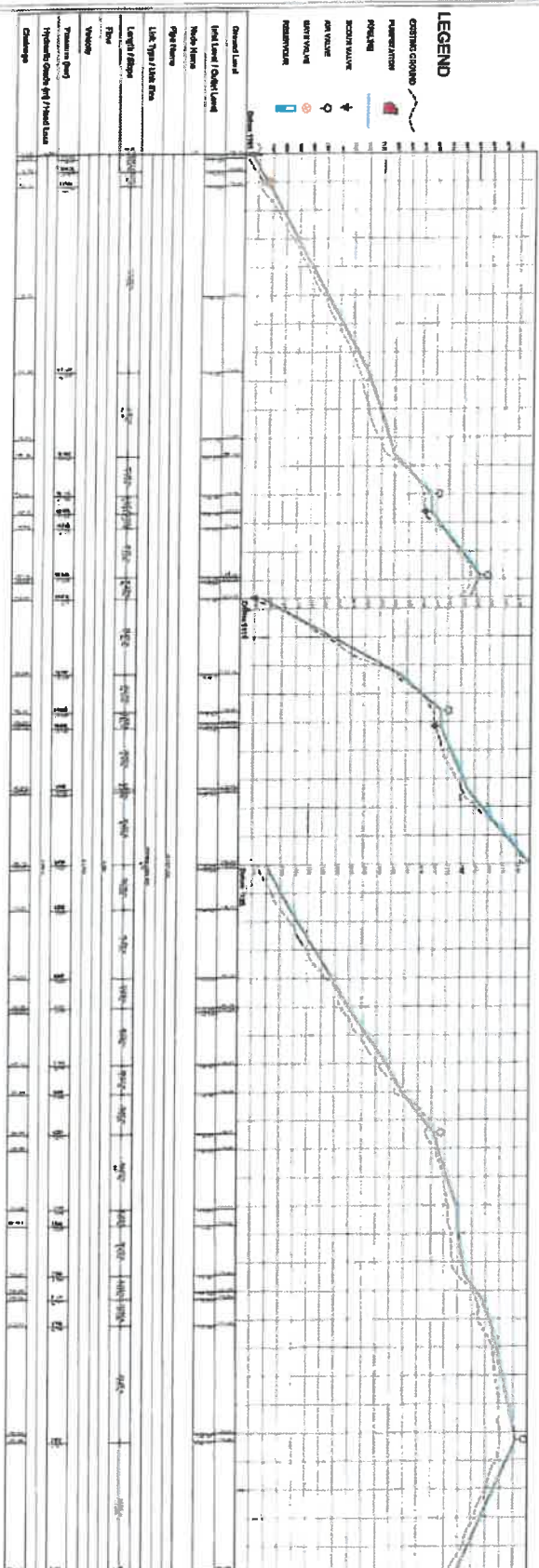
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Rising Main Conveyance Plan-CH0+000 TO CH1+100

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Rising Main Conveyance Long Section-CH0+000 TO CH1+100

REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS		REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS	
REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS		REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS	
REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS		REVISION SCHEDULE 1. ☐ NO REVISIONS 2. ☐ NO CORRECTIONS 3. ☐ NO CORRECTIONS 4. ☐ NO CORRECTIONS 5. ☐ NO CORRECTIONS 6. ☐ NO CORRECTIONS 7. ☐ NO CORRECTIONS 8. ☐ NO CORRECTIONS 9. ☐ NO CORRECTIONS 10. ☐ NO CORRECTIONS	

PART C3: SCOPE OF WORK

GENERAL SPECIFICATION

Scope

This Specification defines the minimum technical requirements for the construction, testing, commissioning and handover of the bulk water pipeline and associated infrastructure forming part of Phase 2 of the Upgrade of Infrastructure at Mdala Nature Reserve.

The Works comprise the construction of approximately 3.6 km of DN100 Stainless Steel Grade 316L Schedule 80S bulk water rising main from the existing Picketts Borehole Pump Station to the 16 m³ Chalet Reservoir, together with all associated civil, structural, mechanical and ancillary works required to provide a complete and fully operational potable water conveyance system.

The Contractor shall provide all labour, supervision, materials, plant, equipment, temporary works, transport and incidentals necessary for the execution and completion of the Works in accordance with the Contract Documents.

These Specifications shall be read together with the Drawings, Bill of Quantities, General Conditions of Contract (GCC 2015), Contract Data, SANS 1200 Standardised Specifications, SANS 2001 Construction Works Specifications and all other Contract Documents. In the event of any discrepancy, the order of precedence stated in the Contract Data shall apply.

Description of the Works

The Contract generally comprises, but is not limited to, the following activities:

- Site establishment and demobilisation.

- Survey control, setting out and verification of the pipeline alignment.

- Clearing and grubbing of the pipeline servitude.

- Trench excavation in all classes of material, including hard rock excavation where encountered.

- Dewatering of excavations where required.

- Supply, handling, storage and installation of stainless-steel pipelines, fittings and specials.

- Welding, jointing and installation of all pipeline sections.

- Construction of reinforced concrete thrust blocks and anchor blocks.

- Construction of reinforced concrete valve chambers, air valve chambers and ancillary structures.

- Construction of reinforced concrete pedestal pipe supports and associated anchor systems.

- Installation of gate valves, air release valves, scour valves, dismantling joints, flanges and mechanical fittings.

Bedding, backfilling and compaction of pipe trenches.

Pressure testing, flushing, disinfection and commissioning of the completed pipeline.

Environmental rehabilitation and reinstatement of all disturbed areas.

Preparation of as-built drawings, operation and maintenance manuals, quality records and project close-out documentation.

Contractor's Obligations

The Contractor shall execute the Works in accordance with:

These Project Specifications.

The approved construction drawings.

The Bill of Quantities.

The General Conditions of Contract (GCC 2015).

Contract Data.

SANS 1200 Standardised Specifications.

SANS 2001 Construction Works Specifications.

Applicable South African National Standards.

Applicable legislation.

Written instructions issued by the Employer's Agent.

The Contractor shall be solely responsible for the quality, accuracy and completeness of all construction activities and shall ensure that all work complies with recognised engineering practice.

Contractor's Responsibilities

Without limiting the Contractor's obligations under the Contract, the Contractor shall:

- Verify all dimensions, coordinates and levels before commencing construction.
- Locate and protect all existing underground and above-ground services.
- Protect existing roads, buildings, structures, fences and utility services.
- Maintain safe public and vehicular access throughout the construction period.
- Prevent damage to environmentally sensitive areas within the Nature Reserve.
- Maintain the Works in a safe condition until Practical Completion.
- Repair, at his own cost, any damage caused during construction.
- Provide competent supervision at all times.
- Supply all temporary works necessary for safe construction.
- Maintain adequate security of the Site and construction materials.

Sequence of Construction

Unless otherwise instructed by the Employer's Agent, construction shall generally proceed in the following sequence:

- Site establishment.
- Survey control and setting out.
- Clearing and grubbing.
- Trench excavation.
- Bedding preparation.
- Pipe laying.
- Welding and jointing.
- Installation of valves and specials.
- Construction of thrust blocks and anchor blocks.
- Construction of valve chambers and pipe supports.
- Backfilling and compaction.
- Pressure testing.
- Flushing and disinfection.
- Commissioning.
- Environmental rehabilitation.
- Final survey.
- Submission of as-built documentation.
- Practical Completion.

The sequence may be varied with the prior approval of the Employer's Agent where necessary to suit site conditions or construction methodology.

Site Investigation

The Contractor shall be deemed to have inspected the Site prior to submitting a Tender and to have satisfied himself regarding:

- Site access.
- Existing services.
- Ground conditions.
- Topography.
- Availability of construction water and power.
- Climatic conditions.
- Environmental constraints.
- Storage areas.
- Material haul routes.
- Any other factor likely to influence the execution of the Works.

No additional payment shall be made for matters that could reasonably have been determined during a pre-tender site inspection.

Setting Out

The Contractor shall be responsible for all setting out of the Works.

Survey control shall be established using approved survey equipment by suitably qualified personnel.

Before commencing excavation, the Contractor shall verify all pipeline chainages, levels, coordinates and tie-ins to existing infrastructure.

Any discrepancies identified shall immediately be reported to the Employer's Agent.

Quality of Workmanship

All workmanship shall be of the highest standard and carried out by suitably qualified personnel experienced in the construction of bulk water pipelines.

The Contractor shall ensure that:

- All welders are appropriately qualified for stainless steel pipe welding.
- Pipe fitters are competent and experienced.
- Concrete works comply with the specified strength and durability requirements.
- Mechanical installations are undertaken by competent personnel.
- Construction tolerances comply with the Drawings and Specifications.

Work not complying with the Contract Documents shall be rejected and shall be removed and replaced at the Contractor's expense.

Coordination of the Works

The Contractor shall coordinate all construction activities to minimise disruption to the operations of Mdala Nature Reserve.

Particular care shall be taken when working adjacent to existing borehole infrastructure, solar-powered pumping equipment, access roads and operational facilities.

Construction activities shall be planned to ensure continuity of existing water supply services wherever practicable.

Handover Requirements

Prior to Practical Completion, the Contractor shall submit:

- As-built drawings.
- Pressure testing certificates.
- Flushing and disinfection certificates.
- Material compliance certificates.
- Welding inspection records.
- Concrete test results.
- Quality control records.
- Operation and Maintenance Manuals.
- Health and Safety File.
- Environmental close-out documentation.
- Defects list and rectification records.

The Works shall not be considered complete until all documentation has been submitted and accepted by the Employer's Agent.

APPLICABLE STANDARDS AND CODES

General

All materials, workmanship, construction methods, testing, inspection and commissioning shall comply with the latest editions of the South African National Standards (SANS), International Standards (ISO), South African Bureau of Standards (SABS) Specifications and all other standards referenced herein, unless otherwise approved in writing by the Employer's Agent.

Where a conflict exists between the requirements of the various standards, the more stringent requirement shall apply unless otherwise instructed by the Employer's Agent.

Where no South African Standard exists for a particular material or process, the relevant ISO, ASTM, AWWA, ASME, API, BS EN or equivalent internationally recognised standard shall apply, subject to the approval of the Employer's Agent.

The Contractor shall ensure that all materials incorporated into the Works are certified as complying with the applicable standards and shall submit Certificates of Compliance, manufacturer's data sheets and test certificates for approval before installation.

South African Legislation

The Contractor shall comply with all applicable legislation, including but not limited to:

- Constitution of the Republic of South Africa, 1996.
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Construction Regulations.
- National Environmental Management Act, 1998 (Act No. 107 of 1998).
- National Water Act, 1998 (Act No. 36 of 1998).
- Water Services Act, 1997 (Act No. 108 of 1997).
- National Building Regulations and Building Standards Act, 1977.
- National Road Traffic Act where applicable.
- Compensation for Occupational Injuries and Diseases Act.
- Basic Conditions of Employment Act.
- Labour Relations Act.
- Employment Equity Act.
- Public Finance Management Act, where applicable.

General Conditions of Contract

The Contract shall be administered in accordance with:

- General Conditions of Contract for Construction Works (GCC), Third Edition (2015), published by the South African Institution of Civil Engineering (SAICE).
- Contract Data.
- Tender Data.
- Employer's Requirements.
- Drawings.
- Bill of Quantities.
- These Project Specifications.

South African National Standards

Unless otherwise specified, the Works shall comply with the latest editions of the following standards:

General Civil Engineering

- SANS 1200 Series – Standardised Specifications for Civil Engineering Construction.
- SANS 2001 Series – Construction Works Specifications.
- SANS 1921 Series – Construction and Management Requirements.
- TMH Series Manuals.
- COLTO Standard Specifications (where applicable).

Concrete

- SANS 10100 – Structural Use of Concrete.
- SANS 5863 – Concrete Tests.
- SANS 50197 – Cement.
- SANS 1083 – Aggregates.

Reinforcement

- SANS 920 – Steel Reinforcement.
- SANS 282 – Reinforcing Fabric.

Stainless Steel Pipework

- ASTM A312 – Stainless Steel Pipe.

- ASTM A403 – Stainless Steel Fittings.
- ASTM A182 – Stainless Steel Flanges.
- ASTM A240 – Stainless Steel Plate.
- ASTM A967 – Stainless Steel Passivation.

Welding

- ASME Section IX.
- AWS D1.6 – Structural Welding Code – Stainless Steel.
- ISO 9606 – Qualification of Welders.
- ISO 15614 – Welding Procedure Qualification.

Pipeline Construction

- SANS 2001 DP Series.
- SANS 10252.
- SANS 10299.
- ISO 7005 – Flanges.
- ISO 5208 – Valve Pressure Testing.

Mechanical Equipment

- SANS 347 – Pressure Equipment Regulations.
- ISO 9906 – Pump Performance Testing.
- IEC Standards applicable to electrical equipment.

Corrosion Protection

- SANS 1217.
- ISO 21809.
- ISO 8501.
- ISO 8502.
- ISO 8503.
- ISO 8504.
- ISO 12944.

Water Quality

- SANS 241 – Drinking Water Quality.

Codes of Practice

Construction shall comply with recognised engineering practice, including:

- SAICE Guidelines.
- Water Institute of Southern Africa (WISA) Guidelines.
- Department of Water and Sanitation (DWS) Design Guidelines.
- Applicable Municipal Standards.
- Employer's Standard Drawings.
- Employer's Standard Specifications.

Manufacturer's Specifications

All proprietary materials, equipment, valves, coatings, stainless steel pipes, fittings and mechanical equipment shall be installed strictly in accordance with the manufacturer's latest written installation instructions.

Where a conflict exists between the manufacturer's recommendations and these Specifications, the Contractor shall immediately notify the Employer's Agent for a written ruling before proceeding with the Works.

Alternative Materials

Alternative materials or products may only be used where:

- They have been approved in writing by the Employer's Agent.
- They comply with the specified performance requirements.
- They meet or exceed the quality requirements of the specified materials.
- Supporting technical literature and test certificates have been submitted for review.

Approval of an alternative product shall not relieve the Contractor of responsibility for the satisfactory performance of the Works.

Quality Certification

All manufacturers supplying materials for incorporation into the Works shall operate an approved Quality Management System, preferably certified to **ISO 9001**.

The Contractor shall submit, where applicable:

- Certificates of Compliance.

- Factory Test Certificates.
- Mill Certificates.
- Material Traceability Records.
- Inspection and Test Plans (ITPs).
- Quality Control Plans (QCPs).
- Product Data Sheets.

No material shall be incorporated into the Works until it has been approved by the Employer's Agent.

PARTICULAR SPECIFICATIONS

General

These Particular Specifications supplement the Standard Specifications and define the project-specific technical requirements for the construction of the bulk water pipeline and associated infrastructure at Mdala Nature Reserve.

These requirements shall be read in conjunction with the Drawings, Bill of Quantities, General Conditions of Contract (GCC 2015), Contract Data, SANS 1200 Standardised Specifications and SANS 2001 Construction Works Specifications.

Where these Particular Specifications differ from the Standard Specifications, the requirements contained herein shall take precedence.

Description of the Works

The Works comprise the construction of approximately 3.6 km of DN100 Stainless Steel Grade 316L Schedule 80S bulk water rising main from the existing Pickets Borehole Pump Station to the 16 m³ Chalet Reservoir, together with all associated civil, structural, mechanical and ancillary works.

The Contractor shall provide a complete and fully operational bulk water conveyance system, including all labour, supervision, materials, plant, equipment, temporary works and incidentals necessary for the successful completion of the Contract.

Site Conditions

The Contractor shall note that the pipeline route traverses varying terrain, including:

- Existing gravel access roads.
- Natural veld.
- Rocky outcrops.
- Steep embankments.
- Environmentally sensitive areas.
- Existing tourism infrastructure.

The Contractor shall satisfy himself regarding all site conditions before submitting a Tender.

No additional payment shall be made for conditions that could reasonably have been identified during a site inspection.

Existing Infrastructure

The Contractor shall protect all existing infrastructure, including but not limited to:

- Existing borehole pump station.
- Solar-powered pumping system.
- Existing reservoirs.
- Existing pipelines.
- Electrical reticulation.
- Access roads.
- Buildings and accommodation facilities.
- Boundary fences.
- Existing drainage structures.
- Existing services.

Any damage caused by the Contractor shall be repaired immediately at the Contractor's own cost to the satisfaction of the Employer's Agent.

Pipeline Materials

Unless otherwise approved in writing by the Employer's Agent, the pipeline shall comprise:

- DN100 Stainless Steel Grade 316L Schedule 80S pipe.
- Stainless Steel Grade 316L fittings and specials.
- Stainless Steel Grade 316 flanges.
- Stainless Steel bolts, nuts and washers.
- Approved stainless steel gaskets suitable for potable water.

All materials shall be new, free from defects and supplied with manufacturer's certificates and Certificates of Compliance.

Mechanical Components

The Contractor shall supply and install all mechanical components required for the satisfactory operation of the bulk water pipeline, including:

- Gate valves.
- Air release valves.
- Scour valves.
- Dismantling joints.

- Flanged joints.
- Flexible couplings where indicated.
- Pipe supports.
- Anchor bolts.
- Mechanical fasteners.
- Pipe identification markers.

All valves shall be suitable for potable water applications and rated for the operating pressure of the system.

Concrete Structures

Concrete works shall include:

- Reinforced concrete thrust blocks.
- Reinforced concrete anchor blocks.
- Valve chambers.
- Air valve chambers.
- Reinforced concrete pedestal pipe supports.
- Concrete marker blocks.
- Minor structural concrete works associated with the pipeline.

Concrete shall comply with the specified strength class shown on the Drawings and shall be properly cured before loading.

Corrosion Protection

Although Stainless Steel Grade 316L provides excellent corrosion resistance, all fabricated steelwork, exposed carbon steel components, anchor bolts, structural steel supports and miscellaneous metalwork shall receive corrosion protection in accordance with the approved corrosion protection specification.

The Contractor shall ensure that handling, fabrication, welding and storage of stainless steel components prevent contamination by carbon steel particles or other foreign materials that may initiate corrosion.

Where stainless steel components are cut or welded on Site, all affected areas shall be cleaned, passivated and restored in accordance with the manufacturer's recommendations and the relevant ASTM and ISO standards.

Welding Requirements

All welding shall be carried out by qualified welders using approved Welding Procedure Specifications (WPS).

The Contractor shall submit the following before commencing welding operations:

- Welding Procedure Specifications (WPS).
- Procedure Qualification Records (PQR).
- Welder Qualification Certificates.
- Inspection and Test Plan (ITP).

The Employer's Agent may require visual inspection, dye penetrant testing or other non-destructive testing of welded joints.

Defective welds shall be repaired or replaced at the Contractor's cost.

Environmental Protection

The Contractor shall minimise disturbance to the natural environment throughout the construction period.

Special care shall be exercised when working near:

- Existing vegetation.
- Watercourses.
- Wildlife habitats.
- Tourist facilities.
- Existing trees.

No vegetation shall be removed outside the approved construction servitude.

All disturbed areas shall be rehabilitated to the satisfaction of the Employer's Agent and the Environmental Control Officer.

Quality Requirements

The Contractor shall implement a documented Quality Management System throughout the Contract.

Inspection and testing shall include, where applicable:

- Material verification.
- Dimensional checks.
- Welding inspections.
- Concrete testing.

- Pressure testing.
- Flushing.
- Disinfection.
- Final commissioning.

The Contractor shall maintain complete quality records for review by the Employer's Agent.

Contractor's Submissions

Before Practical Completion, the Contractor shall submit:

- Material Certificates.
- Factory Test Certificates.
- Pressure Test Certificates.
- Welding Inspection Records.
- Concrete Test Results.
- As-built Drawings.
- Operation and Maintenance Manuals.
- Quality Control Records.
- Health and Safety File.
- Environmental Close-Out Report.
- Commissioning Report.

Practical Completion shall not be certified until all required documentation has been submitted and accepted.

EARTHWORKS

Scope

This section covers all earthworks associated with the construction of the bulk water pipeline, including site clearing, excavation, trenching, dewatering, bedding, backfilling, compaction, disposal of surplus material and reinstatement of disturbed areas.

The Contractor shall provide all labour, plant, equipment, temporary works and Incidentals necessary to execute the earthworks in accordance with the Contract Documents.

Earthworks shall comply with the requirements of SANS 1200 D, SANS 1200 DB, SANS 2001, the Drawings and these Project Specifications.

Site Clearance

Prior to commencing excavation, the Contractor shall:

- Establish the pipeline centreline and construction servitude.
- Obtain approval of the setting out from the Employer's Agent.
- Remove vegetation only within the approved construction servitude.
- Remove unsuitable material, debris, rubbish and obstructions.
- Stockpile reusable topsoil separately from excavated material.
- Protect existing trees identified for retention.
- Protect existing infrastructure and underground services.

Burning of vegetation on Site shall not be permitted unless specifically authorised by the Employer and the relevant environmental authorities.

Setting Out

The Contractor shall establish all pipeline centrelines, chainages, offsets and benchmark levels before excavation commences.

Survey control shall be maintained throughout construction.

The Contractor shall immediately notify the Employer's Agent of any discrepancies between the Drawings and actual site conditions.

Trench Excavation

Excavation shall be carried out to the lines, levels, grades and dimensions shown on the Drawings.

The Contractor shall:

- Excavate only the lengths that can be safely completed within a reasonable period.
- Prevent collapse of trench sides.
- Protect adjacent structures and services.
- Remove all unsuitable material from the trench.
- Keep trench bottoms clean and free from loose material.
- Prevent disturbance of the founding material.

Excavation shall include excavation in:

- Soft material.
- Intermediate material.
- Hard material.
- Hard rock requiring mechanical breaking.

No blasting shall be permitted without the written approval of the Employer's Agent and the relevant statutory authorities.

Trench Widths

Trench widths shall be kept to the minimum practical dimensions necessary to permit safe installation, jointing and testing of the pipeline.

Unless otherwise shown on the Drawings, trench widths shall comply with the requirements of SANS 1200 DB.

Over-excavation attributable to the Contractor shall be made good at the Contractor's own cost using approved material.

Excavation Near Existing Services

Where excavation is carried out adjacent to existing:

- Water pipelines.
- Electrical cables.
- Fibre optic cables.
- Sewer pipelines.
- Buildings.

- Roads.
- Drainage structures.

the Contractor shall:

- Locate services by hand excavation where necessary.
- Provide adequate support to exposed services.
- Prevent damage to existing infrastructure.
- Immediately report any damage to the Employer's Agent.

Any repairs resulting from damage caused by the Contractor shall be undertaken at the Contractor's expense.

Dewatering

The Contractor shall maintain excavations free of water throughout construction.

Where groundwater, seepage or surface runoff enters the trench, the Contractor shall provide suitable pumps, drainage channels, sumps or other approved methods to maintain dry working conditions.

Water removed from excavations shall be discharged in a manner that does not cause erosion, flooding or environmental damage.

No additional payment shall be made for normal dewatering operations.

Bedding

Pipe bedding material shall consist of approved granular material free from:

- Organic matter.
- Clay lumps.
- Rocks.
- Sharp objects.
- Construction debris.

Bedding shall be placed, levelled and compacted to the thickness shown on the Drawings before pipe installation.

The pipeline shall bear uniformly along its entire length.

Backfilling

Backfilling shall not commence until:

- Pipe alignment has been approved.
- Welded joints have been inspected.
- Concrete thrust blocks have achieved the specified strength where applicable.
- The Employer's Agent has authorised backfilling.

Backfill material shall:

- Be free from organic material.
- Be free from stones exceeding the specified size.
- Be placed in uniform layers.
- Be compacted to the specified density.

Mechanical compaction equipment shall not pass directly over exposed pipelines until sufficient cover has been placed.

Compaction

Compaction shall comply with the specified densities stated in the Contract Documents.

The Contractor shall undertake field density testing at frequencies directed by the Employer's Agent.

Areas failing to achieve the specified compaction shall be reworked and retested at the Contractor's expense.

Disposal of Surplus Material

Surplus excavated material not required for backfilling shall be removed to an approved spoil site.

No spoil material shall be deposited:

- Within drainage channels.
- On environmentally sensitive areas.
- Adjacent to existing roads.
- On private property without written permission.
- Within the Nature Reserve except at approved disposal areas.

Reinstatement

Upon completion of construction, the Contractor shall reinstate all disturbed areas to a condition equal to or better than that existing before commencement of the Works.

Reinstatement shall include:

- Replacement of topsoil.
- Regrading.
- Compaction.
- Rehabilitation of disturbed vegetation.
- Reinstatement of access roads.
- Repair of drainage channels.
- Repair of fences.
- Removal of temporary works.
- Removal of construction debris.

The Employer's Agent shall determine whether reinstatement is satisfactory.

Protection of the Environment

The Contractor shall minimise disturbance to natural vegetation throughout construction.

Topsoil shall be stripped separately, stockpiled and reused during reinstatement.

Construction activities shall remain within the approved construction servitude.

The Contractor shall prevent:

- Soil erosion.
- Dust pollution.
- Siltation of drainage lines.
- Damage to protected vegetation.
- Pollution of watercourses.

Measurement and Payment

Measurement and payment for earthworks shall be in accordance with the relevant items in the Bill of Quantities and the applicable provisions of **SANS 1200 D** and **SANS 1200 DB**, unless otherwise stated in the Particular Specifications.

The tendered rates shall be deemed to include full compensation for:

- Setting out.

- Site clearance.
- Excavation in all material classes.
- Temporary support.
- Dewatering.
- Bedding.
- Backfilling.
- Compaction.
- Disposal of surplus material.
- Protection of existing services.
- Environmental protection.
- Reinstatement.
- Labour, plant, equipment and all incidental costs necessary for the satisfactory completion of the earthworks.

STAINLESS STEEL PIPELINE

Scope

This section covers the supply, manufacture, transportation, storage, handling, installation, welding, testing and commissioning of the stainless steel bulk water pipeline and all associated fittings, specials, flanges and appurtenances required for the completion of the Works.

The Contractor shall provide all labour, materials, plant, equipment and temporary works necessary to execute the pipeline installation in accordance with the Contract Documents.

Pipeline Description

The bulk water pipeline shall comprise approximately **3.6 km of DN100 Stainless Steel Grade 316L Schedule 80S rising main**, extending from the existing **Picketts Borehole Pump Station** to the **16 m³ Chalet Reservoir**.

The pipeline shall operate as a potable water rising main and shall include all valves, fittings, flanged joints, supports, anchor blocks, thrust blocks, marker posts and ancillary infrastructure shown on the Drawings.

Materials

All pipeline materials shall be new and unused.

Unless otherwise approved by the Employer's Agent, the pipeline shall comprise:

- DN100 Stainless Steel Grade 316L pipe manufactured in accordance with ASTM A312.
- Stainless Steel Grade 316L fittings manufactured in accordance with ASTM A403.
- Stainless Steel Grade 316 flanges manufactured in accordance with ASTM A182.
- Stainless Steel bolts, nuts and washers suitable for potable water service.
- EPDM or approved potable water gaskets.
- Stainless steel supports and brackets where specified.

The Contractor shall submit manufacturer's certificates and Certificates of Compliance for all materials before delivery to Site.

Manufacture

Pipework shall be manufactured under an approved Quality Management System certified to ISO 9001 or equivalent.

Each pipe length shall be clearly marked with:

- Manufacturer's name.
- Pipe diameter.
- Wall thickness.
- Material grade.
- Heat number.
- Manufacturing date.
- Applicable standard.

The Employer's Agent reserves the right to inspect manufacturing facilities and reject any materials that do not comply with the Contract requirements.

Handling, Transport and Storage

The Contractor shall take all reasonable precautions to prevent damage or contamination of stainless steel materials.

In particular:

- Pipes shall not be dragged on the ground.
- Nylon slings or padded lifting equipment shall be used.
- Carbon steel chains or hooks shall not come into direct contact with stainless steel.
- Pipes shall be stored above ground on timber supports.
- Open pipe ends shall be sealed to prevent ingress of dirt and moisture.
- Damaged pipes shall not be installed without the written approval of the Employer's Agent.

Installation

The pipeline shall be installed to the lines, levels and grades shown on the Drawings.

The Contractor shall ensure that:

- Bedding is prepared before pipe laying.
- Pipes are correctly aligned.
- Pipe joints are free from stress.
- Pipe ends are thoroughly cleaned before welding.
- Foreign material does not enter the pipeline during construction.

Temporary end caps shall be fitted whenever construction is suspended.

Welding

All welding shall be undertaken by suitably qualified welders using approved Welding Procedure Specifications (WPS).

Prior to commencing welding, the Contractor shall submit:

- Welding Procedure Specifications (WPS).
- Procedure Qualification Records (PQR).
- Welder Qualification Certificates.
- Inspection and Test Plan (ITP).

All welds shall comply with the applicable requirements of:

- ASME Section IX.
- ISO 9606.
- ISO 15614.
- AWS D1.6.

The Employer's Agent may require visual inspection and non-destructive testing of welds.

Defective welds shall be removed and re-welded at the Contractor's cost.

Flanged Joints

Flanged joints shall:

- Be correctly aligned.
- Be free from distortion.
- Be fitted with approved potable water gaskets.
- Be tightened using an approved bolt tightening sequence.
- Be tightened to the manufacturer's recommended torque.

Bolts shall project beyond the nuts by at least one complete thread after tightening.

Pipe Supports

Above-ground sections of pipeline shall be supported on reinforced concrete pedestal supports as detailed on the Drawings.

Supports shall:

- Maintain the required pipeline alignment.
- Prevent excessive deflection.
- Allow for thermal expansion and contraction where required.

- Prevent metal-to-metal contact by providing approved rubber or neoprene isolation pads.

Corrosion Protection

Although Stainless Steel Grade 316L possesses excellent corrosion resistance, the Contractor shall ensure that contamination from carbon steel is prevented throughout manufacture and construction.

The following practices shall be observed:

- Separate stainless steel fabrication areas from carbon steel work.
- Use stainless steel wire brushes only.
- Prevent contamination by grinding dust.
- Remove weld discoloration by approved cleaning methods.
- Passivate welded areas where specified.
- Protect completed pipework from contamination until commissioning.

Cleaning

Before testing, the Contractor shall thoroughly clean the pipeline.

Cleaning shall include removal of:

- Dirt.
- Sand.
- Welding slag.
- Scale.
- Oil.
- Grease.
- Foreign matter.

The Employer's Agent may instruct additional cleaning if considered necessary.

Pressure Testing

Upon completion of installation, the Contractor shall pressure test the complete pipeline in accordance with SANS 1200 LB and the approved testing procedure.

The Contractor shall:

- Fill the pipeline slowly.
- Expel all trapped air.
- Maintain the specified test pressure.

- Record pressure losses.
- Repair all leaks.
- Repeat testing until satisfactory results are obtained.

No pipeline shall be accepted until the pressure test has been successfully completed.

Flushing and Disinfection

Following successful pressure testing, the Contractor shall flush and disinfect the pipeline before commissioning.

The Contractor shall:

- Flush the pipeline until clean water is discharged.
- Disinfect using an approved potable water disinfectant.
- Allow the required contact time.
- Dispose of disinfectant safely.
- Obtain water quality approval before placing the pipeline into service.

Inspection

The Employer's Agent shall have unrestricted access to inspect the Works during manufacture and construction.

The Contractor shall provide all labour and equipment necessary to facilitate inspections.

Inspection by the Employer's Agent shall not relieve the Contractor of responsibility for compliance with the Contract.

Acceptance

The stainless steel pipeline shall only be accepted after:

- Successful pressure testing.
- Successful flushing and disinfection.
- Completion of all outstanding defects.
- Submission of all material certificates.
- Submission of welding records.
- Submission of pressure test certificates.
- Submission of as-built drawings.

- Approval by the Employer's Agent.

Measurement and Payment

Measurement and payment for stainless steel pipelines shall be in accordance with the relevant items in the Bill of Quantities.

The tendered rates shall be deemed to include full compensation for:

- Supply of pipes and fittings.
- Transportation and storage.
- Handling and lifting.
- Pipe laying.
- Welding and jointing.
- Flanges, bolts, nuts and gaskets.
- Temporary supports.
- Cleaning.
- Pressure testing.
- Flushing and disinfection.
- Protection of completed works.
- Labour, plant, equipment, tools and all incidental costs necessary for the complete installation of the stainless steel pipeline.

MECHANICAL EQUIPMENT AND VALVES

Scope

This section covers the supply, manufacture, delivery, storage, installation, testing and commissioning of all mechanical equipment and valves required for the bulk water pipeline.

The Contractor shall provide all labour, materials, plant, equipment, tools and temporary works necessary for the complete installation of all mechanical components shown on the Drawings or specified in the Bill of Quantities.

The Works shall include, but shall not be limited to:

- Isolation (gate) valves.
- Air release valves.
- Scour valves.
- Dismantling joints.
- Flanged adaptors.
- Mechanical couplings.
- Flanges and gaskets.
- Bolts, nuts and washers.
- Valve extension spindles.
- Valve operating accessories.
- Pipe supports and brackets.
- Anchor bolts.
- Mechanical identification plates.
- All ancillary fittings necessary for a complete operational installation.

General Requirements

All mechanical equipment shall:

- Be new and unused.
- Be manufactured specifically for potable water applications.
- Be suitable for continuous outdoor service.
- Be compatible with the operating pressure of the pipeline.
- Be resistant to corrosion under the prevailing environmental conditions.
- Be supplied complete with all accessories required for installation and operation.

Only equipment approved by the Employer's Agent shall be installed.

Design Requirements

Unless otherwise specified on the Drawings, all valves and mechanical equipment shall:

- Have a minimum pressure rating of **PN16**, or as indicated on the Drawings.
- Be suitable for potable water.
- Operate under the specified design pressure without leakage.
- Permit easy maintenance and replacement.
- Be interchangeable with standard components where practical.
- Be installed in accordance with the manufacturer's written recommendations.

The Contractor shall verify all operating pressures before procurement.

Gate Valves

Gate valves shall be resilient seated, non-rising spindle type unless otherwise specified.

Each valve shall:

- Be suitable for potable water service.
- Have epoxy-coated internal and external surfaces where ductile iron components are used.
- Operate smoothly throughout its full travel.
- Close tightly without leakage.
- Be supplied complete with handwheel or extension spindle where required.
- Be flanged to the applicable pressure rating.

Valve operation shall be clockwise to close unless otherwise approved by the Employer's Agent.

Air Release Valves

Automatic air release valves shall be installed at the locations shown on the Drawings.

Each valve shall:

- Automatically release accumulated air during operation.
- Permit rapid admission of air during pipeline draining.
- Prevent vacuum conditions within the pipeline.
- Be suitable for potable water service.
- Be complete with isolating valve and fittings.

Air valves shall be installed within reinforced concrete valve chambers unless otherwise shown on the Drawings.

Scour Valves

Scour valves shall be installed at all low points indicated on the Drawings.

Each scour valve assembly shall include:

- Isolation valve.
- Scour valve.
- Pipework.
- Fittings.
- Flanges.
- Supports.
- Outlet arrangement.

The Contractor shall ensure that scour discharges are directed to approved drainage points and do not cause erosion or environmental damage.

Dismantling Joints

Dismantling joints shall be installed where shown on the Drawings to facilitate future maintenance and replacement of valves and mechanical equipment.

Each dismantling joint shall:

- Be suitable for the specified pressure rating.
- Permit axial adjustment during installation.
- Be supplied complete with bolts, nuts, tie rods and gaskets.
- Be protected against corrosion where applicable.

Flanges and Gaskets

Flanges shall comply with the specified pressure class and material requirements.

The Contractor shall ensure that:

- Flanges are correctly aligned.
- Gasket faces are clean.
- Approved potable water gaskets are used.

- Bolts are tightened uniformly using the manufacturer's recommended tightening sequence.
- Bolt torque is checked before commissioning.

No flange shall be forced into alignment.

Bolts, Nuts and Washers

Bolts, nuts and washers shall:

- Be manufactured from stainless steel Grade 316 unless otherwise specified.
- Be compatible with the connected materials.
- Be free from corrosion and mechanical damage.
- Be of sufficient length to ensure full thread engagement.

Threads shall be clean and lightly lubricated with an approved anti-seize compound compatible with potable water applications.

Mechanical Couplings

Where mechanical couplings are specified, they shall:

- Be suitable for the pipeline material and diameter.
- Accommodate minor angular and axial movement where required.
- Maintain a watertight seal under the specified operating pressure.
- Be installed strictly in accordance with the manufacturer's instructions.

The Contractor shall ensure that couplings are correctly restrained where necessary.

Installation

Mechanical equipment shall be installed only after:

- Pipeline alignment has been approved.
- Pipe supports have been completed.
- Concrete thrust blocks have attained the specified strength where applicable.

The Contractor shall ensure that:

- Equipment is installed without imposing undue stress on the pipeline.
- Valve stems remain vertical unless otherwise approved.
- Operating mechanisms are fully accessible.
- Equipment is adequately supported.

- Protective covers remain in place until commissioning.

Inspection and Testing

The Contractor shall inspect all mechanical equipment before installation.

Inspection shall include:

- Verification of dimensions.
- Pressure rating.
- Material certification.
- Coating condition.
- Freedom of operation.
- Mechanical damage.
- Completeness of accessories.

Following installation, all valves shall be:

- Operated through their full travel.
- Checked for smooth operation.
- Inspected for leakage.
- Included in the pipeline pressure test.

Any defective equipment shall be repaired or replaced at the Contractor's expense.

Protection During Construction

The Contractor shall protect all installed mechanical equipment against:

- Dirt.
- Dust.
- Moisture.
- Mechanical damage.
- Theft.
- Vandalism.
- Corrosion.

Valve openings shall remain sealed until final commissioning.

No mechanical equipment shall be used as temporary support for construction activities.

Identification

All valves shall be permanently identified using corrosion-resistant identification plates securely fixed in an approved location.

Identification shall include:

- Valve reference number.
- Valve type.
- Nominal diameter.
- Direction of operation where appropriate.

Valve numbering shall correspond with the Drawings and Operation and Maintenance Manual.

Commissioning

Prior to Practical Completion, the Contractor shall:

- Demonstrate the correct operation of every valve.
- Adjust operating mechanisms where necessary.
- Lubricate moving components in accordance with the manufacturer's recommendations.
- Verify that all mechanical equipment operates satisfactorily under normal operating conditions.
- Submit commissioning records to the Employer's Agent.

Operation and Maintenance Documentation

The Contractor shall provide Operation and Maintenance Manuals containing, as a minimum:

- Manufacturer's technical data sheets.
- Installation instructions.
- Operating procedures.
- Preventative maintenance schedules.
- Recommended spare parts lists.
- Exploded assembly drawings where applicable.
- Warranty information.
- Certificates of Compliance.
- Factory Test Certificates.

Three hard copies and one electronic copy shall be submitted to the Employer's Agent before Practical Completion.

Measurement and Payment

Measurement and payment for mechanical equipment and valves shall be in accordance with the relevant items in the Bill of Quantities.

The tendered rates shall be deemed to include full compensation for:

- Supply and delivery of all mechanical equipment.
- Factory testing and certification.
- Storage and handling.
- Installation.
- Flanges, gaskets, bolts, nuts and washers.
- Dismantling joints and mechanical couplings.
- Alignment and adjustment.
- Functional testing.
- Commissioning.
- Operation and maintenance manuals.
- Labour, plant, equipment, tools and all incidental costs necessary for the complete installation and satisfactory operation of the mechanical equipment.

CONCRETE WORKS

Scope

This section covers the supply of all materials, batching, mixing, transporting, placing, compacting, finishing, curing, testing and protection of concrete required for the construction of the bulk water pipeline and associated structures.

The Works shall include, but shall not be limited to:

- Reinforced concrete thrust blocks.
- Reinforced concrete anchor blocks.
- Valve chambers.
- Air valve chambers.
- Scour valve chambers.
- Pipe support pedestals.
- Concrete plinths.
- Equipment foundations.
- Concrete surrounds.
- Minor structural concrete works.
- Bedding concrete where specified.
- Blinding concrete.
- All associated reinforcement, formwork, inserts and anchor bolts.

The Contractor shall provide all labour, plant, equipment, materials and temporary works necessary for the satisfactory completion of the concrete works.

Applicable Standards

Concrete works shall comply with the latest editions of the following standards:

- SANS 10100 – Structural Use of Concrete.
- SANS 2001 CC1 – Concrete Works.
- SANS 50197 – Cement.
- SANS 1083 – Aggregates.
- SANS 5861 – Concrete Testing.
- SANS 920 – Steel Reinforcement.
- SANS 282 – Welded Steel Fabric.

Where these Specifications differ from the referenced standards, these Particular Specifications shall take precedence.

General Requirements

Concrete shall be designed, produced and placed to produce durable, dense and structurally sound construction suitable for the intended service conditions.

The Contractor shall ensure that:

- Concrete is supplied from an approved source.
- Materials are properly stored.
- Mixing is accurately controlled.
- Concrete is placed without segregation.
- Concrete is properly compacted.
- Adequate curing is provided.
- Concrete surfaces are protected against premature drying, contamination and mechanical damage.

Concrete shall not be placed until the Employer's Agent has inspected and approved the excavation, reinforcement, formwork and embedded items.

Concrete Grades

Unless otherwise indicated on the Drawings, concrete shall comply with the following minimum strength requirements:

Application	Minimum Concrete Strength
Blinding Concrete	15 MPa
Pipe Bedding Concrete (where specified)	20 MPa
Valve Chambers	30 MPa
Thrust Blocks	30 MPa
Anchor Blocks	30 MPa
Pipe Support Pedestals	30 MPa
Equipment Foundations	30 MPa
Structural Concrete	30 MPa

The Contractor shall not substitute concrete grades without the written approval of the Employer's Agent.

Materials

All materials incorporated into the concrete works shall be approved before use.

Materials shall include:

- Portland cement complying with SANS 50197.
- Clean potable water.
- Approved coarse and fine aggregates.
- Approved admixtures where permitted.
- Reinforcing steel complying with SANS 920.

Materials contaminated by dirt, oil, organic matter or deleterious substances shall not be used.

Reinforcement

Reinforcement shall be accurately cut, bent and fixed in accordance with the Drawings.

The Contractor shall ensure that:

- Reinforcement is free from loose rust, oil, paint and scale.
- Reinforcement is securely tied.
- Correct concrete cover is maintained using approved spacers.
- Reinforcement remains in position during concrete placement.

Welding of reinforcement shall not be permitted unless specifically shown on the Drawings or approved by the Employer's Agent.

Formwork

Formwork shall be rigid, true to line and level, and capable of supporting all construction loads without excessive movement.

Formwork shall:

- Produce the required finish.
- Prevent grout loss.
- Permit safe placement and compaction of concrete.

- Be adequately braced.
- Be removed only after sufficient concrete strength has been achieved.

Formwork shall be thoroughly cleaned before concrete placement.

Placement of Concrete

Concrete shall be placed as soon as practicable after mixing.

The Contractor shall ensure that:

- Concrete is deposited close to its final position.
- Free fall does not cause segregation.
- Concrete is placed in continuous layers.
- Cold joints are avoided.
- Concrete is not placed into standing water without approval.

Concrete shall be compacted immediately using approved mechanical vibrators.

Over-vibration resulting in segregation shall not be permitted.

Construction Joints

Construction joints shall be located only where shown on the Drawings or approved by the Employer's Agent.

Joint surfaces shall be:

- Clean.
- Roughened where required.
- Free from laitance.
- Thoroughly wetted before placing adjacent concrete.

Waterstops shall be installed where specified.

Curing

Immediately after finishing, concrete shall be protected against:

- Rapid drying.
- Excessive heat.
- Rain.
- Frost.

- Mechanical damage.

Concrete shall be cured continuously for a minimum period of seven (7) days unless otherwise approved by the Employer's Agent.

Approved curing methods may include:

- Wet hessian.
- Ponding.
- Plastic sheeting.
- Spray-applied curing compounds.

Thrust Blocks

Concrete thrust blocks shall be constructed at all locations shown on the Drawings or directed by the Employer's Agent.

Thrust blocks shall:

- Transfer hydraulic forces safely into undisturbed ground.
- Bear against natural ground.
- Not bear against backfilled material.
- Be constructed to the dimensions shown on the Drawings.
- Be allowed to attain sufficient strength before pressure testing.

The Contractor shall not alter thrust block dimensions without written approval.

Anchor Blocks

Anchor blocks shall be provided wherever indicated on the Drawings.

Anchor blocks shall:

- Resist axial pipeline forces.
- Be founded on competent undisturbed material.
- Incorporate reinforcement and anchor bolts as detailed.
- Be cast monolithically unless otherwise approved.

Valve Chambers

Valve chambers shall be constructed in accordance with the Drawings.

The Contractor shall ensure that:

- Chamber dimensions are accurate.
- Pipe penetrations are neatly formed.
- Access openings are correctly positioned.
- Covers are installed level with the finished ground surface unless otherwise specified.
- Internal surfaces are finished smooth and free from defects.

Pipe Support Pedestals

Concrete pipe support pedestals shall be constructed at the locations shown on the Drawings.

Pedestals shall:

- Maintain pipeline alignment.
- Provide uniform support.
- Be founded on competent material.
- Incorporate anchor bolts and embedded plates where specified.
- Be finished true to line and level.

The Contractor shall verify the finished levels before installation of the pipeline.

Embedded Items

Anchor bolts, sleeves, inserts, holding-down bolts, embedded plates and all other cast-in components shall be accurately positioned before concrete placement.

The Contractor shall ensure that embedded items remain securely fixed throughout concreting operations.

Incorrectly positioned embedded items shall be removed and replaced at the Contractor's expense.

Quality Control and Testing

The Contractor shall implement an approved quality control programme for all concrete works.

Testing shall include:

- Slump tests.
- Concrete cube strength tests.
- Visual inspection.
- Dimensional verification.
- Reinforcement inspection.

- Formwork inspection.

The frequency of testing shall comply with the applicable standards or as directed by the Employer's Agent.

Concrete not meeting the specified strength requirements may be rejected.

Protection of Completed Concrete

Completed concrete shall be protected against:

- Impact damage.
- Vibration.
- Premature loading.
- Chemical contamination.
- Erosion.
- Construction traffic.

No structural loading shall be applied until the concrete has attained the required design strength.

Repair of Defective Concrete

Concrete exhibiting:

- Honeycombing.
- Segregation.
- Cracking.
- Misalignment.
- Surface defects.
- Inadequate strength.

shall be assessed by the Employer's Agent.

Repairs shall only be carried out using approved methods.

Where defects cannot be satisfactorily repaired, the affected concrete shall be demolished and reconstructed at the Contractor's expense.

Measurement and Payment

Measurement and payment for concrete works shall be in accordance with the relevant items in the Bill of Quantities.

The tendered rates shall be deemed to include full compensation for:

- Supply and delivery of all materials.
- Batching, mixing and transporting concrete.
- Formwork.
- Reinforcement.
- Embedded items.
- Concrete placement.
- Compaction.
- Finishing.
- Curing.
- Testing and quality control.
- Removal of formwork.
- Protection of completed works.
- Labour, plant, equipment, tools and all incidental costs necessary for the complete execution of the concrete works.

VALVE CHAMBERS AND ANCILLARY STRUCTURES

Scope

This section covers the design requirements, construction, installation, testing and completion of all valve chambers and ancillary structures associated with the bulk water pipeline.

The Works shall include, but not be limited to:

- Isolation valve chambers.
- Air release valve chambers.
- Scour valve chambers.
- Washout structures.
- Access covers and frames.
- Pipe penetrations.
- Chamber drainage.
- Concrete plinths.
- Valve operating extensions.
- Marker posts.
- Identification signage.
- Ancillary pipe supports.
- Security fittings.
- All associated civil and structural works.

The Contractor shall provide all labour, materials, plant, equipment and temporary works necessary for the complete construction of these structures.

General Requirements

Valve chambers shall:

- Provide safe and unrestricted access for inspection, operation and maintenance.
- Protect valves and fittings against mechanical damage.
- Prevent ingress of surface water.
- Permit adequate ventilation.
- Provide sufficient working space around all mechanical equipment.
- Be durable and suitable for long-term service under site conditions.

All chambers shall be constructed in accordance with the Drawings and these Specifications.

Chamber Locations

Valve chambers shall be constructed at the locations indicated on the Drawings.

Typical chamber installations shall include:

- Isolation valves.
- Air release valves.
- Scour valves.
- Flow control fittings where applicable.
- Pipeline junctions where specified.

The Contractor shall verify chamber positions before construction.

No chamber shall be relocated without the written approval of the Employer's Agent.

Excavation and Foundations

Excavation for valve chambers shall comply with the requirements of **Section 4 – Earthworks**.

The Contractor shall ensure that:

- Foundations are constructed on competent undisturbed material.
- Unsuitable material is removed and replaced with approved material.
- Foundation levels are verified before placing concrete.
- Excavations remain dry during construction.

Where unsuitable founding conditions are encountered, the Employer's Agent shall be notified immediately.

Chamber Construction

Valve chambers shall be constructed from reinforced concrete unless otherwise shown on the Drawings.

Construction shall include:

- Reinforced concrete base slab.
- Reinforced concrete walls.
- Reinforced concrete roof slab where applicable.
- Pipe penetrations.
- Access opening.
- Frame and cover.
- Internal benching where specified.

The finished chamber shall be watertight, structurally sound and free from defects.

Chamber Dimensions

Internal chamber dimensions shall comply with the Drawings and shall provide sufficient clearance for:

- Valve operation.
- Maintenance activities.
- Removal and replacement of mechanical equipment.
- Inspection by maintenance personnel.

Unless otherwise shown on the Drawings, a minimum clear working space of **600 mm** shall be provided around each valve or fitting.

The Contractor shall verify all equipment dimensions before constructing the chamber.

Pipe Penetrations

Pipe penetrations through chamber walls shall:

- Be accurately positioned.
- Be formed using approved sleeves or cast-in openings.
- Be sealed using approved watertight sealing systems.
- Prevent ingress of groundwater and surface water.
- Prevent movement of the pipeline relative to the chamber wall.

No pipe shall bear directly against concrete.

Chamber Covers and Frames

Access covers shall:

- Be heavy-duty ductile iron unless otherwise specified.
- Be suitable for the loading conditions applicable to the installation.
- Be securely seated within galvanized or ductile iron frames.
- Be removable using standard lifting equipment.
- Be fitted flush with the finished ground or road surface unless otherwise indicated.

The Contractor shall ensure that all covers fit correctly without rocking or excessive movement.

Chamber Drainage

Valve chambers shall remain free from standing water.

Where shown on the Drawings, chamber drainage shall include:

- Drain outlets.
- Gravel drainage layers.
- Soakaway systems.
- Connection to stormwater drainage where approved.

Drainage systems shall prevent erosion and shall not discharge onto adjacent roads, footpaths or environmentally sensitive areas.

Access and Safety

Valve chambers shall provide safe access for operating and maintenance personnel.

The Contractor shall ensure that:

- Access openings are unobstructed.
- Internal surfaces are free from projections and sharp edges.
- Ladders or step irons, where specified, are securely fixed and corrosion resistant.
- Chambers are ventilated where required.
- Access covers are capable of being safely removed without damage.

Temporary barriers shall be provided around open excavations and unfinished chambers.

Valve Operating Extensions

Where valve spindle extensions are required, they shall:

- Be manufactured from corrosion-resistant materials.
- Be accurately aligned.
- Operate smoothly throughout the full valve travel.
- Be securely fixed to prevent movement.
- Extend to the finished operating level indicated on the Drawings.

Protective sleeves shall be provided where valve extension spindles pass through concrete.

Marker Posts and Identification

Valve chambers shall be permanently identified using approved marker posts or identification plates.

Identification shall include:

- Valve reference number.

- Valve type.
- Nominal diameter.
- Direction of operation where applicable.
- Chainage where required.

Marker posts shall be durable, corrosion resistant and securely fixed.

Finishes

Concrete surfaces shall be finished to produce a smooth, durable and uniform appearance.

The Contractor shall:

- Remove all fins and projections.
- Repair surface defects.
- Seal construction joints where specified.
- Clean internal chamber surfaces before handover.

No honeycombing, cracking or segregation shall be accepted.

Inspection and Testing

Before acceptance, the Contractor shall demonstrate that:

- Chamber dimensions comply with the Drawings.
- Valves are fully accessible.
- Covers operate correctly.
- Pipe penetrations are watertight.
- Drainage systems function correctly.
- Marker posts have been installed.
- Chambers are clean and free from debris.

The Employer's Agent may require water testing of chambers where watertightness is critical.

Protection of Completed Works

Completed chambers shall be protected against:

- Construction traffic.
- Flooding.
- Vandalism.

- Theft.
- Damage to covers and frames.
- Contamination by construction materials.

Chambers shall remain securely covered until Practical Completion.

Operation and Maintenance Requirements

The Contractor shall ensure that all chambers are designed and constructed to permit routine maintenance without major excavation.

All valves shall be accessible for:

- Inspection.
- Lubrication.
- Operation.
- Adjustment.
- Removal.
- Replacement.

No permanent obstruction shall restrict access to any mechanical component.

Measurement and Payment

Measurement and payment for valve chambers and ancillary structures shall be in accordance with the relevant items in the Bill of Quantities.

The tendered rates shall be deemed to include full compensation for:

- Excavation and foundation preparation.
- Reinforced concrete construction.
- Formwork and reinforcement.
- Pipe penetrations and sealing systems.
- Chamber covers and frames.
- Drainage systems.
- Valve operating extensions.
- Marker posts and identification plates.
- Finishing, cleaning and testing.
- Protection of completed works.

- Labour, plant, equipment, materials and all incidental costs necessary for the complete construction of valve chambers and ancillary structures.

PIPE SUPPORTS AND ANCHOR BLOCKS

Scope

This section covers the design requirements, supply, fabrication, installation, testing and commissioning of all pipe supports, anchor blocks, guide supports, sliding supports and associated structural components required for the bulk water pipeline.

The Works shall include, but shall not be limited to:

- Reinforced concrete pipe support pedestals.
- Fixed pipe supports.
- Sliding pipe supports.
- Guide supports.
- Anchor blocks.
- Pipe clamps.
- Support brackets.
- Base plates.
- Anchor bolts.
- Bearing pads.
- Embedded steelwork.
- Expansion restraint systems.
- Miscellaneous structural steelwork associated with pipeline supports.

The Contractor shall provide all labour, materials, plant, equipment and temporary works necessary for the complete construction and installation of all pipe support systems.

General Requirements

Pipe supports and anchor blocks shall be designed and constructed to:

- Safely support the dead weight of the pipeline.
- Support the weight of the conveyed water.
- Resist hydraulic thrust forces.
- Resist thermal expansion and contraction forces.
- Resist wind and vibration loads where applicable.
- Maintain the required pipeline alignment.
- Prevent excessive pipe deflection.
- Facilitate inspection and maintenance.

- Ensure long-term structural stability.

Support systems shall not induce excessive stresses into the stainless steel pipeline.

Pipe Support Arrangement

The arrangement, spacing and type of pipe supports shall be as indicated on the Drawings.

Support systems may comprise:

- Fixed supports.
- Sliding supports.
- Guide supports.
- Intermediate supports.
- Terminal supports.
- Expansion anchors.
- Special supports at bends, tees and valves.

The Contractor shall verify all support locations prior to installation.

Pipe Support Pedestals

Pipe support pedestals shall be constructed from reinforced concrete in accordance with **Section 7 –**

Concrete Works.

Each pedestal shall:

- Be founded on competent undisturbed material.
- Be constructed to the dimensions shown on the Drawings.
- Be accurately aligned with the pipeline centreline.
- Provide adequate bearing for the support assembly.
- Incorporate all embedded anchor bolts and base plates.

Finished pedestal levels shall be checked before installation of the pipeline.

Fixed Supports

Fixed supports shall restrain movement of the pipeline in all directions where indicated on the Drawings.

Each fixed support shall:

- Securely clamp the pipeline.
- Transfer loads safely into the supporting structure.
- Prevent longitudinal movement.

- Prevent excessive rotation.
- Avoid local deformation of the pipe wall.

Clamping arrangements shall not damage the stainless steel pipe.

Sliding Supports

Sliding supports shall permit controlled longitudinal movement of the pipeline resulting from thermal expansion and contraction.

Sliding supports shall:

- Permit unrestricted movement in the intended direction.
- Prevent vertical settlement.
- Minimise frictional resistance.
- Maintain pipeline alignment.
- Incorporate approved low-friction bearing materials such as PTFE or equivalent where specified.

The Contractor shall ensure that sliding surfaces remain clean throughout construction.

Guide Supports

Guide supports shall control lateral movement while permitting longitudinal movement.

Guide supports shall:

- Maintain pipeline alignment.
- Prevent buckling.
- Prevent excessive horizontal displacement.
- Permit thermal movement in the longitudinal direction.
- Be accurately aligned with the pipeline centreline.

Pipe Clamps

Pipe clamps shall:

- Be manufactured from stainless steel Grade 316 unless otherwise specified.
- Be designed to distribute clamping forces uniformly.
- Prevent local damage to the pipeline.
- Permit maintenance and future adjustment.
- Be fitted with approved neoprene or elastomeric isolation pads where required.

Direct steel-to-steel contact between carbon steel and stainless steel shall not be permitted.

Bearing Pads

Where specified, bearing pads shall be installed between the pipe support and the pipeline.

Bearing pads shall:

- Be manufactured from approved elastomeric or neoprene material.
- Resist weathering.
- Resist ultraviolet exposure.
- Prevent abrasion.
- Permit controlled movement.
- Prevent galvanic interaction between dissimilar metals.

Anchor Blocks

Anchor blocks shall be provided at locations indicated on the Drawings.

Anchor blocks shall be designed to:

- Resist longitudinal hydraulic thrust.
- Resist pipe pull-out forces.
- Transfer loads safely into competent founding material.
- Maintain pipeline stability.
- Prevent movement of the pipeline during operation.

Anchor blocks shall not bear on disturbed or uncompacted material.

Anchor Bolts

Anchor bolts shall:

- Be manufactured from stainless steel Grade 316 unless otherwise specified.
- Be accurately positioned before concrete placement.
- Be protected against mechanical damage during construction.
- Be securely fixed to prevent movement while concrete is placed.

Bolt projection and thread engagement shall comply with the Drawings.

Embedded Steelwork

Embedded plates, brackets and structural steelwork shall:

- Be accurately positioned.
- Be securely fixed before concrete placement.
- Be free from oil, grease and loose rust.
- Be protected against corrosion where applicable.
- Comply with the structural details shown on the Drawings.

Installation

The Contractor shall ensure that:

- Supports are installed only after the supporting concrete has attained the specified strength.
- Pipe supports are accurately aligned.
- Pipe clamps are uniformly tightened.
- Pipelines are not subjected to excessive installation stresses.
- Support levels are verified before commissioning.

Temporary supports shall be removed only after permanent supports have been completed.

Tolerances

Unless otherwise specified, the following construction tolerances shall apply:

- Support level: ± 5 mm.
- Support centreline: ± 10 mm.
- Anchor bolt position: ± 3 mm.
- Pipe alignment between supports: as specified on the Drawings.
- Verticality of support pedestals: maximum deviation of 1 in 500.

Any support outside these tolerances shall be corrected at the Contractor's expense.

Inspection and Testing

The Contractor shall inspect all supports before installation of the pipeline.

Inspection shall include:

- Foundation level verification.
- Concrete strength confirmation.

- Dimensional checks.
- Alignment checks.
- Anchor bolt position.
- Pipe clamp installation.
- Bearing pad installation.
- Weld inspection where applicable.

The Employer's Agent may require corrective work where supports do not comply with the Contract.

Protection of Completed Supports

Completed supports and anchor blocks shall be protected against:

- Construction traffic.
- Mechanical damage.
- Impact loading.
- Corrosion.
- Vandalism.
- Premature loading.

No support shall be loaded before the supporting concrete has attained the specified strength.

Operation and Maintenance

Support systems shall be installed to permit routine inspection and maintenance.

The Contractor shall ensure that:

- Pipe clamps remain accessible.
- Sliding supports can be inspected.
- Bearing pads can be replaced where necessary.
- Fixed supports remain accessible for future maintenance.
- Anchor blocks remain visible where inspection is required.

No support arrangement shall obstruct access to valves, fittings or other mechanical equipment.

Measurement and Payment

Measurement and payment for pipe supports and anchor blocks shall be in accordance with the relevant items in the Bill of Quantities.

TESTING, FLUSHING AND COMMISSIONING

Scope

This section covers the inspection, testing, flushing, disinfection, commissioning and acceptance of the bulk water pipeline and all associated mechanical equipment following completion of construction.

The Contractor shall provide all labour, supervision, materials, plant, equipment, temporary works, instruments and consumables required to undertake all testing and commissioning activities necessary to demonstrate that the Works comply with the Contract requirements.

The Works shall include, but shall not be limited to:

- Pre-commissioning inspections.
- Visual inspection.
- Alignment verification.
- Hydrostatic pressure testing.
- Leakage testing.
- Functional testing of valves.
- Flushing of the pipeline.
- Disinfection of the potable water pipeline.
- Water quality testing.
- Mechanical equipment testing.
- Operational testing.
- Final commissioning.
- Preparation of commissioning reports.

General Requirements

Testing and commissioning shall not commence until:

- The pipeline has been completely installed.
- All welded joints have been inspected and accepted.
- All concrete thrust blocks and anchor blocks have attained the specified design strength.
- Pipe supports have been completed.
- Valve chambers have been completed.
- Backfilling has been completed where required.
- All mechanical equipment has been installed.
- The Employer's Agent has granted written approval to proceed.

The Contractor shall give the Employer's Agent not less than **five (5) working days'** written notice before any pressure testing or commissioning activity.

No testing shall be undertaken in the absence of the Employer's Agent unless otherwise approved in writing.

Test Equipment

All instruments used during testing shall:

- Be suitable for the intended purpose.
- Be in good working order.
- Have a valid calibration certificate issued by an accredited laboratory.
- Be calibrated within the preceding twelve (12) months.
- Be available for inspection by the Employer's Agent.

Pressure gauges shall:

- Have a minimum accuracy of $\pm 1\%$ of full scale.
- Be selected such that the normal test pressure falls between 30% and 70% of the gauge range.

Pre-Commissioning Inspection

Prior to pressure testing, the Contractor shall carry out a comprehensive inspection of the completed pipeline.

The inspection shall confirm that:

- Pipeline alignment complies with the Drawings.
- Supports and anchor blocks have been completed.
- Valves are correctly installed.
- Flanged joints have been tightened.
- Air valves are operational.
- Scour valves are operational.
- Protective coatings have not been damaged.
- Marker posts have been installed.
- Valve chambers are complete.
- The pipeline interior is clean and free from foreign material.

Any defects identified shall be rectified before testing commences.

Hydrostatic Pressure Testing

The completed pipeline shall be subjected to hydrostatic pressure testing in accordance with **SANS 1200 LB, SANS 2001** and the approved testing procedure.

The Contractor shall:

- Fill the pipeline slowly.
- Expel all trapped air through air release valves or temporary vents.
- Increase pressure gradually to the specified test pressure.
- Maintain the specified pressure for the required test duration.
- Inspect the entire pipeline for leakage.
- Record all test readings.

The Contractor shall ensure that no sudden pressure surges occur during testing.

The test pressure shall be as specified on the Drawings or directed by the Employer's Agent.

Leakage Testing

During the hydrostatic test, the Contractor shall inspect:

- Welded joints.
- Flanged joints.
- Mechanical couplings.
- Valves.
- Air valves.
- Scour valves.
- Pipe supports.
- Anchor blocks.
- Pipe penetrations.

Any visible leakage shall constitute failure of the test.

The Contractor shall:

- Locate the source of leakage.
- Repair the defect.
- Repeat the pressure test until satisfactory results are achieved.

All costs associated with repeat testing shall be borne by the Contractor.

Functional Testing of Mechanical Equipment

Following successful pressure testing, the Contractor shall demonstrate the satisfactory operation of all mechanical equipment.

Testing shall include:

- Opening and closing of all isolation valves.
- Operation of air release valves.
- Operation of scour valves.
- Inspection of dismantling joints.
- Inspection of mechanical couplings.
- Verification of valve extension spindles.
- Inspection of valve chamber access covers.

All equipment shall operate smoothly without binding, excessive force or leakage.

Flushing of the Pipeline

Following successful hydrostatic testing, the Contractor shall flush the pipeline using clean potable water.

Flushing shall continue until:

- Water discharged from the pipeline is clear.
- No visible sediment remains.
- No welding debris is present.
- No construction material remains within the pipeline.

Flushing water shall be discharged in a controlled manner to prevent erosion, flooding or environmental damage.

The Contractor shall obtain approval from the Employer's Agent before terminating flushing operations.

Disinfection

Following flushing, the Contractor shall disinfect the pipeline using an approved disinfecting agent suitable for potable water systems.

The Contractor shall:

- Prepare the disinfecting solution.
- Fill the pipeline completely.
- Maintain the required disinfectant concentration throughout the pipeline.

- Maintain the specified contact period.
- Safely dispose of disinfectant after completion.
- Flush the pipeline until residual disinfectant concentrations comply with potable water requirements.

The Contractor shall ensure that disinfectant disposal does not adversely affect the environment.

Water Quality Testing

Following disinfection and final flushing, water samples shall be collected and tested by a SANAS-accredited laboratory.

Testing shall demonstrate compliance with **SANS 241** for potable water quality.

Unless otherwise directed by the Employer's Agent, testing shall include:

- Microbiological quality.
- Residual disinfectant concentration.
- Turbidity.
- Colour.
- pH.
- Electrical conductivity where required.

The pipeline shall not be placed into service until satisfactory laboratory results have been obtained.

Operational Testing

Following satisfactory water quality results, the Contractor shall carry out operational testing of the complete pipeline system.

Operational testing shall demonstrate:

- Stable pipeline operation.
- Correct functioning of all valves.
- Proper operation of air release valves.
- Proper operation of scour valves.
- Absence of abnormal vibration.
- Absence of excessive movement at supports.
- Absence of visible leakage.
- Satisfactory hydraulic performance.

The Employer's Agent may require additional operational testing where considered necessary.

Defects Identified During Testing

Should any defect become apparent during testing or commissioning, the Contractor shall:

- Immediately suspend testing where necessary.
- Notify the Employer's Agent.
- Investigate the cause of the defect.
- Repair or replace defective materials.
- Repeat all relevant testing.
- Demonstrate satisfactory compliance before recommencing commissioning.

The Contractor shall bear all costs associated with corrective work and repeat testing.

Commissioning

Following successful completion of all testing, the Contractor shall commission the completed pipeline.

Commissioning shall include:

- Final inspection.
- Verification of all mechanical installations.
- Confirmation that all valves are correctly positioned.
- Confirmation that all identification markers have been installed.
- Demonstration of normal operating procedures.
- Demonstration of emergency shutdown procedures.
- Handover of operation and maintenance manuals.
- Training of the Employer's operating personnel where required.

The pipeline shall not be placed into permanent service until written approval has been issued by the Employer's Agent.

Documentation

Upon completion of commissioning, the Contractor shall submit a comprehensive Commissioning

Dossier containing:

- Pressure test certificates.
- Calibration certificates.
- Inspection reports.

- Weld inspection records.
- Valve test records.
- Flushing records.
- Disinfection records.
- Water quality laboratory certificates.
- Commissioning reports.
- Non-conformance reports and close-out records.
- As-built drawings.
- Operation and Maintenance Manuals.
- Certificates of Compliance for all major equipment.

The Commissioning Dossier shall be submitted in both hard copy and electronic format.

Acceptance

The Works shall only be considered complete when:

- All specified tests have been successfully completed.
- Water quality complies with **SANS 241**.
- All defects have been rectified.
- Commissioning has been successfully completed.
- The Commissioning Dossier has been accepted.
- The Employer's Agent has issued a Certificate of Practical Completion in accordance with the Contract.

Completion of testing shall not relieve the Contractor of any obligations under the Defects Liability Period.

Measurement and Payment

Measurement and payment for testing, flushing and commissioning shall be in accordance with the relevant items in the Bill of Quantities.

The tendered rates shall be deemed to include full compensation for:

- Preparation of testing procedures.
- Supply of test equipment.
- Calibration of instruments.
- Hydrostatic pressure testing.

- Leakage testing.
- Functional testing of valves and mechanical equipment.
- Supply of flushing water.
- Flushing operations.
- Supply and application of disinfectants.
- Water quality testing by an approved laboratory.
- Operational testing.
- Commissioning activities.
- Preparation of commissioning reports.
- Submission of the Commissioning Dossier.
- Labour, plant, equipment, materials, consumables and all incidental costs necessary for the successful completion and commissioning of the Works.