

BID SPECIFICATION

INVITATION FOR BIDS

APPOINTMENT OF A SERVICE PROVIDER FOR THE CONSTRUCTION OF BULK WATER SUPPLY AT BLYDE RIVER CAN YON NATURE RESERVE-POTHOLES

BID NUMBER:	MTPA/20242025/PMU/02
NAME OF THE BIDDER	
TOTAL BID AMOUNT	R
TENDER LEVY	R200.00
CLOSING DATE:	18 JUNE 2024
CLOSING TIME:	11h00 AM
BID REQUIREMENT	ONLY BIDDERS WITH A CIDB GRADE 6GB/CE 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
N4 National Road, Halls Gateway, Mafaffin, 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	<u>Themba.Betuel@mtpa.co.za</u> 013 065 0888
SCM RELATED QUERIES	<u>Evans.Ngwenya@mtpa.co.za</u> 013 065 0886
DESCRIPTION OF THE BID	APPOINTMENT OF A SERVICE PROVIDER FOR THE CONSTRUCTION OF BULK WATER SUPPLY AT BLYDE RIVER CAN YON NATURE RESERVE-POTHOLES

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.

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (MPUMALANGA TOURISM AND PARK AGENCY)					
BID NUMBER:	MTPA/20242025/PMU/02	CLOSING DATE:	18 JUNE 2024	CLOSING TIME:	11:00 AM
DESCRIPTION	APPOINTMENT OF A SERVICE PROVIDER FOR THE CONSTRUCTION OF BULK WATER SUPPLY AT BLYDE RIVER CAN YON NATURE RESERVE-POTHOLES.				
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	Evans Ngwenya		CONTACT PERSON	Sibusiso Mabunda	
TELEPHONE NUMBER	013 065 0886		TELEPHONE NUMBER	013 065 0888	
FACSIMILE NUMBER	N/A		FACSIMILE NUMBER	N/A	
E-MAIL ADDRESS	Evans.Ngwenya@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		
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]
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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:

1. BACKGROUND

The Blyde River Canyon is the third largest canyon in the world 26 946 ha, after the Grand Canyon in the United States and the Fish River Canyon in Namibia, and is the largest 'green canyon' due to its lush subtropical foliage, with the deepest precipitous cliffs of any canyon on the planet.

One of the most-visited attractions in South Africa, the Blyde River Canyon is 26 kilometres in length and is, on average, around 800m deep. The dam itself, when full, is at an altitude of 665m (2182feet).

The Blyde River Canyon Nature Reserve is situated within the Thaba Chweu and part of the BushbuckridgeLocalMunicipality.

The Blyde River Canyon Reserve extends along the Blyde River Canyon's winding path, which at every turn offers more impressive views over sheer edges droper personing 800m into the riverbed. Blyde River Canyon Reserve is situated against the Greater Drakensberg escarpment and includes natural wonders such as the Bourke's Luck Potholes, the Three Rondavels, Pinnacle Rock and God's Window. Many visitors to this region enjoy the visual splendour of combining the Panorama Route with exceptional game viewing in the Kruger National Park to create a spectacular itinerary in Mpumalanga.

2. PURPOSE

To assist the entity with the construction of the bulk water supply at Blyde Nature Reserve-Potholes

3. SPECIAL CONDITIONS

Where any clauses and/or items contained in this section are in contradiction to the General Conditions of Contract (GCC) or any other item contained in Part One, this section shall apply.

Type of contract

N/a

Contract period

This contract shall be for the construction works of the bulk water supply at Blyde River Canyon Nature Reserve-Potholes as stated in the heading with all functions as detailed in this specification for the duration of the contract. The acceptance period of the Bid shall be within 120 (one two zero) days after closing of Bid. Commencement of this Contract shall be within one calendar month of acceptance of the Bid.

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 Three (3) 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 A-M Consulting Engineers
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): 20 Bavaria Avenue, Midrand, 1685 Address (postal): As above Contact person: Mmanoko Mthethwa Telephone: 011 312 1569/ E-mail: mmotsepe@amce.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. 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.
5.2.1	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.
5.3.1	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</td><td>7 days</td><td>February</td><td>6 days</td><td>April</td><td>3 days</td><td>May</td><td>2 days</td></tr><tr><td></td><td></td><td>June</td><td>1 days</td><td>July</td><td>2 days</td><td>August</td><td>3 days</td></tr><tr><td></td><td></td><td>September</td><td>3 days</td><td>October</td><td>6 days</td><td></td><td></td></tr><tr><td></td><td></td><td>November</td><td>7 days</td><td>December</td><td>7 days</td><td></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	July	2 days	August	3 days			September	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	July	2 days	August	3 days																										
		September	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.

3. EVALUATION CRITERIA

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

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

FUNCTIONALITY			POINTS
Relevant previous experience (Value) This will take into consideration similar contracts successfully completed (minimum 3 similar projects) by the bidder. NB. Proof of similar projects completed must be attached (Practical or Final Completion certificate). Failure to provide proof will result in deduction of points. - No experience equals to 0 points - Below R1 000 000 equals to 5 points - ABOVE R1 000 001 to R2 000 000 equals to 10 points - Above R2 000 001 to R5 000 000 equals to 15 points - Above R5 000 001 equals to 20 points			20
Company experience in similar projects (Years) - No experience equals 0 points 3 years equals 05 points - Above 3 year to 5 years equals 10 points - Above 5 years to 7 years equals 15 points - Above 7 years and above equals 20 points (Proof of relevant experience must be attached i.e. works orders, appointment letters, completion certificates, company registration document and or NHBRC registration certificate)			20
Key Personnel			20
Item	Designation	Points	
	Contracts Manager Minimum Bachelors (BSc) or B-Tech in Civil or Mechanical Engineering (Professional Registration with Engineering Council of South Africa (ECSA) – Pr Eng /		

FUNCTIONALITY			POINTS
	Pr Tech Eng will be advantageous)		
	Minimum 8 years' experience in the built environment industry.	8	
	Minimum 5 years' experience in the built environment industry.	5	
	Minimum 3 years' experience in the built environment industry.	3	
	No relevant experience in the built environment industry.	0	
	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		
	N6 in Civil or Mechanical Engineering field		
	Minimum 5 years' experience in the built environment industry.	4	
	Minimum 3 years' experience in the built environment industry.	3	
	Construction Health and Safety Officer		
	National Diploma in Safety Management		
	or Environmental Health (Professional Registration with South African Council for the Project and Construction		

FUNCTIONALITY			POINTS
	Management Professions (SACPCMP) as Professional Safety Agent Minimum 5 years' experience in the built environment industry. Minimum 3 years' experience in the built environment industry.	3 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 copies of qualifications and professional registrations must be included with the tender. • The service provider to provide appointment letters and completion certificates with contactable references from previous completed projects. • All professional registrations must be in good standing during the period of the tender evaluation and qualifications must be SAQA compliant. • Failure to submit the above stated documents with the bid document will render the bid non-responsive.			
Schedule of Plant and Equipment (20 Points) 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. Any changes to the lease/hire agreement must be approved by the Municipality prior commencement.			20

FUNCTIONALITY					POINTS
NB. 15 points will be allocated to equipment leased/hired.					
Consultants Estimation					
Plant and equipment required	Points Allocation		Bidder Plant own	Bidder Plant hire	
	Plant own	Plant hire			
Tipper Truck (6 – 10m3)	5	4			
Water dowser, 8 000 litre	5	4			
TLB (4X4)	4	3			
Delivery Vehicle (1 ton or equivalent)	4	2			
Concrete Mixer Engine 800L	2	2			
No relevant equipment	0	0			
NB. Proof of ownership on equipment indicated above must be submitted with the bid document. Failing to submit will result in deduction of points.					
Proof of Residence					10
• Within Mpumalanga Province will be 10 points • Outside the province of Mpumalanga 5 points • If proof is not attached 0 points. (Proof must be attached)					
Liability indemnity cover					10
• Below R5 000 000 equals 05 points • Above R5 000 000 equals 10 points (Proof must be attached)					

FUNCTIONALITY	POINTS
TOTAL	100

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

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.

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.)

Skilled artisans employed		Unskilled employees employed	
Categories of artisans	Number	Categories of employees	Number
Machinery	Plant	Workshops	

QUALIFICATIONS AND EXPERIENCE OF PROPOSED SITE SUPERVISION TEAM FOR THE PROJECT

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

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							

PRICING PROPOSAL AND SPECIFIC CONTRACT DETAILS.

1. Bids must be submitted in South African Rand, Fixed price and inclusive of VAT excluding disbursement and travelling.
2. Bidder must provide a detailed pricing scheduled 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 6GB/CE 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. Only bids that were submitted with a valid Tax Clearance certificate from SARS will be considered.
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. Service level agreement will be entered into by the successful Bidder and the Agency within 21 days of award
15. 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)**

1. Service providers must be registered on Central Supplier Database.
2. Duly signed bid documents including all the attached SBD forms.
3. Compulsory Enterprise Questionnaire Certificate of authority
4. Record of Addenda to Tender Documents (where applicable)
5. Legal Joint Venture Agreement (in case of a JV)
6. Identity documents of Owners / Directors / Members / Shareholders
7. Contractor Registration for Incorporation or of Company Registration documents
8. Shareholders' Agreements / Share Certificates / Memorandum of Association for Companies.
9. A valid Tax Clearance Certificate including the PIN issued by the South African Revenue Services

10. Valid Letter of Good Standing from the Agency 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)
11. Complete SBD 1, SBD 4, SBD 6.1, BOQ, and GCC
12. Valid CIDB Registration certificate
13. 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. BID CONDITIONS

This Bid is intended to result in a direct contract between the Mpumalanga Tourism and Parks Agency and the responsive bidder and Supply Chain Management.

ONLY BIDDERS WITH A CIDB GRADE OF 6GB/CE OR ABOVE MUST APPLY

BIDDERS MUST SUBMIT THE FOLLOWING DOCUMENT, FAILURE TO DO SO WILL RESULT TO DISQUALIFICATION

- Duly completed and signed bid document including all the attached SBD forms.
- A valid company tax clearance certificate (or in case of a joint venture, of all partners in the joint venture) must be submitted with the bid documentation.
- Company registration certificate issued by CIPC (CIPRO) and copies of share certificates.
- Bidders who have public sector (i.e. national, provincial or local government) officials as directors / shareholders / partners shall be disqualified if they fail to submit approvals from their executing authorities authorising them to undertake remunerative work outside their employments as public servants.
- In bids where Consortia / Joint Venture are involved, each party must submit copy of a business registration certificate and valid Tax Clearance Certificate.
- Duly signed Joint Venture agreement (In case of JV)
- Bids must be submitted in South African Rand, on fixed all-inclusive price basis
- Including VAT in the event the bidder is a VAT vendor.
- The Agency is not bound to accept any of the bid submitted.
- The Agency reserves the right to call for Best and Final Offers from short-listed bidders before final selection.

- The Agency reserves the right to negotiate price with preferred bidder/s.
- Only bids who have submitted with a valid Tax Clearance issued by SARS will be considered.
- The lowest or any bid will not necessarily be accepted and the Agency reserves the right to accept the whole or part of any bid

7. COMPULSORY BRIEFING SESSION

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

8. SCOPE OF WORK

Background

The Blyde River Canyon Nature Reserve – Bourke's Luck Potholes currently experiences water shortages due to the insufficient supply of water within the reserve. There is no external water supply service to the reserve and water is currently sourced from within the reserve (from a river) and supplied via a temporary bulk supply system that interconnects to the existing water reticulation infrastructure on site.

Client's Objectives

The primary objective of the project entails:

- The construction of bulk water main pipeline and reticulation system at Blyde River Canyon Nature Reserve – Potholes.

The secondary objective of the project includes:

- To provide safe and reliable access to water for all residents, offices and facility includes ensuring that all residents have access to sufficient quantities of water and sanitation.
- To promote water conservation which includes reducing water waste and encouraging residents to use water efficiently.
- Improve the quality of the water supply.
- Expand the water distribution network to reach new areas.
- Create job opportunities.

Overview of the Works

The key element of this project will includes:

- Construction of Bulk main pipes and reticulation system;
- Water supply provision for 20 houses and the other facility within the reserve;
- Construction of infrastructure associated Valve Chambers and Meter Chambers etc.
- Storage water tanks;
- Water Purification;
- Refurbishment of existing infrastructure and the associated work;
- Particular Specifications with regard to environmental management and occupational health and safety, during all the above construction activities;
- Pump House with Plant Room; and
- Fire services.

9. TECHNICAL SPECIFICATION / TERMS OF REFERENCE (DELIVERABLES)

The conditions of the standard condition of Bid as contained in Annexure F of the CIDB standard Uniformity in Construction Procurement (August 2006) (see www.cidb.org.za)

The standard conditions of Bid make several references to the Bid Data for details that apply specifically to this Bid. The Bid data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of Bid. Each item of data given below is cross referenced to the clause in the standard conditions of Bid to which it mainly applies.

10. OUTPUTS AND TIMEFRAMES

The primary deliverables to be achieved are as follows:

- The service should ensure that all work required is done according to specifications and standards.
- Where there are subcontractors, the service should ensure that there is constant coordination between the third (3) party service provider, the contractor and appointed project manager
- The service provider should ensure that projects are executed within project timelines.
- It would be expected of the successful service provider to assume duty immediately upon appointment

11. DRAWINGS and PROJECT SPECIFICATIONS

Refer to Annexure A & B

12. BILL OF QUANTITIES

Refer to Annexure C

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.

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.

- 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 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	80
SPECIFIC GOALS	20
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).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

80/20	or	90/10
$P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right) \text{ or } P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$		

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

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

80/20	or	90/10
$P_s = 80 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) \text{ or } P_s = 90 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right)$		

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{max} = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of

state must, in the tender documents, stipulate in the case of—

- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
- (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

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

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points 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.

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 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:
.....
.....

GOVERNMENT PROCUREMENT

GENERAL CONDITIONS OF CONTRACT

NOTES

The purpose of this document is to:

- (i) Draw special attention to certain general conditions applicable to government bids, contracts and orders; and
- (ii) To ensure that clients be familiar with regard to the rights and obligations of all parties involved in doing business with government.

In this document words in the singular also mean in the plural and vice versa and words in the masculine also mean in the feminine and neuter.

- The General Conditions of Contract will form part of all bid documents and may not be amended.
- Special Conditions of Contract (SCC) relevant to a specific bid, should be compiled separately for every bid (if applicable) and will supplement the General Conditions of Contract. Whenever there is a conflict, the provisions in the SCC shall prevail.

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General Conditions of Contract

1. Definitions

1. The following terms shall be interpreted as indicated:
 - 1.1 “Closing time” means the date and hour specified in the bidding documents for the receipt of bids.
 - 1.2 “Contract” means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
 - 1.3 “Contract price” means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.
 - 1.4 “Corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.
 - 1.5 "Countervailing duties" are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.
 - 1.6 “Country of origin” means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.
 - 1.7 “Day” means calendar day.
 - 1.8 “Delivery” means delivery in compliance of the conditions of the contract or order.
 - 1.9 “Delivery ex stock” means immediate delivery directly from stock actually on hand.
 - 1.10 “Delivery into consignees store or to his site” means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.
 - 1.11 "Dumping" occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.
 - 1.12 "Force majeure" means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not foreseeable.

Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

- 1.13 “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.
- 1.14 “GCC” means the General Conditions of Contract.
- 1.15 “Goods” means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.
- 1.16 “Imported content” means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.
- 1.17 “Local content” means that portion of the bidding price which is not included in the imported content provided that local manufacture does take place.
- 1.18 “Manufacture” means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.
- 1.19 “Order” means an official written order issued for the supply of goods or works or the rendering of a service.
- 1.20 “Project site,” where applicable, means the place indicated in bidding documents.
- 1.21 “Purchaser” means the organization purchasing the goods.
- 1.22 “Republic” means the Republic of South Africa.
- 1.23 “SCC” means the Special Conditions of Contract.
- 1.24 “Services” means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.
- 1.25 “Written” or “in writing” means handwritten in ink or any form of electronic or mechanical writing.

- | | |
|--|--|
| 2. Application | <p>2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services, sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.</p> <p>2.2 Where applicable, special conditions of contract are also laid down to cover specific supplies, services or works.</p> <p>2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.</p> |
| 3. General | <p>3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a non-refundable fee for documents may be charged.</p> <p>3.2 With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria 0001, or accessed electronically from www.treasury.gov.za</p> |
| 4. Standards | <p>4.1 The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.</p> |
| 5. Use of contract documents and information; inspection. | <p>5.1 The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.</p> <p>5.2 The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 5.1 except for purposes of performing the contract.</p> <p>5.3 Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.</p> <p>5.4 The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.</p> |
| 6. Patent rights | <p>6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.</p> |
| 7. Performance security | <p>7.1 Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.</p> |

- 7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.
- 7.3 The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:
- (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or
 - (b) a cashier's or certified cheque
- 7.4 The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.

**8. Inspections,
tests and
analyses**

- 8.1 All pre-bidding testing will be for the account of the bidder.
- 8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organization acting on behalf of the Department.
- 8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.
- 8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.
- 8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.
- 8.6 Supplies and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.
- 8.7 Any contract supplies may on or after delivery be inspected, tested or analyzed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with

supplies which do comply with the requirements of the contract. Failing such removal the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.

- 8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 23 of GCC.

9. Packing

- 9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.
- 9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

- 10.1 Delivery of the goods shall be made by the supplier in accordance with the terms specified in the contract. The details of shipping and/or other documents to be furnished by the supplier are specified in SCC.
- 10.2 Documents to be submitted by the supplier are specified in SCC.

11. Insurance

- 11.1 The goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the SCC.

12. Transportation

- 12.1 Should a price other than an all-inclusive delivered price be required, this shall be specified in the SCC.

13. Incidental services

- 13.1 The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:
- (a) performance or supervision of on-site assembly and/or commissioning of the supplied goods;
 - (b) furnishing of tools required for assembly and/or maintenance of the supplied goods;
 - (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;
 - (d) performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and

- (e) training of the purchaser's personnel, at the supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.

13.2 Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.

14. Spare parts

14.1 As specified in SCC, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:

- (a) such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and
- (b) in the event of termination of production of the spare parts:
 - (i) Advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and
 - (ii) following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

15. Warranty

15.1 The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

15.2 This warranty shall remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.

15.3 The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.

15.4 Upon receipt of such notice, the supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.

15.5 If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

16. Payment	16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified in SCC. 16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfillment of other obligations stipulated in the contract. 16.3 Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier. 16.4 Payment will be made in Rand unless otherwise stipulated in SCC.
17. Prices	17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized in SCC or in the purchaser's request for bid validity extension, as the case may be.
18. Contract amendments	18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties concerned.
19. Assignment	19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.
20. Subcontracts	20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.
21. Delays in the supplier's performance	21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract. 21.2 If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract. 21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority. 21.4 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier's point of supply is not situated at or near the place where the supplies are required, or the supplier's services are not readily available.

21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.

21.6 Upon any delay beyond the delivery period in the case of a supplies contract, the purchaser shall, without canceling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.

22. Penalties

22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.

23. Termination for default

23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

- (a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;
- (b) if the Supplier fails to perform any other obligation(s) under the contract; or
- (c) if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated fourteen (14) days the purchaser may regard

the intended penalty as not objected against and may impose it on the supplier.

23.5 Any restriction imposed on any person by the Accounting Officer / Authority will, at the discretion of the Accounting Officer / Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the Accounting Officer / Authority actively associated.

23.6 If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

- (i) the name and address of the supplier and / or person restricted by the purchaser;
- (ii) the date of commencement of the restriction
- (iii) the period of restriction; and
- (iv) the reasons for the restriction.

These details will be loaded in the National Treasury's central database of suppliers or persons prohibited from doing business with the public sector.

23.7 If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Anti-dumping and countervailing duties and rights

24.1 When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favourable difference shall on demand be paid forthwith by the contractor to the State or the State may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplies or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security,

damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

- 25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

**26. Termination
for insolvency**

- 26.1 The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

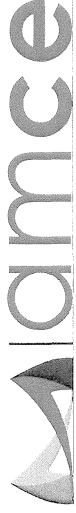
**27. Settlement of
Disputes**

- 27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.
- 27.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.
- 27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.
- 27.4 Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.
- 27.5 Notwithstanding any reference to mediation and/or court proceedings herein,
- (a) the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
 - (b) the purchaser shall pay the supplier any monies due the supplier.

**28. Limitation of
liability**

- 28.1 Except in cases of criminal negligence or willful misconduct, and in the case of infringement pursuant to Clause 6:
- (a) the supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and

		(b) the aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.
29. Governing language	29.1	The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.
30. Applicable law	30.1	The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.
31. Notices	31.1	Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice
	31.2	The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.
32. Taxes and duties	32.1	A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.
	32.2	A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.
	32.3	No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.
33. National Industrial Participation Programme (NIP)	33.1	The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.



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Project Number GP06-2023-1159

PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE - POTHOLES

DETAILED DESIGN ISSUED DECEMBER 2023



Mpumalanga
TOURISM AND PARKS AGENCY

Mpumalanga Tourism and Parks Agency
Pretoria Gateway on the N4 National Highway
Mbombela
Mpumalanga, 1200
Tel No. (013) 065 0665



CIVIL WORKS DRAWINGS



3. SCHEDULE OF INFORMATION

All schedules which accompany this specification form an integral part of it and shall be duly completed in every detail; FAILING which, the Tender in question may be rendered ineligible for consideration.

Under no circumstances will statements such as: -

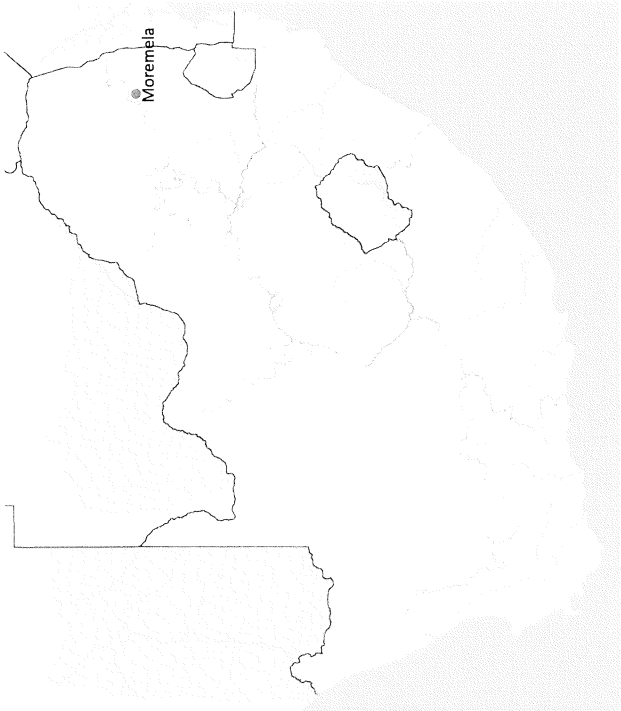
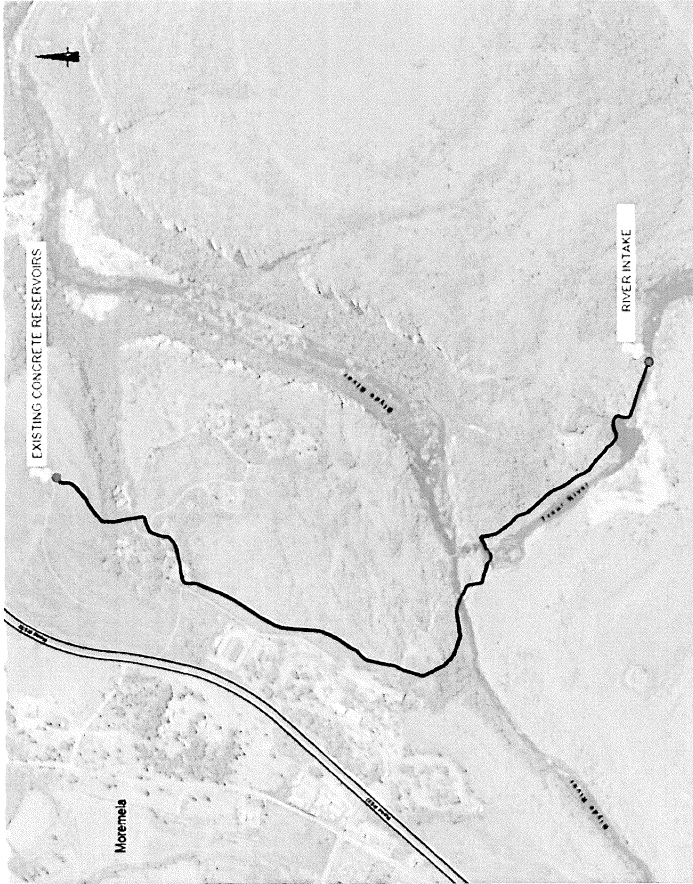
- see attached pamphlets,
- refer to catalogue,
- data to follow,
- as given by supplier, the Employer.

Be acceptable to the Engineer & end user.

Equipment offered and listed on the schedules shall be capable of performing the specified duties and complying with the specification requirements in all respects. **SHOULD** it transpire that such equipment, even when offered by make, model and/or type, is unsuitable or incapable of meeting, or performing in accordance with the specification requirements in any respect, the contractor or sub-contractor shall nevertheless be responsible for any additional costs incurred in providing the required or suitable equipment.

Whenever a specific make, model or type of equipment has been prescribed in the specification and the Tenderer offers an alternative or equal make or type of equipment in his Tender, the Engineer will on acceptance of such a Tender inform the prospective contractor in writing as to make, and/or type of equipment accepted. **HOWEVER**, it should be noted that the use of words "OR EQUAL" by the Tenderer is to be discouraged and lead to the disqualification of the Tender.

GENERAL NOTES



LOCALITY PLAN

SITE LAYOUT PLAN

DRAWING NUMBER	DRAWING DESCRIPTION
1 NT-2023-1159-100-001	Project Front Sheet
2 NT-2023-1159-101-001	Locality Plan and List of Drawings
3 NT-2023-1159-102-001	Bulk Water Pipeline Key Plan
4 NT-2023-1159-103-001	Bulk Water Pipeline Level Control Valve Details
5 NT-2023-1159-104-001	Bulk Water Pipeline Typical Details: HDPE Pipe and Steel Pipe Connection
6 NT-2023-1159-105-001	Valve Chambers Key Plan
7 NT-2023-1159-106-001	Water Pipeline Air Valve Chambers at Nodes W7, W21, W45 & W48
8 NT-2023-1159-107-001	Water Pipeline Scour Valve Chambers at Nodes W15 and W51
9 NT-2023-1159-108-001	Typical Details: Ditch Crossings
10 NT-2023-1159-110-001	Typical Details: Bedding, Thrust Blocks and Pipeline Markers
11 NT-2023-1159-111-001	Typical Details: River Intake Arrangement
12 NT-2023-1159-112-001	Intake Tank arrangement and Details
13 NT-2023-1159-113-001	Reservoirs Arrangement and Details
14 NT-2023-1159-114-001	Typical Detail: Section - HDPE Pipe Anchor Arrangement

LIST OF DRAWINGS

REVISION INFORMATION		
NO	DATE	DESCRIPTION
0	2023-11-07	ISSUED FOR CONCEPT
1	2023-12-04	ISSUED FOR DESIGN

CLIENT

Mpumalanga
TOURISM AND PLANNING
Mpumalanga Tourism and Parks Agency
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Midway, Midway, 1200
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PROJECT DESCRIPTION
PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE CONSTRUCTION OF THE WATER PIPELINE AND VALVE CHAMBERS FOR THE RIVER INTAKE AT THE RIVER INTAKE NATURAL RESERVE - FOTHOLES

DISCIPLINE

CIVIL ENGINEERING

DRAWING DESCRIPTION
SITE LOCALITY PLAN & DRAWING LIST

DESIGNED BY	SIGNATURE AND DATE
M. MOFOKENG	10 November 2023
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	10 November 2023
APPROVED BY	SIGNATURE AND DATE
M. TSOAI	10 November 2023
PROJECT NO	DATE
1159	10 November 2023
DRAWING NO	DATE
NT-2023-1159-101-001	10 November 2023

SCALE	SHEET NO	REVISION
NTS	A1	1



PIPE LEGEND

Existing 50mm Dia Galvannead Steel Pipe from Reservoir to Pump Station at Node W51

New 125mm Dia Galvannead Steel Pipe from Reservoirs to Node W16

New 125mm Dia HDPE Pipe from Node W16 to Pump Station at Node W51

New 110mm Dia HDPE Pipe from Reservoirs to Node W1 to River Intake at Node W61

FLOOD LINE LEGEND

Blyde River 100 year Flood Line

Blyde River 50 year Flood Line

For List of Referenced Drawings, see Drawing Number NT-2023-1159-101

REVISION INFORMATION

No	DATE	DESCRIPTION	BY
1	2023-12-04	ISSUED FOR DESIGN	NT

CLIENT

Mpumalanga

Republic of South Africa

Mpumalanga Tourism and Parks Agency

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CONSULTANT

PROJECT DESCRIPTION

PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITIES AND SUPERVISION SERVICE OF THE PIPELINE FROM THE BLAARWATER RIVER CANYON NATURE RESERVE - POTHOLES

DISCIPLINE

CIVIL ENGINEERING

DRAWING DESCRIPTION

BULK WATER PIPELINE

KEY PLAN

DESIGNED BY

M. MOFOKENG

4 December 2023

DRAWN BY

R. KELSEY

4 December 2023

APPROVED BY

M. TSOAI

4 December 2023

PROJECT NO

1159

4 December 2023

DRAWING NO

NT-2023-1159-102-001

SCALE

NTS

SHEET SIZE

A1

REVISION

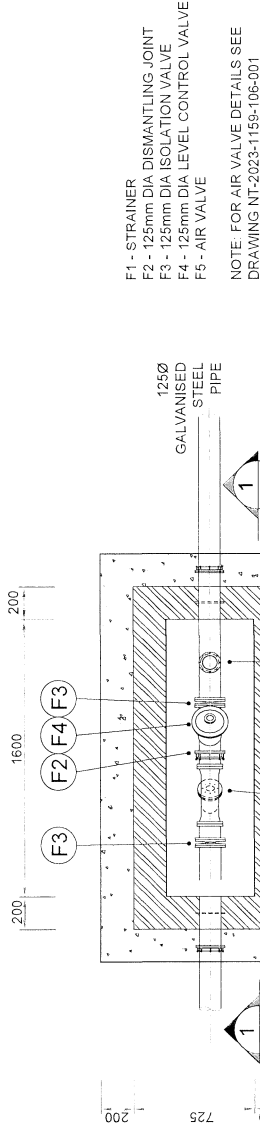
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GENERAL NOTES:

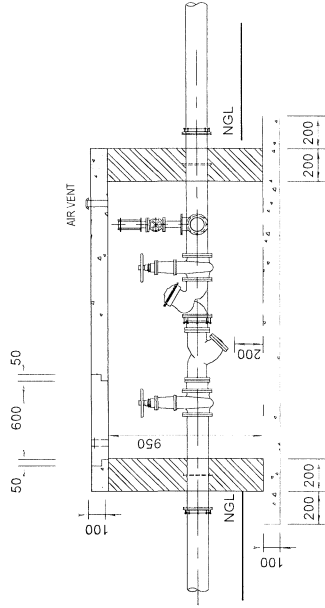
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LEVEL CONTROL CHAMBER
PLAN VIEW



LEVEL CONTROL CHAMBER
SECTION 1-1

For List of Revision Drawing, see
Drawing NT-2023-1159-105-101

REVISION INFORMATION

NO	DATE	DESCRIPTION	BY
1	2023/12/04	REDACTED BY 0404	NT

CLIENT

Mpumalanga
Mpumalanga Tourism and Parks Agency
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PROJECT DESCRIPTION
PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE BULK WATER SUPPLY AT BLVD RIVER CANYON NATURE RESERVE - POTHOLES

DISCIPLINE

CIVIL ENGINEERING

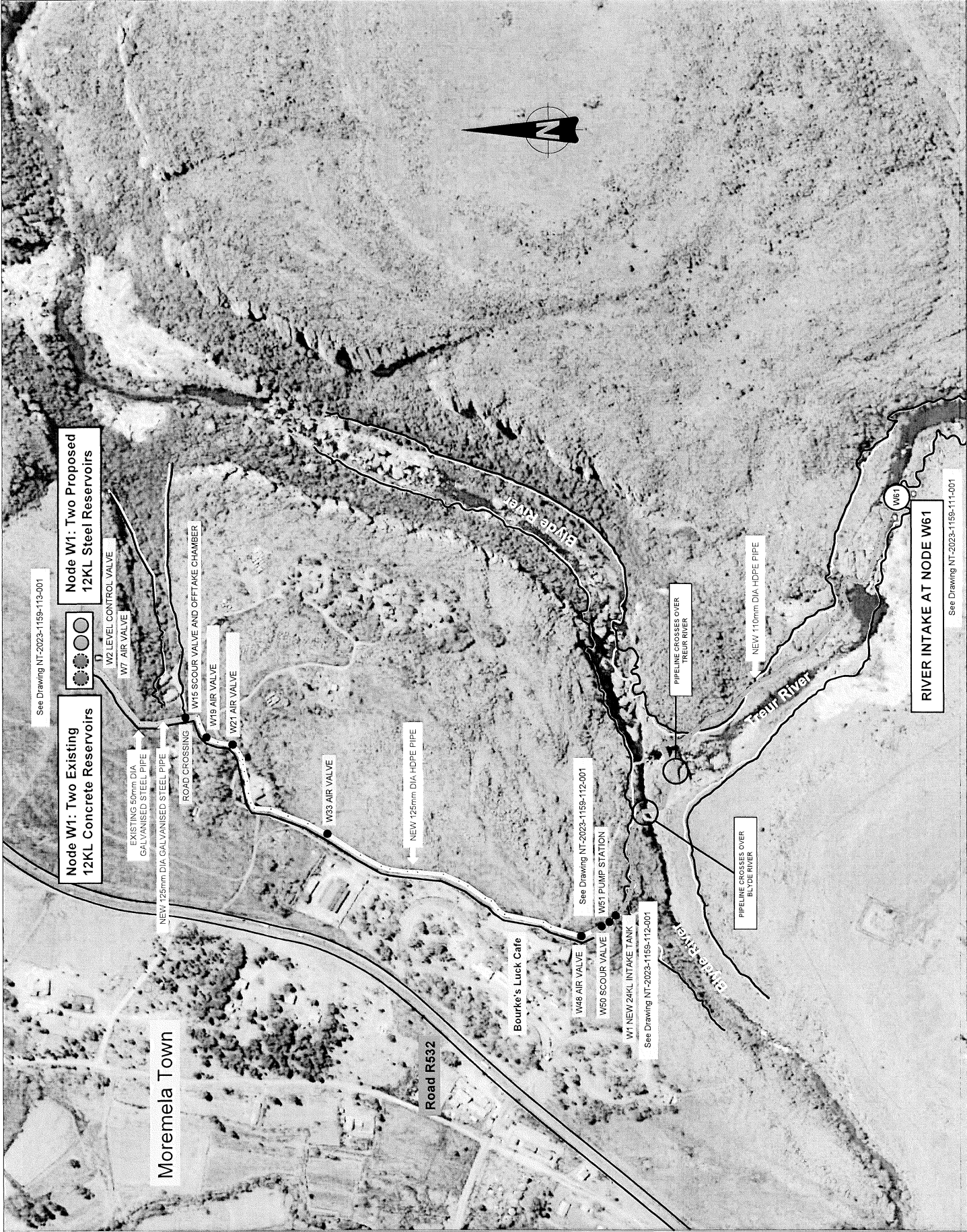
DRAWING DESCRIPTION

WATER PIPELINE LEVEL CONTROL
VALVE DETAILS

DESIGNED BY	SIGNATURE AND DATE
M. MPOKENG	
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	
APPROVED BY	SIGNATURE AND DATE
M. TSOAI	
PROJECT NO	DATE
NT-2023-1159-103-198	
DRAWING NO	
1159	

NT-2023-1159-103-001

NTS	SHEET SIZE	REVISION
	A1	0



PIPE LEGEND

Existing 50mm Dia Galvanised Steel Pipe from Reservoir to Pump Station at Node W51

New 125mm Dia Galvanised Steel Pipe from Reservoirs to Node W16

New 125mm Dia HDPE Pipe from Node W16 to Pump Station at Node W51

New 110mm Dia HDPE Pipe from Pump Station at Node W51 to River Intake at Node W61

FLOOD LINE LEGEND

Blode River 100 year Flood Line

Blode River 50 year Flood Line

For List of Reference Drawings, see Drawing Number: NT-2023-1159-101

REVISION INFORMATION		
No	DATE	DESCRIPTION
1	2023-11-01	ISSUED FOR CONCEPT
2	2023-11-04	FOR TALKED DESIGN

CLIENT

Mpumalanga

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PROJECT DESCRIPTION

PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE SUPPLY AND INSTALLATION OF PIPELINE FROM BLUETHE SUPPLY AT BLUDE RIVER CANYON, NATIVE RESERVE - TOTOLONGES

DISCIPLINE

CIVIL ENGINEERING

DRAWING DESCRIPTION

VALVE CHAMBERS KEY PLAN

DESIGNED BY

M. MOKONG

SIGNATURE AND DATE

10 November 2023

DRAWN BY

R. KELSEY

SIGNATURE AND DATE

10 November 2023

APPROVED BY

M. TSOAI

SIGNATURE AND DATE

10 November 2023

PROJECT NO

PT-Eng-20160198

DATE

10 November 2023

DRAWING NO

1159

NT-2023-1159-105-001

SCALE

NTS

SHEET SIZE

A1

REVISION

1

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VISION INFORMATION

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DISCIPLINE

INTAKE TANK ARRANGEMENT AND DETAILS

M. MOFOKENGAPPROVED BY _____NT-2023-1159-106-001

SCALE



FOR ALL NEW AIR VALVE CHAMBERS

GENERAL NOTES

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For List of Reference Drawings, see
Drawing Schedule on page 155 of 160

REVISION INFORMATION

NO.	DATE	DESCRIPTION	BY
1	20/11/24	ISSUED FOR TENDER	MT

CLIENT



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Water Services Unit
Water Services Unit
Mpumalanga 1300
Tel No: (013) 975 5665

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PROJECT DESCRIPTION

PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL
OF MATERIALS AND SUPERVISION SERVICE OF THE
BULK WATER SUPPLY AT BLYDE RIVER CANYON
NATURE RESERVE - POTHOLES

DISCIPLINE

CIVIL ENGINEERING

DRAWING DESCRIPTION

WATER PIPELINE
SCOUR VALVE CHAMBER DETAIL

DESIGNED BY

SIGNATURE AND DATE

M. MOFOKENG

4 December 2023

DRAWN BY

SIGNATURE AND DATE

R. KELSEY

4 December 2023

CHECKED BY

SIGNATURE AND DATE

M. TSOALI

4 December 2023

PROJECT NO

DATE

1159

4 December 2023

DRAWING NO

NT-2023-1159-107-001

SCALE

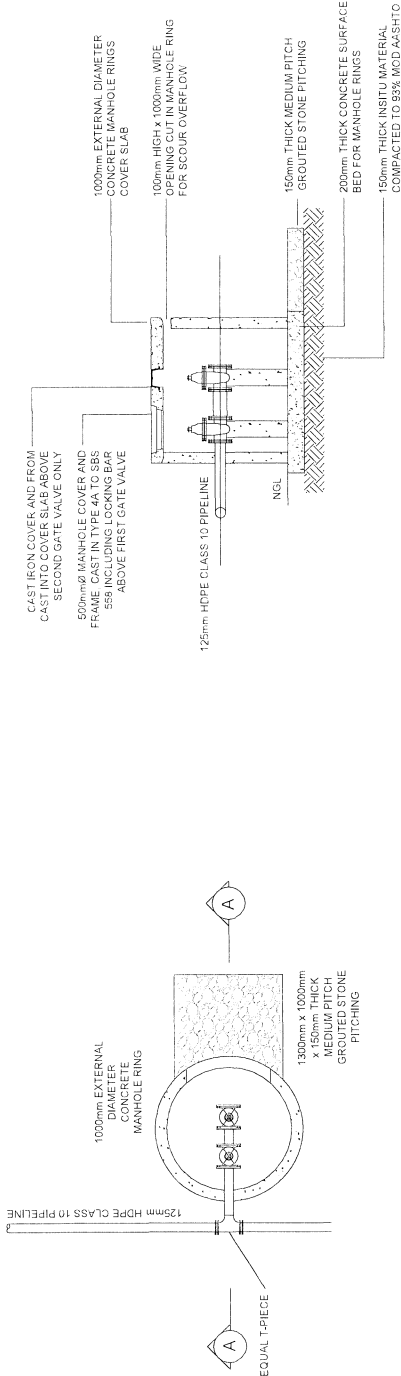
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SHEET SIZE

A1

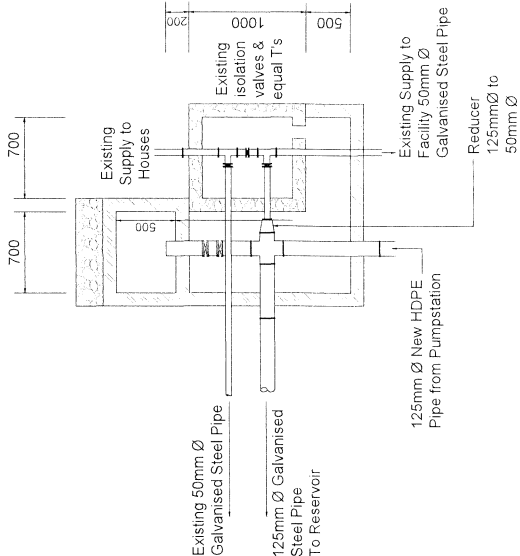
REVISION

0



SCOUR CHAMBER
SECTION A-A

Not to Scale - Schematic Representation



EXISTING CHAMBER CONNECTION AT W15
WITH PROPOSED EXTENSION
PLAN

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[illegible]

 Mpumalanga
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 South Africa 1685
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PROJECT DESCRIPTION

Journal of Management Education 36(7) 809-824

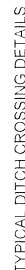
10

PIPELINE DITCH CROSSING

DESIGNED BY M. MOFOKEING	SIGNATURE AND DATE
DRAWN BY R. KELSEY	SIGNATURE AND DATE
APPROVED BY M. TSOAI Pr Eng.-20160198	SIGNATURE AND DATE
PROJECT NO 1159	DATE

NIT 3032 1150 109 001

SCALE	SHEET SIZE	REVISION
UTS	A1	0



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REVISION RECORD COLUMN AND MUST BE SIGNED
THE DRAWING IS A SCHEMATIC REPRESENTATION AND MUST NOT BE SCALED

For List of References, Drawings and
Design Information, See Drawing NT-2023-1159-001

REVISION INFORMATION		
NO	DATE	DESCRIPTION
1	2023-04	INITIAL DESIGN
2	2023-04	REVISION
3	2023-04	REVISION
4	2023-04	REVISION
5	2023-04	REVISION
6	2023-04	REVISION
7	2023-04	REVISION
8	2023-04	REVISION
9	2023-04	REVISION
10	2023-04	REVISION

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PROJECT DESCRIPTION
PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL
OF MATERIALS AND SUPERVISION SERVICE OF THE
BULK WATER SUPPLY AT BLAYDE RIVER CANYON
NATURE RESERVE - POTHOLES

DISCIPLINE

CIVIL ENGINEERING

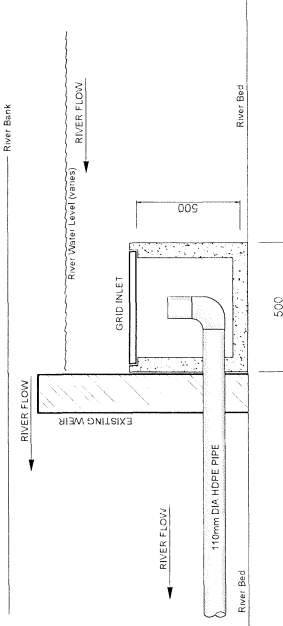
DRAWING DESCRIPTION

TYPICAL DETAIL
RIVER INTAKE AT NODE W61

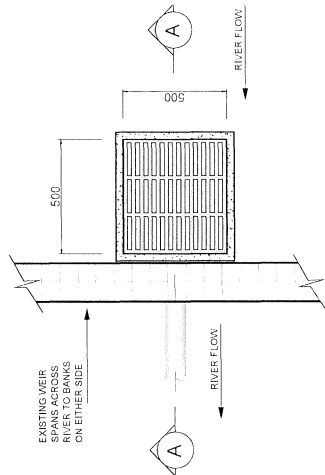
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M. MPOKENG	4 December 2023
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	4 December 2023
APPROVED BY	SIGNATURE AND DATE
M. TSOAI	4 December 2023
PROJECT NO	DATE
1159	4 December 2023
DRAWING NO	

NT-2023-1159-111-001

SCALE	SHEET SIZE	REVISION
NTS	A1	0



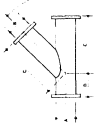
SECTION A-A
Not to Scale - Schematic Representation



CONCRETE GRID INLET
at Node W61
PLAN VIEW
Not to Scale - Schematic Representation

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PIPE LATERAL JOIN													
Item	Nominal diameter mm		Outside diameter mm		ANGLE 60° TO 90°			ANGLE 45° TO 59°			ANGLE 30° TO 44°		
	A	A	A	A	C	D	C	D	C	D	C	D	
F8	125	139.7	mm	mm	200	200	400	150	400	150	600	150	



Notch Scale - Schematic Representation

[illegible]

CLIENT



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PROJECT DESCRIPTION

PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE - POTHOLES.

DISCIPLINE

CIVIL ENGINEERING

DRAWING DESCRIPTION

INTAKE TANK ARRANGEMENT

DESIGNED BY	SIGNATURE AND DATE
M. MOFOKENG	4 December 2023
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	4 December 2023
APPROVED BY	SIGNATURE AND DATE
M. TSOAI	4 December 2023
PROJECT NO	DATE
1159	4 December 2023
DRAWING NO	

NT-2023-1159-112-001

SCALE NTS	SHEET SIZE A1	REVISION 1
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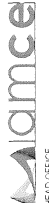
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For List of Reference Drawings, see Drawing Number NT-2023-1159-101			
NO	DATE	DESCRIPTION	BY
6	2023-11-07	ISSUED FOR TENDER	WT
1	2023-11-04	DRAWING DESIGN	WT

CLIENT



Mpumalanga Tourism and Parks Agency
The National Parks and Nature Reserves of the Mpumalanga Province
Mpumalanga 1200
Tel No: (013) 065 0855

CONSULTANT



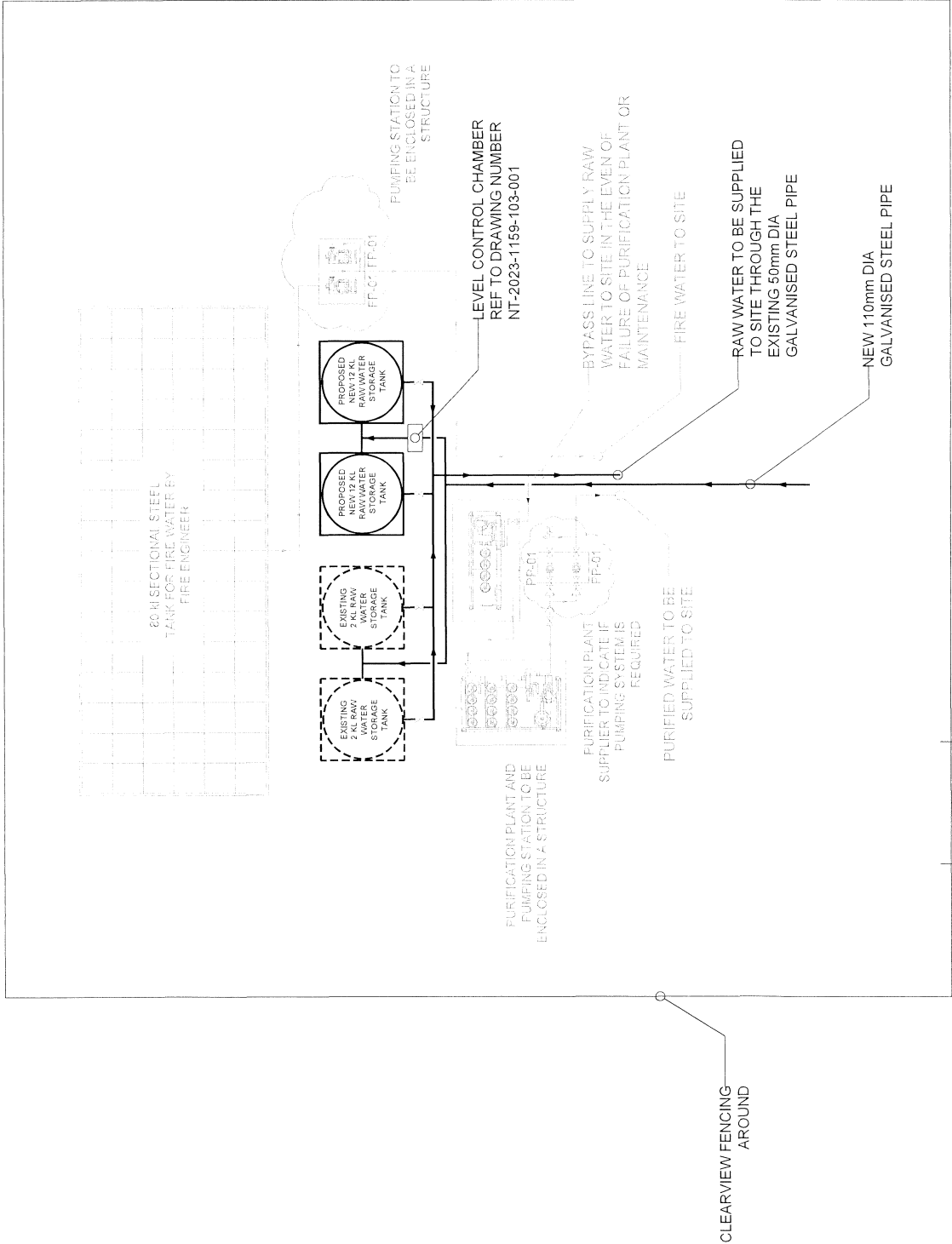
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PROJECT DESCRIPTION
PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF MATERIALS AND CONSTRUCTION OF THE BULK WATER SUPPLY AT BLUDE RIVER CANYON NATURE RESERVE - POTHLES

DISCIPLINE
CIVIL ENGINEERING
DRAWING DESCRIPTION
RESERVOIRS ARRANGEMENT AND DETAILS

DESIGNED BY	SIGNATURE AND DATE
M. MOFOKENG	4 December 2023
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	4 December 2023
APPROVED BY	SIGNATURE AND DATE
M. TSOAI P Eng: 20160198	4 December 2023
PROJECT NO	DATE
1159	4 December 2023
DRAWING NO	

SCALE	SHEET SIZE	REVISION
NTS	A1	1



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For List of References, Drawings and Drawing Information, Refer to: 2023-1159-001		
REVISION INFORMATION		
NO	DATE	DESCRIPTION
1	2023-12-04	ISSUED FOR DESIGN

CLIENT



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PROJECT DESCRIPTION
PROVISION OF THE DESIGNS, DEVELOPMENT OF BILL OF QUANTITY AND SUPERVISION SERVICE OF THE BULK WATER SUPPLY AT BLUDE RIVER CANYON NATURE RESERVE - POTHLES

DISCIPLINE

CIVIL ENGINEERING

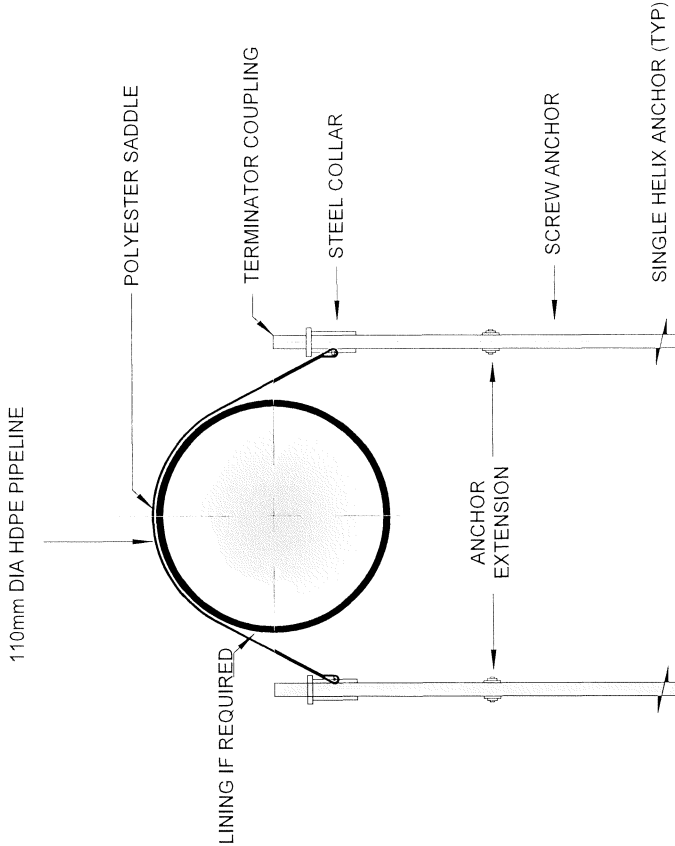
DRAWING DESCRIPTION

TYPICAL DETAIL
SECTION - HDPE PIPE ANCHOR

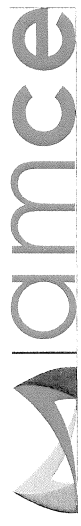
DESIGNED BY	SIGNATURE AND DATE
M. MOFOKENG	4 December 2023
DRAWN BY	SIGNATURE AND DATE
R. KELSEY	4 December 2023
APPROVED BY	SIGNATURE AND DATE
M. TSOAI	4 December 2023
PROJECT NO	DATE
1159	4 December 2023
DRAWING NO	

NT-2023-1159-114-001

SCALE	SHEET SIZE	REVISION
NTS	A1	0

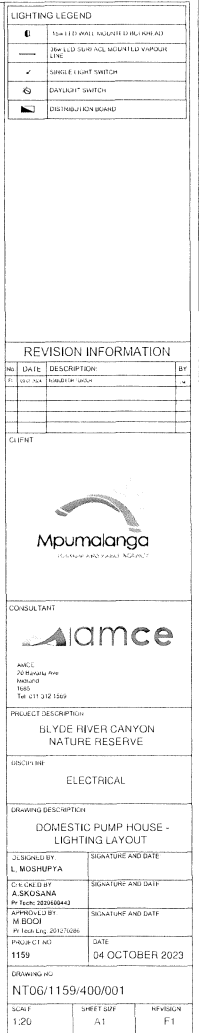


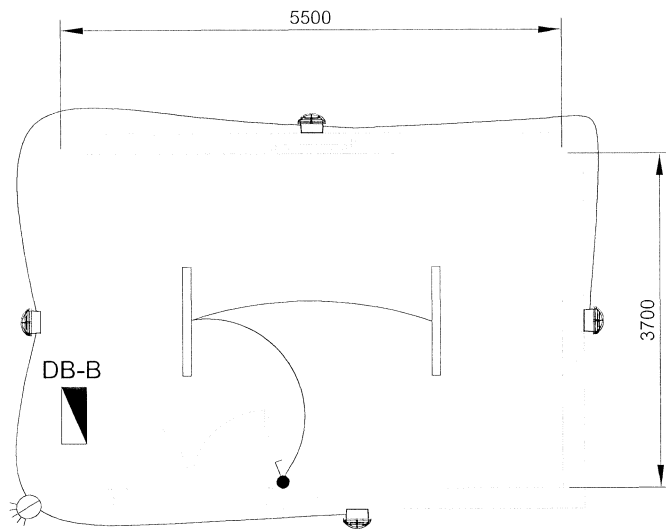
SECTION - HDPE PIPE ANCHOR ARRANGEMENT
Not to Scale - Schematic Representation



ELECTRICAL WORKS DRAWINGS







LIGHTING LEGEND	
	15W LED PANEL MOUNTED TO BUILDING AND WALLS
	15W LED SQUARE MOUNTED TO VERTICAL SURFACE
	SINGLE LIGHT SWITCH
	DAYLIGHT SWITCH
	DISTRIBUTION BOARD

REVISION INFORMATION		
NO.	DATE	DESCRIPTION
01	04 OCTOBER 2023	PRELIMINARY DESIGN SUBMITTAL
02	04 OCTOBER 2023	REVISION FOR CLIENT



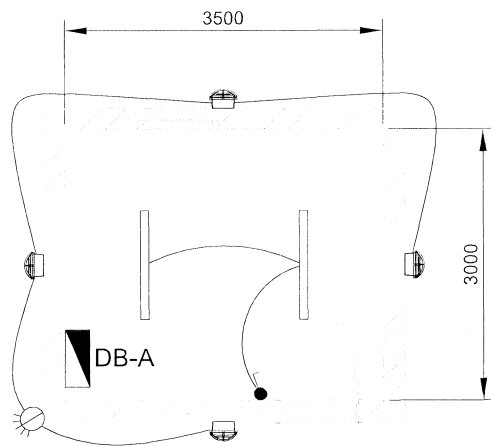
PROJECT DESCRIPTION
 BLYDE RIVER CANYON
 NATURE RESERVE

DISCIPLINE
 ELECTRICAL

DRAWING DESCRIPTION
 FIRE PUMP HOUSE - LIGHTING
 LAYOUT

DESIGNED BY L. MUSHUPYA	SIGNATURE AND DATE
CHECKED BY A. SIKOSANA	SIGNATURE AND DATE
APPROVED BY M. BOOI	SIGNATURE AND DATE
PROJECT NO. 1159	DATE 04 OCTOBER 2023

DRAWING NO. NT06/1159/400/002		
SCALE 1:20	SHEET NO. A1	REVISION F1



LIGHTING LEGEND	
	CEILING MOUNTED 2-PIN HEAD
	SURFACE MOUNTED 1-PIN HEAD
	SINGLE LIGHT SWITCH
	DOUBLE LIGHT SWITCH
	DISTRIBUTION BOARD

REVISION INFORMATION		
NO.	DATE	DESCRIPTION
01	15/10/2023	INITIAL DESIGN
02	15/10/2023	REVISIONS



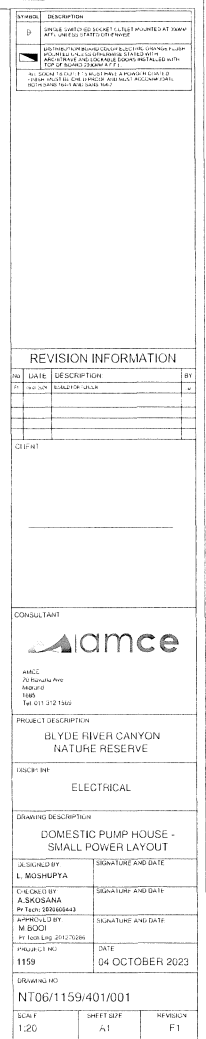
PROJECT DESCRIPTION
BLYDE RIVER CANYON
NATURE RESERVE

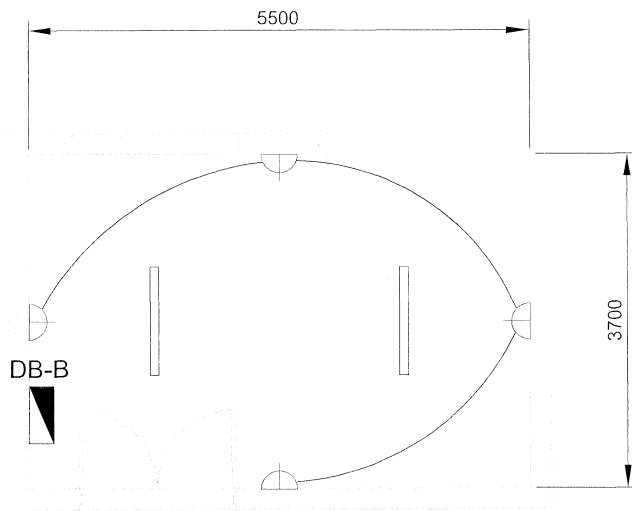
DISCIPLINE
ELECTRICAL

DRAWING DESCRIPTION
CIVIL PUMP HOUSE - LIGHTING
LAYOUT

DESIGNED BY	SIGNATURE AND DATE
L. MOSHUPA	
CHECKED BY	SIGNATURE AND DATE
A. SIKOSANA	
APPROVED BY	SIGNATURE AND DATE
M. BOOI	
PROJECT NO.	DATE
1159	04 OCTOBER 2023

DRAWING NO.		
NT06/1159/400/003		
SCALE	DATE	REVISION
1:20	A1	F1





SYMBOL	DESCRIPTION
1	SPACE QUALIFIED ELEMENTS MUST BE INDICATED AT DRAWING SCALE AND NOT IN FIELD NOTES
2	SYMBOLS FOR ELECTRICAL EQUIPMENT MUST BE INDICATED AT DRAWING SCALE AND NOT IN FIELD NOTES
3	SYMBOLS FOR MECHANICAL EQUIPMENT MUST BE INDICATED AT DRAWING SCALE AND NOT IN FIELD NOTES
4	SYMBOLS FOR PIPING AND DUCTS MUST BE INDICATED AT DRAWING SCALE AND NOT IN FIELD NOTES
5	SYMBOLS FOR STRUCTURAL ELEMENTS MUST BE INDICATED AT DRAWING SCALE AND NOT IN FIELD NOTES

REVISION INFORMATION			
NO.	DATE	DESCRIPTION	BY
1	15/10/2023	PRELIMINARY LAYOUT	AM
2	15/10/2023	REVISIONS	AM
3	15/10/2023	REVISIONS	AM
4	15/10/2023	REVISIONS	AM
5	15/10/2023	REVISIONS	AM

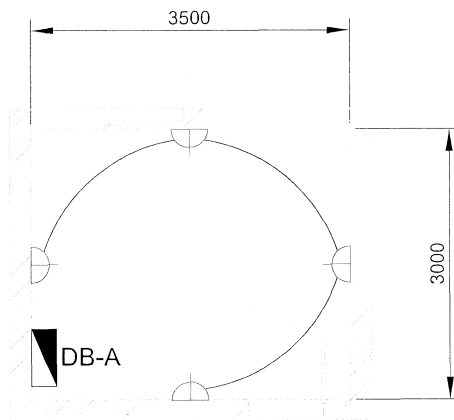


PROJECT DESCRIPTION
BLYDE RIVER CANYON NATURE RESERVE
DISCIPLINE
ELECTRICAL

DRAWING DESCRIPTION
FIRE PUMP HOUSE - SMALL POWER LAYOUT

DESIGNED BY	SIGNATURE AND DATE
L. MUSHUPTA	
CHECKED BY	SIGNATURE AND DATE
A. SIKOSANA	
APPROVED BY	SIGNATURE AND DATE
M. BOOI	
PROJECT NO.	DATE
1159	04 OCTOBER 2023

DRAWING NO		
NT06/1159/401/002		
SCALE	SHEET SIZE	REVISION
1:20	A1	F1



SYMBOL	DESCRIPTION
1	1. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
2	2. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
3	3. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
4	4. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
5	5. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
6	6. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
7	7. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
8	8. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
9	9. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE
10	10. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE

REVISION INFORMATION			
NO.	DATE	DESCRIPTION	BY
1	10/01/2023	1. LAYOUT OF ELECTRICAL EQUIPMENT TO BE INSTALLED AT THE PUMP HOUSE	1
2			
3			
4			
5			

CLIENT



AMCE
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Blyde River
Tel: 011 312 1140

PROJECT DESCRIPTION
BLYDE RIVER CANYON
NATURE RESERVE

DISCIPLINE
ELECTRICAL

DRAWING DESCRIPTION
CIVIL PUMP HOUSE - SMALL
POWER LAYOUT

DRAWN BY
L. MASHUPTA

CHECKED BY
A. SIKOSANA

APPROVED BY
H. SIKOSANA

PROJECT NO.
1159

DATE
04 OCTOBER 2023

DRAWING NO.
NT06/1159/401/003

SCALE
1:20

SHEET SIZE
A1

REVISION
E1

DB-A

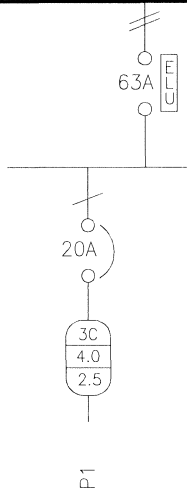
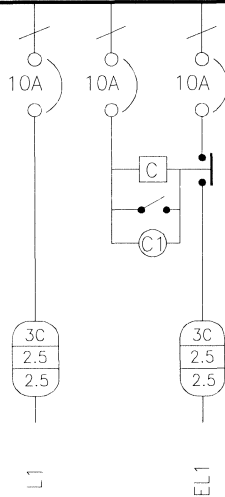
FED FROM ?"

10mm² x 4C & 6mm² BCEW

32A

400/231V

5kA



CLASS 1 & 2 SURGE
ARESTOR

No. OF CORES
CONDUCTOR SIZE mm²
EARTH CONDUCTOR mm²

3C
2.5
2.5

3C
2.5
2.5

3C
4.0
2.5

3C
6
4

3C
6
4

LEGEND

	CONDUCTOR
	SINGLE POLE CIRCUIT BREAKER
	TWO POLE CIRCUIT BREAKER
	THREE POLE CIRCUIT BREAKER
	CLASS 1 AND 2 SURGE ARESTOR

CLIENT



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REVISION INFORMATION

No.	Date	Description	BY
E1	12-12-2023	PRELIMINARY / DETAILED DESIGN	L.M
F1	22-02-2024	PRELIMINARY / DETAILED DESIGN	L.M

PROJECT DESCRIPTION

BLYDE RIVER CANYON
NATURE RESERVE

DISCIPLINE:

ELECTRICAL

DRAWING DESCRIPTION

DB-A LAYOUT

DRAWN BY

L. MPHOLFOLO

SIGNATURE & DATE

PROJECT NO
1159

CHECKED BY

A. SKOSANA
Pr Tech: 2020600443

SIGNATURE & DATE

DRAWING NO
KN06/1159/420/001

APPROVED BY

M. BOOI
Pr Tech-Eng: 201270286

SIGNATURE & DATE

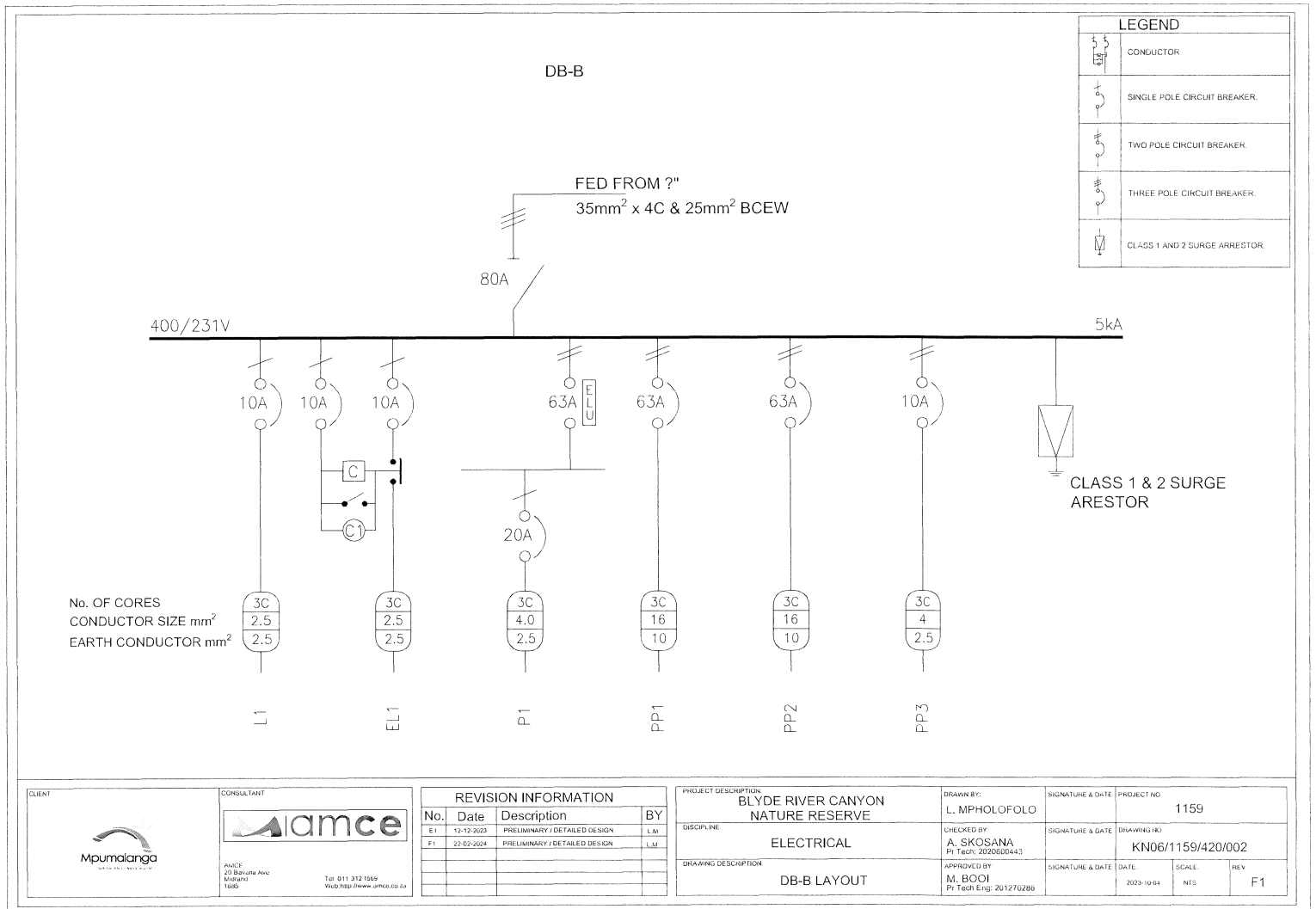
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2023-10-04

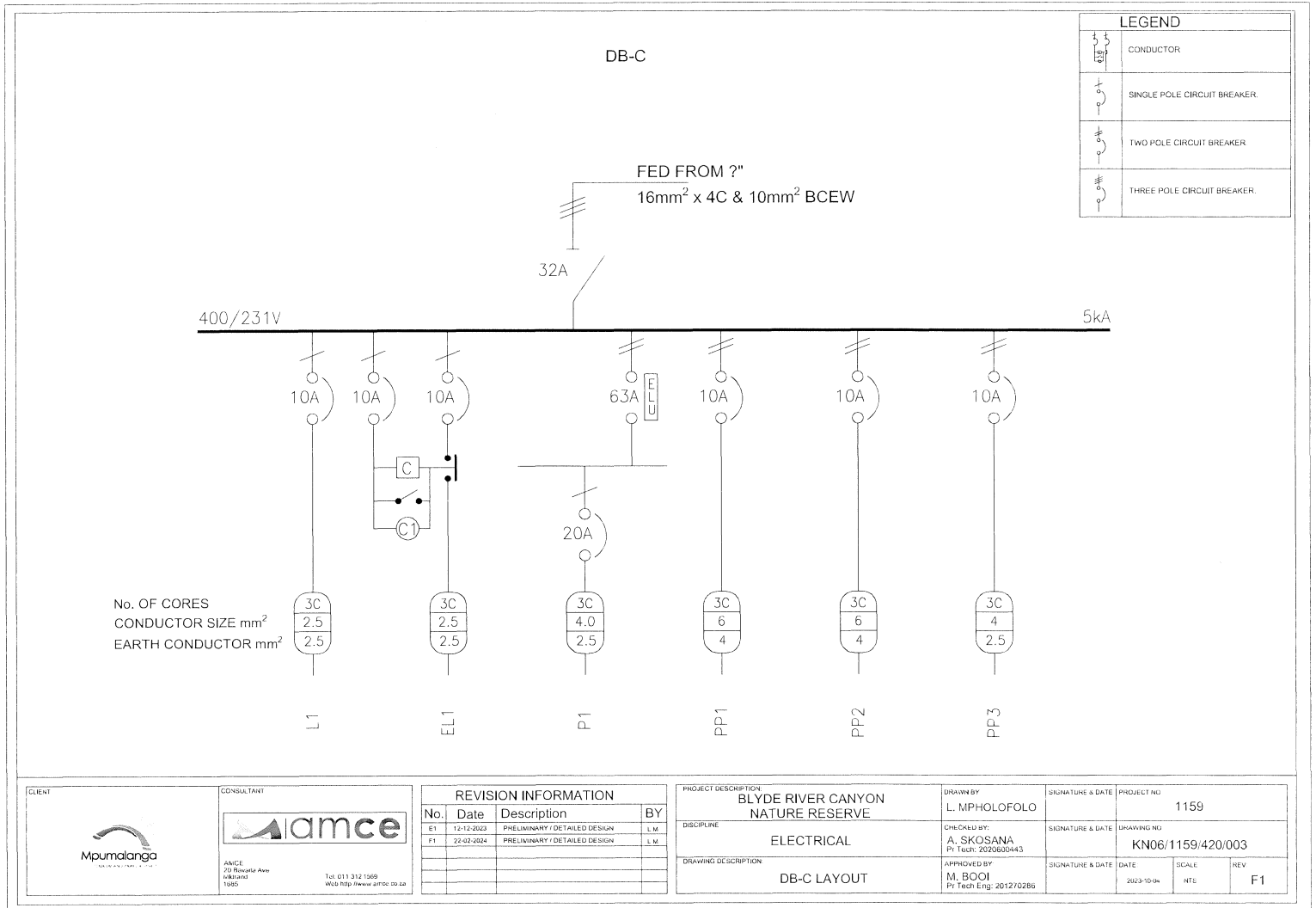
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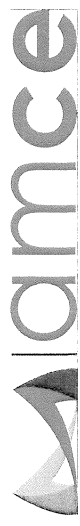
NTS

REV

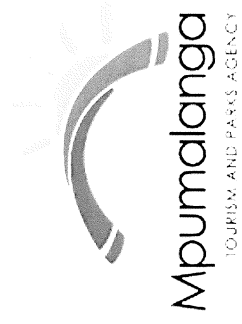
F1

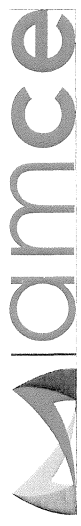




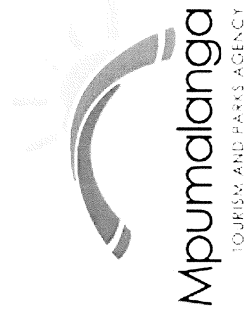


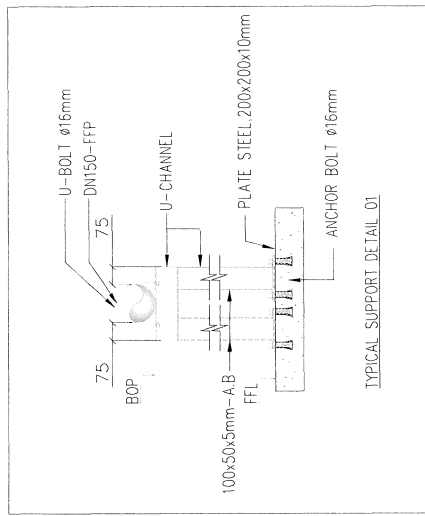
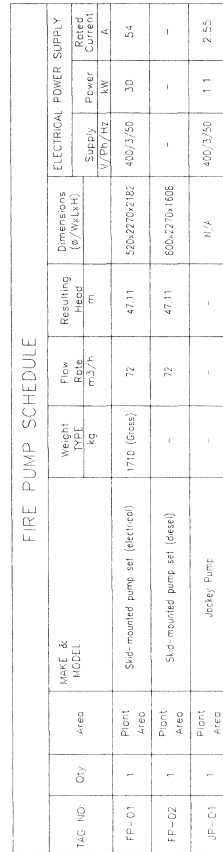
WET SERVICES DRAWINGS





FIRE SERVICES DRAWINGS



[illegible]

Electrical Specification

Construction of the Bulk Water Supply at Blyde Canyon Nature Reserve

1. STANDARD SPECIFICATIONS, ACTS, REGULATIONS, AND BY-LAWS

Wherever any reference is made to the South African National Standard (SANS) and the British Standard specification (BS) in either of the General Specification (Section 1), Project Specification (Section 2), and Quality Specifications for schools this reference shall be deemed to read "SANS or equivalent standard" and "BS or equivalent standard" respectively.

The following shall apply to this contract:

- (a) GP_E5_1: Standard Quality Specifications – General Electrical Installations
- (b) GP_E5_2: Quality Specification – Electrical Material and Equipment
- (c) GP_E6_1 Rev1: Standard Quality Specification for General Electrical Installations (Schools)
- (d) GP_E6_2 Rev1: Standard Quality Specification for Electrical Material & Equipment (Schools)
- (e) GP_E1_2: Standard Quality Specification for Intercommunication Systems
- (f) GP_E1_7: Standard Quality Specification for Public Address Systems
- (g) GP_E2_2: Standard Quality Specification for Access Control Systems
- (h) GP_E2_7: Standard Quality Specification for Intruder Alarm Systems
- (i) GP_E2_C: Standard Quality Specification for Automatic Fire Alarm Systems
- (j) GP_E4_2: Standard Quality Specification for Standby Diesel Alternator Sets
- (k) GP_E4_7: Standard Quality Specification for Uninterruptible Power Supply Systems
- (l) GP_E4_C: Standard Quality Specification for Solar Power Systems
- (m) SANS 10142: The Wiring of Premises.
- (n) SANS 204: Energy Efficiency in Buildings
- (o) SANS 10114-1: Interior lighting Part 1: Artificial interior lighting.
- (p) SANS 10114-2: Emergency Lighting

Steel conduit exposed to damp or weather conditions shall be galvanized to SANS 121.

Galvanized draw wires must be provided in all conduits provided for other services.

- All steel conduit joints in concrete slabs and all running joints must be painted.
- No chasing by hammer and chisel will be accepted. Slots for conduits must be cut by using power-cutting disk tools where necessary.
- Bushes on metal conduit shall be of brass only.
- All outlet box cover plates must be metal and steel outlet boxes must be hot-dipped galvanized to SANS 121.
- Where cavity walls or face brick walls are encountered deep back-to-back (one end closed) wall boxes must be used.
- Blank cover plates on round outlet boxes must be fixed with flathead brass screws and a gasket to seal the box.
- Blank cover plates on 100 x 100 mm outlet boxes must be fixed with two countersunk chrome screws.
- Where outlet boxes or draw boxes are mounted on finished surfaces the electrical contractor shall take care that such outlets are mounted symmetrically. It will not be sufficient to scale the position of any outlet of the drawings. No extra payment will be allowed where the outlets are not mounted symmetrically and must be changed. Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.
- Non-metallic conduit or conduit boxes shall not support luminaries and other fittings. These fittings shall be secured to the surrounding structure in a way that is acceptable to the Employer's Agent.
- Surface-mounted conduit shall be supported and fixed with saddles with a maximum spacing of 1,5 m, even in roof spaces. (Refer to SANS 10142-1).
- The contractor shall supply and install all additional supporting timbers required.

It shall be possible to rewire the completed installation in the future without undue difficulty.

Non-metallic conduit and fittings shall not be used under the following conditions:

- a) Outside a building (unless protected or sheltered under eaves).

to half the length of the coupling is achieved and that no excess jointing adhesive is squeezed into the conduit or accessory.

NOTE: Solvent adhesives containing highly volatile liquids and their containers should not be left open.

Cutting of Conduit

A fine-tooth hacksaw shall be used to cut the conduit to the required length. Each cut end shall be square and free from swarf, burrs, and loose material. When determining the length of conduit to be cut, allowance must be made for the length of couplings or accessories attached to the conduit. Incorrect determination will cause bulging of the conduit or insufficient joint length.

4. CONDUIT IN ROOF SPACES

In roof spaces, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit shall be secured at intervals not exceeding 1,5 m using saddles fixed to the roof timbers using screws or acceptable clout nails.

In the case of repairs and renovations, conduit runs from a distribution board shall, where possible, terminate in fabricated sheet steel draw boxes installed directly above or near the boards.

5. WIRING

Except where otherwise specified in Section 2 of the specification or indicated on the drawings, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into the conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduit is to be clear of moisture and debris before wiring is commenced.

6. SWITCHES AND SOCKET OUTLETS

All light switches shall be installed with the center line at 1,4 m above the finished floor level and all socket outlets with the center line at 300mm above the finished floor level or, where applicable, between a worktop window sill in such manner that it is either totally within or totally above any tiled area, unless a specific mounting height is indicated on the drawings or specified in the Project Specification (Section 2).

Screws longer than 30mm to affix a light switch or switch socket cradles to the draw box will not be accepted.

7. DISTRIBUTION BOARDS

General

All boards shall be by the types as specified, be constructed according to the detail or type drawings, and must be approved by the Employer's Agent before installation.

In all instances where provision is to be made on boards for the Supply Authority's main switch and/or metering equipment, the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Two spare 25mm dia. and three spare 20mm dia conduits must be supplied from all distribution boards to roof spaces.

Three sets of factory drawings on all distribution boards must be submitted for approval before the manufacture of the distribution boards commences.

The Employer's Agent must be notified at least two weeks in advance of the completion of the distribution boards so that an inspection may be carried out.

Installation

All distribution boards shall be supplied and installed in the positions shown on the drawings.

All distribution boards must be flush mounted unless otherwise indicated and are to be installed with the top of the board 2,0 m above the finished floor level.

All hot and cold water and waste pipes are to be effectively bonded using 12,5 mm x 1,6 mm solid or perforated copper tape (not wire), clamped using brass bolts and nuts. The tape is to be fixed to walls using rounded brass screws at intervals not exceeding 150 mm.

Provision must be made for the conduit to be installed in the wall for all earthing requirements. Main earth copper tapes/wires must be installed in these conduits. Where provision was not made as stipulated above, 20 mm diameter galvanized steel conduit must be installed from below ground level to 3 m above ground level. This conduit must be securely fixed to the walls. Corrugated iron roofs and guttering must be effectively earthed with copper tape and brass bolts with nuts at intervals not exceeding 2m. Self-tapping screws are not acceptable as a means of securing earth conductors.

Connection from the main earth bar on the main board must be made at the cold water main, the incoming service earth conductor, if any, and the local earth electrode using 12,5 mm x 1,60 mm solid or perforated copper tape or 16 mm² stranded (not solid) bare copper wire or such conductor as the Employer's Agent may direct.

9. LIGHTNING PROTECTION

The buildings shall be protected against lightning by way of a 40mm x 4mm aluminium strip secured to the roof tiles along the ridges. Fixing shall be done in such a manner that no tile is penetrated or cracked, using M7 concrete anchors at every second tile edge.

The aluminium strip shall be installed perfectly straight without weaving or twisting.

At the roof edges the strip shall be bonded to a down conductor consisting of 10mm² bare copper earth wire contained in a 20dia PVC conduit, running from a point close to the roof edge to the earth pegs below.

A 100 x 100mm draw box with a cover shall be provided 300mm above floor level and another above ceiling level to facilitate installation.

Bonding shall be using M8 stainless steel bolts washers and nuts

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- (d) Registration certificates and latest receipts of payment to the Workman's Compensation as required by the Workman's Compensation Act of 1941, as amended.

The contractor must enclose certified copies of the above documents (a) (b) and (c), with the tender submission. Failure to provide these documents disqualifies the tender.

4. CABLE SUPPORT SYSTEM

- The contractor is to provide the following cable support systems, as indicated on the drawings and in the standard specifications:
- All associated fittings, accessories, and fixtures are to be factory-manufactured and NOT to be manufactured on-site by the contractor. All makeshift fittings will be rejected.
- Wire all contacts and monitoring facilities to a terminal block at the back of the panel.
- Should the isolator panel not be able to accommodate the equipment required for the current energy measurement, the contractor should consider the use of a summation transformer to provide an indication of these measurements on the main incomer. The engineer must approve the designs of all equipment to be provided before the commencement of the actual work.
- Wire all contacts and monitoring facilities to a terminal block at the back of the panel.

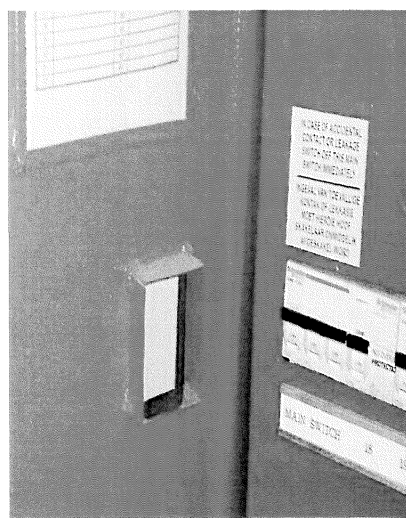
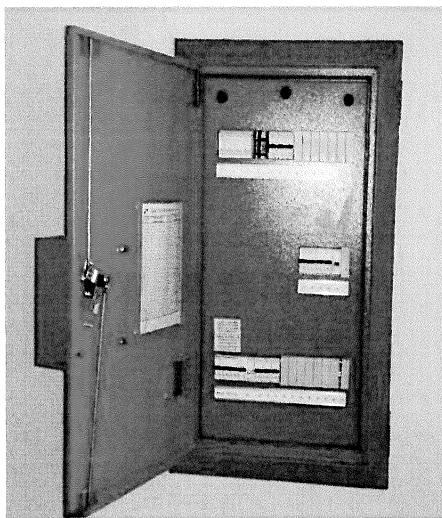
5. WIRING SCHEDULES

Item	Description	Cable Size	Earth Wire
1	Lighting	2.5mm ² PVC conductor GP wire	2.5mm ² PVC insulated earth conductor
2	Plugs	4.0 mm ² PVC conductor GP wire	4.0mm ² PVC insulated earth conductor

The main circuit breaker in the generator room distribution board and the administration building main distribution board must be adjustable to trip at lower currents than the maximum rating.

All main distribution boards and sub-distribution boards are to be fitted with a digital display kilowatt-hour meter with data storage and retention (with battery backup). Both kilowatt-hours and maximum demand must be measured for the main incoming supply and the generator supply. Phase and neutral currents must also be measured. Provide battery backed up data storage and retention.

Install surge arrestors for the main incoming supply and in all distribution boards that complies with SANS 10142-1:2017, Edition 2.





WET SERVICES SPECIFICATION

For

Construction of the Blyde Canyon Nature Reserve Water Supply

Blyde Canyon, Mpumalanga

Client: Mpumalanga Tourism and Parks Agency

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- Tender return:
- Tender award:
- Date of completion:

The contractor shall be responsible for the following;

- 1.20.1. Compliance with Tender formalities
- 1.20.2. One (1) week site work execution, commissioning and balancing from date of completion
- 1.20.3. Twelve (12) months free maintenance period: start on completion & acceptance of site work execution.

A penalty of R..... per day shall be paid for each calendar day the works remain incomplete following the periods indicated here. The calculation of days shall include public holidays, and weekends.

1.7 MATERIALS OFF-SITE AND SERVICES

Notwithstanding the options given in the principal agreement or form of contract an application for payment for materials stored off-site and payment for services off-site will only be considered upon receipt of an approved guarantee from an approved bank or financial institution for the full value thereof and shall be made at the discretion of the Employer and or his agent.

1.8 SITE SECURITY

The contractor is to provide his own security arrangements to safeguard his own property and unfixed materials on site.

1.9 PRICING OF THESE GENERAL NOTES

The Contractor may allow in his pricing, or where provided for in the Preliminaries, for all additional costs arising out of requirements of the notes set out in Section 1 as no claims for additional costs in this respect will be considered.

1.10 SUFFICIENCY OF TENDER

The Tenderer shall be deemed to have satisfied himself before submitting his offer as to the correctness and sufficiency thereof for the Works and of the rates and prices he has stated in the Schedules which rates and prices shall cover all his obligations under the Contracts and all matters and things necessary for the proper completion of the Works.

1.11 RATES AND PRICES

The rates and prices inserted in the Contract Documentation shall be deemed to include, but shall not be limited to the following:

- 1.25.1. Materials, workmanship and utilization of plant and equipment,
- 1.25.2. Transport, unloading, storing and hoisting to all levels of all materials,

STANDARD SPECIFICATION

1.13 DEFINITIONS & ABBREVIATIONS

Definitions of terms used in these documents shall mean:

"Approved" / "Satisfactory" / "Accepted":	As approved, satisfactory, and accepted by the Employer or his agent.
"Balancing":	Work adjustments and checks necessary to proportion the flow within the distribution system, sub-mains, branches and terminals of a system in accordance with specified quantities and to achieve specified performance.
"Contractor" "Tenderer":	The contractor or Tenderer is the party, persons or company successful in their bid return as part of this contract.
"Commissioning":	Work necessary to place the installation and work covered by this specification into normal operating conditions to the satisfaction of the Employer or his agent.
"Indicated": "Shown" or "Noted"	As indicated, shown or noted on drawings and/or specifications
"Install":	To erect, mount, fix and connect complete with all related accessories to enable the desired function.
"Provided":	To supply, install, connect up and commission into regular and safe operation of particular item referred to.
"Testing":	Work and checks necessary to determine quantitative performance of equipment installation and workmanship.
"SANS":	South African National Standards

1.14 RELEVANT NORMS AND STATUTORY REQUIREMENTS

The soil and waste drainage and the internal water services system shall be designed and installed in accordance with the following standards



The Tenderer shall ensure their program of works is co-ordinated with others and satisfies the requirements of the main contractor and the principle building contract.

The program of works shall be updated bi-monthly to indicate progress on site and remediate any potential delays.

The Contractor shall submit a detailed works program and anticipated cash flow estimate of his/her Tender.

Suitable time shall be allocated to perform commissioning, validation and hand-over to the approval of the engineer. Particular attention must be made to the required completion dates and penalties as described within the contract conditions.

1.16.3 Lead time guarantee

The contractor shall submit with the Tender return a guarantee that all equipment and corresponding supply (lead times); delivery, installation and commissioning of all equipment can be achieved within the project time frame.

1.16.4 Quality management

The Tenderer shall maintain an ISO9001 series compliant Quality Management System for the duration of the contract. The quality file shall be kept on site and shall be made available for inspection by the Engineer, Employer or his agents.

Signed off quality control checklists, commissioning schedules and test certificates shall be provided prior with all invitations for inspection by the contractor.

The Engineer reserves the right to charge the contractor at the prevailing Engineering Council rates for abortive inspections.

Only the highest possible standards of workmanship will be accepted. No inferior quality of workmanship will be tolerated.

1.16.5 Scrutiny of drawings

All drawings, circuit or schematic diagrams prepared by or on behalf of the Contractor for submission to the Engineer in terms of the requirements of this specification shall have been thoroughly checked, corrected where necessary and signed as approved by the Contractor, prior to such submission.

The Engineer's scrutiny of any drawings will cover the arrangement, type and operational suitability of the equipment in general only. Such approval will not release the Contractor from his responsibility for the proper operation of the installation or for its full compliance with the specification, drawings, local authority and statutory requirements, or for ensuring that the equipment can be physically accommodated within the space and via the access provided.

1.17 DOCUMENTATION

Documentation shall be provided to demonstrate compliance with all applicable Quality, Regulatory and specified requirements.

3	A full commissioning report including actual test results of all systems after commissioning	3
4	All pressure test results for each area wherever applicable	3
6	Certificate of commitment for the maintenance & guarantee period as applicable via the contract.	2

1.18 TESTING, BALANCING & COMMISSIONING

All safety devices shall be checked for effective operation by simulating the abnormal or overload conditions.

All tests and results shall be recorded, and a test report shall be compiled for insertion in the operating and maintenance manual.

1.18.1 Drainage and Wet Services Testing and Commissioning - Methodology

A normal working test shall be carried out with the drainage and wet services design working pressures. During this test all necessary adjustments and regulation of valves, meters and fixtures will be reported to the Employer. Provision shall be made to obtain the required system balancing and performance.

When the systems have been set to work the Contractor shall employ the services of the commissioning Engineer to carry out the final commissioning of all services.

The final commissioning of the systems shall not take place until the building is complete with all its building works and process services in place or as directed by the Engineer and Employer.

The balancing of the system shall be witnessed, with 100% of the readings retaken in automatic system operation, including all pitot traverses and grille/ diffuser readings checked by means of a barometer (air flow hood) or similar approved device.

All the tests and test schedules shall be drawn up by the Contractor in collaboration with the Engineer. Testing and Commissioning shall be carried out to satisfy the following final design requirements:

- 2.6.1: The correct operation of all drainage systems.
- 2.6.2: The correct operation of all safety systems.
- 2.6.3: Correct water flow rates and pressures

The site tests shall be carried out over several days and shall be long enough to allow the taking of all the measurements as required to demonstrate that the performance of the installation meets the design requirements.

1.19 WORK ALLOCATION

The work allocation will consist of the following:

- a) The end user will provide the necessary permanent electric power supply to a point required by the Drainage and Wet Services Contractor.

2.10.8: Drawings shall include all sections, 3D views, assembly views, plan views and layouts as required to fully understand the works to be executed.

2.10.9: Works shall be executed strictly in accordance with shop drawings approved by the Engineer.

2.10.10: Three (3) copies of the approved shop drawings shall be maintained on site for the inspection of the Engineer at all times.

1.23 WORKING DRAWINGS

One (1) copy of the approved shop drawings shall be maintained up to date to reflect the as built conditions on site. This drawing shall be marked up with all deviations from the approved drawings and shall be highlighted to show installation progress. This marked up drawing shall be copied and issued to the Engineer on a monthly basis.

1.24 OPERATION AND MAINTENANCE MANUAL SUBMITTAL

The contractor shall compile and submit one (1) booklet of the operation and maintenance manual to the Consulting Engineer two months prior to practical completion for approval.

On approval by the consulting Engineer, the contractor shall prepare and submit four (4) copies of the approved operation and maintenance manual on practical completion sign off in both hard and soft copies.

The Operation and Maintenance booklet shall consist of:

1. Cover page stating the project name, the client, the consulting engineer and the contractor with contact persons and details
2. The index page stating the contents and sections of the submittal with page numbers
3. General information on the project:
 - i. Name of project
 - ii. Address of project
 - iii. Start and completion date
 - iv. The professional team and contacts
 - v. The contracting team and contacts
 - vi. Emergency contact details of the contractor
 - vii. Maintenance start and completion date
 - viii. Major equipment suppliers and contact details
4. Description of the System
 - i. Design conditions and technical specification
 - ii. Salient points of the installation

15. Approval page for signature and date:

- i. The contractors name and responsible person signature
- ii. The consulting Engineers name and responsible person signature
- iii. The client's signature and responsible person
- iv. Approval stamp by consulting engineer.

1.25 DEFECTS LIABILITY PERIOD

The defects liability period shall be in accordance with the form of contract but shall not be less than two years (24 months). During the defects liability period all patent and latent defects shall be attended to by the contractor without cost to the client.

Any item which is repaired or replaced during the guarantee period shall be guaranteed for a further Twelve (12) months. The guarantee shall include parts, labour, shipping, transportation, consumables. No cost associated with equipment or workmanship failure or defect shall be attributed to the client during the defects liability period.

1.26 WARRANTY

The contract works shall remain under warranty for Twelve (12) months following practical completion of the works. Sectionalized practical completion shall necessitate sectionalized warranty.

A warranty schedule shall be provided for the installation and contained within the O&M manual.

1.27 MAINTENANCE

After first delivery of the installation (practical completion), there will follow a 12-month free maintenance and guarantee period.

No costs of maintenance shall be incurred by the client during the free maintenance period.

1.28 TEMPORARY USE OF EQUIPMENT

No equipment forming part of the permanent installation shall be operated or used, during the construction period without the Engineer's written permission.

Equipment shall be handed over to the Employer in an as new condition for the beneficial use of the client.

1.29 DIVISION OF WORK

The division of work between the Main-Contractor and the Drainage and Wet Services contractor together with other specialist contractors are as stated in the detailed technical specification.

- 2.22.4: Ensure higher density insulation material is placed at locations of support to avoid over compression of insulation materials. Ensure insulation, vapour seal and cladding as applicable is continuous where pipes are supported.
- 2.22.5: Material compatibility between the insulated service, insulation, vapour seal and cladding as applicable shall be ensured by the Tenderer.
- 2.22.6: All insulation systems shall be applied and utilized in accordance with manufacturer's guidance.

1.35 PIPING

All hot and cold water piping shall be carried out in copper piping and has to be fully SABS approved to SANS 15874 part 2, 3 and 5 and SANS 460 and as set out below:

LOCATION	MATERIAL	SPECIFICATION
External spaces	Copper	SANS 460 CLASS 0

1.36 PIPE JOINTING AND FITTINGS

Copper piping shall be joined by means of compression type fittings or solder capillary fittings. Soldered capillary fittings are preferred. All fittings used shall be in accordance with the SANS Specifications and shall be certified after passing the SABS dezincification test.

Compression fittings shall be of the type employing a cone and screw connections. No jointing compound shall be used with these fittings, except as recommended by the manufacturer.

Capillary fittings for piping shall be in compliance with ISO 2016, Din 2856 or relevant SANS Specification (when it becomes available) and suitable for the system testing pressure. Welding shall be performed by qualified artisans.

To ensure the uniform flow of solder by capillarity along the annular space between the outside of the tube and the inside of the socket of the fitting and consequently making a satisfactory joint, it is essential that the inside diameter of the socket shall be dimensionally accurate within the close limits laid down in the aforementioned specifications.

When joining tubes with capillary solder fittings, tube and tube ends shall first be mechanically cleaned. Tubes shall then be joined using manufacturers cold water soluble flux (Din 8511 or equal), and recommended soft solder. The Solder shall be distributed 0.97 tin: 0.03 copper or 0.97 tin: 0.03 silver to a recognised standard (Din 1707 or equal). Soft lead solders shall not be used.

Care shall be taken that joints are not overheated and that all residual flux be thoroughly removed from the outside of the tubes.

All cold and hot service pipework and fittings within the building constructed from Polyethylene of raised temperature resistance (PE-RT) shall conform to SANS 22391-2:2008 / ISO 22391-2:2007, SANS 22391-3:2008 / ISO 22391-3:2007, SANS 22391-1:2008 / ISO 22391-1:2007 and SANS 22391-5:2008 / ISO 22391-5:2007.

All cold and hot service pipework and fittings within the building constructed from Polyethylene (PE) shall conform to SANS 4427-2:2008 / ISO 4427-2:2007, SANS 4427-3:2008 / ISO 4427-3:2007, SANS 370:2009, SANS 4427-1:2008 / ISO 4427-1:2007, SANS 4427-5:2008 / ISO 4427-5:2007 and SANS 4427:1996 / ISO 4427:1996 (2009-07-31).

All cold and hot service pipework and fittings within the building constructed from copper shall conform to SANS 460:2011, SANS 460:2011, SANS 1067-1:2005, SANS 1067-2:2005, SANS 1808-10:2005 (2010-08-20) and SANS 1857:2005 (2010-08-20).

1.37 PIPE SUPPORTS

Hot and cold water piping shall be supported as set out in the table below

Pipe diameter (mm)	Spacing for horizontal (m)	Spacing for Vertical (m)
15	1.2	1.8
15 to 28 mm	1.2	2.4
32 to 54 mm	1.8	3.0
67 to 108 mm	2.4	3.7

1.38 EXPANSION JOINTS

Approved Expansion bellow types shall be provided where necessary on long straight runs, as shown. Where possible, expansion shall be taken up at the bends. Slide supports and anchors shall be provided at suitable positions to control pipe movement. The specified cold pull shall be provided to give the required pretension at the expansion bellows and bends. The complete installation shall be in accordance with the manufacturer's recommendations.

1.39 THERMAL INSULATION

2.27.1: All hot water piping shall be insulated with flame retardant, preformed, expanded, polyethylene foam, sections.

2.27.2: Joints shall be sealed by means of tape, glue, or a proprietary jointing system, in accordance with the manufacturer's recommendations.

1.43 DESIGN PARAMETERS

The above ground drainage system shall be based on a primary and secondary ventilated stack arrangement.

The systems are based on the discharge unit method as per System III BS EN 12056-2, Table 2, and using the following frequency factors:

- “Frequent” $K = 0.7$
- “Congested” $K = 1.0$

1.44 FIXINGS

- 2.32.1: Install pipes, fittings and accessories in accordance with relevant Building Regulations and manufacturer’s recommendations to ensure the complete discharge of drainage from the building without any leaks, ingress to the building or nuisance.
- 2.32.2: The pipes shall be fixed in straight runs and all horizontal runs are to be laid to gradients in accordance with SABS 0400 Table 13.
- 2.32.3: Allow for thermal and building movement when jointing and fixing drainage pipework in accordance with the manufacturer’s recommendations.
- 2.32.4: Ensure pipe routes are shortest practicable, with minimum number of bends, unless indicated otherwise.

1.45 PIPELINES AND FITTINGS

All drainage pipework and fittings shall be installed in the positions as indicated on the drawings.

1.46 UPVC PIPING

- 2.34.1: The drainage pipes and fittings shall be coloured grey (or as specified by the Architect), unplasticised PVC, manufactured in accordance with SANS and shall, where appropriate, bear the SANS mark.
- 2.34.2: The method of jointing shall be that of solvent welding, using the manufacturer’s approved cleaner and cement.
- 2.34.3: All Fittings shall be coloured grey, unplasticised PVC manufactured in accordance with SANS and shall, where appropriate, bear the SANS mark.
- 2.34.4: Seal ring fittings shall be used where necessary to accommodate thermal movement or where the manufacturers recommend. The rubber seals for seal ring joints shall be of section that gives more than one point of contact with the pipe. Horizontal and vertical

2.36.1.2: Traps shall have seal depths and diameters in accordance with SANS 0400.

2.36.1.3: Traps shall be fitted with a universal compression outlet in accordance with the following unless otherwise specified:

- Wash Hand Basins – 32 mm deep seal resealing trap or bottle trap
- Sinks – 40 mm deep seal tubular trap
- Urinals – 40 mm deep seal tubular or bottle trap
- Showers – 40 mm deep seal trap with top access
- For condensate or for other situations where there is insufficient water flow to replenish a traditional water seal trap HepvO self-sealing waste valves (waterless traps) should be used.

1.49 COATINGS AND COATED PIPES

- 2.37.1: Install pipes, fittings and accessories in accordance with SABS 0400 and manufacturer's recommendations to ensure the complete discharge of drainage from the building without any leaks, ingress to the building or nuisance.
- 2.37.2: Obtain all components for each type of pipework from the same manufacturer, unless otherwise indicated.
- 2.37.3: Inspect components carefully before fixing and reject and which are defective. Ensure cut ends of pipes are clean and square with burrs removed.
- 2.37.4: The pipes shall be fixed in straight runs and all horizontal runs are to be laid to gradients in accordance with Building Regulations and this specification. Horizontal runs should be connected with 45/135° branches swept in the direction of flow.
- 2.37.5: Allow for thermal and building movement when jointing and fixing drainage pipework in accordance with the manufacturer's recommendations.
- 2.37.6: Form junctions using fittings intended for the purpose, ensuring that jointing material does not project into bore of pipes and fittings.
- 2.37.7: Avoid contact between dissimilar metals and other materials, which would result in electrolytic corrosion.
- 2.37.8: In convenient locations, provide access covers and cleaning eyes as necessary and in accordance with local authority requirements, to permit adequate testing and cleaning of pipework.

- 2.40.5: Where drainage pipework is required to be installed prior to the erection of supporting walls, supply and install independent adequate galvanized mild steel support framework from floor slab to soffit.
- 2.40.6: Provide and install protection of openings and fire stopping in accordance with the Building Regulations.
- 2.40.7: Provide and install on all plastic pipework passing through fire compartment floors or walls and exceeding 40 mm internal diameter an intumescent fire sleeve in accordance with Building Regulations. The fire sleeve shall have a fire rating compatible with the floor, wall or cavity barrier to which it is fitted.

1.53 EARTH BONDING

Carry out equi-potential bonding and tests of the drainage system (above ground) to prove the effectiveness of the earthing system. All tests shall be fully recorded and included within the operating and maintenance manuals.

1.54 THERMAL INSULATION

- 2.42.1: Provide and install pipe insulation to pipework where required which would be prone to the formation of condensation or to prevent freezing. All insulated drainage pipes are to be labelled to aid identification. Labels shall be provided at a maximum of 3 m centres.
- 2.42.2: Insulation shall comprise 25 mm foil faced mineral wool and shall be securely located on the pipe by utilising self-adhesive aluminium tape.

Or,

Insulation shall be 25 mm thick plain finish rigid fibre glass sections 915 mm long of 80-110 kg/m³ density, split for fixing, neatly cut with mitres at all bends and fittings and fastened with 0.9 mm galvanized wire, unless specified otherwise.

- 2.42.3: Insulation shall be protected with 0.8 mm thick polyisobutylene (PIB) sheet, having a tensile strength of not less than 2.5N/mm². Note: PIB coat is to be encased in aluminium sheet or another robust finish determined by architect. The PIB sheet material shall be adhered to the external surface of the insulation and all joints shall be laped, secured and sealed by adhesive or solvent welding. All jointing, sealing materials and methods of application shall be strictly in accordance with the manufacturer's recommendations.

2.4 DETAILED SCOPE OF WORKS

The following installations will form part of this drainage and wet services specification and only these services are addressed in this specification;

2.4.1 Drainage and Wet Services

The drainage and wet services installations, testing and commissioning contained within this scope will consist of:

- Installation of hot water storage system complete with electrical element; hot water circulation pumps all necessary accessories associated with the water storage system/s.
- Installation of drainage with all the access caps and other sewerage outlets proposed by the responsible engineers. The pipework shall be complete with all the necessary fittings and the systems are to be naturally ventilated.
- Installation of cold-water pipe system to circulate in ceiling void and walls of the buildings and distribute to the fixtures in the building.

2.4.2 Tender Drawings

- The Tender drawings are noted in the drawing register included within this Tender specification. These drawings are also available on CD for ease of reference by the Tenderers.

The scope shall be executed in accordance with this project specification and project drawings

DOCUMENT NUMBER	DESCRIPTION	REV	SIZE	TYPE
NT06/2023/1159/201/001	PLANT ROOM LAYOUT – DOMESTIC WATER SUPPLY	F1	A0	PDF

2.5 DIVISION OF WORK SCHEDULES

The following work related to the Contract will be executed as follows:

2.5.1 Electrical Work

3.6.1.1: An appropriate single phase or three phase isolator to supply power to any hot water geyser or POU hot water heater is to be provided within 1 meter of the mechanical equipment by the electrical Contractor. The cost of which shall be included under the electrical contractor. Any and all switchgear, wiring and distribution boards upstream from this isolator shall be provided for under the electrical contractor.

3.6.1.2: It is the responsibility of the wet services contractor to timeously confirm the location and electrical requirements with the electrical contractor. The final connection to the mechanical

- Cold Water Services Installation – The provision of cold water to all cold-water outlets and appliances within the building.
- Drainage Installation – The provision of vented/non-vented gravity drainage system to all wet services appliances and drip trays within the building, to connect to underground drainage (provided by the main builder).

2.6.2 Excluded Services

The following installations are specifically excluded from this specification and will be designed by others:

- Fire Services (Portable firefighting equipment, Fire Hose Reels and Internal fire water reticulation),
- Water supply to Site,
- Site Sewer Reticulation
- Rainwater Drainage Installation,
- Site Storm water Drainage Installation

The scope shall be executed in accordance with this project specification and project drawings.

2.7 INCOMING MAINS COLD WATER SUPPLY

The Civil engineer will be responsible for providing a metered mains cold water supply to the site boundary. The water supply shall enter the site boundary in the demarcated area of the site. After the water meter and the extend of the pipework reticulating internally on the site has been provided, the internal site water reticulation 1 m into the building will be the responsibility of the wet services engineer. The mains cold water shall run on the perimeter of the site as per SANS requirements underground. The mains cold water shall branch into the site, to rise and reticulate in the ceiling spaces and walls of the buildings.

2.8 COLD WATER INSTALLATION

- 3.10.1: The water supply pipework shall reticulate within the ground inside trenching, which runs on the perimeter of the site at a particular distance away from the buildings. The pipes will branch from the underground pipe (specified by the Civil Engineer) and transform in the reticulation.
- 3.10.2: The contractor will install Isolating valves, non-return valves, pressure regulating valves, and other necessary fittings at the entry of such a pipe into the buildings.
- 3.10.3: The water supply shall have a minimum of 4 bar (400 kPa) water pressure. Reliance shall be made on municipal water pressure as detailed within the tender drawings (to be investigated by the Civil Engineer).
- 3.10.4: After entering the building/s, the pipework shall rise into the ceiling and walls further reticulating into the building. The pipework will be supported by hangers and other

- 3.11.5: The hot water geysers shall be a stainless-steel insulated vessel built in accordance with SANS 151:2010, SANS 60335-2-21, SANS 60335-2-73:2003 / IEC 60335-2-73:2002 (2008-12-12 and SANS 10254.

2.10 INTERNAL DOMESTIC WATER DISTRIBUTION INSTALLATION

- 3.12.1: The contractor shall provide isolation valves to each catering outlet to allow maintenance to be carried out individually to that fitting but retaining the distribution elsewhere.
- 3.12.2: Air release valves will be installed at high points to release any air in the system to prevent air locks.
- 3.12.3: The contractor shall supply and install pressure-reducing valves at floor levels as necessary to ensure correct flow to outlets.
- 3.12.4: The contractor shall supply and install flow restriction valves where required to ensure excessive water consumption through fittings is prevented.
- 3.12.5: All control valves and safety valves associated with the cold and hot water distribution shall conform to SANS 198:2010.
- 3.12.6: All hot water piping shall be insulated to limit heat gain and/or loss to not more than 5 % from source to furthest point of delivery on a system.
- 3.12.7: Pipework layouts shall be installed by the contractor to allow for thermal expansion.
- 3.12.8: The routing of the cold water service pipes will be such so that separation from any adjacent hot water service is achieved to avoid heat gain to the cold water service causing its temperature to rise.
- 3.12.9: The distribution pipework shall be installed to minimize dead-legs, and thus the risk of stagnant water occurring within pipework.
- 3.12.10: The contractor shall supply and install water conditioners as necessary to prevent the build-up of limescale.
- 3.12.11: The insulation shall be protected from mechanical damage using finishes suitable for the location in which it has been installed. All pipework within plant rooms and regularly accessed areas, such as but not limited to, risers, cleaners cupboards and regularly accessed areas.
- 3.12.12: Insulating materials shall meet Green Guide rating A, with a Global Warming Potential (GWP) of zero, and an Ozone Depletion Potential (ODP) of zero.
- 3.12.13: All exposed pipes to and from the hot water cylinders shall be insulated with pipe insulation material with an R-value in accordance with table below.

Minimum R-values of pipe insulation:

<i>Internal diameter of</i>	<i>Minimum R-value - W/m²K</i>
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4. SCHEDULE OF EQUIPMENT

4.1 PLANT EQUIPMENT

TAG NO:	QTY	Area	Make & Model	Flow Rate	Dimensions	Electrical Power Supply	
						V/Ph/Hz	kW
FLTR-01	1	Plant Area	Filtration vessel complete with accessories and 5000 LPH raw water pump	5	TBD	380/3/50	3
RO-01	1	Plant Area	4000 LPH Reverse Osmosis system	4	TBD	380/3/50	TBD
PP-01	2	Plant Area	Booster pump with duty point @0,984 l/s and 0.6 bar of head	4.6	TBD	380/3/50	0.9

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2.2.1.2. Shop Drawings shall be based on the Engineer's design concept shown on the tender drawings, approved equipment selections and samples. The Shop Drawings shall be checked and passed by the Subcontractor's Chief Draughtsman and Project Engineer / Manager. The Shop Drawings shall be stamped to confirm that co-ordination with Architects, Structural and other affected Sub-contractor's drawings, has taken place.

2.2.1.3. Copies of Shop Drawings of all parts of the subcontract works shall be submitted to the Engineer for approval.

2.2.1.4. The Subcontractor may, if he so desires, obtain "electronic / e-mail" copies of the Engineer's drawings for modifications and updating if required. These drawings shall be re-titled in accordance with the Subcontractor's system and shall thereafter be submitted as the Sub-contractor's Shop Drawings. No portion of the Sub-contractor's works shall be commenced until the shop drawing has been approved by the Engineer and Architect.

3.2.2. "As-Built" Drawing Submissions

3.2.2.1. "As-Built" drawings are the Shop Drawings embodying all modifications made during construction. They shall include floor and ceiling layout drawings indicating all outlet positions. SICO drawings are also "As Built" drawings indicating the intended functioning, capacity data and control functioning of all systems.

3.2.2.2. Copies of "As-Built" drawings shall be submitted to the Engineer for approval.

3.2.3. Equipment Selection Submissions

3.2.3.1. The Subcontractor shall select equipment which complies with these specifications. These selections shall be submitted to the Engineer for approval.

3.2.3.2. No equipment shall be installed until the equipment selection submission has been approved by the Engineer if the selected equipment deviates from the design concept and/or deviates from the accepted equipment offered.

3.2.4. Sample Submissions

Samples are any samples required by the Architect or Engineer. Samples shall be physical examples to illustrate materials, equipment or workmanship, and to establish standards by which the works may be judged. Such samples, after approval, will be retained by the Architect or Engineer for a period sufficient to ascertain that the relevant component is actually provided as per such sample, but will then be returned to the Subcontractor for incorporation in the works.

3.3. Submission Procedures

Submission for approval will consist of the following activities executed by the Subcontractor and other parties involved:

3.1. General

- 3.1.1. The following related work to the Fire Water Installation (FWI) contract will be provided by others. The FWI Contractor shall be responsible for the detailing, checking and ensuring that the work as listed in the schedules and shown in principle on the drawings is provided as per his detailed builder's work and related services drawings.
- 3.1.2. Instructions for FWI Contractor's exact requirements shall be transmitted to the Contractor timeously in the form of builder's and associated services drawings in accordance with an agreed Contractor's programme. Should these instructions be issued after the completion of relevant areas, then this work will be carried out at the expense of the FWI Contractor.

4.2. Contractor and FWI Sub-Contractor

The provision and making good of all openings, sleeves, etc. through the structure shall not form part of this contract. The sub-contractor's shop drawings are to be prepared taking the location of these openings into account.

Item	Contract Documents	
	Contractor	FWI
Construction of pump house	X	
Holes through structure and brickwork	X	
Access routes, holes for equipment	X	
Maintenance space for equipment		X
Access to shafts	X	
Access to outlets and control	X	
Construction of tank bases	X	
Construction of tanks		X

4. COMPLIANCE WITH REGULATIONS AND STANDARDS

The Subcontractor shall comply with all Acts of Parliament and all regulations and bylaws of local and or other authorities having jurisdiction regarding the execution of the works in particular the following:

- ASIB 11th Edition Rules 2014 Edition (Revision 4 [August 2014]);
- National Building Regulations and Building Standards Act (Act 103 of 1977);
- The Subcontractor is to comply with all requirements of the Occupational Health and Safety Act (Act 85 of 1993) and all subsequent revisions thereof. Further, the Contractor undertakes to employ only people who have been duly authorised in terms thereof and who have received sufficient health and safety training to ensure that they can comply therewith. In addition, the Sub

- Government, Provincial and Local Authorities Ordinances, Regulations, By Laws, Rules and other Statutory requirements; and
- Specifications and Codes of Practice issued by the South African Bureau of Standards and British Standards Institute. The former shall have precedence over the latter where both bodies have issued conflicting specifications or codes of practice.

5. APPROVALS

The subcontractor shall, before building starts, submit the following to the Consulting Fire Engineer:

- a) the application for the approval of the design;
- b) a signed declaration that the installation has been designed in accordance with this standard by a competent person;
- c) a signed undertaking that the installation will be installed by an approved installer, in accordance with the appropriate plans and drawings, and as specified in this specification and relevant standards;
- d) appropriate plans, drawings, details and information required in terms of this specification;
- e) particulars of the power supplies; and
- f) a statement that the installation will comply with this standard, together with details of any deviation(s), and

The consulting fire engineer shall be provided with a summarized schedule that contains all the relevant information relating to the system.

6. HOISTING AND RIGGING

6.1. Hoisting

If at time of tendering the Contractor is known, the tenderer shall check with the Contractor which of his proposed equipment and/or materials could be hoisted by the Contractor and at which cost.

If the Contractor is not known, the Tenderer shall make due allowance for the hoisting of his equipment and/or materials.

6.2. Rigging

The Tenderer shall be responsible for rigging of his equipment in position.

7. PROGRAMMING

7.1. Subcontractor shall submit to the Engineer within two weeks of appointment, a

the Sub-contractor as the Contractor shall require.

- 7.8.** The purpose of such meetings will be to review progress against the programme, to investigate and establish actual or impending causes of delays, to instruct on such remedial action as may from time to time be necessary and generally to ensure that the progress of the work remains on programme at all times.

8. CONTRACT MANAGEMENT

- 8.1.** All activities, information required, approvals, etc. shall be managed by the officially appointed Sub-contractor's Project Engineer / Manager to ensure completion of the Sub- contract at the agreed completion date and of specified quality.
- 8.2.** It shall be the duty and responsibility of this Project Engineer / Manager to identify any item such as delays, activity time overrun, late information and/or approval at least fortnightly, and describe in his standard report to the Contractor proposed action to overcome the adverse conditions to maintain the planned construction schedule.
- 8.3.** It shall be the duty and responsibility of this Project Engineer / Manager to prepare a detailed tabulated construction activities breakdown with related earliest and latest dates for information required, approval, area availability and inspection.

Construction activities are:

1. Drawing Submissions.
 2. Equipment Selection Submissions.
 3. Off-Site Manufacturing.
 4. Installation on Site.
 5. Testing and Commissioning Procedures Submission.
 6. Testing, of the complete works.
- 8.4.** The Project Engineer / Manager shall weekly, throughout the progress of the Sub-contract, amend and update the 'tabular list of activities' to incorporate all variations, delays and remedial action to ensure that the completion date will be met. He shall particularly note and report to the Contractor on unusual conditions encountered which may (or has) delayed progress of the work related to the contractor's programme.
- 8.5.** The Project Manager shall monthly report to the contractor, with copies to the Architect and Engineer, in writing only and shall sign each progress report, equipment submission, drawings and inspection checklists.
- 8.6.** The Project Manager shall be capable of using network diagrams to explain the sequence and actual dates used by him in his tabular form monthly report in order to prove that 'cut off' dates are realistic and factual and not an attempt to

- 12.1. Concurrent with equipment submissions the subcontractor shall submit full testing, balancing and commissioning procedures for each item of equipment.
- 12.2. Prior to the pre-start inspection the sub-contractor shall submit, and have obtained approval of a fully detailed commissioning programme.
- 12.3. After physical completion of the sub-contract works the Sub-contractor shall carry out all preliminary tests necessary to satisfy himself that the materials and equipment comply with the provisions of the sub-contract and are in a state suitable to satisfy the requirements of the acceptance tests by the Engineer. The preliminary tests shall then be completed satisfactorily before the Sub-contractor, through the Contractor, requests the Engineer to witness the acceptance tests.
- 12.4. The Engineer may request the Sub-contractor to replace any portion of the subcontract work which does not conform to the requirements of the subcontract documents.
- 12.5. In the event of the plant or installation not conforming to the requirements of the sub- contract documents, the Employer shall be at liberty to either recover from the Sub- contractor or to deduct from the subcontract price all reasonable expenses incurred by himself or his agents attending the repeated test.
- 12.6. After physical completion has been reported and all defects made good, "start-up" shall take place and the above check out procedures shall be carried out.
- 12.7. Prior to the carrying out of acceptance tests the Subcontractor shall operate the entire system for as long a period as may be required to provide satisfactory performance in this specification and ASIB 11th Edition Rules at all times for 24 hours a day continually.
- 12.8. The Subcontractor's Operator(s) shall be fully conversant with the equipment operation and experienced in running similar installations. The Subcontractor shall train the Employer's operator(s) to enable them to be responsible for and capable of operating the equipment.

13. GUARANTEE

The Subcontractor shall guarantee that the automatic sprinkler installation is installed and commissioned in such a manner that it will function to the true intent and meaning of the sub-contract documents.

14. CERTIFICATION

14.1. Background

In order to obtain a Fire Clearance Certificate on completion of the project, it will

-
- 15.4.** No portion of the work shall commence before the Quality Manual has been approved by the Engineer.

16. OPERATING AND MAINTENANCE MANUALS

The Subcontractor shall supply five (5) comprehensively indexed Operating and Maintenance Manuals, bound in loose leaf plastic covers.

The manuals shall be arranged in two sections:

16.1. Operation Manual

This manual should consist of two parts.

16.1.1. Part I - Operation Instruction

Contains information a qualified operator needs.

- 1) to start and stop equipment.
- 2) to control and monitor the performance of the equipment in normal modes of operation.
- 3) to change from one mode of operation to another and
- 4) to operate equipment in emergency situations.

Operation procedures with proper flow charts for all integrated systems are also required. The system function should be represented pictorially and in writing.

Full trouble analysis procedures shall also be included.

16.1.2. Part II - Performance Verification Procedures

Contains all the information a qualified operator needs to verify equipment and overall system performance. Any design calculations needed for performance verification shall be included in this manual.

16.2. Maintenance Manual

This manual should also consist of two parts.

16.2.1. Part I - Inventory

Contains a listing of all systems and pieces of equipment to be maintained as well as all the technical information needed to order spare parts. Manufacturers' catalogues are considered useful adjuncts only.

The full names, addresses and contact details of all suppliers of equipment shall be included.

16.2.2. Part II - Maintenance Programme

Contains the information necessary to perform breakdown, preventative, and predictive maintenance. These programmes include written information regarding when or how often to perform maintenance in the most efficient and economical

20.2. Sub-Contractor Requirements

The sub-contractor responsible for the installation of the automatic sprinkler system must comply with the following requirements:

- Employ at least two people who hold a certificate of competency issued by a training establishment (such as the ASIB) to the Engineer's approval;
- Employ their own erection workforce with a minimum of two fitters deemed competent by experience and / or qualification;
- Maintain a suitably stocked, staffed and equipped workshop capable of servicing the contractual obligations and emergency repairs;
- Have 24-hour availability for emergencies;
- Successfully completed other installations of at least the size and scope of this project

Note: Proof of compliance with these requirements is to accompany the tender submissions.

20.3. Quality Assurance

The Subcontractor shall submit quality plans in conformance with ISO 9000, for approval by the Engineer. The subcontractor shall establish, document and maintain throughout this project an effective and economical quality system to ensure and demonstrate that material or services conform to the specified requirements. The documented Quality system shall include Quality Management objective policies, organisation and procedures to demonstrate compliance.

The tenderer shall submit with this tender:

- The level of Quality Assurance which will be provided for this project to ensure the quality of material and services.
- Sufficient information and data to allow the evaluation of the proposed Quality Management System in order to provide the purchaser with assurance that the quality of material and service is provided in a rational and cost-effective manner.

No portion of the work shall commence before these quality plans have been approved by the Engineer.

21. EQUIPMENT SELECTION

Only equipment and components specifically designed for the proposed use may be used. To this end, all equipment must be either listed / approved by an approved testing laboratory / authority. Proof of such compliance must be provided for each item.

Equipment Selection Submissions shall be indexed in order to form part of the O&M Manual.

The drawings and Equipment Selections shall be submitted in a number of copies

piping to SANS 62 suitably protected against corrosion with two layers of fully overlapping Denso wrap or equally approved, or Class 16 PVC-U may be used for pipes always under pressure as per SANS 966 Code of Practice. Pipes in excess of 150 mm diameter shall be medium grade quality black piping to SANS 719 with two layers of fully overlapping Denso wrap or equally approved or PVC-U piping to SANS 966 as above.

22.3. Welding

No welding will be allowed to take place on site. All welding (off site) is to be SANS 044. Only coded welders shall be allowed to weld pipe work, and welders certification shall be submitted prior to commencing the installation.

22.4. Surface Preparation

All sharp edges, burrs, rags and weld splatter shall be removed and weld areas shall be abraded and/or ground. The surface shall be degreased and rinsed with solutions supplied by the coating manufacturer prior to mechanical cleaning (Section 4.4 of SANS 064 Code of Practice). Surface preparation shall be in accordance with ISO 8501-1 and SANS 064 and shall be conducted before erection of pipes.

22.5. Priming of Pipework

All concealed and exposed piping shall have a red oxide prime coat which is factory applied. All damaged areas are to be wire-brushed and re-primed where necessary.

22.6. Use of Denso Wrap

Where Denso protection is required, the following specifications must be adhered to:

- Piping to be prepared using Denso Primer, Denso HT Inner Wrap and Denso PVC Outer Wrap;
- Fittings and pipework other than cast iron must be hot dip galvanised prior to wrapping;
- Denso HT shall be applied by hand and wrapped in a clockwise direction with a minimum 55% overlap; A second layer shall then be installed.

steelwork shall not exceed Grade B of ISO 8501-1.

22.10. Fasteners

All nuts and bolts shall be either hot dip galvanised or stainless steel unless otherwise specified. All galvanised nuts and bolts shall be de greased, patch primed and finish coated in accordance with the specification for the respective area of the plant.

22.11. Prevention of Galvanic Corrosion

Care must be taken to prevent or mitigate the corrosion caused by dissimilar metal contact on cooling coils, tubes and tube plates, pipes, flanges, frames etc. Typical metals encountered would be copper, aluminium, zinc, mild steel and stainless steel. The junctions between dissimilar metals must be electrically insulated where possible. Pipe flanges between dissimilar metals must be insulated using insulating gaskets for the flange faces and insulating sleeves and washers for all nuts and bolts. Where the insulation of the junction between dissimilar metals is not practical, the cathode surface on the electrolyte or "wet" side must be coated for a minimum distance of 100 mm from the junction. The applied coating must effectively isolate the coated surface from the electrolyte.

22.12. Inspection and Testing

The following inspections and tests shall be performed by the sub-contractor and witnessed by the design team in accordance with the approved Quality Plan on corrosion protection. Visual inspection for paint film defects shall be performed after each coat is applied. All defects including pinholes, sags and runs shall be corrected before the next full coat is applied. Dry film thickness shall be measured in accordance with SANS Method 141 Clause 3.3 (smooth disc). The required dry film thickness given in "windows" for each coat in the relevant coating specification, i.e. required minimum and acceptable maximum. Any reading outside this range is cause for rejection and may require the removal of the entire coating and reapplication thereof. Actual readings and not averages shall be recorded.

22.13. Quality Assurance

22.13.1. Sub-Contractor Qualification

The design team may, at its discretion, require a Quality Audit of the painting sub-contractor to ensure that he has the management, facilities, skilled staff and quality control facilities and staff, to carry out quality control during application of coatings to ensure compliance with specification. The sub-contractor shall accept full responsibility for the quality of his work and of materials used, irrespective of any quality surveillance that may be carried out by the design team.

lettering, shall be fixed on the outside of an external wall as close as practicable to the entrance nearest to the control valve, and shall bear the following wording:

FIRE INSTALLATION CONTROL VALVE

Each Fire Installation Control Valve shall be fitted with a sign corresponding to the area protected as depicted on the block plan.

23.3. Labelling

A sign bearing the wording:

CONTROL VALVE

in letters of height at least 20 mm shall be fitted close to the main and any subsidiary control valves.

NOTE: The wording should be in white letters against a red background.

Where the control valve is enclosed by a door, the sign shall be on the outside of the door, and a second sign in white letters against a blue background, bearing the wording:

KEEP LOCKED / SHUT

in letters of height at least 5 mm shall be on the inside of the door.

23.4. Signage Material

All fire signs such as stack storage heights, terminal test points, valve location plates, block plans, operating instructions and so forth are to be fabricated from material such as anodised aluminium or chromodeck.

23.5. Non-Return Valves

A reflux / non-return valve is to be fitted to the water supply connection with testing arrangement. This valve must be so positioned that it can easily be tested and maintained.

A non-return valve-suitable for use shall be installed at the following positions:

- a) on each water supply from a main;
- b) on a fire brigade inlet or a booster pump connection;
- c) between a pump connection and the communication pipe that serves the installation; and
- d) on any pipe that is provided with a fire brigade or a booster pump connection and that is connected to a storage tank in such a position and way as to prevent the flow of water into the tank when the pump connection is in operation.

24. BOOSTER CONNECTIONS

Twin 65mm booster connection must be provided with 65mm instantaneous male

tanks within 36 hours.

The tank infill must include the allowance for a quick fill option where a (normally closed) ball valve is supplied in addition to the flow control valve. This can be used during initial fill, as well as refill after maintenance.

If, with the means available, the tank cannot be refilled at the above rates, the capacity of effective stored water must be increased by one third in excess of the calculated requirement or by the appropriate amount of the shortfall, whichever is the greater.

Flow control for tank in-fill and all other associated valves shall be readily accessible for exercising, testing and maintenance.

Where the pressure characteristic of the town main is not capable of operating a flow control valve, ball valves will be permitted for tank in-fill.

All steelwork, including any roof steel of a suction tank shall be protected against corrosion. This shall include sand-blasting, priming and coating making use of an epoxy paint.

Content gauges must be provided which shall be an indicator of the flag and ball float type or other approved indicator type, showing the depth of water therein. The use of glass or plastic tube which indicates the level of the water is not acceptable due to clouding.

Overflow pipes and drainage facilities must be provided. Where necessary these shall be taken to a suitable drainage point.

Tanks must be completely enclosed with a roof to exclude daylight and to ensure that water does not become contaminated with extraneous matter.

An easily accessible roof hatch with a minimum dimension of 750 mm shall be provided for the roof. The hatch cover shall be of steel plate construction with a minimum thickness of 4,8 mm. The opening shall have a curb of not less than 100 mm high and the cover shall have a minimum downward overlap of 50 mm. A substantial lockable catch shall be fitted to the cover to keep it closed.

Outside and inside steel ladders that are arranged for convenient passage from one to the other and through the roof hatch shall be provided. Ladders shall not interfere with the opening of the roof hatch cover and shall not incline outward from the vertical at any point.

A town main bypass connection shall be provided. The connection is to be taken to the delivery side of the pump downstream of the non-return and stop valve. The bypass shall be the same diameter of the water supply connection and shall be fitted with a non-return valve. Stop valves, chained in the closed position, shall be fitted on the upstream and the downstream side of the non-return valve.

Where necessary, provision shall be made at the point where the supply water enters the tanks for suitable baffles to ensure the minimum entrainment of air.

The pump suction tank suction pipe shall be fitted with a suitable vortex inhibitor which allows for the low water level of a suction tank to be taken as the underside

2 and 3 cylinder naturally aspirated or air cooled	6 m ³ per minute
4 cylinder naturally aspirated	6 m ³ per minute
4 cylinder turbo charged	6 m ³ per minute
6 cylinder naturally aspirated	6 m ³ per minute
6 cylinder turbo charged	12 m ³ per minute
8 cylinder engines	15 m ³ per minute
Above 7 litre capacity	20 m ³ per minute

Provisions shall be made for natural drainage of the pump room. The cooling water from the engine jacket and the leak off water from the pumps shall be taken to a point external to the pump room. If required, a sump pump must be provided and a warning device fitted at the top of the sump.

The pump house must be arranged and sized so as to allow easy access to pipe work, pump units and controlling equipment.

All pressure gauges within the pump house must be glycerine filled with a dial face of not less than 100 mm.

To minimise the amount of time the fire pump is inoperative for maintenance or other reasons there shall be a suitable number of flanged joints on the pipe work to allow any of the equipment to be removed for overhauling or replacement.

All pipe work must be suitably supported with at least one support on both suction and delivery as close to the pump casing as possible and no strain shall be imposed on the pump casing by the pipe work. It shall be possible to unbolt suction and delivery flange bolts on the pump and no visible movement shall be observed in the pipe work at this time.

The pump and driver shall be mounted on a common base plate and connected by the means of a flexible coupling. A suitable coupling guard shall be fitted. Provision shall be made for suitable lifting lugs permanently attached to the base plate.

The base plate shall be securely attached to a solid foundation. A substantial foundation is important in maintaining alignment. The foundation shall be made of reinforced concrete.

The base plate with pump and driver mounted on it shall be set level on the foundation. After the pump and driver unit have been placed on the foundations, the coupling halves shall be disconnected and the pump and driver checked for alignment; they shall be checked for alignment again after all pipe work has been connected, the base plate levelled, and the base plate and foundation bolts grouted in concrete. Only after alignment shall the coupling halves be reconnected.

28.3. Suction Pipework and Fittings

All suction lines shall be fitted with suitable strainers.

All pump suction stop valves must be of the gear driven butterfly type and be

shall be connected with a concentric reducer, i.e. a nozzle shaped transition piece.

A non-return valve shall be installed on all pump delivery assemblies.

A stop valve shall be installed on the downstream side of the non-return valve to make the non-return valve and pump accessible for repair.

A glycerine filled pressure gauge having a dial not less than 100 mm in diameter shall be connected to the delivery pipe work between the non-return valve and the pump delivery via a 10 mm isolating gauge cock. The face of the dial shall read in kilopascals and have a pressure range of at least twice the rated working pressure of the pump.

There must be a test valve and pipe connection coupled to the pump delivery branch downstream of the back pressure valve, including an orifice plate, if necessary, to facilitate a running pressure test on the pump at approximately the full load condition when the test valve is fully open.

Alternatively, an approved direct reading flow meter may be used to test the pump. Where the pump draws its water from a sump, care shall be taken to avoid aeration of the water during testing.

The test water shall be returned to the suction tank.

Where it is impracticable to dispose of the water discharged under a full load test condition, details of the facilities available must be submitted to the consultant for consideration.

As more than one pump forms the source of supply to the fire protection system, they shall have identical characteristics. The test pipe may be taken from the common delivery pipe, provided a stop valve is fitted in the delivery pipe downstream of the test connection.

While not testing, the stop valves on the test pipe must be secured in the closed position by 25 mm link chains and keyed alike padlocks.

All pump delivery stop valves must be of the gear driven butterfly type and secured in the open position by 25 mm link chains and keyed alike padlocks.

A direct connection without isolating facilities for the starting mechanism must be taken from downstream of the delivery stop valve and shall be not less than 20 mm diameter. Each pump must have separate starting arrangements.

All pump delivery pipe work, inclusive of the installation pipe work, must be pressure tested to at least one and a half times the working pressure of the systems subject to a minimum pressure of 2 000 kPa at a ground level hydrant or hose reel.

29. JOCKEY OR MAKE UP PUMP

A jockey or make up pump must be fitted to maintain pressure in the system.

The jockey or make up pump shall have a rated capacity of not less than any normal leakage rate. They shall be of centrifugal pump design having a discharge

the rate of flow and pressure required at the highest and most remote parts of the protected premises, the output will be so controlled that there is not an excessive rate of discharge at the lowest level in areas close to the installation valves.

Applications for approval shall show that the pressure over flow characteristics of the pump will adequately satisfy the calculated requirements of the most remote and most favourable areas of operation.

It is recommended that the Nett Positive Suction Head, (NPSH), required for any pump when discharging at the maximum flow rate shall not exceed 5.9 metres. It shall be ensured that the differential between the NPSH available and the NPSH required will not be less than 1.5 metres.

The closed outlet valve pressure, under installed conditions must not exceed 600kPa. In selecting pump characteristic curves, allowance shall be made for the increase in pressure at zero flow due to an increase in shaft speed of the prime mover and for an increase or decrease in pressure due to a positive or negative pressure at the pump suction flange.

Pumps shall be of centrifugal horizontal shaft design.

Where the following pump parts are used, the following materials shall apply:

Part	Material
Bearings	Ball/Roller
Casing	Cast Iron
Case wear rings	Bronze
Gland	Bronze
Gland packing	High Grade Graphite Cotton
Impeller	Bronze
Lantern Rings	Hi-dur
Mechanical Seals	Carbon Ceramic
Shaft	E N 8 Steel

-
- The pump serial number
 - The impeller diameter
 - The rotational speed
 - The maximum power absorbed at the flow rate given

Where the performance characteristic is achieved with an orifice plate not integral with the pump delivery, the plate must carry a reference to the fact that the performance given is that of the pump and orifice plate combination, together with the K-Factor of the orifice plate calculated in accordance with accepted formulae.

Sufficient water must be permitted to circulate when the pump is running to prevent it from overheating when operating against a closed discharge valve. The quantity of water discharged may not be less than the equivalent of 10% of the numerical kilowatt rating of the prime mover and must be taken into account when sizing a pump. When the pump set is shut down, no water must circulate. In any event the manufacturer must be consulted and his recommendations adhered to. A flow indicator or sight glass must be provided upstream of an isolating valve which shall be locked in its correct operative position.

Means must be provided to reduce the applied water pressure to the starting device to simulate the condition of automatic starting at the requisite pressure.

This can take the form of a drain valve on the hydraulic connection to the pump starting pressure switch and suitable permanent drainage facilities must be provided. In order that the pressure may be dropped at a suitable rate to judge the pump cut in pressure, this drain valve may be fitted with an orifice plug. To facilitate testing and servicing, an isolating valve, with a bypass, shall be fitted on the hydraulic connection. The bypass shall incorporate a 3 mm orifice and a back pressure valve allowing flow towards the trunk main. A glycerine filled pressure gauge with a dial face of not less than 100 mm and fitted with an isolating gauge cock to indicate the pressure at which the pump starts must be placed between the isolating and drain valves in such a position that it can be read during the starting test.

Power sufficient to drive the pump at the required pressure must be available at all times throughout the year.

Power for the warning systems must be taken from a separately switched sub-circuit to that feeding the pump in the case of the electric motor driven pump. In the case of the diesel engine driven pump, the power for the warning system may not be taken from the battery which is used for automatic starting.

The warning system shall be equipped with its own batteries which shall have an ampere-hour capacity to provide 48 hours of monitoring the complete system and 1 hour of audible and visual alarm. The term "sub-circuit" means a circuit connected to a switch supplied directly from the low or medium voltage bus-bars on the fire pump room distribution board.

- The engine speed
- If the engine is fitted with a heat exchanger, the initial temperature and the rise in temperature of the engine closed-circuit cooling water
- The pump gland temperature
- Ambient temperature
- Motor bearing temperatures
- Stator temperature

30.2. Diesel Engine Driven Pump

The diesel engine must be of the compression ignition mechanical injection type capable of being started without the use of wicks, cartridges, heater plugs or ether, at an engine room temperature of 4° Celsius and must accept full load within 15 seconds from the receipt of the signal to start.

The diesel engine must be naturally aspirated, supercharged or turbo-charged and either air or water cooled. Charge air cooling must be water cooled. Radiator cooling is not an acceptable or suitable for South African climatic conditions.

The diesel engine must be capable of operating continuously on full load at the site elevation for a minimum period of 6 hours.

The diesel engine must be provided with a governor to control the engine speed within 4.5% of its rated speed under any condition of load up to the full load rating.

The diesel engine must not have any manual device fitted to the engine which could prevent the engine starting. Any device must return automatically to the reset position for automatic starting.

The diesel engine must be provided with a tachometer and hour meter which must be permanently attached to the engine or the controller panel.

The diesel engine must be provided with, if necessary, an excess fuel device for the automatic cold starting of the engine. The device is to return automatically to the reset position for automatic starting.

The following are the permitted maximum speeds for a diesel engine:

Diesel engine size	Maximum speed
2 or 3 cylinder	2600 rpm
4 cylinder naturally aspirated	2400 rpm
4 cylinder turbocharged	2200 rpm
6 cylinder naturally aspirated	2400 rpm
6 cylinder turbocharged	2200 rpm
8 cylinder	1800 rpm

The diesel engine selection must be based on the continuous rating in accordance with BS 5514 or DIN 6271 B2 or SA Equivalent.

open" regulating valve on the inlet side and the ultimate open discharge shall be free of any other valves or restrictive fittings.

A flow indicator sight glass or tundish shall be fitted on the engine cooling water discharge pipe. The piping must not be returned directly to the pump suction branch. In all cases care shall be taken to ensure that no flow through the engine jacket takes place whilst the engine is stationary. Spring loaded or electrically operated devices are not permitted.

30.4. Air Filtration

The air intake must be fitted with a filter of adequate size to prevent foreign matter entering the engine and must be protected from water discharge where sprinklers are fitted in the engine room.

30.5. Exhaust System

The exhaust must be fitted with a suitable silencer and the total back pressure shall not exceed the engine manufacturer's recommendation.

Where the exhaust system rises above the engine, means must be provided to prevent any condensate flowing into the engine.

The exhaust system must run at least 300mm above engine base plate level.

The engine exhaust system shall be lagged or guarded, as necessary, for the safety of personnel.

Attention is drawn to the need to ensure that the point of exit of the exhaust pipe from the engine house does not pose any fire risk to the structure, and that exhaust fumes cannot be drawn into the engine house or into any occupied building.

Note: The tenderer shall allow for all exhaust pipework from the pump room to the exterior of the building.

30.6. Engine Shut-Down Mechanism

An extended accessible fuel stop control or other approved means, clearly labelled must be manually operated and return automatically to the starting position after use.

30.7. Fuel

The engine fuel must comply with the engine manufacturer's requirements. There must be kept on hand at all times sufficient fuel to run the engine on full load for six hours in addition to that in the engine fuel tank.

Note: The fuel tank shall be full at the time of hand over to the client.

30.8. Fuel Tank

The fuel tank must be of welded steel conforming to British Standard 814:1 or SA equivalent for Mild Steel Drums.

- An inspection and cleaning hole
- A filter between the fuel tank and fuel pump mounted in an accessible position for cleaning
- Means to enable the entire fuel system to be bled of air

Air relief cocks are not allowed, screwed plugs are permitted.

30.11. Starting Mechanism

Provision must be made for two separate methods of engine starting as under noted. Two separate batteries of adequate capacity must be provided for automatic and manual starting of the engine. Where electric starting is used, the system must operate from a battery supply recommended by the engine supplier.

Automatic starting by means of a battery powered electric starter motor of the axial displacement type having no retaining catches or inertial features. The pinion must rotate at reduced speed during the process of engagement with the flywheel ring, but during the initial engagement the pinion and armature shaft assembly must mesh by moving axially towards the gear ring. The starting sequence must be initiated by a fall in pressure in the water supply pipe to the sprinkler installation, and repeat engagement facilities must be provided should the starter pinion fail to engage with the engine flywheel ring.

When the engine fires, the starter motor pinion must be withdrawn from the flywheel ring automatically by means initiated by a directly driven tacho generator or centrifugal speed switch or proximity switch. Flexible drives are not permitted. Battery charging, voltage generators, alternators and pressure switches on the engine lubricating system or water pump outlet, as a means of de-energising the starter motor, are not permitted.

The starter motor in combination with each battery power supply shall have a design capability to rotate the engine for at least 3 minutes or 12 cycles of not less than 15 seconds cranking and not more than 6 seconds rest.

30.12. Batteries

Batteries shall be mounted and securely clamped against displacement on wooden base stands or stillages and located in a readily accessible position where the likelihood of contamination by oil, fuel, damp, pump set cooling or flooding water or being damaged by vibration or mechanical means is unlikely. The battery shall be installed as close to the starter motor as possible to minimise voltage drops between the battery and starter motor terminals.

Current carrying parts shall be at least 300 mm above finished floor level.

Dual, continuously rated, heavy current solenoid operated contactors for connecting the batteries to the engine starter motor shall be located on the engine or bedplate immediately adjacent to the engine starter motor or batteries.

Sealed maintenance free batteries only are acceptable.

30.15. Spare Parts

Spare parts recommended by the engine manufacturer must be supplied with and kept on hand.

30.16. Deration Factors

The following deration factors must be allowed for when determining the kilowatt output of the diesel engine:

Altitude Deration	
Altitude Deration	
Naturally Aspirated Engines:	3,5% every 300 metres above 150 metres above sea level
Turbo Charged Engines:	1,5% every 300 metres above 150 metres above sea level

Temperature Deration	
Inter-cooled Turbo Charged Engines:	1% every 300 metres above 150 metres above sea level
Naturally Aspirated Engines:	2% every 5,5° Celsius above 30° Celsius ambient
Turbo Charged Engines:	3% every 5,5° Celsius above 30° Celsius ambient
Intercooled Turbo Charged Engines:	1% every 5,5° Celsius above 30° Celsius ambient

The engine shall have 10% power in excess of that absorbed by the pump at 110% of the calculated maximum flow after deductions for altitude, temperature and ancillary components using the continuously rated curve at the engines selected speed.

Power available shall be understood as the net power at the driver shaft after derating for altitude and temperature, and for engines and auxiliary drives such as fans and cooling water pumps.

31. ELECTRICAL INSTALLATIONS

31.1. General

Each pump room shall be equipped with a distribution board which shall be designed to interrupt the fault current. The board shall be fitted with current limiting devices to ensure that the controller, monitoring panel or any other accessory which is connected to the switchboard is afforded suitable short circuit back up protection.

In the case of diesel engine drive controllers, the following shall apply:

- All DC electrical components shall be capable of functioning effectively at the reduced voltage levels that occur during engine cranking; and
- Relays shall not chatter on drop-out and solid state circuits shall not "switch" under reduced voltage conditions.

The battery power supply for indicator panels or alarm systems shall not be supplied from the batteries provided to start the diesel engine(s).

31.3. Cables and Wires

Electric cables shall be:

- Suitable for fire water installation use
- Selected, handled and installed in accordance with SANS 10198-2; SANS 10198-4 and SANS 10198-8
- Protected from direct exposure to fire
- Rubber-insulated and rubber-armoured, or enclosed in steel conduit, or mineral- insulated and copper-sheathed.

31.4. Wires

Electrical wires shall:

- Be single core, PVC-u-insulated, annealed copper conductors of 600 V grade in accordance with SANS 1507
- Be continuously rated
- Not use conductors that have fewer than seven strands or that are of cross-sectional area less than 2.5mm².

The following are normally deemed suitable for sprinkler use (depending on the particular application):

- Wiring and wireways that comply with the requirements of SANS 529, SANS 950 and SANS 1065: Part 1
- Cross-linked polyethylene-insulated (XLPE-insulated) electric cables that comply with the requirements of SANS 1339
- In the case of cables to motors inside buildings, cable that are
 - armoured and rubber-insulated in accordance with the requirements of SANS 1574, or
 - enclosed in screwed steel conduit and that are rubber-insulated in accordance with the requirements of SANS 1574 or that are mineral-insulated and copper-sheathed, and
 - wireways for electrical cables that comply with the requirements of SANS 1197: Part 1.

Steel conduit shall be threaded in accordance with the requirements of SANS 1306: Part 1.

External overhead cables are not permitted.

drive controllers or monitoring panels.

31.8.2. Main Power Supplies

The power supply shall be obtained from a public electricity supply or other suitable reliable source. Diesel engine driven generator sets are not classed as a reliable source.

If the electricity supply is not taken from a public source, full particulars of the generating plant shall be submitted to the consulting engineer at the planning stage.

Main power supplies for the installation shall be taken direct from:

- The main high voltage (HV) switchboard for HV electric motor-drive controllers
- The main medium voltage (MV) switchboard for all MV

equipment The power supplies for the pump room shall be derived direct from:

- The main HV switchboard, in the case of the HV electric motor-driven controllers
- The main MV switchboard, in the case of the pump room MV switchboard

Pump room electrical power connections from the distribution board to the pump drive controllers, annunciator / repeater panels, audible and visual signalling devices, pressure, flow and level monitors and interconnections between these items shall be such as to be approved by the ASIB.

The power supply circuit for electric motor-driven pumps shall be separate from all other circuits in the premises.

Power to drive the pumps shall be available at all times.

overload protection.

Sprinkler installation metalwork and metal wire-ways for electric cables shall be efficiently connected to the main earthing terminal of the electrical installation.

Cables and cable routes for electrically driven pumps

External overhead cables shall be not used for electrically driven pumps.

To protect cables from direct exposure to fire they shall be run outside the building, or through those parts of the building where the fire risk is negligible and that are separated from any significant fire risk by walls, partitions or floors with a fire-resistance rating of at least 60 minutes, or they shall be given additional direct protection.

31.11. Pump Drive Controllers

31.11.1. General

Each pump must have its own controller which shall be specifically designed for sprinkler fire pump service and approved by the ASIB.

All pump manufacturers must use the panels which were approved in conjunction with their units.

A certificate of approval will be issued by the ASIB or its nominated representative and any modifications without prior approval will invalidate the certificate.

The controller shall be completely assembled, wired and tested by the manufacturer and an independent authority before shipment from the factory to site.

The controller shall be labelled in accordance with this tender document and the nameplate shall show plainly the name of the manufacturer, the identifying designation, the complete electrical rating, and the certificate of approval number.

It shall be the responsibility of the approved sprinkler installer to make the necessary arrangements for the services of a manufacturer representative, when needed, for installation and adjustment of the equipment.

31.11.2. Labels

Labels shall consist of a composite red/white/red plastic sandwich type to show white letters on a red background. Anodised aluminium type labels with red background are acceptable.

Label descriptions shall be in both English and any other required official language. The following letter and numeral sizes shall be used for labels:

Label Type	Letter Height
Main panel designation	12 mm
Individual component designations	6 mm

and shall be equipped with a hinged door supported on robust hinges and secured by a sufficient number of substantial catches to ensure proper sealing of the gasket.

The door shall be fitted with a non-deteriorating gasket made from butyl sponge rubber or similar material.

The following shall be provided in a suitable pocket permanently secured inside the enclosure door:

- Wiring diagrams with clearly identifiable letters and numbers for all components and wires
- Complete component schedule giving wiring diagram reference, make, type, size and supplier
- Operation and maintenance instructions.

Complete operating instructions, in English and any other official language that may be required, a wiring diagram and a component schedule shall be mounted in a glazed frame permanently fixed in the pump room.

Electrical terminals and both ends of all wires shall be plainly marked to correspond with the as made wiring diagrams for the controller.

31.12. Electric Motor Drive Controllers

The controller shall be labelled: ELECTRIC MOTOR DRIVEN PUMP CONTROLLER

All busbars and connections shall be readily accessible for maintenance work after installation of the controller without disconnecting the external circuit conductors.

Circuits which are depended upon for proper operation of the controller shall not have over current protective devices connected in them. Maximum short circuit protection with current limiting facilities shall, however, be provided for all circuits.

All switching equipment for manual use in connecting or disconnecting or starting or stopping the motor shall be externally operable.

A manually operated fused isolating switch shall be mounted within the controller enclosure.

The switch shall be equipped with one fuse in each phase and the switch rating shall be determined by the fuse size.

The fuses shall conform to this tender document and the fuse rating shall be in accordance with the Fuse Table detailed in this document, irrespective of method of starting.

High rupturing capacity, (HRC), cartridges of a suitable rating mounted in insulated withdrawable fuse holders, conforming to this tender document shall be provided for the protection of each branch circuit conductor.

The removal or blowing of any HRC fuse will initiate an alarm or fault condition at the alarm annunciator panel.

55	200	75	200
80	250	93	250
132	350	120	300
160	400	165	350
185	450	220	400
215	500	300	500
250	600	325	600
320	700	425	800
375	1000	550	1000

For motors in excess of these ratings, the manufacturer shall submit details of a proposed back up protection for approval to the ASIB.

A voltmeter complete with fuses and a voltmeter selector switch arranged to select phase to phase and phase to neutral readings shall be provided.

An Ammeter, 3 current transformer and a selector switch shall be fitted on the controller connected in such a way as to test each phase in order to check the loading of the motor.

The controller shall be fitted with electrically separate potential free contacts to make provision for the following conditions to be maintained:

- Fire alarm
- Power failure, (main electrical supply)
- Pump failure
- Pump running
- Control circuit failure, (wired from the end of the control circuit)

Indication on the controller shall be in the form of indicating lamps in duplicate to show the following:

- Fire alarm
- Pump failure to start.
- Pump running

A reset push button shall be fitted on the controller to reset the controller.

The controller shall latch on to a starting signal until the reset push button is pressed.

A push button shall be fitted on the controller for emergency starting which will bypass the automatic starting circuit.

A separate test push button shall be fitted on the controller to initiate the automatic starting sequence operation.

Should the power requirements of the fire pump be such that it cannot be started at the same time as the plant is operating, an electrically separate contact and timer shall be provided on the controller to initiate tripping of the plant circuit breaker before power is applied to the motor terminals.

-
- Power failure, (battery charger electrical supply)
 - Pump failure
 - Pump running
 - Low oil pressure
 - Charger failure, (from both charger outputs in parallel)
 - Control circuit failure, (from the end of the control circuit)

Indication in the form of duplicate indicating lamps shall be provided to show the following:

- Fire alarm
- Pump failure
- Pump running
- Low oil pressure

A reset push button shall be provided to reset the controller.

The controller shall latch on to a starting signal until the reset push button is pressed.

One "emergency start" push button shall be provided for each battery and the circuitry shall be arranged so that each push button will bypass the automatic starting circuit and will energize its associated starter motor solenoid. It shall be possible to depress both push buttons and apply power from both batteries simultaneously to the starter motor.

An adjustable voltage sensitive device shall be provided to sense the potential generated by the tacho generator mentioned in this tender document. One set of normally open contacts of one voltage sensitive relay shall be wired in parallel with that of the other relay to initiate the pump running relay.

- Each engine shall be fitted with two tacho generators taken off different drive points on the engine, or,

- A timer with a 0 to 30 second setting normally set to 20 seconds.

When the hand/auto selector switch is in the hand position, the pump shall run continuously, and when the switch is in the auto position, the pump will start and stop automatically under the control of the pressure switch.

Selector switches incorporating off positions are not acceptable.

32. ANNUNCIATORS FOR PUMP ROOM INSTALLATIONS

32.1. General

The controller shall be labelled: PUMP HOUSE ANNUNCIATOR PANEL

The pump room shall have its own annunciator panel, audible and visual signalling devices and, where required, a repeater panel, all of which shall be approved by the ASIB.

Unapproved audible and visual signalling devices such as sirens, bells, hooters, beacons and lamps will not be accepted for use in conjunction with approved annunciator and repeater panels.

It shall be the responsibility of the approved sprinkler installer to make the necessary arrangements for the services of a manufacturer representative, when needed, for installation and adjustments of annunciator and repeater panels and equipment.

Each component of the alarm or annunciator and/or repeater panel shall be marked to clearly indicate the identifying letter or number referenced to the wiring diagram and the markings shall be located so as to be permanently visible after installation.

All circuits, including the pressure switches and battery connections, shall be monitored as follows:

- Open circuits shall indicate a "fault" condition.
- High impedance closed circuits shall constitute a normal condition and no indication is required.
- Short circuits shall indicate an "alarm" or "warning" condition.

A "fault", "alarm" or "warning" as described above shall initiate the audible alarm which shall be silenced by means of an "accept" push button.

When a "fault", "alarm" or "warning" condition occurs, the circuit annunciator shall flash on and off until the signal has been accepted, when the annunciator will change from a flashing to a steady visual signal. When the circuit is restored to a normal condition as described above, the steady signal shall extinguish.

A first alarm condition must cause the audible alarm to sound and, after acceptance, a second alarm must again cause the audible alarm to sound. Systems in which the audible alarm is negated after acceptance will not be approved.

factory fitted during panel construction before ASIB certification tests.

The hardware product must operate independently from all installed panel systems, i.e. Electric, Diesel, Annunciator or Jockey controllers. The device shall send alarm notification messages via cell phone SMS or pager to both personnel, and or remote offsite computers. The device must have the capability log events internally if pager or cell phone services are unavailable.

The remote alarm module shall conform to the following technical specifications:

- Store up to 1000 events internally on a FIFO (First in first out) basis
- Both a local and remote event log upload facility to obtain log files
- A Minimum of 6 personnel contact numbers. (Cell phone or pager)
- A minimum of 20 potential free (dry contact) alarm inputs
- A minimum of 2 relay outputs (2A)
- A minimum of 4 counters and timers so that required pump house rules can be defined
- A 24/7 schedule for daily tests and weekly statistic reports

The remote logger shall conform to the following pump house alarm rules:

- If the jockey pump runs longer than 5 minutes, then send an alarm
- If the jockey pump starts more than 10 times within a 1-hour period, then send an alarm
- If the system is in maintenance mode, then disarm the cell phones or pagers.

To facilitate weekly tests the panel must have a maintenance button that disables remote alarms messages to cell phones or pagers while the pump house is being tested or repaired, however data is still logged on a remote computer for hard copy test reports.

The following are deemed to be the minimum alarms that shall be monitored:

Alarm Monitoring		
1	Panel	Maintenance MODE SWITCH
2	Jockey Controller Panel	ALARM – Pump RUN
3	Jockey Controller Panel	ALARM – Pump FAIL
4	Electric Motor Driven Pump Controller Panel	ALARM – Fire ALARM
5	Electric Motor Driven Pump Controller Panel	ALARM – Pump RUN
6	Electric Motor Driven Pump Controller Panel	ALARM – Mains FAIL
7	Electric Motor Driven Pump Controller Panel	ALARM – Control Circuit FAIL
8	Electric Motor Driven Pump Controller Panel	ALARM – Pump FAIL
9	Diesel Engine Driven Pump Controller Panel	ALARM - Fire ALARM

PART VI

FIRE PROTECTION EQUIPMENT INSTALLATION

PROJECT SPECIFICATION

1 GENERAL

- 1.1 In this document where the term “Main Contractor”, “Building Contractor” or “Builder” is used, it shall mean the Principal Contractor and where the term “Subcontractor” is used; it shall mean the Contractor appointed in terms of this document.

2 APPLICABLE DOCUMENTS AND DRAWINGS

- 2.1 The supply and installation of the mechanical systems are subject to the following documents forming part of this specification:

- Standard Technical Specification
- Project Specification
- Schedules of Materials and Equipment Offered
- Bills of Quantities

- 2.2 List of Specifications

All specifications listed hereafter refer to the latest version as issued by the relevant body.

- 2.3 SANS SPECIFICATIONS*

SANS 11200	:	Standardized Specifications for Civil Engineering Construction
SANS 10400	:	The application of the National Building Regulations (all parts)
SANS 11200 HC	:	Corrosion protection of structural steelwork
SANS 11091	:	National colour standards for paint
SANS ISO 11461	:	Hot-dip galvanized coatings on fabricated iron and steel articles – Specification and test methods.
SANS ISO 13575	:	Continuous hot-dip zinc-coated carbon steel sheet of commercial, lock forming and drawing qualities
SANS 10214	:	The design, fabrication and inspection of articles for hot-dip galvanising
SANS 10103	:	The measurement and rating of environmental noise with respect to annoyance and speech communication
SANS 1186-1	:	Symbolic safety signs – Part 1: Standard signs and general requirements
SANS 1475-2	:	The production of reconditioned fire-fighting equipment – Part 2: Fire hose reels, hydrants and booster connections.
SANS 9227/ISO 9227 (SABS ISO 9227)	:	Corrosion tests in artificial atmospheres – Salt spray tests.

EN 1561		Founding – Grey cast irons
	EN 12163	Copper and copper alloys – Rod for general purposes.
	EN 12165	Copper and copper alloys – Wrought and unwrought forging stock.
	EN 694	Fire-fighting hoses – Semi-rigid hoses for fixed systems Building Hardware – Panic devices operated by a
	EN 1125	: horizontal bar, for use on escape routes – Requirements and testing methods.

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- d) All required electrical installations, including the panel, controls, all cabling and cable trays.
- 3.6 Compilation and submittal of new Operation and Maintenance Manuals including maintenance schedule.
- 3.7 The Tenderer shall include in his tender prices for the supply, fitment and painting of all the supports and brackets within the relevant equipment prices as the supports are not billed.

4 GENERAL REQUIREMENTS

- 4.1 The Building:
The facility is in Bathlarelwa School.
- 4.2 Water Supply
The connection to the new installation will be from the existing municipal system. The connection point from the existing mains will be as per the Site Development Plan.
- 4.3 Fire Protection by Others
The following fire protection measures will be provided by others:
- Fire detection and alarm system in the building (not the pump room)
- 4.4 Site supervision by Subcontractor
This installation will be a subcontract and all site supervision and management will be the responsibility of the Subcontractor appointed in terms of this specification.
- 4.5 Submissions by Subcontractor
- 4.5.1 Submissions with regard to equipment
- a) The Subcontractor should take note that all equipment selections approved (or not rejected) by the Engineer shall not free the Subcontractor to comply with the specification.

roof and concrete building structures required to fit the piping installation,

- Dimensions and positions of supporting brackets required to locate equipment, Installation positions of wooded, glass fibre or steel frames or sleeves to be built in by the principal contractor.

c) Shop Drawings and As-built Drawings

- All shop drawings shall be approved and signed by the Engineer, before the installation commences,
- Shall indicate the required service space around equipment.

d) The successful Subcontractor shall verify that provision has been made for all openings, wooded frames, sleeves, etc. as described above and that such openings, frames, etc. are in the correct position before any concrete casting or building work is done.

4.6 Performance of Systems and Equipment

The systems, equipment and layout with regard to installation and performance shall be accordance with the specification. This also implies that the performance of the equipment in the system supplied and installed by the Subcontractor, shall be in accordance with the design and performance figures as published by the manufacturers and/or suppliers.

The efficiency of the design of the specified system is not the responsibility of the Subcontractor. It is, however, the responsibility of the Subcontractor to see to it that the quality of the workmanship and the installation of the equipment as well as the re- commissioned equipment conform to the requirements of the Engineer and to the satisfaction of the manufacturer and/or supplier.

It is furthermore accepted that the Subcontractor has assured himself that all equipment supplied and installed under this contract shall perform within the given limits, as stated by the manufacturer/supplier, to confirm to the specification.

4.7 Protection, Cleaning, Adjustments, Commissioning, Test and Operating Maintenance Manuals

a) The Subcontractor shall be responsible for the installation, including the maintenance and replacement of worn parts, from the start-up date until it

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- 6.3 The hose reels water supply shall be permanently connected and shall be capable to supply water at any hose of not less than 300kPa pressure and 0.5l/s per hose reel.
 - 6.4 The fire water installation piping shall be as is indicated on the drawings.
 - 6.5 Where a fire hydrant and hose-reel is to be installed in the same location, the supply pipe to the hydrant shall be no less than Ø75mm and a tee-off may be made for the hose reel of Ø25mm.

7 WATER SUPPLY PIPING, FLUSHING AND TESTING

- 7.1 The supply piping from the main fire water supply shall be uPVC piping for all underground installations, and galvanized mild steel piping, above ground, to the fire hydrants and hose reels, installed in accordance with SANS 10400 and other relevant SANS specifications.
- 7.2 The water pipe installation for the fire hydrants and hose reels shall be installed as per the drawings. The installation shall be inspected by the engineer, in order to ensure the installation is as per the drawings, ensure there is no visible damage to the material and equipment installed, and to ensure best practice methods were applied during the installation of the system. The contractor shall ensure that the installation is completed timeously and inform the engineer of completion in order to do an inspection, either of the full system or parts of the system, while the system is visible and can be reached for inspection.
- 7.3 The installation shall be flushed after the inspection to ensure the system is free of any debris and any possible foreign matter. This shall be done by connecting the system to the municipal supply and opening the highest and furthest installed hydrant in the system. The highest point of each riser should also be opened to ensure all branches are cleaned. Care should be taken during this process of where the water will flow.
- 7.4 After flushing and confirmation that the system is free of any foreign matter, the system shall be pressure tested by a qualified plumber. The tests shall be as per the requirements of SANS 10252 Part 1. All pressure tests on the complete, or parts of the, system, shall be at least 2 000 kPa, and twice the maximum operating pressure. The pressure test needs to be witnessed by the engineer and a representative from the client, if so required by the client.
- 7.5 The piping supports for all fire piping are critical. Each section of pipe will have to be supported with brackets, as well as riser or droppers will have to be

PART VII

FIRE INSTALLATION

SCHEDULE OF CAPACITIES

PART VII

FIRE WATER PUMP INSTALLATION

SCHEDULE OF CAPACITIES

With regards the fire water installation, the following is applicable:

Description	Quantity	Value
Electric motor driven pump	1	Duty point of 1 500 l/min at 450 kPa (to be confirmed prior to final ordering)
Diesel driven pump	1	Duty point of 1 500 l/min at 450 kPa (to be confirmed prior to final ordering)
Water storage tanks	1	Capacity of 80m ³ (to be confirmed prior to final ordering)

MPUMALANGA TOURISM AND PARKS AGENCY



SCHEDULE OF QUANTITIES

**CONSTRUCTION OF THE BULK WATER SUPPLY AND RETICULATION NETWORK
AT BLYDE RIVER CANYON NATURE RESERVE**

BILL OF QUANTITIES

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 1: GENERAL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
	SANS 1200A	SCHEDULE 1: GENERAL				
	8.3	SCHEDULED FIXED-CHARGE AND VALUE RELATED ITEMS				
1.01	8.3.1	Contractual Requirements	Sum	1		
	8.3.2	Establishment of Facilities on the Site:				
	8.3.2.1	Facilities for Engineer (SANS 1200 AB)				
1.02	PSA 8.3.2.1(a)	Engineers Office	Sum	1		
1.03	PSA 8.3.2.1(b)	Communication costs (cellular phone)	Sum	1		
1.04	PSA 8.3.2.1 c)	Nameboards (1 No.)	Sum	1		
1.05	PSA 8.3.2.1(d)	Computer facilities complete with printer, modem with 4G connection	Sum	1		
1.06	PSA 8.3.2.1 e)	Provision of survey equipment	Sum	1		
	8.3.2.2	Facilities for Contractor				
1.07	8.3.2.2(a)	Offices and storage sheds	Sum	1		
1.08	8.3.2.2(b)	Workshops	Sum	1		
1.09	8.3.2.2(c)	Laboratories	Sum	1		
1.10	8.3.2.2(e)	Ablution and latrine facilities	Sum	1		
1.11	8.3.2.2(f)	Tools and equipment	Sum	1		
1.12	PSA 8.3.2.2(g)	Water supplies, electric power and communications	Sum	1		
1.13	8.3.2.2(h)	Dealing with water (Sub-clause 5.5)	Sum	1		
1.14	8.3.2.2(i)	Access (Sub-clause 5.8)	Sum	1		
1.15	8.3.2.2.(j)	Plant.	Sum	1		
1.16	8.3.3	Other fixed-charge obligations	Sum	1		
1.17	8.3.4	Removal of Site establishment	Sum	1		
1.18	PSA 8.3.5.1	Issuing of notices to consumers	Sum	1		
Total Carried Forward						

SECTION 1: CIVIL WORKS
SCHEDULE 1: GENERAL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
	PSA 8.3.3.2	OHS Act Obligations:				
1.19		i) General Safety obligations (incl. provision of personal protective equipment)	Sum	1		
1.20		ii) Health and Safety plan/file including health and safety training.	Sum	1		
1.21		iii) Fulfil legislated and/or specified requirements for blasting (incl. submission of plans).	Sum	1		
1.22	PSA 8.3.5.3	Environmental Management Plan Obligations	Sum	1		
	8.4	SCHEDULED TIME-RELATED ITEMS				
1.23	PSA 8.2.1.2	Contractual Requirements.	Month	3		
1.24	8.4.2	Operate and maintain facilities on the Site for duration of Construction:	Month	3		
	PSA 8.4.2.1	Facilities for the Employer's Agent:				
1.25	8.4.2.1.a)	Engineers Office	Month	3		
1.26	8.4.2.1.b)	Provision of name board	Month	3		
1.27	8.4.2.1.c)	Provision of cellular phone	Month	3		
1.28	8.4.2.1.d)	Provision of survey equipment	Month	3		
1.29	8.4.2.2	Facilities for Contractor:				
1.30	8.4.2.2(a)	Offices and storage sheds	Month	3		
1.31	8.4.2.2(b)	Workshops	Month	3		
1.32	8.4.2.2(c)	Laboratories	Month	3		
1.33	8.4.2.2(e)	Ablution and latrine facilities	Month	3		
1.34	8.4.2.2(f)	Tools and equipment	Month	3		
1.35	PSA 8.4.2.2.(g)	Water supplies, electric power and communications	Month	3		
1.36	8.4.2.2(h)	Dealing with water (Sub-clause 5.5)	Month	3		
Total Carried Forward						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 1: GENERAL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
1.37	8.4.2.2(i)	Access (Sub-clause 5.8)	Month	3		
1.38	8.4.3	Supervision for the Duration of Construction	Month	3		
1.39	8.4.4	Company and Head Office Overhead Costs for Duration of Contract	Month	3		
1.40	8.4.5	Other Time-related Obligations	Month	3		
1.4.1	8.4.5.3	Community liaison Officer (CLO)	Month	3		
1.4.2		Contractors overhead, charges and profit on item 1.4.1	%			
	PSA 8.4.6.1	OHS Act Obligations				
1.43		i) General Safety obligations	Month	3		
1.44		ii) Health and Safety plan/file	Month	3		
1.45		(iii) Safety Officer	Month	3		
1.46	PSA 8.4.6.2	Security Services	Month	3		
1.47	PSA 8.4.6.4	EMP Obligations	Month	3		
Total Carried to Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 2: GENERAL - DAYWORKS & PROVISIONAL SUMS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
	8.5	SUMS STATED PROVISIONALLY BY ENGINEER				
2.01		a) Safeguarding of excavations as required by the Engineer	Prov Sum	0	R50 000,00	R50 000,00
2.02		a)(i). Overheads, charges and profit on item 2.01 above	%	50 000		
2.03		b)Additional Control tests by independent laboratory	Prov Sum	1	R50 000,00	R50 000,00
2.04		b)(i) Overheads, charges and profit on item 2.03 above	%	50 000		
2.05		c) Relocation of existing services (water mains, electricity cables/poles, etc.) by Services utility	Prov Sum	0	R100 000,00	R100 000,00
2.06		c)(i) Overheads, charges and profit on item 2.05 above	%	100 000		
2.07		d) Additional surveys and underground service detection by nominated specialist as ordered by Engineer	Prov Sum	1	R50 000,00	R50 000,00
2.08		d)(i) Overheads, charges and profit on item 2.07 above	%	50 000		
2.09		e) Provision for training of targeted labourers	Prov Sum	1	R50 000,00	R50 000,00
2.10		e)(i) Overheads, charges and profit on item 2.09 above	%	50 000		
2.11		f)Safeguarding of excavations as required by the Engineer	Prov Sum	1	R50 000,00	R50 000,00
2.12		f)(i) Overhead, charges and profit on item 2.11 above	%	50 000		
2.13		g) Appoint a Community Liaison Officer from the community for the duration of the contract	Prov Sum	1	R50 000,00	R50 000,00
2.14		g)(i) Overheads, charges and profit on item 2.13	%	50 000		
2.15		h)Tri-gonometrical survey beacons, bench marks and plot boundary pegs, -locate and record and expose on completion of Works	Prov. Sum	0	R50 000,00	R50 000,00
2.16		h)(i)Contractors mark-up on Item 2.15 above	%	50 000		
Total Carried Forward						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 2: GENERAL - DAYWORKS & PROVISIONAL SUMS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
2.17		i)Tri-gonometrical survey beacons and plot boundary pegs, -protect and re-establish located under item 2.15, above, as ordered, by a Registered Land Surveyor on completion of the Works	Prov. Sum	1	R50 000,00	R50 000,00
2.18		i)(i)Contractors mark-up on Item 2.17 above	%	50 000		
2.19		j)Provisional sum for cost of material	Prov. Sum	1	R50 000,00	R50 000,00
2.20		j)i)Contractors mark-up on Item 2.19 above	%	50 000		
8.7		DAYWORKS				
2.21		Unskilled Labour	hours	322		
2.22		Semi-skilled Labour	hours	38		
2.23		Construction-hand	hours	32		
2.24		Carpenter	hours	38		
2.25		Driver (LDV, machines, trucks, etc.)	hours	32		
2.26		Artisan	hours	38		
2.27		Foreman	hours	50		
2.28		Gangers and section leaders	hours	26		
2.29		Bricklayer or plasterer	hours	32		
2.30		Welder	hours	16		
8.7		PLANT				
		Tenderers to insert the hire rate at which each item will be charged that will cover all relevant costs of plant hire, including operating crew				
2.31		Lowbed transport of plant to and from site	km	500		
2.32		Excavator (medium), between 93kW & 200kW	hours	26		
2.33		Tractor loader backhoe (TLB)	hours	26		
2.34		Front end wheel loaders (2 cub or larger)	hours	26		
Total Carried Forward						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 2: GENERAL - DAYWORKS & PROVISIONAL SUMS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
2.35		Generator 5Kw	hours	26		
2.36		Trucks (6 cub or larger)	hours	26		
2.37		Tip trucks (10 Cub or larger)	hours	26		
2.38		Water pump 100mm diameter	hours	32		
2.39		Plate compactor	hours	26		
2.40		Light delivery vehicles (1ton or equivalent)	km	32		
2.41		Sewer pump 100mm diameter	hours	32		
	8.8	TEMPORARY WORKS				
2.42	8.8.1	Contractors Access Road to Works	Sum	1		
	8.8.4	Existing Services				
2.43	8.8.4(a)	Supply (or hire) and use of specialist equipment for the detection of a particular service (electrical) on request of the Employer's Agent	Sum	1		
2.44	8.8.4(b)	The use of equipment for detection referred to in item 1.89 above	Day	1		
2.45	8.8.4(c)	Excavation and backfill by hand in soft material to expose service	m³	300		
	PSA8.8.7	Provision of PVC sleeves for protection of existing services (as instructed by Employer's agent):				
		(a) Split PVC pipes sleeves, for diameter:				
2.46		(i) 200 mm Ø	m	100		
2.47		(ii) 250 mm Ø	m	100		
2.48	PSA8.8.8	Survey of existing services	Sum	1		
2.49	PSA8.8.9	Liaison with service providers, landusers, land owners regarding shutdowns & connections	Sum	1		
2.5	PSA8.8.10	Provision of record/as-build drawings	Sum	1		
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 3: SITE CLEARANCE

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
3.	SANS 1200 C	SCHEDULE 3 : SITE CLEARANCE				
3.1		CLEAR SITE				
3.1.1	8.2.1	Clear and grub Site	m ²	87		
		Demolish and remove structures/buildings				
3.1.2		Manholes	No	5		
3.1.3		Concrete structures	m ³	10		
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 4: PIPE TRENCHES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
4.		SCHEDULE 4: PIPE TRENCHES				
4,1	SANS 1200 DB	PIPE TRENCHES				
4.2	8.3.1	SITE CLEARANCE				
4.2.1	8.3.1	a) Site clearance	m ²	2 116		
4.2	8.3.2	EXCAVATION				
	8.3.2	a) Excavate in all materials for trenches, backfill, compact, and dispose of surplus/ unsuitable material, for pipes: 100 mm diam. to 700 mm for total trench depth:				
4.2.1		Exceeding 0.0 m but not exceeding 1.0 m	m	895.0		
	8.3.2	b) Extra-over items 8.3.1 to 8.3.4 included for (provisional):				
4.2.2		Intermediate excavation	m ³	125.3		
4.2.3		Hard rock excavation	m ³	10.0		
4.2.5	8.3.2	c) Excavate and dispose of unsuitable material from trench bottom (Provisional)	m ³	10,0		
4,3	SABS	BEDDING (PIPES)				
		Provision of Bedding trench excavation within 0,4 km (Sub-clause 3.4.1)				
4.3.1	8.2.1	a) Selected granular material	m ³	140,8		
4.3.2	8.2.1	b) Selected fill material	m ³	1 196.2		
		Supply only of Bedding by Importation				
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 5: STRUCTURAL STEELWORKS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
5.	SANS	SCHEDULE 5: STRUCTURAL				
5.1.1		Pipe anchors	No.	400		
		STRUCTURAL STEELWORK : ABECO				
5.1.2		1 x Intake Steel Tank : 24kl rectangular Tank (Incl.supply and assemble of the steel	Sum	1		
5.1.3		2 x Circular 12kl Circular steel tanks(Incl.	Sum	2		
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 6: PUMP STATION

ITEM NO	Payment	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
6		SCHEDULE 6: PUMP STATION				
6,1		PUMP STATION (AS PER DWG NO : NT-2023-1159-112-001)				
		<u>Bulk excavation</u>				
		Excavate in all materials and use for embankment or backfill or dispose as ordered, from				
6.1.1		a) Necessary excavations	m ³	16		
6,2		CONCRETE				
	SANS 1200G	<u>SCHEDULED FORMWORK ITEMS</u>				
	8.2.1	Rough (below ground):				
		Vertical:				
6.2.1		(a) To outside of walls	m ²	10		
6.2.2		(c) To sides of pipe supports	m ²	4		
	8.2.2	Horizontal:				
6.2.3		(c) To roof slab including 1/2 round drip on outside	m ²	4		
6.2.4		(e) To ground floor slab	m ²	12		
	8.2.4	Box out holes and form voids:				
6.2.5		Small, circular of diameter up to and including 0,35 m: Over 0 m deep up to 0,5m deep	No.	2		
6,3		<u>SCHEDULED REINFORCEMENT ITEMS</u>				
6.3.1	8.1.2.3a)	Mild steel bars All sizes	t	1		
6.3.2	8.1.2.3a)	High-tensile steel bars All sizes	t	1		
6.3.3	8.4.2	Strength concrete 15 MPa/19mm (a) Blinding layer in 50 mm thickness	m ²	30		
6.3.4	PA 8.2.3	Strength concrete 20 MPa/8mm a) Screed to Floor Slab	m ³	1		
6.3.5	PA 8.2.3	b) Screed to Roof Slab	m ³	1		
6.3.6	8.4.3	Strength concrete 35 Mpa/19 mm (b) In floor slabs	m ³	9		
6.3.7	8.4.3	(c) In concrete surround	m ³	1		
6.3.8	8.4.3	(d) In roof slab	m ³	12		
Total Carried Forward						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 6: PUMP STATION

ITEM NO	Payment	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
6.3.9		Test Blocks Making and testing 150 × 150 × 150mm concrete strength test cubes	Sum	1		
		<u>Unformed surface finishes:</u>				
	8.4.4	Steel-floated finish				
6.3.10		(a) To top of floor slab	m ²	9		
6.3.11		(b) To top of roof slab	m ²	12		
6.3.12		(c) To top of plinth	m ²	8		
	8.2.3	Joints				
		Joint Sealant				
6.3.13		(b) 2 Layers of malthoid or hard board between walls and roof slab & Floor slab	m	14		
		2 X Pumps as per specifications				
6.3.14		Pump cost	Sum	2		
Total Carried Forward						

SECTION 1: CIVIL WORKS
SCHEDULE 6: PUMP STATION

ITEM NO	Payment	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (Rand)
Total Brought Forward						
6,2		BUILDING WORK				
	PB 8.2.1	BRICKWORK				
		a) Supply and construct double brick wall (230mm), inclusive of mortar and brickforce every third layer, both faces face brick.	m ²	43		
		e) Supply and install lintols (220x150mm)	m	3		
	PB 8.2.10	Supply and install Kilcher bearing strip (40kN/m) between concrete roof and brickwork.	m ²	3		
	PB 8.2.9 (b)	Supply and install two layers 500 micron thick plastic sheeting, 230mm wide between floor slab and brick wall.	m ²	3		
	PB 8.2.10	Supply and construct 10mm Isolation joint between walls and surface bed	m	14		
	PB 8.2.6	PLASTERWORK				
		10mm thick, wood floated finish to internal walls.	m ²	38		
	PB 8.2.4	WINDOW SILL				
	PB 8.2.4	a) Brick on edge on external side of window.	m	3		
	PB 8.2.17	a) JOINERY				
		Supply and install the following doors and windows complete with frame, hinges, locking devices, glass				
		1486mm wide x 924mm high residential steel frame including 12mm dia. burgular proofing on full face window and 4mm clear glass glazed to spec. (Inclusive of one coat steel primer paint and two	No.	1		
	PB 8.2.20	PAINTING				
		All inclusive (1 x Base/Primer Coat, 2 Final Coat):				
		Plastered Walls - Dulux Weatherguard or similar approved.	m ²	38		
		Soffit of Concrete Roof - White Emulsion Paint	m ²	9		
	PB 8.2.23	FIRE PROTECTION & SAFETY				
		a) Danger Signs and Safety Notices.	Sum	1		
		b) Supply and install 7,5kg DCP Extinguisher complete with safety signage.	No.	1		
	PB 8.2.21	LIGHTING AND SMALL POWER				
		Complete electrical installation for Pump Station	Prov Sum	1	50 000,00	R 50 000,00
Total Carried Forward						

SECTION 1: CIVIL WORKS
SCHEDULE 7: CHAMBERS

[illegible]

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 1: CIVIL WORKS

SCHEDULE 8: MEDIUM PRESSURE PIPELINES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8		SCHEDULE 8: MEDIUM PRESSURE PIPELINES				
8,1	SANS 1200 L	MEDIUM PRESSURE PIPELINES				
		Supply, handle and lay PE 100 Class PN 16 HDPE pipe above Ground				
8,1,1	8.2.1	110mm dia	m	985		
		Supply, handle and lay HDPE pipe below ground				
8,1,2		125mm dia	m	895		
		Supply, handle and lay Galvanised Steel Pipe above ground				
8,1,3		125mm dia	m	238		
8,2		PIPE FITTINGS				
		Supply and install bends complete with couplings or flanged fittings on site for HDPE Pipes Class PE100 PN16	Prov.sum	1	R 50 000,00	R 50 000,00
8,3		CONNECTION TO EXISTING WATER NETWORK				
8,3,1		Connect to two existing reservoirs and two new steel tanks	Prov. Sum	1	R 50 000,00	R 50 000,00
Total Carried Forward To Summary						

**CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE
RESERVE**

SECTION 1: CIVIL WORKS

SCHEDULE 9: CONCRETE REMEDIAL WORKS

Item No	Payment	Description	Unit	Qty	Rate	Amount (Rand)
9	SANS	SCHEDULE 9: CONCRETE REMEDIAL CONCRETE (STRUCTURAL)				
9,1		Refurbishment of the two existing Reinforced Concrete Reservoirs	Prov. Sum	1	R 100 000,00	R 100 000,00
9,2		Refurbishment of the broad crest weir wall across the river 25m in length	Prov. Sum	1	R 50 000,00	R 50 000,00
Total Carried Forward						R 150 000,00

**CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE
RESERVE**

SECTION 1: CIVIL WORKS

SCHEDULE 9: CONCRETE REMEDIAL WORKS

Item No	Payment	Description	Unit	Qty	Rate	Amount (Rand)
13.		SCHEDULE 13: FENCING				
13,1	PA 8.2	SUPPLY AND ERECT NEW STEEL SEE THROUGH FENCE				
13.1.2	PA 8.2.2	New 2.4m high Concrete Palisade fence complete as shown in the drawing NT06-22-1121-601-PS- 005	m	140,0		
13.3	PA 8.4	SUPPLY AND ERECT NEW SECURITY				
13.3.1	PA 8.4.1	New 2.4m high, 4m wide steel palisade security gate (Double Leaf Type) complete as shown in the drawing NT06-22-1121-601-	No.	1,0		
13.3.2	PA 8.4.2	New 2.4m high, 4m wide steel palisade security gate (Sliding Type) complete as shown in the drawing NT06-22-1121-601-PS-005	No.			
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE
SECTION 1: CIVIL WORKS

SUMMARY OF SCHEDULES

ITEM	Description	Amount (Rand)
1	<u>SCHEDULE 1: GENERAL</u>	
2	<u>SCHEDULE 2: GENERAL - DAYWORKS & PROVISIONAL SUMS</u>	
3	<u>SCHEDULE 3: SITE CLEARANCE</u>	
4	<u>SCHEDULE 4: PIPE TRENCHES</u>	
5	<u>SCHEDULE 5: STRUCTURAL STEEL</u>	
6	<u>SCHEDULE 6: PUMP STATION</u>	
7	<u>SCHEDULE 7: CHAMBERS</u>	
8	<u>SCHEDULE 8: MEDIUM PRESSURE PIPES</u>	
9	<u>SCHEDULE 9: CONCRETE REPAIRS</u>	
10	<u>SCHEDULE 9: FENCING</u>	
Total Carried Forward To Summary Of Sections		

SECTION 2: ELECTRICAL WORKS

SCHEDULE 1: CABLES AND ACCESSORIES

[illegible]

SECTION 2: ELECTRICAL WORKS
SCHEDULE 2: TRENCHING AND EXCAVATIONS

[illegible]

[illegible]

SECTION 2: ELECTRICAL WORKS
SCHEDULE 3: INTERNAL ELECTRICAL INSTALLATION

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	SUPPLY PRICE	INSTALL PRICE	TOTAL
TOTAL BROUGHT FORWARD								
3.3.1	Vapourline 36W	No.	10					
3.3.2	Bulkhead Round black NW 20WLED complete with its holder and cover	No.	16					
3.3.3	Single lever one way light switch complete with all accessories	No.	4					
	Photo cell/ Day night switch with controller	No.	3					
3.3.4	20 mm diameter steel galvanized conduit complete installed with all bends, fixing saddles, adaptors, chased into walls, act. as specified.	m	200					
3.3.5	25 mm diameter Steel Galvanized conduit complete installed with all bends, fixing saddles, adaptors, chased into walls, act. as specified.	m	200					
3.3.6	100 mm x 50 mm draw box surface mounted complete installed into Brickwork	m	10					
3.4	EARTHING AND BONDING							
3.4.1	Complete EARTHING and bonding of all water pipes, waste pipes, trunking, cable ladders, trays, etc.	Sum	1					
3.4.2	Clean earth installation for the voice data installation to be tested and upgrade complete as required, etc.	Sum	1					
TOTAL CARRIED TO SUMMARY OF SCHEDULE OF QUANTITIES								

SECTION 2: ELECTRICAL WORKS
SCHEDULE 4: COMMISSIONING OF INSTALLATION

[illegible]

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE
SECTION 2: ELECTRICAL WORKS

SUMMARY OF SCHEDULES

ITEM	DESCRIPTION	Amount (Rand)
1	SCHEDULE 1: CABLES AND ACCESSORIES	
2	SCHEDULE 2: TRENCHING AND EXCAVATIONS	
3	SCHEDULE 3: INTERNAL ELECTRICAL INSTALLATION	
4	SCHEDULE 4: COMMISSIONING OF INSTALLATION	
TOTAL CARRIED FORWARD TO SUMMARY OF SECTIONS		

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE
SECTION 3: WET SERVICES
SCHEDULE 1: PRELIMINARIES AND GENERAL

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	TOTAL AMOUNT
1	Site Establishment	Sum	1		
2	Workshop Drawings	No	3		
3	OPERATING AND MAINTENANCE MANUALS The Contractor shall make provision for 4 x copies of O & M Manuals in accordance with the detail in the Standard specification.	No	3		
4	TRAINING OF CLIENTS STAFF The Contractor shall make provision for 1 full day's training of the Clients Staff, on the operation of the installation.	Sum	1		
5	AS-BUILT LAYOUT DRAWINGS The Contractor shall make provision for a detailed set of As Fitted Layout drawings of the entire installation, as the project progresses.	No	3		
6	COMMISIONING AND TESTING The Contractor shall make provision to commission and pressure test the installation during construction MAINTENANCE AND GUARANTEE	Sum	1		
7	Pressure testing	Sum	1		
8	The Contractor shall make provision for 1 x Full years Maintenance and Guarantee of the entire installation. 11 x Standard Maintenance visits and 1 x Major service is required throughout the 12 months.	Sum	1		
	Total Carried Forward To Summary				

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 3: WET SERVICES

SCHEDULE 2: DOMESTIC HOT AND COLD WATER PIPE INSTALLATION

ITEM	ITEM DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	INSTALL RATE AMOUNT	TOTAL AMOUNT
1	<u>DOMESTIC HOT AND COLD WATER PIPE INSTALLATION</u>					
1,1	Galvanised Pipe: (Surface Mounted) Water piping in accordance with SANS 460 installed complete with short lengths, cutting, plain couplings, capillary solder and jointing strictly in accordance with the Manufacturer's instructions, support brackets etc. All coldwater pipes to be installed as per SANS 10252 regulations.					
1.1.1	dia 100	m	20			
1.1.2	dia 50	m	20			
1,2	Bends: Extra over Galvanised piping for capillary fittings in accordance with SANS 1067 - 2 complete with hangers, brackets, soldering , etc.					
1.2.1	dia 42	No	5			
1.2.2	dia 35	No	5			
1,3	Tees: Extra over Galvanised piping for capillary fittings in accordance with SANS - 10252 complete with hangers, brackets, soldering , etc.					
1.3.1	dia 50-50-50	No	2			
1.3.2	dia 35-35-35	No	2			
1,4	Reducers Extra over Galvanised piping for capillary fittings in accordance with SANS - 2 complete with hangers, brackets, soldering , etc.					
1.4.1	100-76	No	2			
1.4.2	76-50	No	2			
Total Carried Forward						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 3: WET SERVICES

SCHEDULE 2: DOMESTIC HOT AND COLD WATER PIPE INSTALLATION

ITEM	ITEM DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	INSTALL RATE AMOUNT	TOTAL AMOUNT
2	ISOLATING VALVES: Ball type Isolating Valve complete with couplings to piping, etc., all strictly in accordance with Manufacturer's instructions and complying to SANS 1056 - 3					
2,1	dia 100	No	5			
2,2	dia 50	No	5			
3	BALANCING VALVES: Specified Balancing Valve complete with couplings to piping, etc., all strictly in accordance with Manufacturer's instructions.					
3,1	dia 50-50-50	No	2			
3,2	dia 35	No	2			
4	Strainers: Specified Strainer complete with couplings to piping, etc., all strictly in accordance with Manufacturer's instructions.					
4,1	dia 100	No	2			
4,2	dia 50	No	2			
5	ELECTRIC MOTOR PUMPSET Pump specification @ min 100 l/min @ 15 m All control panels with basic alarms. Electrical installation within the confines of the pump house with cable runs not exceeding 6 m between pump & panels supplied. 2 Tier Autostart arrangement c/w pressure switches and gauges. Includes pump house pipe work and tank to pump complete with valves and trim.	No	2			
6	PUMP CONTROLS Supply install pump, Emergency electric power requirement complete with all necessary accessories	No	2			
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE
SECTION 3: WET SERVICES

SUMMARY OF SCHEDULES

ITEM	DESCRIPTION	AMOUNT
1	SCHEDULE 1: PRELIMINARIES AND GENERAL	
2	SCHEDULE 2: DOMESTIC HOT AND COLD WATER PIPE INSTALLATION	
Total Carried Forward To Summary Of Sections		

Qualifications:

- 1 This Bill of Quantities forms part of the contract documents and is to be read in
- 2 All works billed here shall include for the full scope of service specified including but not
- 3 Quantities indicated here are to be verified by the contractor against the project
- 4 No variation in rates shall be due based on variation in quantities, rate of exchange or
- 5 Errors and omissions of equipment or material required to execute the project solution
- 6 All works required to execute the scope of works in accordance with the project
- 7 Rates provided shall include for fixing, hangers, fittings, transformations, sealant and all
- 8 The bill of quantities shall not be used as the basis for material order.

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE
SECTION 4: FIRE SERVICES

SCHEDULE 1: PRELIMINARIES AND GENERAL

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	TOTAL AMOUNT
1	Site Establishment	Sum	1		
2	Workshop Drawings	No	3		
3	OPERATING AND MAINTENANCE MANUALS The Contractor shall make provision for 4 x copies of O & M Manuals in accordance with the detail in the Standard specification.	No	3		
4	TRAINING OF CLIENTS STAFF The Contractor shall make provision for 1 full day's training of the Clients Staff, on the operation of the installation.	Sum	1		
5	AS-BUILT LAYOUT DRAWINGS The Contractor shall make provision for a detailed set of As Fitted Layout drawings of the entire installation, as the project progresses.	No	3		
6	COMMISSIONING AND TESTING The Contractor shall make provision to commission and pressure test the installation during construction	Sum	1		
7	PRESSURE TESTING	Sum	1		
8	The Contractor shall make provision for 1 x Full years Maintenance and Guarantee of the entire installation. 11 x Standard Maintenance visits and 1 x Major service is required throughout the 12 months.	Sum	1		
9	SHOP DRAWINGS				
9,1	Submission of shop drawings	Sum	1		
10	NON-RETURN VALVE (SIZE TO BE CONFIRMED WITH CIVIL CONTRACTOR - ALLOWED FOR DIAMETER 100 mm)	No	1		
11	FIRE SIGNAGE AS INDICATED IN THE DRAWINGS ISSUED	Sum	1		
12	DESIGN, SUPPLY, AND INSTALLATION OF OBLIQUE ANGLED FIRE HYDRANTS WITH 65 mm DIAMETER INSTANTANEOUS COUPLINGS TO SANS 10400 AND SANS 10252. PIPE TO CONNECT TO UNDERGROUND PIPEWORK (BY CIVIL ENGINEER). ITEM TO INCLUDE THE TESTING OF THE INSTALLATION.	No	1		
	Total Carried Forward To Summary				

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 4: FIRE SERVICES
SCHEDULE 2: ENTIRE SITE

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	LABOUR RATE AMOUNT	TOTAL AMOUNT
1	External Above Ground Fire Equipment Installation					
1,1	65 mm Pillar Type Fire Hydrant	No.	2			
1,2	F13 Signage 190mm x 190mm	No.	2			
1,3	F30 Signage 290mm x 290mm	No.	2			
1,4	100mm piping Underground Class 12 uPVC	No.	150			
1,5	50mm piping Underground Class 12 uPVC	No.	900			
1,7	30 m Fire Hose Reel	No.	2			
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 4: FIRE SERVICES
SCHEDULE 3: PLANT AREA

ITEM	ITEM DESCRIPTION	UNIT	QTY	SUPPLY RATE AMOUNT	INSTALL RATE AMOUNT	TOTAL AMOUNT
1	FIRE WATER INSTALLATION					
1.1	Galvanised Pipe: Installed above ground Medium Class Galvanised steel water piping in accordance with SANS 62-1 installed complete with short lengths, cutting, plain couplings, capillary solder and jointing strictly in accordance with the Manufacturer's instructions, support brackets etc. All coldwater pipes to be installed as per SANS 10252 regulations.					
1.1.1	dia 100	m	200			
1.1.2	dia 50	m	100			
1.2	Bends: Extra over Galvanised piping for capillary fittings in accordance with SANS 1067 - 2 complete with hangers, brackets, soldering , etc.					
1.2.1	dia 100	No	8			
1.3	Tees: Extra over Galvanised piping for capillary fittings in accordance with SANS - 10252 complete with hangers, brackets, soldering , etc.					
1.3.1	dia 100-100-100	No	5			
1.4	Reducers Extra over Galvanised piping for capillary fittings in accordance with SANS - 2 complete with hangers, brackets, soldering , etc.					
1.4.1	100 - 50	No	6			
2	ISOLATING VALVES: Ball type Isolating Valve complete with couplings to piping, etc., all strictly in accordance with Manufacturer's instructions and complying to SANS 1056 - 3					
2,1	dia 100	No	5			
3	Strainers: Specified Strainer complete with couplings to piping, etc., all strictly in accordance with Manufacturer's instructions.					
3,1	dia 100	No	2			
4	ELECTRIC MOTOR PUMPSET (COMPLETE) Supply, delivery, installation,connection, testing and commissioning of Pump set with characteristics as per Wet Services Specification.					
4.1	1 off Electrical Booster Pump Entire spec for pump house. Entire Pumphouse spec: 4 off Electric driven pump c/w direct reading flow meter Duty min 15l/s @ 430m.; Complete with mild steel base plate, flexible coupling, guard, valves and fittings to complete the function of the pressurised water system. All control panels with basic alarms. Electrical installation within the confines of the pump house with cable runs not exceeding 6m between pumps & panels supplied. 2 Tier Autostart arrangement c/w pressure switches and gauges. Includes a direct reading flow meter 4" -450-B Includes Pump house pipe work and tank to pump work complete with valves and trim. Commisioning and handover	No.	1			
4,2	Electrical Supply from DB. Complete and Handover	No	2			
5	STORAGE TANK 80 kl Sectional steel tank c/w with all accessories and fittings	No	1			
Total Carried Forward To Summary						

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SECTION 4: FIRE SERVICES

SUMMARY OF SCHEDULES

ITEM	DESCRIPTION	AMOUNT
1	SCHEDULE 1: PRELIMINARIES AND GENERAL	
2	SCHEDULE 2: ENTIRE SITE	
3	SCHEDULE 2: PLANT AREA	
Total Carried Forward To Summary Of Sections		

Qualifications:

- 1 This Bill of Quantities forms part of the contract documents and is to be read in conjunction therewith.
- 2 All works billed here shall include for the full scope of service specified including but not limited to supply,
- 3 Quantities indicated here are to be verified by the contractor against the project drawings. All
- 4 No variation in rates shall be due based on variation in quantities, rate of exchange or escalation.
- 5 Errors and omissions of equipment or material required to execute the project solution specified or
- 6 All works required to execute the scope of works in accordance with the project program and quality
- 7 Rates provided shall include for fixing, hangers, fittings, transformations, sealant and all other items required
- 8 The bill of quantities shall not be used as the basis for material order.

CONSTRUCTION OF THE BULK WATER SUPPLY AT BLYDE RIVER CANYON NATURE RESERVE

SUMMARY OF SECTIONS

ITEM	DESCRIPTION	AMOUNT
1	SECTION 1: CIVIL WORKS	
2	SECTION 2: ELECTRICAL WORKS	
3	SECTION 3: WET SERVICES	
4	SECTION 4: FIRE SERVICES	

SUB-TOTAL	
ADD 10% CONTINGENCY	
SUB-TOTAL	
ADD 15% VAT	
TOTAL (Carry forward to Form of Offer)	