



OVERBERG WATER BAORD

OVERBERG WATER BOARD (OWB) AS AN ORGAN OF STATE SUBSCRIBES TO AND PROPAGATES BOTH THE NOTION OF BROAD BASED BLACK ECONOMIC EMPOWERMENT ACT, 2003 (Act No. 53 of 2003) (BBBEE), THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 (Act No. 5 of 2000) AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022.

DUE AT 12:00 PM

(CLOSING DATE: 27 August 2026

RFP OW- 015 2026/27

SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY-SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE.

SUBMIT BID DOCUMENTS TO:

PHYSICAL ADDRESS:

1 Niblick Way, Ground Floor Trident
Park 3
Somerset West 7137

COMPULSORY BRIEFING SESSION

Date: 20 August 2026

Time: 12:00 pm (BIDDERS THAT ARRIVE 15 MINUTES AFTER THE START TIME WILL NOT BE ALLOWED)

Venue: Rûensveld East WTW 34° 4'35.83"S 20°14'44.63"E

Bidder's name, company address and stamp	
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THE TENDER

PART T1: TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

Overberg Water Board invites tenders for the Supply, delivery and installation of a modern telemetry system, upgrade of a supervisory control and data acquisition (SCADA) system from ADROIT Classic to ADROIT SMART UI/EQUIVALENT and maintenance of the system for thirty six Months (36) for Overberg Water (OWB) in the Western Cape. The following tenderers who are registered with the Construction Industry Development Board (CIDB), or are capable of being so registered prior to the evaluation of submissions, are eligible to submit tenders:

- Contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for **SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE**. It is estimated that the tenderer must have a CIDB contractor grading designation of a minimum of **6 EP or Higher**.
- Tenders from contractors registered as potentially emerging enterprises but with a CIDB contractor grading designation lower than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, as per amended notice no. 357 of 2019, will not be accepted.
- Only tenderers that meet all the eligibility criteria under clause C.2.1 of the Tender Data will be considered.

Bid documents will be available on the e-Tender website at www.etenders.gov.za, and OWB website at www.overbergwater.co.za from 13 August 2026

The bids will be evaluated in three stages with stage one focusing on initial screening on Supply Chain Management (SCM) mandatory returnable requirements, stage two focusing on responsiveness to the functionality criteria and stage three focusing on price and Specific goals as outlined in this bid document. Bidders who fail to meet the minimum requirements for each stage will not be considered further.

THE CLOSING DATE AND TIME FOR RECEIPT OF TENDERS IS 27 August 2026 at 12:00pm

Only Tenders complying with the following requirements will be considered:

- I. The tender is for contractors who shall have a CIDB contractor rating as outlined above
- II. Tenders sealed in envelopes conspicuously marked as follows:

Tender Bid No RFP OW-015 2026/27 OVERBERG WATER BOARD

OWB Head Office Reception

Physical address: 1 Niblick Way, Ground Floor, Trident Park 3, Somerset West, 7137

Bid Box is situated on Ground Floor, OWB Office at the above-mentioned address. Telegraphic, telephonic, telex, facsimile and late tenders will not be accepted.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

(SBD 1) PART A**RETURNABLE SCHEDULE 1: INVITATION TO BID AND THE TERMS AND CONDITIONS OF BIDDING INVITATION TO BID**

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE OVERBERG WATER BOARD					
BID NUMBER:	RFP OW- 015 2026/27	CLOSING DATE:	27 August 2026	CLOSING TIME:	12:00 PM
DESCRIPTION	SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE.				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM OR AGREEMENT OF FORM OF OFFER AND ACCEPTANCE.					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT <i>Overberg Water Board Head Office Reception. Physical address: 1 Niblick Way, Ground Floor, Trident Park 3, Somerset West, 7137</i>					

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER					
CELLPHONE NUMBER					
FACSIMILE NUMBER					
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS					
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]		No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	
				No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
1. ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?		No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	
				Yes No [IF YES, ANSWER PART B:3]	
2. TOTAL NUMBER OF ITEMS OFFERED				3. TOTAL BID PRICE	
				R	
4. SIGNATURE OF BIDDER				5. DATE	
6. CAPACITY UNDER WHICH THIS BID IS SIGNED					
PROCEDURE ENQUIRIES MAY BE DIRECTED TO:				TECHNICAL INFORMATION MAY BE DIRECTED TO:	
DEPARTMENT		Overberg Water Board		DEPARTMENT	
				Overberg Water Board	
CONTACT PERSON		Mr. E Nwamafela, Mr. S Mayixhale & Mr. A Boo		CONTACT PERSON	
				Mr. Anthony Lotz	
TELEPHONE NUMBER		021 851 2155		TELEPHONE NUMBER	
				028 001 0049	
FACSIMILE NUMBER		N/A		FACSIMILE NUMBER	
				N/A	

E-MAIL ADDRESS	enwamafela@overbergwater.co.za , smayixhale@overbergwater.co.za & abooi@overbergwater.co.za	E-MAIL ADDRESS	alotz@overbergwater.co.za
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(SBD 1) PART B

TERMS AND CONDITIONS FOR BIDDING

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)
- 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022

TAX COMPLIANCE REQUIREMENTS

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

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

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

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

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID. NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

IMPORTANT NOTICE

Bidders should ensure that bids are delivered timeously to the correct address. If the bid is late, it will not be accepted for consideration. The bid box is open, 5 days a week, Monday to Friday, between 08h00 – 17h00 and to Friday. Not open on public holidays.

The bid box is located in Overberg Water Board

OWB Head Office Reception Physical address:

1 Niblick Way, Ground Floor, Trident Park 3, Somerset West, 7137

All bids must be submitted on the official forms – (not to be re-typed)

All bidders must sign a reception tender register when submitting their tender documents Writing must be in block letters and black ink.

This bid is subject to the Preferential Procurement Policy Framework Act and the Preferential Procurement Regulations, 2022, The General Conditions of Contract for Construction Works 3rd Edition 2015 and any other special conditions of contract specified by OWB.

BIDDING PROCEDURE ENQUIRIES

Name: Mr E Nwamafela, Mr S Mayixhale & Mr A Booi

Office Telephone No.: (021) 851 2155

E-mail: enwamafela@overbergwater.co.za, smayixhale@overbergwater.co.za & abooi@overbergwater.co.za

TECHNICAL ENQUIRIES

Name: Mr. Anthony Lotz

Office Telephone No.: (028) 001 0049

E-mail: alotz@overbergwater.co.za

T1.2 TENDER DATA

Clause number	Tender Data
	The conditions of tender are the Standard Conditions of Tender (Annex C as published/ amended by CIDB in August 2020) contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts (August 2019) as published in Government Gazette No 42622, Board Notice 423 of 2019 of 08 August 2019. (See www.cidb.org.za). The standard conditions of tender for procurements make several references to the tender data for details that apply specifically to this tender. The tender data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. Each item of tender data given below is cross-referenced to the clause in the standard conditions of tender to which it mainly applies.

C.1.1	The employer is the Overberg Water Board
C.1.2	For this contract, the following documents will be adopted: The single volume procurement document issued by the employer comprises of the following: The Tender Part T1: Tendering procedures T1.1 - Tender notice and invitation to tender T1.2 - Tender data Part T2: Returnable documents T2.1 - List of returnable documents T2.2 - Returnable schedules The Contract Part C1 - Agreements and Contract data C1.1 – Form of offer and acceptance C1.2 – Contract data C1.3 – Construction guarantee Part C2 - Pricing Data C2.1 – Pricing Instructions C2.2 – Bill of Quantities Part C3 - Scope of Works C3.1 – Description of the works C3.2 – Construction C3.3 - Annexures Part C4 - Site Information
C.1.4	The Employer's agent for the purpose of this tender is Mr. Anthony Lotz or his successor, who is chosen by the Employer. Address: OWB Head Office Reception 1 Niblick Way, Ground Floor, Trident Park, Somerset West, 7137 Name: Mr. Anthony Lotz Office Telephone No.: (028) 001 0049 E-mail: alotz@overbergwater.co.za

C.1.5	Cancellation and Re-Invitation of Tenders
C.1.5.1	An employer may, prior to the award of the tender, cancel a tender if- due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation; funds are no longer available to cover the total envisaged expenditure; or no acceptable tenders are received. there is a material irregularity in the tender process.

C.1.5.2	The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised
C.1.5.3	An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.
C.1.6	Procurement procedures
C.1.6.1	Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.
C.1.6.2	Competitive negotiation procedure
C.1.6.2.1	Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.
C.1.6.2.2	All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.
C.1.6.2.3	At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.
C.1.6.2.4	The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.
C.2	Tenderer's obligations

Eligibility

Only those tenderers who satisfy the following criteria are eligible to submit tenders:

a) CIDB contractor grading designation of a minimum of 6 EP or Higher.

Registered with the CIDB, at close of tender, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, as per amended notice no. 357 of 2019, for a electrical engineering works - infrastructure (EP) or Mechanical Engineering ME or Civil Engineering CE class of construction work. Tenderers whose CIDB registration expires within the tender validity period, need to demonstrate that there is a reasonable chance of being registered in the appropriate grading designation during the tender evaluation period, by submitting a copy of their timely application for CIDB registration, with their tender submission. Tenders received from such tenderers who are not capable of being registered in the required contractor designation, within 10 working days after either expiry of their registration or after being requested to provide proof of registration, will be considered non-responsive. **Note that in terms of the Construction Industry Development Board Act, 2000 (Act No. 38 of 2000) a registered contractor must apply for renewal of registration three months before the existing registration expires.**

Tenderers registered as potentially emerging enterprises but with a CIDB contractor grading designation lower than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, as per amended notice no. 357 of 2019, are not eligible to have their tenders evaluated.

For the sake of clarity and subject to satisfactory proof of a tenderer's ability to perform the work specified at the tendered value, the Employer lists in the table below the margins it considers reasonable. However, in the event that the sum tendered exceeds the margins shown then such tender shall be deemed non-responsive.

Category of tender	ts per CIDB Regulation 17	allowable margins
EP/ME/CE 1		The Employer will use its discretion in terms of CIDB Practice Note 3 on allowable margins to be accepted
EP/ME/CE 2		
EP/ME/CE 3		
EP/ME/CE 4		
EP/ME/CE 5		
EP/ME/CE 6		
EP/ME/CE 7		
EP/ME/CE 8		

Joint Ventures are eligible to submit tenders provided that: - every member of the joint venture is registered with the CIDB; - the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; and - the combined contractor grading designation calculated in accordance with

the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a EP/ME/CE class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, as per amended notice no. 357 of 2019.

C.2.1.1	Only those bidders who satisfy the following eligibility criteria are eligible to submit bids: (a) Availability of resources (b) Previous experience on contracts of a similar value and nature (c) Have registered with the CIDB and meet the required grading of construction work
C.2.2	Cost of Tendering
C.2.2.1	The Employer will not compensate the tenderer for any costs incurred in attending briefings, meeting, interviews or making any submissions in the office of the Employer
C.2.2.2	The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.
C.2.3	Check documents Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.
C.2.4	Confidentiality and copyright of documents Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.
C.2.6	Acknowledge addenda Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary, apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.
C.2.7	Clarification meeting Compulsory clarification session Date: 20 August 2026 Time: 12:00 pm Venue: Rûensveld East WTW 34° 4'35.83"S 20°14'44.63"E
C.2.8	Seek clarification Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.
C.2.9	Insurance Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.
C.2.10	Pricing the tender offer
C.2.10.3	This contract shall not be subject to Contract Price Adjustments, foreign fluctuations, etc and all rates and prices shall remain FIXED, final and binding.
C.2.11	Alterations to documents Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12	Alternative tender offers No alternative tender offers will be considered
C.2.13	Submitting a tender offer
C.2.13.1	Submit one tender offer only as a single tendering entity to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.
C.2.13.2	Return all returnable documents to the employer after completing them in their entirety either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.
C.2.13.3	Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.
C.2.13.4	Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.
C.2.13.5	Seal the original tender offer as separate packages marking the packages as "ORIGINAL" . Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
C.2.13.6	Bidders are requested to deliver the submission in one envelope and must ring bound. The Employer's delivery of tender offers and identification details to be shown on each tender offer package are: Title to appear on envelope one (1): 1. CONTRACT NO.: RFP OW- 015 2026/25 SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY-SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE. This envelope must contain the Returnable, SCM Documentation and Relevant Annexures. This envelope must contain printed copies of all the pages in this document, duly completed and signed, the pricing schedules (schedule of quantities). For identification purposes, bidders are requested to ensure that the envelopes containing the company's bids are clearly marked and are easily identifiable by the company's logo or name. Location of tender box: Ground Floor of the Overberg Water Board Physical address: Location of tender box: OWB Head Office Reception
	Physical address: 1 Niblick Way, Ground Floor, Trident Park 3, Somerset West, 7137 Identification details: TENDER BOX
C.2.13.7	Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.
C.2.13.8	Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.
C.2.13.9	Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer.

C.2.14	Information and data to be completed in all respects Accept that tender offers, which do not provide all the data or information requested completely and, in the form required, may be regarded by the employer as non-responsive.
C.2.15	Closing time The closing time for submission of tender offers is 27 August 2026 @ 12:00 PM The Overberg Water Board is not obliged to accept the lowest or any tender and reserves the right to accept any tender as a whole or in part.
C.2.16	The tender offer validity period is 120 days from the closing date.
C.2.17	Clarification of tender offer after submission Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.
C.2.18.2	The Tenderer shall, when requested by the Employer to do so, submit the names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that such staff members satisfy the eligibility requirements.
C.2.19	Inspections, tests and analysis Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.
C.2.20	Submit securities, bonds and policies If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.
	Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.
C.2.23	The Tenderer is required to submit with his/her tender all documents and schedules listed under T2.1 and T2.2.
Add the following new clause C2.24	Canvassing and obtaining additional information by tenderers
	The Tenderer shall not make any attempt either directly or indirectly to canvass any of the Employer's officials or the Employer's agent in respect of his tender, after the opening of the tenders but prior to the Employer arriving at a decision thereon. The Tenderer shall not make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.

Add the following new clause C2.25	Prohibitions on awards to persons in service of the state The Employer is prohibited to award a tender to a person - a) who is in the service of the state; or b) if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or c) a person who is an advisor or consultant contracted with the Department of Water and Sanitation and/or Overberg Water Board. In the service of the state means to be - a) a member of:- • any municipal council; • any provincial legislature; or • the National Assembly or the National Council of Provinces; b) a member of the board of directors of any municipal entity; c) an official of any municipality or municipal entity; d) an employee of any national or provincial department; e) provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999); f) a member of the accounting authority of any national or provincial public entity; or g) An employee of Parliament or a provincial legislature. In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.
C.3	The employer's undertakings
C.3.1	Respond to requests from the tenderer The Employer will respond to requests for clarification received via email up to five (5) working days before the tender closing time. 27 Augst 2026 at 12:00 PM
C.3.2	Issue Addenda Addenda will be issued until four (4) calender days before the tender closing time 27 August 2026 @12:00 pm.
C.3.5	The time and location for opening of the tender offers are: The (BRR) Bid Received Register will be published on the website within 10 days of closing.
C.3.9	Arithmetical errors, omissions and discrepancies
C.3.9.1	Check the highest ranked tenders or tenderers with the highest number of tender
	evaluation points after the evaluation of tender offers in accordance with C.3.11 for: a) the gross misplacement of the decimal point in any unit rate; b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in: i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or the summation of the prices.

C.3.9.2	The arithmetical errors shall be corrected in the following manner: - Where there is a discrepancy between the amounts in words and amounts in figures, the amount in words shall govern. - If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected. - Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices. Offer will be rejected if the tenderer does not correct or accept the Correction of the arithmetical error in the manner described above.
C.3.11	Functionality, Price and Preference The purpose of the evaluation is to ensure and promote compliance with the Constitution, specifically Section 217, which provides that when organs of state contract for goods or services, they must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective. The evaluation of bids will be undertaken in 4 stages.
	Stage 2: Initial screening (compliance) on Supply Chain Management returnable requirements During this phase bid documents will be reviewed to determine the compliance with Standard Bidding Documents (SBD), SCM returnable, tax matters and contractors had registered on Central Data Base (CSD) and CIDB. All returnable documents must be submitted with the bid documents at the closing date and time of the bid. Bids which do not satisfy the compliance criteria will be disqualified and will not be evaluated further on pre-qualification criteria. The bid proposal will be screened for compliance with administrative requirements as indicated below and bidders must circle the correct answer

Phase 1: Administrative Requirements RETURNABLE SCHEDULES (All schedules must be completed and returned by the supplier when submitting the offer.)			
DOCUMENT	ANNEXURE	DIRECTIVE	COMPLY/ NOT COMPLY
SBD1	A	Bidders are required to complete this document in full and be signed off. The date on this form must be a date which is within the bid advert period	
ANNEXURE A3 (See Attached) PRICING SUBMISSION.	B	Bidders are required to complete the applicable form in full and ensure that the amounts in the document are properly calculated. The total amount (inclusive of VAT) as reflected herein will be regarded as the Total Bid Price. Bidders who are not VAT Vendors are not allowed to charge VAT Bidders are required to constantly verify their TAX Status on CSD to ensure that their tax matters are in order	

SBD4	C	This document must be completed in full. Bidders' attention is drawn particularly to paragraph 2.3 which requires the bidder to disclose if the company or any of its directors have interest in other companies whether they have bid or not. Bidders are required to provide all information. Should a bidder have more companies to declare, such information can be provided on a separate sheet in the format prescribed in the form and be attached to the SBD 4. Information captured must be in line with what is captured in the CSD report	
SBD 6.1	D	This document must be completed in full. Bidders are advised to ensure that information captured in this form is aligned to information contained in the CSD Reports.	
BBBEE Certificate / Sworn affidavit	E	Bidders are required to submit a valid BBBEE Certificate or sworn affidavit.	
CSD Report	F	Bidders are requested to provide copies of registration on CSD Report	
Certificate of authority for signature	G	3 Different forms are attached. Bidders are required to only complete one form which is relevant to their situation	
Copy of an Identity document of the authorized individual	H	The ID copy to be attached should be that of a person authorized to represent the Service provider as per the completed certificate of authority for signatory form	

Stage 2: Mandatory

During this phase Supply Chain Management will check the below

Criteria	Description	Tick supplied	
		Yes	No
Compulsory Briefing session	Bidder must attend briefing session.		
SBD 3.2 Pricing Schedule	The bid will be awarded to one service provider that will be able to supply all the items listed on the Bill of Quantities. Failure to quote on all items on the Bill of Quantities will be deemed non-responsive and will be disqualified for further evaluation.		
Organogram	Organogram for the team (visual diagram showing organizations structure, reporting relationships, and roles)		
ECSA registration of Team Lead/Project Manager	Professional Engineer Electrical or Automation (Proof of valid ECSA certificate)		
Instrumentation Trade Test certificate of Instrumentation Mechanician	Proof of Trade Test certificate		
Valid COIDA Registration Certificate	Submitting a Valid COIDA certificate or A valid Letter of Good Standing must be handed in with the tender in this regard		
Valid CIDB certificate and on the system on the day of evaluation	It is estimated that tenderers must have a CIDB contractor grading designation of a minimum of 6 EP or higher		
JV agreement completed and signed, if applicable	In case of bids where Consortia / Joint Ventures, Consortia/Joint Venture agreement signed by both parties must be submitted with bid proposal.		
Contractor's Certificate as an Elpro/Equivalent Telemetry System Integrator or Channel Partner	Proof of valid certificate (Individual or company)		

Contractor's Certificate by ADROIT/Equivalent as a System Integrator or Channel Partner	Proof of valid certificate (Individual or company)		
Contractor's Certificate as a Rockwell or any PLC System Integrator	Proof of valid certificate (Individual or company)		

Stage 3: Functional Evaluation

Stage 3: Functional Evaluation

The Functional Evaluation will be carried out to assess Bidder's suitability to undertake the project, the Bidder's Company Experience, Current Resource, Current Expertise and project cost will be evaluated. Bidders who fail to obtain a **minimum 75%** for functionality under stage 3 will not be considered further.

i) In order to qualify for maximum points, the bidder's Contractor must have successfully completed related projects of *at least five (5) ADROIT or equivalent SMART UI SCADA related projects*.

(1 project gets 1, 2 projects get 2, 3 projects get 3, 4 projects get 4, 5 or more projects get 5)

ii) Team Lead must be registered as a Professional Engineer Electrical or Automation (Proof of valid ECSA certificate)

iii) In order to qualify for maximum points, the bidder must have in its employment one experienced Team lead – should be a sheet where they provide their organogram and attach CV – site personnel should be identified in that sheet. Number of years for maximum points: 10 years or more score maximum points.

iv) Contractor's Certificate as a Rockwell or any PLC System Integrator

v) Contractor's Certificate by ADROIT/Equivalent as a System Integrator or Channel Partner

vi) Contractor's Certificate as an Elpro/Equivalent Telemetry System Integrator or Channel Partner

vii) Project plan/methodology – the Project plan must be well broken down with methodology. The deliverables should be clearly outline, timeframe/milestone, quality assurance & management of the project including staff deployment to each activity/deliverable. Training of Overberg Water's staff namely maintenance officers. SMART principle should be used

Functional Evaluation Criterion Summary

The maximum points allocation per criterion is summarized in the following table: - **Length of experience will be based on closing date of tender not evaluation date**

CRITERION (minimum 75%)	POINTS
Contractor Experience	50
Team Capability and Experience	35
Project Plan/Methodology	15
TOTAL POINTS	100

CRITERIA	TERIA/CLAUSE	SCORE	EVIDENCE	
1. Company Experience in the industry	The bidder must indicate work experience of projects completed to the value of R 200 000 or above in supply, installation and commissioning of ADROIT SCADA / Elpro Telemetry systems in the last 10 years. Substantial Evidence: The Bidder must submit reference letters on a client's letterhead which indicates the start and end date of years of services and the total price of the works rendered by the bidder.	25	reference letters on a client's letterhead	
	More than 4 similar projects successfully completed	5		
	4 similar projects successfully completed	4		
	3 similar projects successfully completed	3		
	2 similar projects successfully completed	2		
	1 similar project successfully completed	1		
	The bidder must indicate depth of working experience with client's reference letters demonstrating the capability and quality of services rendered by the bidder in in supply, installation and commissioning of ADROIT SCADA/ELPRO Telemetry systems Substantial Evidence: The Bidder must submit an appointment letter of the highest value project they have completed to satisfaction. Evidence required will be appointment letter, completion certificate and reference letters on a client's letterhead which indicate the value, start and end date of the project rendered by the bidder	25	Copies of appointment letter, reference letter and completion certificate	
	Above R15 000 000 project successfully completed	25		
	Between R15 000 000 - R10 000 000 project successfully completed	18		
	Between R10 000 000 - R4 000 000 project successfully completed	15		
	Between R4 000 000 - R2 000 000 project successfully completed	12		
	Between R2 000 000 - R1 000 000 project successfully completed	9		
	Between R1 000 000 - R500 000 project successfully completed	6		
	below R500 000 project successfully completed	0		

2. TEAM CAPABILITY	Team Capability and experience: Team Lead must be registered with ECSA as Pr Eng, Pr Tech Eng or Pr Techni. with Electrical/Electronic engineering qualification. The lead Engineer must have experience working in the similar project. Bidders must submit as part of the proposal, the following: The organogram of proposed team; CVs of proposed team (Lead Engineer), Certified copies of qualifications of the Lead Engineer including the copy of ECSA registration. ECSA registration will be checked with ECSA Team leader must have experience in implementing ADROIT SCADA-related projects. S/he should have led projects that developed and implemented ADROIT SCADA projects. Contact details for reference checks in line with the projects should be provided Team Lead/Project Manager: Years of experience in similar work Comprehensive CV, ECSA Registration and Certified Qualifications together with an Organogram	20	Comprehensive CV, ECSA Registration and Certified Qualifications together with an Organogram
	(above 15) years of experience working on the similar projects	20	
	(10 ≤ x < 15) years of experience working on the similar projects	16	
	(7 ≤ x < 10) years of experience working on the similar projects	12	
	(5 ≤ x < 7) years of experience working on the similar projects	8	
	(3 ≤ x < 5) years of experience working on the similar projects	4	
	(x < 3) years of experience working on similar projects	0	
	The Trade Tested Instrumentation Mechanician with a Instrumentation Trade Test. Copies of certified certificates must be attached to the proposal as proof, failure to attach, bidders will forfeit points. CVs of proposed team Technician (Electrical or Instrumentation); Certified copies of qualifications Technician (Electrical Instrumentation) . Certified copies of qualifications Technician and must issue a COC		
	Trade Tested Instrumentation Mechanician: Years of experience in similar work with Instrumentation Trade Test	15	
	(6) and above years’ experience working on the similar projects	15	
	(5) years’ experience working on the similar projects	12	
	(4) years’ experience working on the similar projects	9	
	(3) years’ experience working on the similar projects	6	
	(2) years’ experience working on the similar projects	3	
	(below 2) years of experience working on similar projects	0	

3. Project Plan and Methodology	Capability: Methodology/Project Plan	15	Project Plan and Methodology	
	24hr/365 call out facility: Bidders must outline fault logging / call out process followed when clients report an urgent mechanical/electrical/ Instrumentation problem to the bidder's company. Escalation procedure must be outlined. Clearly state response times for critical and non- critical breakdowns specified in terms of reference.			
	Project plan well broken down with methodology, deliverables, timeframe/milestone, quality assurance & management of the project including staff deployment to each activity/deliverable	15		
	Project plan provided with clear methodology, deliverables, timeframe/milestone & management of the project	12		
	Project plan provided with clear deliverables & timeframes/milestones	9		
	Project plan provided with no clear deliverables & timeframes/milestones	6		
	Project plan provided without milestones and how the deliverables will be attained	3		
	No project plan provided	0		
TOTAL SCORE		100	Minimum 75	

Stage 4: Price and B-BBEE

Stage 4: Price and B-BBEE

The procedure for the evaluation of responsive tenders is Method 2 where the tender is evaluated in terms of price and preferences. The score for the financial offer will be calculated using Formula 2 (option 1) of SANS294. The 80/20 Preference points system will be used, with a maximum of 80 is allocated for price on the following basis:

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

Where

P_s = Points scored for price of bid under consideration

P_t = Price of bid under consideration

$P_{\min}$ = Price of lowest acceptable bid

In terms of Regulation 5 (2) and 6 (2) of the Preferential Procurement Regulations, preference points must be awarded to a Bidder in accordance with the table below:

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)
Women		
People with disability		
Youth (35 and below)		
Location of enterprise western cape		
B-BBEE status level contributors from level 1 and 2 which are EME or QSE		
TOTAL points for specific goals		

C.3.13.1	Tender offers will only be accepted on condition that: a) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; b) the bidder or any of its directors is not listed in the Register of Bid Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; c) the bidder has not: i. abused the Employer's Supply Chain Management System; or ii. failed to perform on any previous contract and has been given written notice to this effect. d) Has completed the Compulsory Enterprise Questionnaire, SBD4, 6.1, 7.1 and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process Has submitted the documentation listed in T2.21 and T2.22
C.3.18	The number of paper copies of the signed contract to be provided by the employer is ONE.

PART T2: RETURNABLE DOCUMENTS AND SCHEDULES

T2.1 LIST OF RETURNABLE DOCUMENTS

*The following documents must be returned by the Bidder for evaluation purposes in addition to the Schedule listed in previous paragraphs. **Failure to supply the documents listed below will result in disqualification.***

THE FOLLOWING DOCUMENTS MUST BE FURNISHED (FAILURE TO SUBMIT COMPULSORY DOCUMENTATION WILL RESULT IN YOUR BID BEING DISQUALIFIED)			NO
	Tax Compliance (Provide PIN)	☐	☐
	B-BEE Certificate issued by SANAS accredited verification agent/ OR AFFIDAVIT FOR EME/QSE ON DTI FORMAT	☐	☐
	Proof of valid registration with CIDB	☐	☐
	Signed Declaration of Interest	☐	☐
	Certificate of Independent Bidder determination	☐	☐
	Valid COIDA certificate issued by the Department of Labour	☐	☐
	Fully Completed and Signed all other SBD forms	☐	☐
	ECSA Certificates for the Team Lead	☐	☐
	Instrumentation Trade Certificate for the Instrumentation Mechanician	☐	☐

T2.2 RETURNABLE SCHEDULES

Insert all the Forms required and re-number them

FORM A: ATTENDANCE REGISTER OF THE COMPULSORY CLARIFICATION MEETING

**ATTACH THE ATTENDANCE
REGISTER OF THE
COMPULSORY CLARIFICATION
MEETING**

FORM B: VENDOR NUMBER REGISTRATION WITH CENTRAL SUPPLIER DATABASE

- 1. Bidders must submit Vendor Number Registration with Central Supplier Database
- 2. Failure to submit the Vendor Number Registration with Central Supplier Database may result with the bidder being disqualified.

ENTITY NAME _____

**CSD VENDOR NUMBER
REGISTRATION**

NAME

**SIGNATURE OF
BIDDER**

DATE

**CAPACITY UNDER WHICH
BID IS SIGNED** _____

FORM C: TAX

COMPLIANCE CONDITIONS

PERTAINING TO TAX

TAX CLEARANCE CERTIFICATE REQUIREMENTS

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

1. Any person who requires his or her tax compliance status to be disclosed to a government institution or department, for purposes of submitting a bid or to confirm its good standing after the phasing out of paper based TCCs must request a unique security personal identification number (PIN) from SARS.
2. Very important to note is that the disclosure of a bidder's tax compliance status is an express condition for all acceptable Government bids. Failure to make the relevant disclosures will invalidate your bid and your response will be null and void.
3. The Government institution or department must use the PIN referred to above to verify a person's tax compliance status with SARS.
4. Bidders to complete the table below and provide a unique security personal identification number (PIN) from SARS which will enable the OWB to access online real-time verification of a person's tax compliance status with the electronic Tax Compliance Status (TCS) system. Failure to submit the PIN may result in the bid being disqualified. By completing the below form the bidder gives OWB permission to access their tax compliance status

Full name of bidder:	Electronic Tax Compliance Status System PIN No:

NAME:

SIGNATURE OF BIDDER.....

DATE.....

CAPACITY UNDER WHICH BID IS SIGNED.....

FORM D: PREFERENCE SCHEDULE

FORM E: PROOF OF REGISTRATION WITH CIDB

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

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

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

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

Person authorized to sign the bid:

Full name (in BLOCK letters):

Signature:

Date:

-

FORM F: BIDDER'S DISCLOSURE (SBD 4)

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

1.1 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, 1996 (Constitution), and further expressed in the various applicable legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

1.2 If a person is 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. DECLARATION ON EMPLOYMENT BY ORGAN OF STATE

2.1 Is the bidder, or any of the directors / trustees / shareholders / members / partners of the bidder employed by an organ of state, as defined in section 239 of the Constitution? **YES/NO**

2.2 If YES, furnish particulars of the names, individual identity numbers, in the table below:

Full Name	Identity Number	Name of organ of state

2.3 Do you, or any person connected with the bidder, have a relationship with any person who is

employed by the procuring institution? **YES/NO**

2.3.1 If so, furnish particulars:

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

2.4 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**

2.4.1 If so, indicate all companies registered in the CSD in the table below:

Supplier registration number (MAAA)	Status (active/inactive/deleted)

Failure to disclose all CSD-registered active companies linked to all Directors will lead to disqualification.

3 GENERAL DECLARATION

I,, the undersigned, 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 to be false.

3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.5 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the

awarding of the contract.

3.6 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.7 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act, 1998 (Act No. 89 of 1998) and or may be referred to law enforcement agencies for criminal investigation and or may be restricted from conducting business with the state for a period not exceeding 10 years in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No. 12 of 2004) or any other applicable legislation.

I CERTIFY THAT THE ABOVE IS CORRECT.

I ACCEPT THAT THE PROCURING INSTITUTION MAY REJECT THE BID OR TAKE
APPROPRIATE ACTION AGAINST ME IF THIS DECLARATION IS FALSE.

.....
Signature

.....
Date

.....
Designation

.....
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 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.

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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
$Ps = 80 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right) \text{ or}$		$Ps = 90 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right)$

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

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:

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 (80/20 system) (To be completed by the organ of state)	Bidder's points claimed for specific goals (To be completed by Bidder)
Women	5	
People with disability	5	
Youth (35 and below)	5	
Location of enterprise western cape	2	
B-BBEE status level contributors from level 1 and 2 which are EME or QSE	3	
TOTAL points for specific goals	20	

DECLARATION WITH REGARD TO COMPANY/FIRM

- 4.1. Name of company/firm.....
- 4.2. Company registration number:
- 4.3. TYPE OF COMPANY/ FIRM
- Partnership/Joint Venture / Consortium
 - One-person business/sole propriety
 - Close corporation
 - Public Company
 - Personal Liability Company Pty Ltd
 - Non-Profit Company
 - State Owned
- Company [Tick
applicable box]

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

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

Table 1: Specific goals for the tender and points allocation are indicated as per the table below:
In terms of Regulation 4(2); 5(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this bid the bidder will be allocated points based on the bidder's goals claimed as per table 5. Bidder's goal claimed must be supported by proof/documentation stated as per table 5 and the special conditions of this bid where applicable:

Table 1:

The specific goals allocated points in terms of this tender	Number of maximum points allocated (80/20 system)	Bidder's points claimed for specific goals (To be completed by Bidder)
Women Ownership		
Disability Ownership		
Youth Ownership		
Location of enterprise (local equals province) Western Cape		
B-BBEE status level contribution from level 1 to 2 which are QSE or EME		
SCORED POINTS		

Specific goals" means specific goals as contemplated in section 2(1)(d) of the PPPFA Act which may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability including the implementation of programs of the Reconstruction of Development Programme as published in *Government Gazette* No. 16085 date 23 November 1994.

"Ownership" means the percentage ownership and control, exercised by individuals within an enterprise.

"Disability" means, in respect of a person, a permanent impairment of a physical, intellectual, or sensory function, which results in restricted, or lack of, ability to perform an activity in the manner, or within the range, considered normal for a human being.

- i. A blind person (in terms of the Blind Persons Act, 1968 (Act no.26 of 1968);
- ii. A deaf person, whose hearing is impaired to such an extent that he/she cannot use it as a primary means of communication.
- iii. A person who, as a result of permanent disability, requires a wheelchair, caliper or crutch to assist him/her to move from one place or another.
- iv. A person who requires an artificial limb; or
- v. A person who suffers from a mental illness (in terms of the Mental Health Act, 1973 (Act no. 18 of 1973).

"Youth" means, in respect of a person younger than 35 years of age.

"Location of enterprise" Local equals province. Where a project cuts across more than one province, the bidder may be located in any of the relevant provinces to claim and be allocated the points.

Women, disability, and youth will be measured by calculating the pro-rata percentage of ownership of the bidding company which meets the criterion. E.g., Company A has five shareholders, each of whom own 20% of the company. Three of the five shareholders meet the criterion, i.e., they are women/disability/youth. Therefore, this bidder will obtain 60% of the points allowable for this goal.

Table 1: Documents required for verification of Bidder's claimed points

Documents/ information listed on the below table 6 must be submitted to support and verify points claimed as per **Table 1**

Specific Goal	Requires Proof Documents
Women Ownership	Full CSD Report
Disability Ownership	Full CSD Report(medical certificate)
Youth Ownership	Full CSD Report
Location of enterprise	Full CSD Report
B-BBEE status level contribution from level 1 to 2 which are QSE or EME	B-BBEE certificate/sworn affidavit Consolidated B-BBEE certificate in cases of Joint Ventures (JV) Full CSD Report for each bidder who formed a (JV)

Failure on the part of a bidder to submit proof of documentation required in terms of this tender to claim specific goals with the bid, will be interpreted to mean that preference points for specific goals are not claimed and will not be allocated

FORM G: OHS ACT DECLARATION AND SUBMISSION

The Bidder declares him/herself/herself to be conversant with the following:

1. All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of the Act:

- i) Section 8: General duties of Employers to their employees
- ii) Section 9: General duties of Employers and self-employed persons to persons other than employees.
- iii) Section 13: Duty to Inform
- iv) Section 37: Acts or omissions by employees or mandatories
- v) Sub-section 37(2) relating to the purpose and meaning of this Agreement

2. Construction Regulations, 2014 (Government Notice R.84) pertaining to the Contractor and to all his Subcontractors, or any amendments thereto.

The Bidder declares that he has or will obtain the necessary knowledge, competence and resources to comply fully with all OHS requirements should he be awarded the contract.

The Bidder confirms that he has included with his bid a written proposal describing how he will comply with OHS requirements

Signature Date_____

Name Capacity_____

Bidder _____

FORM H: COIDA CERTIFICATE ISSUED BY DEPARTMENT OF LABOUR

The Bidder must submit valid ***COIDA CERTIFICATE FROM DEPARTMENT OF LABOUR***.

The Bidder hereby certifies that the COIDA CERTIFICATE as required by the Bid, has been submitted and is attached after this page

Signature _____

Date_____

Name _____

Capacity_____

Bidder _____

ATTACH AFTER THIS PAGE

FORM I: SCHEDULE OF BIDDER'S EXPERIENCE IN MAINTENANCE PROJECTS

OWB shall not be held responsible for incorrect judgement misled by unclear written letters/words on the forms below, to be completed by the Bidder(s). **DO NOT COMPLETE THE FORMS BY WRITING "SEE ATTACHED"**, Bidder(s) who refer to attachment will be scored zero. Attachment shall strictly be made where specified and at the correct location, any attachment other than what has been requested by OWB, shall be completely ignored, and scored zero, where points allocation is required.

When completing Forms, Bidder(s) may make copies of the original Forms, should the provided forms be inadequate for their completion of the information required. Forms must be hand completed in black ink, no computer regenerated forms will be accepted. Forms must be completed in full, forms not completed in full shall be rejected by scoring zero.

- i) In order to qualify for maximum points, the bidder's Contractor must have completed construction of ***more than four(4) SCADA/Telemetry related project***
- ii) Main contractor must have a CIDB contractor grading designation of a minimum of **6 EP OR higher**.

FORM J: COMPLETED PROJECTS (to be completed for each individual project)

Name of Bidder	
PROJECT No. 1	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tell/Cell no)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (month/year)	
Is the Project Completed (Yes/No)	
Completion certificate attached (Yes or No)	
Estimated Completion Date (If not yet Completed)	
Completion Date (If completed) (months/year)	
Main Contractor (Yes/No)	

Name of Bidder	
PROJECT No. 2	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tel/Cell no)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (months/year)	
Is the Project Completed (Yes/No)	
Completion certificate attached (Yes or No)	
Estimated Completion Date (If not yet Completed)	
Completion Date (If Completed) (months/year)	
Main Contractor (Yes/No)	

Name of Bidder	
PROJECT No. 3	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tel/Cell)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (months/year)	
Is the Project Completed (Yes/No)	
Completion certificate attached (Yes or No)	
Estimated Completion Date (If not yet Completed)	
Completion Date (If Completed) (months/year)	
Main Contractor (Yes/No)	

Name of Bidder	
PROJECT No. 4	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tel/Cell)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (months/year)	
Is the Project Completed (Yes/No)	
Completion certificate attached (Yes or No)	
Estimated Completion Date (If not yet Completed)	
Completion Date (If Completed) (months/year)	
Main Contractor (Yes/No)	

Name of Bidder	
PROJECT No. 5	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tel/Cell no)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (months/year)	
Is the Project Completed (Yes/No)	
Completion certificate attached (Yes or No)	
Estimated Completion Date (If not yet Completed)	
Completion Date (If Completed) (months/year)	
Main Contractor (Yes/No)	

Name of Bidder	
PROJECT No. 6	
Project Name	
Nature of Project	
Client (Responsible for supervision)	
Client Contact person	
Clients Contact Person (name, tel/Cell no)	
Clients Contact Person (email address)	
Consulting Engineer (name, tel/Cell no)	
Appointment Value	
Project Location (Province)	
Project Duration(months)	
Project Commencement Date (months/year)	
Is the Project Completed (Yes/No)	

FORM K: EXPERIENCE OF NOMINATED PERSONNEL

Bidders must have in their full time employment an experienced Team who has previously worked on ADROIT SCADA and Elpro Telemetry projects and a person registered with ECSA as professional. The information will be verified with the references provided. The bidder must have in its employment a:-

The Team Lead/Project Manager and Instrumentation Mechanician must have an experience working in the similar project. Bidders must submit as part of the proposal, the following:

- The organogram of proposed team,
- CVs of proposed team,
- Certified copies of qualifications of the Team Lead/Project Manager,
- Certified copies of Instrumentation Trade Test of the proposed Instrumentation Mechanician that will be servicing

NB:

One individual may not be nominated for more than one role or position for this bid. If an individual is nominated for more than one role then the points will only be allocated for one of the roles and the bidder will score zero on any other role.

It is **mandatory** to complete all fields in Form J for each project listed as this information will be deemed to be material to the award of the Contract. Failure to complete all fields for the project listed may lead to the bidder losing points during functional evaluation under the categories "Team Capability: Team Lead/Project Manager and Instrumentation Mechanician(s)". Should the bidder choose to present the required information in the attachments, then the bidder must **COMPLETE FORM (L) FIRST and then** make a clear reference to such attachments so that they may be considered; and such attachments must provide the same information requested for in Form L.

TYPICAL FORMS TO BE COMPLETED BY THE BIDDERS

- **Form L (i) Team Lead / Project Manager**
- **Form M (ii) Instrumentation Mechanician (With Instrumentation Trade Test)**
- **Form**

FORM L (i) Team Lead / Project Manager

Post	Name	Qualifications (Diploma, Degree in etc)	Experience in years
Team Lead			

Signature _____

Date _____

Name _____

Capacity _____

Bidder _____

The Bidder must note that repeating the same year under different project will still be considered as one year's experience.

FORM M (ii) Instrumentation Mechanician

Post	Name	Trade Test Certificate	Experience in years
(Instrumentation Mechanician)			

Signature _____ Date_____

Name _____ Capacity_____

Bidder _____

Instrumentation Mechanician		
Name and Surname		
Experience in years' experience as a Instrumentation Mechanician Agent		
EXPERIENCE AS Instrumentation Mechanician IN ADROIT SCADA INSTALLATION PROJECTS		
YEAR of Experience as Instrument Artisan	Year 1 (... ..) (e.g.2019 etc)	Year 2 (... ..) (e.g.2018).
Project Name		
Nature of Project		
Client (Responsible for supervision)		
Client Contact person		
Clients Contact Person (name, tel/Cell no and fax no)		
Clients Contact Person (email address)		
Consulting Engineer (name, tel no and fax no)		
Appointment Value		
Project Location (Province)		
Project Duration(months)		
Project Commencement Date (months/year)		
Is the Project Completed (Yes/No)		
Estimated Completion Date (If not yet Completed)		
Completion Date (If Completed) (months/year)		
Roles/Responsibilities performed by the Bidder on the project:		

Signature _____

Date_____

Name _____

Capacity

PART C1: AGREEMENT AND CONTRACT DATA

C1.1: FORM OF OFFER AND ACCEPTANCE

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of: **SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF A SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE.**

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

Rand.

..... (in words);

R.....(in figures)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

Signature(s)

Name(s)

Capacity

for the tenderer

(Name and

address of organization/)

.....

Name and signature of witness Date

Acceptance

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract are contained in:

Part C1: Agreements and contract data (which includes this agreement) Part C2:

Pricing data

Part C3: Scope of work Part

C4: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfill any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five working days of the date of such receipt notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

Signature(s)

Name(s) **ONLY TO BE COMPLETED**

TAGE

Capacity **AT ACCEPTANCE STAGE**

Employer

Name and

signature

of witness

Date

Schedule of Deviations

Notes:

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

1 Subject	
Details	
.....	
.....	
.....	
2 Subject	
Details	
.....	
.....	
.....	
3 Subject	
Details	
.....	
.....	
.....	
4 Subject	
Details	
.....	
.....	

Y TO BE COMPLETE
ACCEPTANCE STAGE

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

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

FOR THE TENDERER:

Signature(s) _____

Name(s) _____

Capacity _____

[Name and address of organisation]

Name and signature
of
witness

~~ONLY TO BE C~~

~~COMPLETED~~

FOR THE EMPLOYER: ACCEPTANCE STAGE

Signature(s) _____

Name(s) _____

Capacity _____

[Name and address of organisation]

Name and signature
of witness

Date _____

CONFIRMATION OF RECEIPT

The Tenderer (now Contractor), identified in the Offer part of this Agreement, hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

The *[day]*

of *[month]*

20 *[year]*

at *[place]*

For the Contractor:
Signature

.....
Name

.....
Capacity

Signature and name of witness:
Signature

.....
Name

ONLY TO BE COMPLETED AT ACCEPTANCE STAGE

C1.2 CONTRACT DATA

PROJECT TITLE:	SUPPLY, DELIVERY AND INSTALLATION OF A MODERN TELEMETRY SYSTEM, UPGRADE OF SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FROM ADROIT CLASSIC TO ADROIT SMART UI/EQUIVALENT AND MAINTENANCE OF THE SYSTEM FOR THIRTY SIX MONTHS (36) FOR OVERBERG WATER (OWB) IN THE WESTERN CAPE
CONTRACT NO:	RFP OW- 015 2026/27
C.1.2 Contract Data	
The General Conditions of Contract for Construction Works, Third Edition (2015) published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and is obtainable from www.saice.org.za. The General Conditions of Contract for Construction Works make several 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 Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the General Conditions of Contract.	
Part 1: Data provided by the Employer	
	Clause 1.1.1.13: Defects Liability Period The Defects Liability Period is 12 months, measured from the date of the Certificate of Completion
	Clause 1.1.1.14: Due Completion Date The time for achieving Practical Completion is 3 months after the Commencement Date
	The name of the Employer is Overberg Water Board, represented by Mr. Anthony Lotz and/or such persons or person duly authorised to be the Employer in writing by Overberg Water.
	The Pricing Strategy for Maintenance is day work rate
	The Employer's address for receipt of communications is: Delivery Address: Attention: Supply Chain Manager: Supply Chain Management Overberg Water Board 1 Niblick Way Ground Floor, Trident Park 3 Somerset West 7137

	"in the event of any ambiguity, conflict or discrepancy between the various contract documents, lists and schedules, the order of precedence (from highest to lowest) shall be as follows: • The contract data • The form of offer and acceptance (Tender document) • General conditions of contract (GCC 2015) • Service Level Agreement • Contract forms
	• Scope of Work • SANS 1200 Standardised Specifications • Site Information • Construction drawings • Bill of quantities • The returnable schedules
	The Contractor shall obtain the specific approval of the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract: GCC 2015 3rd Edition 1. Clause 5.8.1 Non-working times 2. Clause 5.11.1 Suspension of the Works 3. Clause 5.12.1 Approval of any extension of time for completion 4. Clause 5.12.4 Acceleration of progress instead of extension of time 5. Clause 5.13.2 Reduction of a penalty for delay 6. Clause 6.3.2 The issuing of variation orders 7. Clause 6.8.4 The determination of additional or reduced cost arising from changes in the legislation 8. Clause 6.11 The agreeing of the adjustment of the sums for general items 9. Clause 10.1.5 The giving of a ruling on a Sub-Contractor's claim

	“The Employer and the Contractor hereby agree, in terms of the provisions of section 37 (2) of the Occupational Health & Safety 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, namely: a) The Contractor undertakes that the appropriate officials and employees of the Contractor will fully acquaint themselves with all relevant provisions of the Act and the Regulations promulgated in terms of the Act; b) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with; c) The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and Regulations, and expressly absolves the Employer from itself 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; d) The Contractor agrees that any duly authorised official of the Employer shall be entitled to take such steps as may be necessary to ensure that the Contractor has complied with his undertakings as set out more fully in paragraphs (a) and (b) 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 to inspect any appropriate records or Safety Plans held by the Contractor; e) The Contractor shall be obliged to report forthwith to the Employer any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the Act and regulations, pursuant to work performed in terms of this Contract, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge;
--	--

	Clause 5.3.1: Commencement of the Works The documentation required before commencement with Works execution are: a) Health and Safety Plan (Refer to Clause 4.3) b) Initial programme (Refer to Clause 5.6) c) Security (Refer to Clause 6.2) d) Insurance (Refer to Clause 8.6)
	Clause 5.3.2: Timeframe to deliver documentation The time to submit the documentation required before commencement with Works execution is fourteen (14) days.
	“The Contractor shall bear all costs and charges for special and temporary rights of way required by him/her in connection with access to the Site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him/her for the purposes of the Works.”

	Clause 5.8.1: Non-Working Times The special non-working days are: 1. All gazetted public holidays falling outside the year end break.
	Clause 5.12.2.: Some reasons for extension of time Clause 5.12.2.2: Abnormal climatic conditions. <i>Add the following:</i> 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. 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 Employer's Agent such extension of time will be added to the Time for Completion. It shall be further noted that where the critical path is not affected, no extension of time for <u>abnormal</u> climatic conditions or for any other reason will be entertained. Rainfall of less than 12mm between 7am and 5pm shall not be deemed to be an inclement weather day.
	Clause 5.13.1: Penalty for Delay

	The penalty for failing to complete the Works will be charges per day. The cost will be 0.1% of the contract sum per day
	Clause 5.16.3: Latent defect liability The latent defect period is one (1) year for mechanical, Electrical and Instrumentation engineering works.

	Clause 6.2: Security The security to be provided by the Contractor shall be a performance guarantee of 10% of the Contract Sum. The performance guarantee shall contain the wording of the document included in C1.3. In the event that the contractor is unable to provide such a guarantee, a deduction of 10% shall be made to each payment certificate payable to the contractor with the accumulated amount only paid out at the end of the contract liability period.
	Delete in its entirety
	Clause 6.8.2: Contract Price Adjustment The Contract Price Adjustment is not applicable in this contract.
	Clause 6.8.3: Variation in Cost of Special Materials Price adjustments for variations in the costs of special materials are not allowed
	Clause 6.10.1.5: Interim Payments - Materials on Site Overberg Water will make payments based on the successful completion and commissioning of telemetry stations throughout the duration of the project.
	Clause 6.10.3: Retention Money The limit on retention is: 10% of the Contract Price.
	Clause 6.10.4: Delivery, dissatisfaction with and payment of payment certificate Delete 28 days and add 30 days Add the following to clause 6.10.4: Notwithstanding the above, the Engineer shall be empowered to withhold the delivery of the payment certificate until the Contractor has complied with his obligations to report in terms of Clause 4.10.2 and as described in the Scope of Work.
	Clause 8.6.1.1.2: Insurance The value of the materials supplied by the Employer to be included in the insurance sum is -Nil.
	Clause 8.6.1.1.3: Insurance The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is Nil.

6.1.3	Clause 8.6.1.3: Insurance The limit of indemnity for liability insurance is R 1 million for any single claim – the number of claims to be unlimited during the construction.
6.1.5	Clause 8.6.1.5: Additional Insurance Additional Insurance is required for the following: a) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacturing or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.
2.1.3.8	Add the following: The Contractor has furnished inaccurate information during the execution of his works.
2.1.3.9	Add clause 9.2.1.3.9 after clause 9.2.1.3.8 An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the contract that benefited the Contractor.
0.4.1	The parties may at time agree to settle disputes with the help of an impartial third party
10.5	Clause 10: Dispute Resolution "Dispute resolution shall initially be by means of ad-hoc adjudication as per Clause 10.5.2. the number of adjudicators is one (1). Should adjudication not be successful, then the dispute shall be referred to Arbitration under the provisions of Clause 10.7.1."
0.5.3	The number of Adjudication Board Members to be appointed is one (1).
11	Clause 11: Confidentiality The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without prior written consent of the Engineer.
12	Clause 12: Amendments in writing No amendments of this Contract or of any provisions or terms hereof and no waiver or relaxation or suspension of any of the provisions or terms of this Contract shall be of any force or effect unless reduced to writing and signed by both the parties hereto.

PART 2: DATA PROVIDED BY THE CONTRACTOR

The contractor is advised to read the *general conditions of contract for construction works, third edition, 2015* published by the South African institution of civil engineering, private bag x200, halfway house, 1685, in order to understand the implications of this contract data which is required to be completed. Copies of these conditions of contract may be obtained from www.saice.org.za.

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

	The name of the Contractor is:							
	The address of the Contractor is: Address (physical): Address (postal): Telephone: Facsimile: e-mail:							
	The security to be provided by the Contractor shall be one of the following:							
	<table border="1"> <thead> <tr> <th>Type of Security</th> <th>Contractor's choice Indicate your choice with "Yes" to one of the below</th> </tr> </thead> <tbody> <tr> <td>Cash deposit of 10% of the Contract Sum, incl. VAT plus retention of 10% of the value of the Works.</td> <td></td> </tr> <tr> <td>Performance guarantee of 10% of the Contract Sum, incl. VAT plus retention of 5% of the value of the Works.</td> <td></td> </tr> </tbody> </table>	Type of Security	Contractor's choice Indicate your choice with "Yes" to one of the below	Cash deposit of 10% of the Contract Sum, incl. VAT plus retention of 10% of the value of the Works.		Performance guarantee of 10% of the Contract Sum, incl. VAT plus retention of 5% of the value of the Works.		
Type of Security	Contractor's choice Indicate your choice with "Yes" to one of the below							
Cash deposit of 10% of the Contract Sum, incl. VAT plus retention of 10% of the value of the Works.								
Performance guarantee of 10% of the Contract Sum, incl. VAT plus retention of 5% of the value of the Works.								

C1.3 CONSTRUCTION GUARANTEE

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

Physical address:

"Employer" means:

"Contractor" means:

"Engineer" means:

"Works" means:

"Site" means:

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R Amount in words:
.....

"Guaranteed Sum" means: The maximum aggregate amount of R Amount in words:

"Expire Date" means:

CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

- 1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
- 3 The Guarantor hereby acknowledge that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.
- 4 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
- 5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that

the Performance Guarantee is called up in terms of 5; and the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

- 6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
- 7 Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 8 Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
- 10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory: (1)

Capacity

Guarantor's signatory: (2)

PART C2: PRICING DATA AND BILL OF QUANTITIES

C2.1	Pricing Instructions
C2.2	Bill Of Quantities

C2.1 PRICING INSTRUCTIONS

1. All bidders Must bid on every item. Not bidding on all items may invalidate the tender. Overberg water reserves the right to appoint different bidders for different schemes. Overberg water reserves the right not to procure all the quantities of the items listed in the bill of quantities below.
2. The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the items. Such prices and rates shall cover all costs and expenses that may be required in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices shall be used as a basis for assessment of payment for additional work that may have to be carried out.
3. It will be assumed that prices included in the Bill of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.sabs.co.za or www.iso.org for information on standards).
4. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered for such items.
5. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.
6. The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.
7. Reasonable compensation will be received where no pay item appears in respect of work required in the Bills of Quantities in terms of the Contract and which is not covered in any other pay item.
8. The short descriptions of the items of payment given in the Bill of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work. More information is also available in section 11.9. under general system requirements

Technical Documentation:

Rûensveld East Water Scheme Telemetry and SCADA Upgrade

This technical documentation defines the proposed telemetry, instrumentation, control, communications, power, installation, commissioning and handover requirements for the Rûensveld East & Rûensveld-West Water Schemes. It is based on the site assessment findings and is intended to guide detailed design, procurement, implementation and acceptance testing for the upgrade of the water treatment works pump stations, repeater station, reservoirs and remote flowmeter sites.

1. Scope of Work

- Replace obsolete and non-functional telemetry equipment with PLC, RTU, wireless CPE, LTE logger or equivalent field control equipment suited to each site.
- Integrate reservoir levels, pump status, pump faults, flowmeter pulses, level switches, analog level signals and selected VSD information into the central SCADA system.
- Upgrade or replace damaged field panels, power supplies, batteries, solar systems, cabling, conduits, junction boxes, antenna systems and mounting hardware.
- Provide reliable communications using wireless Ethernet, telemetry radio, LTE/cellular or direct network connectivity depending on site conditions.
- Improve site security by using lockable enclosures, padlocks, vandal-resistant panels where required and secured reservoir access hatches.
- Commission, test and document all installed equipment, signal mapping, communications links, alarms and SCADA displays.

2. System Architecture

The upgraded system shall use the Rûensveld East & Rûensveld-West Water Treatment Works as the central SCADA node. Field sites shall report process data to the central SCADA either directly or via intermediate communications infrastructure. Pump stations shall use PLC-based local control panels with Ethernet-capable communications. Reservoir and flowmeter sites shall use telemetry panels, low-power RTU/logger equipment, solar-powered assemblies or battery-operated LTE devices depending on vandalism risk, available power and required functionality.

3. Technical Requirements

Discipline	Minimum Requirement
SCADA	Upgrade outdated SCADA computer hardware and software platform; integrate all field signals, alarms and trends into the central system.
PLC/RTU	Provide suitable PLC, RTU or logger units with sufficient digital inputs, digital outputs, analog inputs, pulse inputs and communications interfaces for each site.
Communications	Use wireless Ethernet, telemetry radio, LTE/cellular or existing IT network connectivity according to line-of-sight, site risk and power availability.
Instrumentation	Use ultrasonic/radar level sensors for reservoirs and sumps unless site conditions justify hydrostatic sensors; provide reed/pulse pickups for mechanical flowmeters.
Power	Provide dedicated protected mains supplies where available; use solar panels and battery backup at remote sites; use long-life battery LTE loggers where solar is not suitable.
Enclosures	Use weatherproof, lockable and corrosion-resistant panels; vandal-proof panels shall be used at high-risk sites.
Cabling	Install screened instrumentation cable, mains Cabtyre cable, Cat5e outdoor cable, RF cable, conduits, glands and IP68 junction boxes as applicable.
Security	Provide padlocks, secure panel doors, sealed cable entries and locked reservoir access hatches where missing or damaged.

4. Site-Specific Implementation Requirements

- Water Treatment Works: Replace outdated SCADA workstation and connect inflow and outflow flowmeters to the automation system using dedicated power and signal cabling.
- Low Lift Pump Station: Install a PLC control panel, wireless CPE, new sump/river level sensor, conduit, junction boxes and MCC interface cabling.
- High Lift Pump Station: Install PLC control panel with battery backup, integrate pump running, fault, auto/off/manual, VSD-related data where available, clearwater sump level and remote reservoir level signals.
- Repeater Station: Restore telemetry function by installing new telemetry equipment, RF cabling and secured access; investigate third-party use of the building and mast.
- Reservoir Sites: Replace missing, vandalised or degraded telemetry panels, batteries, antennas, level sensors, flowmeter pickups, cabling and solar systems as required per site.
- Flowmeter: Use a battery-operated LTE device in a vandal-resistant above-ground enclosure with reed switch pickup; avoid installing electronics in the chamber due to groundwater risk.

5. Testing and Commissioning

- Verify power supply, earthing, protection devices, battery backup and solar charging performance at each site.
- Perform loop testing for all analog inputs, digital inputs, digital outputs and pulse inputs.
- Confirm communications link stability, signal strength, latency and reconnection after power interruption.
- Validate SCADA point naming, alarm limits, trends, historical logging and operator display values.
- Test pump control interlocks and remote monitoring signals without compromising local manual operation.
- Record as-built wiring, IP addresses, radio/LTE settings, panel drawings, I/O schedules, configuration backups and commissioning certificates.

6. Project Deliverables

- Approved detailed design documentation and equipment datasheets.
- Site-specific bill of materials and installation drawings.
- Updated SCADA tag database, alarm list and communications register.
- PLC/RTU/logger configuration backups and source files.
- Factory and site acceptance test records.
- As-built drawings, cable schedules, I/O schedules and panel layouts.
- Operations and maintenance documentation, including recommended spares and maintenance intervals.
- Training session for operations and maintenance personnel

Rûensveld-East

Name	Latitude	Longitude	Elevation	Status
Rûensveld East WTW	34° 4'35.83"S	20°14'44.63"E	111.9 m	Offline
High Lift PS	34° 4'33.59"S	20°14'41.86"E	100.8 m	Offline-partial
Low Lift PS	34° 4'29.54"S	20°14'34.39"E	88.3	Offline-partial
Repeater - Tower	34° 07'53.18"	20°18'21.10"E	379.6 m	Offline
East Reservoir R1	34° 7'44.98"S	20°18'4.97"E	350 m	Online
East Reservoir R2	34° 8'19.44"S	20°18'42.81"E	270.3 m	Offline
East Reservoir R3	34°16'17.37"S	20° 4'51.44"E	275.7 m	Offline

East Reservoir R4	34°23'21.80"S	20° 1'52.01"E	204.8 m	Offline
East Reservoir R5	34°17'33.98"S	20°12'18.78"E	250.7 m	Offline
East Reservoir R6	34°26'59.83"S	20° 6'15.38"E	152.5 m	Offline
East Reservoir R7	34°19'2.08"S	20°25'52.95"E	229.5 m	Offline
East Reservoir R8	34°19'31.92"S	20°29'33.52"E	172.5 m	Offline
East Reservoir BRC9	34°23'36.72"S	20° 9'36.80"E	155.7 m	Offline
West Line Flow	34° 8'24.87"S	20°17'12.47"E	156.9 m	New
P&B Lime works Flowmeter	34°30'50.24"S	20°04'13.32"E	81.42 m	New
East Reservoir BRE3	34°11'33.75"S	20°21'53.50"E	227 m	Offline
East Reservoir BWR4	34°13'13.10"S	20° 6'11.05"E	279.2	New

Rûensveld-West

Name	Latitude	Longitude	Elevation	Status
Rûensveld West WTW	34° 5'42.48"S	19°18'52.04"E	256.47 m	Online
Tuinkop Repeater	34° 6'35.19"S	19°22'52.97"E	495.51 m	Offline
Low Lift Pumps	34° 5'37.86"S	19°18'52.43"	244.01 m	Offline
High Lift Pumps	34° 5'42.63"S	19°18'53.43"E	248.65 m	Online
Pumpstation 3	34° 6'45.61"S	19°22'25.97"E	342.89 m	Online
Pumpstation 4	34°13'26.50"S	19°25'31.15"E	312.57 m	Offline
Reservoir 1 & 1A	34° 7'46.42"S	19°23'9.91"E	460.21 m	Online
Reservoir 2 (Caledon Res)	34°13'25.78"S	19°25'32.10"E	315.7 m	Offline
Reservoir 3 (South Res)	34°13'7.34"S	19°25'25.86"E	445.46 m	Offline
Reservoir 4 (Jongensklip Res)	34°15'4.14"S	19°38'48.89"E	391.16 m	Offline
Reservoir 5 (Central Res)	34°11'23.34"S	19°46'3.34"E	348.27 m	Offline
Reservoir 6 (East Res)	34°13'44.82"S	19°55'28.03"E	313.35 m	Offline
BN16 Flow	34° 9'10.85"S	19°54'19.22"E	171.53m	New
BS5A Flow	34°16'36.09"S	19°32'13.99"E	209.95 m	New
West Line Flow	34° 9'51.36"S	19°23'52.49"E	274.56 m	New
East Line Flow	34° 9'56.27"S	19°49'12.38"E	208.18 m	New

Rûensveld-East Water Treatment Works

SCADA Computer

The existing SCADA computer at the Rûensveld East Water Treatment Works serves as the central monitoring and control workstation for the entire water scheme. However, both the hardware and software have reached the end of their useful life and require upgrading.

Key Findings

- The current workstation is an older **Intel Core i5 computer** with **4 GB RAM**.
- The computer is running **Microsoft Windows 7**, which is no longer supported and presents reliability and cybersecurity risks.
- The existing SCADA software is **Adroit Version 7**, which is obsolete and should be upgraded to the latest supported version.
- The workstation remains operational but is not suitable for long-term operation of the upgraded telemetry system.
- The current platform limits future expansion, support, and integration capabilities.

Recommended Upgrades

- Replace the existing SCADA workstation with a modern industrial-grade computer.
- Upgrade the operating system to a currently supported version of Windows.
- Upgrade the SCADA software from Adroit Version 7 to the latest supported release.
- Migrate all existing telemetry points, alarms, trends, and historical data where required.
- Configure new dashboards, alarm management, and reporting functions.
- Provide remote access functionality for authorised personnel.
- Verify communications with all upgraded remote telemetry sites.

Conclusion

The existing SCADA computer and software platform have become obsolete and should be replaced as part of the telemetry upgrade project. A new SCADA workstation and software upgrade will form the foundation of the upgraded monitoring system and enable reliable integration of all remote sites within the Rûensveld East Water Scheme.

Rùensveld East – Low Lift Pump Station

The Low Lift Pump Station is responsible for transferring raw water from the river source to the Water Treatment Works. While the pumping infrastructure remains operational, the telemetry and monitoring equipment has reached the end of its service life and requires replacement to restore reliable monitoring and integration with the central SCADA system.

Key Findings

- Existing telemetry equipment is obsolete and beyond repair.
- The station remains operational but lacks reliable remote monitoring.
- The river/sump level monitoring system is no longer functional.
- Existing control equipment requires integration with a modern telemetry platform.
- The MCC panel contains signs of contamination and should be cleaned and secured.
- Communications infrastructure requires upgrading.

Level Monitoring

The existing river or sump level monitoring system has failed and should be replaced.

Recommended solution:

- Install a new ultrasonic or radar level sensor.
- Install new instrumentation cabling and conduit.
- Install IP68-rated junction boxes.
- Integrate level data into the SCADA system.

Telemetry and Communications

The existing telemetry equipment should be replaced with a modern PLC-based monitoring system.

Recommended upgrades:

- New PLC telemetry panel.
- Wireless CPE communications link.
- New power supplies and interface equipment.
- Integration with the Water Treatment Works SCADA system.

Control System Integration

The upgraded telemetry system should monitor and report:

- Pump running status.
- Pump fault conditions.
- Power supply status.
- River/sump level.
- Operational alarms.

Where applicable, interfaces should be provided to the existing MCC and VSD equipment.

Recommended Scope of Work

- Replace the existing telemetry system.
- Install a new PLC control panel.
- Install wireless communications equipment.
- Install a new ultrasonic or radar level sensor.
- Install new field cabling, conduit and junction boxes.
- Clean and secure the MCC panel.
- Integrate all monitoring and alarm signals into the SCADA system.
- Commission and test the complete installation.

Conclusion

The Low Lift Pump Station remains operational but is operating with obsolete telemetry infrastructure and no reliable level monitoring. Replacing the telemetry system, restoring level measurement, and integrating the station into the upgraded SCADA system will significantly improve operational visibility, alarm management, and overall reliability of the Rùensveld East Water Scheme.

Rùensveld East – High Lift Pump Station

The High Lift Pump Station is responsible for pumping treated water to the elevated tower and Reservoir 1. The station consists of **two service pumps** supplying the tower and **three transfer pumps** supplying Reservoir 1. While the pumping equipment remains operational, the telemetry and monitoring systems are largely non-functional and require upgrading.

Key Findings

- Existing telemetry equipment is obsolete and requires replacement.
- Clearwater sump level monitoring is not operational.
- Reservoir 1 level indication is not functioning.
- Tower level monitoring is required for automatic pump control.
- Existing MCC panel remains operational but has undergone several undocumented modifications.
- Existing drawings are no longer fully representative of the installation.
- Wireless communications can be used instead of telemetry radio due to the site's proximity to the control room.

Pump Monitoring and Control

The existing MCC panel can be integrated into the SCADA system to provide monitoring and control functions.

Proposed monitoring includes:

- Pump running/stopped status.
- Pump fault/trip indications.
- Auto/Off/Manual status.
- VSD speed feedback.
- Clearwater sump level monitoring.
- Reservoir 1 level monitoring.
- Tower level monitoring.

A recently installed **Control Techniques Unidrive M600 VSD** is fitted with RS485 communications capability, allowing additional operational data to be collected and displayed in SCADA.

Clearwater Sump Monitoring

The existing clearwater sump monitoring system is not operational.

Recommended upgrade:

- Install a new level sensor.
- Install new cabling between the sump and control panel.
- Monitor high, low and analogue level signals.

Communications

The station is located close to the Water Treatment Works and can communicate directly with the SCADA system using a **wireless Ethernet link (CPE)**.

Recommended upgrade:

- Install a wireless CPE.
- Reuse the existing mast where possible.
- Integrate communications directly into the central SCADA system.

Telemetry System

The existing telemetry equipment should be removed and replaced with a modern PLC-based control and monitoring system.

Recommended equipment includes:

- New PLC control panel.
- Battery backup system.
- Power supply and DC conversion equipment.
- Interface relays and terminals.
- Wireless communications equipment.
- New control and instrumentation cabling.

Additional MCC Modifications

The existing Auto/Manual selector switches do not have spare auxiliary contacts available for telemetry feedback.

Recommended upgrade:

- Replace selector switches where additional status indication is required.
- Update wiring and interfaces to support SCADA monitoring.

Recommended Scope of Work

- Replace the existing telemetry system with a PLC-based control panel.
- Install battery-backed control and communications equipment.
- Install a new clearwater sump level measurement system.
- Integrate pump status, alarms and VSD data into SCADA.
- Install a wireless communications link to the Water Treatment Works.
- Upgrade MCC interfaces and selector switches where necessary.
- Commission and integrate all signals into the central SCADA system.

Conclusion

The High Lift Pump Station remains mechanically operational but lacks reliable telemetry and process monitoring. Upgrading the telemetry, communications and instrumentation systems will provide real-time visibility of pump performance, reservoir levels and alarm conditions, enabling improved operational control of the Rûensveld East Water Scheme.

Rûensveld East – Repeater Station

The Repeater Station was originally used to provide communications between the Water Treatment Works and the remote telemetry sites. The facility consists of an enclosed building with a 240 VAC power supply and an existing communications mast. However, the site is currently **non-operational** and no longer provides telemetry services.

Key Findings

- No operational telemetry equipment remains on site.
- Only a battery was found; all other telemetry equipment is missing.
- The building is not secured and does not have a padlock.
- Third-party service providers have installed equipment in the building and on the mast.
- The mast has become heavily populated with third-party communications equipment.
- Existing cable entry points into the building have been fully utilised by other users.
- The site is accessible only by **4x4 off-road vehicle**.

Communications Infrastructure

The existing building and mast remain structurally available and could be reused for the telemetry network. However:

- New telemetry equipment is required.

- New RF cables will be required.
- Additional cable entry points must be created to allow installation of new communications cabling.
- Existing communications infrastructure should be inspected and verified before reuse.

Security Concerns

The lack of site security presents a significant risk to any future telemetry installation.

Key concerns include:

- Unlocked building access.
- Uncontrolled third-party occupancy.
- Potential theft or vandalism of replacement equipment.
- Limited control over mast space and cable routing.

Recommended Actions

- Investigate the ownership and authorisation status of third-party equipment installed on the site.
- Secure the building with suitable locks and access control.
- Install new telemetry repeater equipment.
- Install new RF cabling and associated communications hardware.
- Create new sealed cable entry points for telemetry cabling.
- Assess mast loading and available mounting positions before installing additional equipment.
- Recommission the repeater station as part of the overall telemetry network upgrade.

Conclusion

The Repeater Station retains value due to its existing building, mast and available power supply, but it is currently **non-functional** and incapable of supporting the telemetry network. Restoration will require new telemetry equipment, communications infrastructure, security upgrades and verification of third-party use of the site. Once upgraded, the repeater station can again serve as a key communications node within the Rùensveld East Water Scheme.

Rùensveld East – Reservoir 1

Reservoir 1 is a **4 500 m³ reservoir** and is currently the **only remote telemetry site that remains operational** within the Rùensveld East Water Scheme. The site communicates directly with the Water Treatment Works SCADA system after being reconfigured to bypass the repeater station.

Key Findings

- The only reservoir currently reporting data to SCADA.
- Site access requires a **4x4 vehicle**.
- The telemetry building is not adequately secured.
- Cable entry points are unsealed, allowing moisture and insects to enter.
- No mains power is available; the site operates entirely on **solar power and battery backup**.
- The telemetry panel is corroded and requires replacement.
- The existing battery is unsecured, and its condition cannot be verified.
- Security upgrades are required for both the telemetry equipment and reservoir access points.

Level Monitoring

The reservoir currently uses a **hydrostatic level sensor** connected to the telemetry system.

Key findings:

- Existing cable protection is missing.
- Junction boxes are degraded.

- Sensor cabling is exposed and vulnerable to damage.

Recommended solution:

- Replace the hydrostatic sensor with an **ultrasonic or radar level sensor**.
- Install new conduit and cable protection.
- Replace existing junction boxes with IP68-rated units.
- Retain the existing high- and low-level float switches for control and alarm functions.

Flow Monitoring

An **Elster H4000 200 mm mechanical flowmeter** is installed and remains operational.

Key findings:

- Pulse pickup sensor is already installed.
- Existing wiring between the flowmeter and telemetry system is present.

Recommended solution:

- Verify operation of the existing pickup sensor.
- Connect flow data to the upgraded telemetry and SCADA system.
- Replace or upgrade cabling where required.

Telemetry and Power System

The existing telemetry installation is aging and no longer provides an acceptable long-term solution.

Recommended upgrades:

- Replace the telemetry panel.
- Replace the battery system.
- Upgrade the solar charging system.
- Install a lockable weatherproof enclosure.
- Improve surge and lightning protection.

Security Improvements

- Install padlocks on the telemetry building.
- Secure the telemetry enclosure.
- Seal all cable entry points.
- Secure the reservoir access hatch.
- Consider relocating telemetry equipment to the top of the reservoir to improve security and reduce exposed cabling.

Conclusion

Reservoir 1 remains the **only functional telemetry site in the scheme**, but the infrastructure is showing signs of age and deterioration. Upgrades to the telemetry panel, power system, level monitoring equipment and site security are recommended to ensure continued reliable operation and maintain communications with the central SCADA system.

Rüensveld East – Reservoir 2

Reservoir 2 is currently **completely vandalised and non-operational**. The telemetry enclosure has been stripped of equipment, the antenna mast has been removed, and all telemetry functionality has been lost. Although the reservoir is fenced, the access gate is not locked, allowing unrestricted access and increasing the risk of further damage or theft.

Key Findings

- Telemetry equipment has been removed from the enclosure.
- Antenna mast and communications infrastructure are missing.
- Equipment has either been stolen or damaged by exposure to weather.
- The site has no operational telemetry or remote monitoring capability.

Level Monitoring

The original level sensor has been removed, and no level monitoring is currently available.

Recommended solution:

- Install a new ultrasonic or radar level sensor.
- Integrate the level measurement into the telemetry and SCADA system.
- Install new instrumentation cabling and junction boxes.

Flowmeter 1

An **Elster 150 mm mechanical flowmeter** remains installed on the reservoir outlet pipeline.

Key findings:

- No pulse pickup sensor is installed.
- Flow data cannot be monitored remotely.

Recommended solution:

- Install a new pulse pickup sensor.
- Connect the flowmeter to the telemetry system for flow monitoring and reporting.

Flowmeter 2

A second **Elster 50 mm mechanical flowmeter** is installed in a separate flowmeter chamber.

Key findings:

- No pulse pickup sensor is installed.
- Additional cabling will be required between the flowmeter chamber and the telemetry installation point.

Recommended solution:

- Install a new pulse pickup sensor.
- Install new signal cabling and conduit.
- Integrate flow monitoring into the SCADA system.

Security Improvements

- Install lockable or vandal-resistant telemetry enclosures.
- Protect all field cables within conduit.

Recommended Scope of Work

- Completely replace the telemetry system.
- Install a new communications mast and antenna system.
- Install a new ultrasonic or radar level sensor.
- Install pulse pickup sensors on both flowmeters.
- Install new field cabling, conduits and junction boxes.
- Provide a new power system and battery backup.
- Commission and integrate all signals into the central SCADA system.

Conclusion

Reservoir 2 has suffered extensive vandalism and requires a **complete rebuild of its telemetry, communications, instrumentation and power systems**. Once upgraded, the site will be restored to full SCADA functionality with reliable level and flow monitoring.

Rùensveld East – Reservoir 3

Reservoir 3 is a **300 m³ reservoir** located near the Protea area. While the site is fenced, the access gate is not locked and the reservoir access hatch is unsecured, creating a significant security risk. Due to its proximity to nearby buildings, the site is considered vulnerable to vandalism and theft.

Key Findings

- The original telemetry panel and solar power system are missing.
- Only the existing mast and mounting bracket remain.
- The site currently has no operational telemetry system.
- Good cellular network coverage is available at the location.

Communications

The site has reliable cellular coverage, making it suitable for a battery-powered LTE telemetry solution.

Recommended solution:

- Install a battery-powered LTE telemetry device instead of a traditional solar-powered telemetry system.
- Reduce the amount of visible infrastructure and minimise vandalism risk.
- Provide direct communication to the central SCADA system.

Level Monitoring

No reliable level monitoring is currently available.

Recommended solution:

- Install a new ultrasonic or radar level sensor.
- Secure the sensor access point to prevent theft or tampering.
- Integrate level monitoring into the SCADA system.

Flowmeter

An **Elster H4000 mechanical flowmeter** is installed in the chamber below the reservoir.

Key findings:

- The existing flowmeter remains in place.
- The pulse pickup sensor was tested and found to be faulty.
- Flow data is therefore not available remotely.

Recommended solution:

- Replace the pulse pickup sensor.
- Connect the flowmeter to the telemetry system.
- Integrate flow monitoring into SCADA.

Security Improvements

- Use lockable vandal-resistant telemetry enclosures.
- Protect all exposed cables within conduit.

Recommended Scope of Work

- Install a new telemetry monitoring system.

- Reuse the existing mast if structurally suitable.
- Install a new ultrasonic or radar level sensor.
- Replace the faulty flowmeter pulse pickup sensor.
- Install new signal cabling, conduit and junction boxes.
- Integrate all monitoring signals into the central SCADA system.

Conclusion

Reservoir 3 currently has no functioning telemetry system but is well suited to a **battery-powered LTE monitoring solution** due to good cellular coverage. Replacement of the telemetry system, level monitoring equipment, and flowmeter interface, together with improved site security, will restore reliable remote monitoring while reducing future vandalism risks.

Rûensveld East – Reservoir 4

Reservoir 4 is a **200 m³ reservoir** that is fenced, but the site access gate is not secured. Although there are no visible signs of vandalism or theft, the telemetry infrastructure has deteriorated significantly due to age, corrosion, and prolonged exposure to weather conditions.

Key Findings

- Existing telemetry equipment is **non-functional**.
- Telemetry enclosure is heavily corroded internally and externally.
- Evidence of electrical burn damage was observed on some components.
- The existing installation has reached the end of its service life and requires replacement.
- Earthing conductors are exposed and vulnerable to theft.

Earthing System

The existing earthing cables are routed externally and are clearly visible from the nearby road. This presents a risk of copper theft.

Recommendation:

- Install earthing conductors in protective conduit.
- Inspect and test the existing earthing system.
- Upgrade earthing where required to meet current standards.

Level Monitoring

The existing level monitoring system should be replaced.

Recommended solution:

- Install a new ultrasonic or radar level sensor.
- Provide new instrumentation cabling and junction boxes.
- Integrate level monitoring into the central SCADA system.

Flowmeter

An **Elster Kent WP4000 50 mm mechanical flowmeter** is installed in a chamber adjacent to the reservoir.

Key findings:

- Existing pulse pickup sensor was tested and found to be faulty.
- Flow data is currently unavailable remotely.

Recommended solution:

- Replace the pulse pickup sensor.
- Install new signal cabling and conduit where required.
- Integrate flow monitoring into the telemetry system and SCADA.

Recommended Scope of Work

- Replace the complete telemetry system.
- Install a new level monitoring system.
- Replace the flowmeter pulse pickup sensor.
- Upgrade the earthing system and protect exposed conductors.
- Install new field cabling, conduits and junction boxes.
- Commission and integrate all monitoring signals into the central SCADA system.

Conclusion

Reservoir 4 has not experienced significant vandalism; however, the telemetry infrastructure has deteriorated beyond practical repair due to corrosion and weather exposure. A complete telemetry upgrade, together with level monitoring, flow monitoring, earthing improvements and security upgrades, is recommended to restore reliable remote monitoring and SCADA integration.

Rûensveld East – Reservoir 5

Reservoir 5 is a **750 m³ reservoir** with a fenced perimeter; however, the access gates are not locked, creating a security risk. The telemetry installation has deteriorated due to prolonged exposure to weather and moisture, resulting in extensive corrosion and equipment failure.

Key findings include:

- Existing telemetry equipment is **non-operational** and requires complete replacement.
- The telemetry enclosure is heavily corroded internally and externally.
- Moisture ingress has damaged the installed equipment.
- The existing **RF cable and antenna are corroded** and should be replaced.
- The existing mast can potentially be reused following inspection.
- The current solar panel installation is unsuitable, as the replacement solar panel does not fit the existing mounting bracket.
- Site security should be improved through lockable gates, secure reservoir access hatches, and lockable telemetry enclosures.

Recommended Upgrades

- Install a new telemetry control panel and communications equipment.
- Replace the antenna and RF cable.
- Install a new solar power system with battery backup.
- Install a new ultrasonic or radar level sensor for reservoir level monitoring.
- Install a pulse pickup sensor and telemetry interface for the flowmeter.
- Replace damaged field cabling, conduits, and junction boxes.
- Integrate all signals into the central SCADA system.

Conclusion

Reservoir 5 has not suffered major vandalism, but the existing telemetry infrastructure has reached the end of its service life due to environmental deterioration. A complete telemetry and power system replacement is recommended to restore reliable remote monitoring and SCADA integration.

Rûensveld East – Reservoir 6

Reservoir 6 is a **300 m³ reservoir** that is fenced; however, the access gate is not secured with a padlock, creating a security concern. The telemetry installation has been heavily damaged, with the enclosure door missing and all telemetry equipment removed.

Key Findings

- The telemetry panel door is missing.
- Telemetry equipment has been removed or stolen.
- The solar panel is missing.
- Water ingress and weather exposure have caused severe corrosion and damage to the remaining panel components.

- The existing installation is beyond repair and requires complete replacement.
- No operational level monitoring equipment remains on site.

Level Monitoring

- The existing level monitoring system is non-functional.
- A new reservoir level sensor is required.
- An ultrasonic or radar level sensor is recommended for reliable long-term operation.

Recommended Upgrades

- Replace the complete telemetry system.
- Install a new telemetry enclosure.
- Install a new solar power system and battery backup.
- Install a new ultrasonic or radar level sensor.
- Replace all damaged field components and wiring.
- Install lockable weatherproof enclosures.
- Integrate all signals into the central SCADA system.

Conclusion

Reservoir 6 has experienced significant asset loss and environmental damage. The telemetry and power systems require complete replacement, together with improved site security, to restore reliable remote monitoring and communications.

P&B Flowmeter

Site Overview

The P&B Lime Works site contains a newly installed **Infinity Evo Class B bulk water meter**. The site is located in an area with a high risk of vandalism, and the flowmeter chamber is protected by a large concrete lid that requires lifting equipment to access.

Current Status

- No telemetry monitoring is currently installed.
- The flowmeter is operational but is not connected to the SCADA system.
- The flowmeter chamber is susceptible to groundwater ingress and may flood during wet conditions.
- Installing telemetry equipment inside the chamber is not recommended due to the risk of equipment damage and maintenance difficulties.

Recommended Solution

A **battery-powered LTE monitoring device** should be installed in a secure above-ground enclosure near the flowmeter chamber. The system should use a reed-switch pulse pickup to monitor flow and transmit data directly to the central SCADA system via the cellular network.

Requirements

- Vandal-resistant telemetry enclosure.
- Reed-switch pulse pickup for the flowmeter.
- Low-power LTE/cellular telemetry logger.
- Long-life internal battery.
- Small concrete plinth for mounting the enclosure.
- No solar power system required.

Conclusion

The preferred solution for the P&B Flowmeter site is a **stand-alone battery-powered LTE telemetry system** installed above ground in a secure enclosure. This approach avoids groundwater-related failures, reduces maintenance requirements, and provides reliable remote flow monitoring with minimal infrastructure.

Rûensveld East – Reservoir 7

Site Overview

Reservoir 7 is a **200 m³ reservoir** that is fenced; however, the access gate is not secured, and the site remains vulnerable to unauthorised access.

Key Findings

- The telemetry equipment remains physically present on site.
- The telemetry system is **not operational** due to deterioration from prolonged weather exposure.
- Significant corrosion is visible on both the inside and outside of the telemetry enclosure.
- The existing telemetry panel has reached the end of its service life and should be replaced.

Level Monitoring

- No reliable level monitoring is currently available.
- A new level sensor is required.
- An **ultrasonic or radar level sensor** is recommended for reservoir level measurement.

Flowmeter

- An existing **Elster H4000 mechanical flowmeter** is installed.
- No pulse pickup sensor is connected to the telemetry system.
- New cabling is required between the flowmeter chamber and the telemetry installation point on top of the reservoir.

Recommended Upgrades

- Replace the telemetry enclosure and telemetry equipment.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor for the existing flowmeter.
- Install new signal cabling and conduit between the flowmeter chamber and telemetry panel.
- Upgrade field junction boxes and cable terminations.
- Commission and integrate the site into the central SCADA system.

Conclusion

Reservoir 7 has not suffered major vandalism, and much of the physical infrastructure remains in place. However, the telemetry equipment has deteriorated due to environmental exposure and is no longer functional. Replacement of the telemetry system, level instrumentation, and flow monitoring equipment is required to restore reliable remote monitoring.

Rûensveld East – Reservoir 8

Site Overview

Reservoir 8 is a **200 m³ reservoir** that is fenced; however, the access gate is not secured, and the site is vulnerable to unauthorised access.

Key Findings

- The telemetry installation has suffered significant deterioration.
- The telemetry panel is heavily corroded internally.

- Several telemetry components are missing.
- Moisture ingress has damaged the remaining equipment.
- The telemetry system is no longer operational.
- The site requires a complete telemetry replacement.

Level Monitoring

- No reliable level monitoring system is currently available.
- A new level sensor is required.
- An **ultrasonic or radar level sensor** is recommended for continuous reservoir level monitoring.

Flowmeter

- An existing **ABB H4000 50 mm mechanical flowmeter** is installed at the site.
- The flowmeter does not have a pulse pickup sensor.
- Flow information is therefore not available remotely.
- New cabling is required between the flowmeter chamber and the telemetry installation point on top of the reservoir.

Recommended Upgrades

- Replace the complete telemetry system.
- Install a new telemetry enclosure and communications equipment.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor on the existing flowmeter.
- Install new signal cabling and conduit between the flowmeter chamber and telemetry panel.
- Replace damaged field wiring and junction boxes.
- Integrate all monitoring signals into the central SCADA system.

Conclusion

Reservoir 8 has experienced significant deterioration due to weather exposure and moisture ingress, resulting in the failure of the telemetry system.

A complete replacement of the telemetry, level monitoring, and flow monitoring infrastructure is required to restore reliable remote monitoring and SCADA integration.

Rüensveld East – Reservoir BRC9

Site Overview

Reservoir BRC9 is a **200 m³ reservoir** that is fenced; however, the access gate is not secured and the site remains vulnerable to unauthorised access. The site has experienced severe vandalism, resulting in the loss of most of the telemetry infrastructure.

Key Findings

- The site has been extensively vandalised.
- All telemetry cabling has been removed.
- The telemetry panel has been removed and stripped of components.
- The antenna mast has been removed.
- No operational telemetry equipment remains on site.
- A complete telemetry rebuild is required.

Level Monitoring

- No operational level monitoring equipment remains.
- A new level sensor is required.
- An **ultrasonic or radar level sensor** is recommended for continuous reservoir level monitoring.

Flowmeter

- An existing **ABB (Elster H4000) 50 mm mechanical flowmeter** remains installed.
- The flowmeter does not have a pulse pickup sensor.
- Flow information is therefore not available for remote monitoring.
- A new pulse pickup sensor will be required to integrate the flowmeter into the telemetry system.

Security Requirements

Due to the history of vandalism at this site, security should be a key design consideration.

Recommended improvements include:

- Vandal-resistant telemetry enclosure.
- Secure mounting arrangements.
- Concealed or protected cable routes.

Recommended Upgrades

- Install a completely new telemetry system.
- Install a new mast, antenna and communications equipment.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor on the existing flowmeter.
- Install new field cabling, conduits and junction boxes.
- Provide a new solar power system and battery backup.
- Integrate all signals into the central SCADA system.

Conclusion

Reservoir BRC9 has suffered extensive vandalism and theft, leaving no functional telemetry infrastructure on site. The reservoir requires a complete replacement of all telemetry, communications, power and monitoring equipment, together with improved security measures to prevent future losses.

Rûensveld East – Reservoir BWR4

Site Overview

Reservoir BWR4 is a **200 m³ reservoir** that is fenced; however, the access gate is not secured with a padlock. The reservoir access hatch is also unsecured, creating a risk of unauthorised access to the reservoir and instrumentation.

Key Findings

- No telemetry equipment is currently installed on site.
- The site is not adequately secured.
- The site requires a completely new telemetry installation.

Level Monitoring

- No operational level monitoring equipment is installed.
- A new level sensor is required.
- An **ultrasonic or radar level sensor** is recommended for continuous reservoir level monitoring and SCADA integration.

Flowmeter

- An existing **ABB H4000 mechanical flowmeter** is installed in a chamber adjacent to the reservoir.
- The flowmeter does not have a pulse pickup sensor connected to a telemetry system.
- Flow information is therefore not available remotely.

- A new pulse pickup sensor and associated telemetry interface are required.

Security Requirements

The site should be upgraded to improve equipment protection and reduce the risk of theft or vandalism.

Recommended improvements include:

- Secure telemetry enclosure.
- Protected cable routes and conduit.
- Tamper-resistant mounting arrangements.

Recommended Upgrades

- Install a new telemetry monitoring system.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor on the existing flowmeter.
- Install new signal cabling, conduits and junction boxes.
- Provide a new power system (solar and battery backup if mains power is unavailable).
- Install communications equipment and antenna infrastructure.
- Integrate all telemetry signals into the central SCADA system.

Conclusion

Reservoir BWR4 currently has **no telemetry infrastructure** and limited site security. A complete telemetry installation is required, including level monitoring, flow monitoring, communications equipment, and improved security measures to enable reliable remote monitoring and integration into the Rûensveld East SCADA system.

Rûensveld East – Reservoir BER3

Site Overview

Reservoir BER3 is a **100 m³ reservoir** that currently has **no telemetry equipment installed**. The site is fenced; however, the access gate is not locked, and the reservoir access hatch does not have a locking mechanism, resulting in poor site security.

Key Findings

- No telemetry system exists at the site.
- The site access gate is unsecured.
- The reservoir access hatch is unsecured.
- No power supply is available on site.
- A complete telemetry installation is required.

Power Supply

- There is no mains power available.
- A **solar-powered telemetry system** with battery backup will be required to power the instrumentation and communications equipment.

Level Monitoring

- No level sensor is currently installed.
- A new level monitoring system is required.
- An **ultrasonic or radar level sensor** is recommended for reliable, low-maintenance reservoir level measurement.
- A suitable mounting bracket and support structure will be required.

Flowmeter

- An existing **ABB (Elster) H4000 mechanical flowmeter** is installed at the site.
- The flowmeter does not have a pulse pickup sensor.
- Flow information is therefore not available for remote monitoring.
- A pulse pickup sensor must be installed and integrated into the telemetry system.

Recommended Upgrades

- Install a new telemetry monitoring system.
- Install a solar power system with battery backup.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor on the existing flowmeter.
- Install a telemetry enclosure, communications equipment and antenna system.
- Install new field cabling, conduits and junction boxes.
- Integrate all monitoring signals into the central SCADA system.

Conclusion

BER3 currently has **no telemetry infrastructure and no power supply**. A complete new solar-powered telemetry installation is required, including level monitoring, flow monitoring, communications equipment, and site security improvements to enable reliable remote monitoring and SCADA integration.

Rûensveld East – Flow Meters: Central & West

Site Overview

Flow Chambers has no telemetry equipment installed. These sites are not fenced and are split by a gravel road between them

Key Findings

- No telemetry system exists at the site.
- No power supply is available on site.
- A complete telemetry installation is required.

Power Supply

- There is no mains power available.
- A solar-powered telemetry system with battery backup will be required to power the instrumentation and communications equipment.

Flowmeter

- An existing 150mm ABB (Elster) H4000 and a 200mm Kent H400 mechanical flowmeter is installed at these two sites.
- The flowmeter does not have a pulse pickup sensor.
- Flow information is therefore not available for remote monitoring.
- A pulse pickup sensor must be installed and integrated into the telemetry system.

Recommended Upgrades

- Install a new telemetry monitoring system.
- Install a solar power system with battery backup.
- Install a new ultrasonic or radar level sensor.
- Install a pulse pickup sensor on the existing flowmeters.
- Install a telemetry enclosure, communications equipment and antenna system.
- Install new field cabling, conduits and junction boxes.
- Integrate all monitoring signals into the central SCADA system.

Bill of Quantities (BOQ)

Rûensveld East Water Scheme Telemetry Upgrade

A. General & Preliminary Items

Item	Description	Unit	Qty	Price
A.1	Electrical compliance certification	Sum	1	
A.2	Telemetry FAT & SAT testing certificate	Sum	1	
A.3	SCADA commissioning	Sum	1	
A.4	Training of operators	Sum	1	
A.5	As-built drawings	Sum	1	
A.6	O&M manuals	Sum	1	
A.7	Project management	Sum	1	
A.8	Health & safety file	Sum	1	
	Subtotal excluding VAT	Sum		

1. Water Treatment Works (WTW)

Item	Description	Unit	Qty	Price
1.1	Industrial SCADA Workstation including 65" screen	No	1	
1.2	SCADA Software Upgrade (Adroit)	Lot	1	
1.3	SCADA Configuration & Integration	Lot	1	
1.4	SAFMAG Flowmeter Integration	No	1	
1.5	Ultrasonic Outflow Meter Integration	No	1	
1.6	Ethernet Switch	No	1	
1.7	Instrumentation Cable	m	100	
1.8	Communication Cable	m	100	
1.9	Testing & Commissioning	Lot	1	
	Subtotal excluding VAT	Sum		

2. Low Lift Pump Station

Item	Description	Unit	Qty	Price
2.1	PLC Telemetry Panel	No	1	
2.2	Wireless CPE Radio	No	1	
2.3	Ultrasonic/Radar Level Sensor	No	1	
2.4	Junction Boxes IP68	No	2	
2.5	8-Core Screened Cable	m	25	
2.6	Power Cable	m	15	
2.7	Heavy Duty PVC Conduit	m	15	

2.8	Surge Protection	No	1	
2.9	Installation & Commissioning	Lot	1	
	Subtotal excluding VAT	Sum		

3. High Lift Pump Station

Item	Description	Unit	Qty	Price
3.1	PLC Control Panel	No	1	
3.2	Battery Backup System	No	1	
3.3	Wireless CPE Radio	No	1	
3.4	Sump Level Sensor	No	1	
3.5	Interface Relays	No	20	
3.6	12-Core Control Cable	m	100	
3.7	4-Core Instrument Cable	m	40	
3.8	CAT5E Outdoor Cable	m	50	
3.9	Surge Protection	No	1	
3.10	Installation & Commissioning	Lot	1	
	Subtotal excluding VAT	Sum		

4. Repeater Station

Item	Description	Unit	Qty	Price
4.1	Telemetry Radio Repeater	No	1	
4.2	Antenna	No	1	
4.3	RF Cable	m	30	
4.4	Lightning Arrestor	No	1	
4.5	Power Supply Unit	No	1	
4.6	Cable Entry Seals	No	4	
4.7	Building Security Upgrade	Lot	1	
4.8	Installation & Commissioning	Lot	1	
	Subtotal excluding VAT			

5. Reservoir 1

Item	Description	Unit	Qty	Price
5.1	Telemetry Panel	No	1	
5.2	Solar Panel	No	1	
5.3	Battery System	Set	1	
5.4	Solar Charge Controller	No	1	
5.5	Radar/Ultrasonic Level Sensor	No	1	
5.6	Flowmeter Interface	No	1	

5.7	Instrumentation Cable	m	50	
5.8	PVC Conduit	m	40	
5.9	IP68 Junction Boxes	No	2	
5.10	Security Improvements	Lot	1	
	Subtotal excluding VAT			

6. Reservoir 2

Item	Description	Unit	Qty	Price
6.1	Telemetry Panel	No	1	
6.2	Solar Power System	Set	1	
6.3	Battery Backup System	Set	1	
6.4	Antenna Mast	No	1	
6.5	Antenna	No	1	
6.6	Radar/Ultrasonic Level Sensor	No	1	
6.7	Pulse Pickup – 150 mm Flowmeter	No	1	
6.8	Pulse Pickup – 50 mm Flowmeter	No	1	
6.9	Signal Cable	m	130	
6.10	Conduit	m	80	
6.11	IP68 Junction Boxes	No	4	
6.12	Vandal Resistant Enclosure	No	1	
	Subtotal excluding VAT	Sum		

7. Reservoir 3

Item	Description	Unit	Qty	Price
7.1	LTE Telemetry Logger	No	1	
7.2	Radar/Ultrasonic Level Sensor	No	1	
7.3	Pulse Pickup Sensor	No	1	
7.4	Instrument Cable	m	40	
7.5	Conduit	m	40	
7.6	Lockable Enclosure	No	1	
	Subtotal excluding VAT	Sum		

8. Reservoir 4

Item	Description	Unit	Qty	Price
8.1	Telemetry Panel	No	1	

8.2	Solar Power System	Set	1	
8.3	Radar/Ultrasonic Level Sensor	No	1	
8.4	Pulse Pickup Sensor	No	1	
8.5	Flowmeter Signal Cable	m	35	
8.6	Conduit	m	35	
8.7	Earthing Upgrade	Lot	1	
	Subtotal excluding VAT			

9. Reservoir 5

Item	Description	Unit	Qty	Price
9.1	Telemetry Panel	No	1	
9.2	Solar Power System	Set	1	
9.3	Battery Backup	Set	1	
9.4	Antenna	No	1	
9.5	Low Loss RF Cable	m	30	
9.6	Radar/Ultrasonic Level Sensor	No	1	
9.7	Pulse Pickup Sensor	No	1	
9.8	Instrumentation Cable	m	40	
9.9	Conduit	m	40	
	Subtotal excluding VAT			

10. Reservoir 6

Item	Description	Unit	Qty	Price
10.1	Telemetry Panel	No	1	
10.2	Solar Power System	Set	1	
10.3	Battery System	Set	1	
10.4	Radar/Ultrasonic Level Sensor	No	1	
10.5	Instrumentation Cable	m	30	
10.6	Conduit	m	30	
10.7	Lockable Enclosure	No	1	
	Subtotal excluding VAT			

11. Reservoir 7

Item	Description	Unit	Qty	Price
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11.1	Telemetry Panel	No	1	
11.2	Solar Power System	Set	1	
11.3	Radar/Ultrasonic Level Sensor	No	1	
11.4	Flowmeter Pulse Pickup	No	1	
11.5	Signal Cable	m	40	
11.6	Conduit	m	40	
	Subtotal excluding VAT			

12. Reservoir 8

Item	Description	Unit	Qty	Price
12.1	Telemetry Panel	No	1	
12.2	Solar Power System	Set	1	
12.3	Radar/Ultrasonic Level Sensor	No	1	
12.4	Flowmeter Pulse Pickup	No	1	
12.5	Signal Cable	m	45	
12.6	Conduit	m	45	
	Subtotal excluding VAT			

13. Reservoir BRC9

Item	Description	Unit	Qty	Prices
13.1	Telemetry Panel	No	1	
13.2	Solar Power System	Set	1	
13.3	Antenna Mast	No	1	
13.4	Antenna	No	1	
13.5	Radar/Ultrasonic Level Sensor	No	1	
13.6	Pulse Pickup Sensor	No	1	
13.7	Signal Cable	m	40	
13.8	Conduit	m	40	
13.9	Vandal Resistant Enclosure	No	1	
	Subtotal excluding VAT			

14. Reservoir BWR4

Item	Description	Unit	Qty	Price
14.1	Telemetry System	No	1	
14.2	Solar Power System	Set	1	
14.3	Radar/Ultrasonic Level Sensor	No	1	
14.4	Flowmeter Pulse Pickup	No	1	
14.5	Signal Cable	m	40	
14.6	Conduit	m	40	
	Subtotal excluding VAT			

15. Reservoir BER3

Item	Description	Unit	Qty	Price
15.1	Telemetry System	No	1	
15.2	Solar Power System	Set	1	
15.3	Battery Backup	Set	1	
15.4	Radar/Ultrasonic Level Sensor	No	1	
15.5	Flowmeter Pulse Pickup	No	1	
15.6	Signal Cable	m	35	
15.7	Conduit	m	35	
	Subtotal excluding VAT			

16. P&B Flowmeter Site

Item	Description	Unit	Qty	Price
16.1	LTE Data Logger	No	1	
16.2	Reed Switch Pulse Pickup	No	1	
16.3	Vandal Resistant Enclosure	No	1	
16.4	Concrete Plinth	No	1	
16.5	Signal Cable	m	15	
16.6	Conduit	m	15	
	Subtotal excluding VAT			

17. West and Central Flow Meters sites

Item	Description	Unit	Qty	Price
17.1	LTE Data Logger	No	2	

17.2	Reed Switch Pulse Pickup	No	2	
17.3	Vandal Resistant Enclosure	No	2	
17.4	Concrete Plinth	No	2	
17.5	Signal Cable	m	30	
17.6	Conduit	m	30	
	Subtotal excluding VAT			

Bill of Quantities (BOQ)

Rûensveld East Water Scheme Telemetry Upgrade

Item	Description	Unit	Qty	Price
A	General & Preliminaries	Sum	1	
1	Water Treatment Works (WTW)	Sum	1	
2	Low Lift Pump Station	Sum	1	
3	High Lift Pump Station	Sum	1	
4	Repeater Station	Sum	1	
5	Reservoir 1	Sum	1	
6	Reservoir 2	Sum	1	
7	Reservoir 3	Sum	1	
8	Reservoir 4	Sum	1	
9	Reservoir 5	Sum	1	
10	Reservoir 6	Sum	1	
11	Reservoir 7	Sum	1	
12	Reservoir 8	Sum	1	
13	Reservoir BRC9	Sum	1	
14	Reservoir BWR4	Sum	1	
15	Reservoir BER3	Sum	1	
16	P&B Flowmeter Site	Sum	1	
17	West and Central Flow Meters sites	Sum	2	
18	Subtotal A Excluding VAT	Sum	1	

Rûensveld West Water Scheme :

Repair & Upgrade Recommendations

1. Water Treatment Works (WTW) & SCADA

Findings

- SCADA system is operational on a Core i7 PC running Adroit SCADA Version 7.
- Internet connectivity is via Hughes HT2000 satellite with approximately 600 ms latency.
- Communications to most remote sites have failed due to the Tuinkop repeater being offline.
- Wireless link to High Lift Pump Station shows weather degradation.
- Wireless link to Low Lift Pump Station is disconnected.
- Telemetry panel is not fully integrated into SCADA.
- Only Reservoir 1/1A and the High Lift Pump Station reliably communicate with SCADA.

Recommended Upgrades

- Replace all wireless radios, antennas and communication cabling.
- Reconnect telemetry I/O currently disconnected from SCADA.
- Restore communications to all remote sites through a rebuilt repeater network.
- Audit and document satellite service ownership and connectivity.
- Assess migration from satellite to cellular/fibre-based communication where available.
- Upgrade SCADA tags and telemetry integration to achieve full scheme visibility.

2. Low Lift Pump Station (PS1)

Findings

- Communication link to SCADA is not functional.
- Siemens MAG5100W inflow flowmeter is operational but disconnected from telemetry.
- River level monitoring is not installed or no longer operational.
- Wireless communications have failed.
- Pumps are controlled remotely from the High Lift Pump Station.

Recommended Upgrades

- Replace wireless communication equipment.
- Install a local PLC/RTU panel for telemetry collection.
- Reconnect Siemens MAG5100W flowmeter to SCADA.
- Install new river level sensor and integrate into central SCADA.
- Commission Modbus RS485 communication from flowmeter to telemetry unit.

3. High Lift Pump Station (PS2)

Findings

- Site remains operational and controls eight pumps.
- Newly installed WEG VSD drives are in service.
- ABB PLC documentation is unavailable.
- PLC licensing is owned by a third party and not Overberg Water.
- HMI displays inaccurate process information.

- Communication equipment positioning is unsuitable.

Recommended Upgrades

- Obtain or redevelop PLC documentation and source code.
- Verify PLC licensing and ownership.
- Replace or upgrade HMI to ensure reliable process indication.
- Relocate wireless communication equipment from electrical panels to building wall.
- Upgrade communication link to improve reliability.

4. Pump Station 3 (PS3)

Findings

- Pump station has three pumps with WEG VSDs.
- Telemetry communication is intermittent.
- Connectivity problems are caused by failure of the Tuinkop Repeater.
- No cellular coverage available.
- Security is poor with unlocked gates, generator and control room.
- Existing telemetry panels are aging and require replacement.
- HMI values are incorrect for one pump.
- Existing E&H level sensors are functional but aging.
- Flowmeter can be reused.

Recommended Upgrades

- Replace telemetry control panel.
- Replace wireless radio, antennas and cabling.
- Upgrade balancing tank level measurement to radar/ultrasonic technology.
- Waterproof and protect flowmeter chamber electrical connections.
- Install perimeter security measures including padlocks and pepper-gas alarm system.
- Correct HMI process value inaccuracies.

5. Pump Station 4 (PS4)

Findings

- ▮ Site has suffered extensive vandalism and theft.
- ▮ Telemetry equipment has been removed.
- ▮ All telemetry cabling has been cut.
- ▮ Reservoir and valve chamber cables stolen.
- ▮ Operators report the site as a high-risk vandalism area.
- ▮ MCC panel is still present and controls two pumps.

Recommended Upgrades

- Replace all stolen field cabling.
- Install new telemetry cabinet and PLC/RTU.
- Restore pump monitoring and remote-control functionality.
- Install pepper-gas alarm and enhanced security.
- Secure all access points with lockable infrastructure.
- Recommission communications to Reservoir 2.

6. Tuinkop Repeater Site

Findings

- Critical communication hub for the scheme.
- Site was vandalised and stripped of equipment.
- RTU, radio systems, batteries and communication cables stolen.
- Solar infrastructure damaged.
- Antennas and feeder cables weather damaged.
- Existing fencing is inadequate for security.

Recommended Upgrades

- Complete reconstruction of repeater installation.
- Install new solar power system.
- Install new batteries within secure steel enclosure.
- Replace RTU, radios and antenna systems.
- Upgrade site fencing and physical security.
- Install CCTV and/or PIR intrusion monitoring.
- Use anti-theft cable routing and protected antenna feeders.

7. Reservoir 1 & 1A

Findings

- Only reservoir currently communicating with SCADA.
- Solar installation and cabling deteriorated.
- Batteries housed in unsecured plastic enclosures.
- Instrument cabling damaged by weather.
- Existing E&H level sensor display is broken.
- Flowmeter remains operational.

Recommended Upgrades

- Replace weather-damaged field cabling.
- Install galvanised conduit protection.
- Replace failed level sensor display.
- Upgrade level measurement to radar/ultrasonic sensor.
- Replace solar panels and associated cabling.
- House batteries inside lockable enclosure.

8. Reservoir 2

Findings

- Site is offline.
- Underground cables between Reservoir 2 and PS4 have been stolen.
- Hydrostatic level sensor requires replacement.
- Existing flowmeter requires pulse/output interface for monitoring

Recommended Upgrades

- Replace stolen SWA cables.
- Install LoRaWan ultrasonic level sensor.
- Install LoRaWan flow monitoring solution.
- Upgrade security with lockable access hatches.
- Reduce dependence on vulnerable underground cabling.

9. Reservoir 3 (South Reservoir)

Findings

- Capacity approximately 1,500 m³.
- Gate has been stolen.
- High risk of vandalism.
- Cellular coverage available.
- No telemetry installed.
- No level sensor installed.
- No flowmeter present.

Recommended Upgrades

- Install complete telemetry system.
- Install new radar/ultrasonic level sensor.
- Provide secure reservoir access locking.
- Install telemetry communications using available cellular service.
- Install new flowmeter where none currently exists.
- Repair fencing and secure site access.

10. Reservoir 4 (Jongensklip)

Findings

- Capacity approximately 400 m³.
- Telemetry hardware present but controller failed.
- Communications lost because of repeater failure.
- Severe enclosure corrosion present.
- Battery storage is insecure.
- Hydrostatic level sensor requires replacement.

Recommended Upgrades

- Replace failed telemetry controller and cabinet.
- Install corrosion-resistant enclosure.
- Secure battery installation in lockable cabinet.
- Replace hydrostatic level sensor.
- Repair cable gland sealing to prevent moisture ingress.
- Install gate padlock and improve site security.

11. Reservoir 5 (Central)

Findings

- Capacity approximately 400 m³.

- Telemetry equipment is non-functional.
- Solar panel damaged and not operating correctly.
- Battery storage insecure.
- Telemetry enclosure shows corrosion.
- Existing hydrostatic level sensor should be replaced.

Recommended Upgrades

- Replace telemetry equipment.
- Replace damaged solar panel.
- Replace rusted enclosure.
- Relocate batteries into secure cabinet.
- Upgrade level measurement to radar/ultrasonic technology.
- Install pulse pickup on flowmeter for SCADA monitoring.

12. Reservoir 6 (East)

Findings

- Capacity approximately 400 m³.
- Solar power infrastructure deteriorated.
- Solar brackets corroded.
- Telemetry enclosure rusted with moisture ingress.
- Antenna cables stolen.
- Battery installation insecure.
- Hydrostatic level sensor requires replacement.

Recommended Upgrades

- Replace solar panels, brackets and cabling.
- Replace corroded telemetry enclosure.
- Replace stolen antenna cables.
- Install secure battery enclosure.
- Upgrade level sensor.
- Install locking mechanism on reservoir hatch.
- Re-establish telemetry communications.

13. BN16 Flowmeter

Recommended Upgrades

- Elster Kent 50mm flowmeter
- Install cellular data logger with long-life battery.
- Implement remote flow monitoring.

14. BS5A Flowmeter

Recommended Upgrades

- Install telemetry or logger solution once access is restored.
- Elster Kent 50mm flowmeter

15. East Line Flowmeter

Recommended Upgrades

- Elster Kent 80mm flowmeter
- Install telemetry/logger for remote monitoring.

16. West Line Flowmeter

Findings

- ▮ No telemetry or logging available.
- ▮ Mechanical ABB/Elster meter installed.
- ▮ No pulse pickup device fitted.
- ▮ Cellular service available at site.

Recommended Upgrades

- Install pulse pickup sensor on ABB mechanical meter.
- Deploy cellular data logger.
- Implement flow monitoring and reporting.
- Avoid full telemetry station by leveraging existing cellular coverage.

Bill of Quantities (BOQ):**Rûensveld West Water Scheme Rehabilitation & SCADA Upgrade****B. General & Preliminary Items**

Item	Description	Unit	Qty	Price
B.1	Electrical compliance certification	Sum	1	
B.2	Telemetry FAT & SAT testing	Sum	1	
B.3	SCADA commissioning	Sum	1	
B.4	Training of operators	Sum	1	
B.5	As-built drawings	Sum	1	
B.6	O&M manuals	Sum	1	
B.7	Project management	Sum	1	
B.8	Health & safety file	Sum	1	
	Subtotal excluding VAT	Sum	1	

1. Central SCADA & WTW

Item	Description	Unit	Qty	Price
1.1	Industrial SCADA Workstation including 65" screen	No	1	
1.2	SCADA Software Upgrade (Adroit)	Lot	1	
1.3	Audit and recommission Adroit SCADA integration	Sum	1	
1.4	Reconfigure telemetry database and tags	Sum	1	
1.5	Replace wireless base station radio equipment	No	1	
1.6	Replace directional antennas and mounting hardware	No	2	
1.7	Replace antenna feeder cables and surge protection	Lot	1	
1.8	SCADA server backup and system documentation	Sum	1	
1.9	Commission communications network	Sum	1	
	Subtotal excluding VAT	Sum	1	

2. Tuinkop Repeater Site

Item	Description	Unit	Qty	Price
2.1	New outdoor telemetry enclosure	No	1	
2.2	Industrial RTU/Telemetry Controller	No	1	
2.3	Long-range wireless radios	Pair	1	
2.4	High gain antennas	No	2	
2.5	Antenna mast refurbishment	Sum	1	
2.6	Solar panels 550W	No	4	
2.7	MPPT solar charge controller	No	1	
2.8	Deep cycle batteries	No	4	

2.9	Lockable battery enclosure	No	1	
2.11	PIR intrusion alarm/CCTV system	No	1	
2.12	Installation & commissioning	Sum	1	
Subtotal excluding VAT		Sum	1	

This site is the highest priority because it is the primary communications hub for most remote assets.

3. Low Lift Pump Station (PS1)

Item	Description	Unit	Qty	Price
3.1	Small telemetry PLC panel	No	1	
3.2	Industrial LTE/Radio communications device	No	1	
3.3	Wireless radio link replacement	No	1	
3.4	River level sensor (Radar/Ultrasonic)	No	1	
3.5	Flowmeter communication integration (Modbus RTU)	Sum	1	
3.6	Field cabling and termination	Lot	1	
3.7	SCADA integration	Sum	1	
Subtotal excluding VAT		Sum	1	

4. High Lift Pump Station (PS2)

Item	Description	Unit	Qty	Price
4.1	PLC software audit and documentation	Sum	1	
4.2	HMI replacement/upgrade	No	1	
4.3	Communication cabinet modifications	Sum	1	
4.4	Wireless radio replacement	No	1	
4.5	Antenna relocation works	Sum	1	
4.6	SCADA integration testing	Sum	1	
Subtotal excluding VAT		Sum	1	

5. Pump Station 3

Item	Description	Unit	Qty	Price
5.1	Telemetry PLC panel	No	1	
5.2	SCADA communication upgrade	No	1	
5.3	Radio equipment replacement	No	1	
5.4	Antenna replacement	No	1	
5.5	Radar/Ultrasonic level sensor	No	1	
5.6	Pepper gas security alarm	No	1	
5.8	Flowmeter electrical protection upgrade	Sum	1	
5.9	Installation and commissioning	Sum	1	
Subtotal excluding VAT		Sum		

6. Pump Station 4

Item	Description	Unit	Qty	
6.1	New telemetry PLC panel	No	1	
6.2	MCC monitoring interface	No	1	
6.3	Remote communications equipment	No	1	
6.4	Replacement SWA cables	m	500	
6.5	Instrumentation cable replacement	m	500	
6.6	Pepper gas security alarm	No	1	
6.7	SCADA integration and testing	Sum	1	
	Subtotal excluding VAT	Sum		

Site suffered severe vandalism and cable theft.

7. Reservoir 1 & 1A

Item	Description	Unit	Qty	Price
7.1	Radar/Ultrasonic level sensor	No	1	
7.2	Sensor display replacement	No	1	
7.3	Galvanised conduit installation	m	100	
7.4	Solar panels replacement	No	4	
7.5	Solar cabling replacement	Lot	1	
7.6	Battery enclosure	No	1	
7.7	Telemetry refurbishment	Sum	1	
	Subtotal excluding VAT	Sum		

8. Reservoir 2

Item	Description	Unit	Qty	Price
8.1	LoRaWan level sensor	No	1	
8.2	LoRaWan flow pickup device	No	1	
8.3	Telemetry gateway integration	No	1	
8.4	Commissioning	Sum	1	
	Subtotal excluding VAT	Sum	1	

9. Reservoir 3

Item	Description	Unit	Qty	Price
9.1	Complete telemetry installation	Sum	1	
9.2	Cellular communications logger	No	1	
9.3	Radar/Ultrasonic level sensor	No	1	
9.4	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum	1	

10. Reservoir 4

Item	Description	Unit	Qty	Price
10.1	Telemetry cabinet replacement	No	1	
10.2	Telemetry controller/RTU	No	1	
10.3	Radar level sensor	No	1	
10.4	Battery enclosure	No	1	
10.5	Opto pulse pickup	No	1	
	Subtotal excluding VAT	Sum		

11. Reservoir 5

Item	Description	Unit	Qty	Price
11.1	Telemetry controller replacement	No	1	
11.2	Solar panel replacement	No	1	
11.3	New lockable enclosure	No	1	
11.4	Radar level sensor	No	1	
11.5	Opto pulse pickup	No	1	
11.6	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum		

12. Reservoir 6

Item	Description	Unit	Qty	Price
12.1	Solar panel replacement	No	1	
12.2	Solar mounting structure replacement	Sum	1	
12.3	Telemetry enclosure replacement	No	1	
12.4	Antenna cable replacement	Lot	1	
12.5	Battery enclosure	No	1	
12.6	Radar level sensor	No	1	
12.7	Opto pulse pickup	No	1	
	Subtotal excluding VAT	Sum		

13. BN16 Flowmeter

Item	Description	Unit	Qty	Price
13.1	Opto pulse pickup sensor	No	1	
13.2	Cellular data logger	No	1	
13.3	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum		

14. BS5A Flowmeter

Item	Description	Unit	Qty	Price
14.1	Opto pulse pickup sensor	No	1	
14.2	Telemetry logger installation	No	1	
14.3	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum		

15. East Line Flowmeter

Item	Description	Unit	Qty	Price
15.1	Opto pulse pickup sensor	No	1	
15.2	Cellular telemetry logger	No	1	
15.3	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum		

16. West Line Flowmeter

Item	Description	Unit	Qty	Price
16.1	Opto pulse pickup sensor	No	1	
16.2	Cellular logger	No	1	
16.3	SCADA integration	Sum	1	
	Subtotal excluding VAT	Sum		

Bill of Quantities (BOQ):

Rûensveld West Water Scheme Rehabilitation & SCADA Upgrade

Item	Description	Unit	Qty	Price
B	General & Preliminaries	Sum	1	
1	Central SCADA & WTW	Sum	1	
2	Tuinkop Repeater Site	Sum	1	
3	Low Lift Pump Station (PS1)	Sum	1	
4	High Lift Pump Station (PS2)	Sum	1	
5	Pump Station 3	Sum	1	
6	Pump Station 4	Sum	1	
7	Reservoir 1 & 1A	Sum	1	
8	Reservoir 2	Sum	1	
9	Reservoir 3	Sum	1	
10	Reservoir 4	Sum	1	
11	Reservoir 5	Sum	1	
12	Reservoir 6	Sum	1	
13	BN16 Flowmeter	Sum	1	
14	BS5A Flowmeter	Sum	1	
15	East Line Flowmeter	Sum	1	
16	West Line Flowmeter	Sum	1	
17	Subtotal B Excluding VAT	Sum	1	

Bill of Quantities (BOQ):

OVERBERG WATER TELEMETRY UPGRADE

Item	Description	Unit	Qty	Price
A	Rûensveld East SCADA Upgrade	Sum	1	
B	Rûensveld West SCADA Upgrade	Sum	1	
C	Maintenance Contract For 36 Months	Sum	1	
	SUBTOTAL A			
	CONTINGENCIES (10%)			
	SUBTOTAL B			
	VAT 15%			
	GRANDTOTAL INCLUSIVE OF VAT			

SCADA Software License per year calculation example

PMT = 1 000 i = 3% = 15 years	FV = PMT * [((1 + i) ⁿ - 1) / i] =1 000 X [(1 + 0.03) ¹⁵ 1)/0.03] =18 598.91
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The rates above in the bill of quantities must be all inclusive. E.g. travel, Labour, material, profit etc.. Quantities will be increased or decreased as per the client's determination.

SIGNED ON BEHALF OF THE TENDERER

_____ DATE _____

PART C3: SCOPE OF WORK

C3.1 DESCRIPTION OF THE WORKS:

1. SCADA System

1.1. Background

The Overberg Water Board was established in 1993 with the amalgamation of Duivenhoks and Rûensveld water boards. The Overberg Water Board is one of the national water public entities under the Department of Water and Sanitation (DWS). It exists to complement the work of the department and primarily supports the Minister as the shareholder. It is a water board providing bulk water services in terms of the Water Services Act 108 of 1997 and is subjected to a number of applicable laws such as the Constitution, the National Water Act 36 of 1998, Public Finance Management Act 1 of 1999. Overberg Water discharges its services by placing its customers ahead of the delivery menu. It has a long history of delivery service and placing customers at the forefront since its inception. Overberg Water has been a pillar of hope to its customers in terms of the quality of drinking water. The Head Office of OW is situated in Somerset West which is approximately 40 km from the Cape Town CDB and 30 km from Cape Town International Airport. It also has three water schemes functioning as satellite offices and these are Rûensveld West, Caledon; RûENSVELD East Swellendam and Duivenhoks in Heidelberg. It is also managing other systems in the Western Cape Province.

The Overberg Water's area of jurisdiction is the south-western Cape in the west to the Heidelberg/ Heidelberg districts in the east and bounded by the Langeberg Mountains in the north and by the Indian Ocean in the south. Its area includes the following towns: Caledon, Napier, Bredasdorp, Riviersonderend, Swellendam, Heidelberg, Heidelberg and a number of other smaller areas. It is situated in one of the water management areas, namely, the Breede-Olifants Catchment Management Agency (BOCMA) which measures approximately 72 000 square kilometers. The BOCMA is the sole water resource authority in the catchment. The BOCMA "gives effect to its function to investigate and advise water users on the protection, conservation, management and control of water resources in a cooperative manner" (BGCMA, 2015).

1.2. Purpose

The primary function of Overberg Water is mainly the provision of bulk drinking water to its customers. Viewing the location of OW schemes within the BOCMA area of jurisdiction naturally creates a symbiotic relation with BOCMA in managing the water use.

The scope of the contract will consist of the Supply, delivery and installation of a modern telemetry system, upgrade of a supervisory control and data acquisition (SCADA) system from ADROIT Classic to ADROIT SMART UI and maintenance of the system for thirty six Months (36) for Overberg Water (OWB) in the Western Cape with associated equipment, fully configured, tested and commissioned in accordance with the specification.

As part of this contract, SCADA will be limited to equipment at the Schemes and offices as specified below as well as a 3G/4G interface to the central control room. The contractor shall be responsible for the supply, installation and commissioning of the interface.

1.3. Length of Project

The project must be completed within **3 (three) months** from date of award. This includes planning, procurement, installation, commissioning and training of Overberg Water Board staff. An additional thirty six (36) months of maintenance of the system to ensure system up time and availability including skills transfer to the Overberg Water personnel.

2. SCADA Upgrade

The upgrade of SCADA system from ADROIT Classic to ADROIT SMART UI which shall include but not be limited to:

- All SCADA Software and licenses (Adroit Agent Server, Smart UI, ASI, ADROIT Connect & M2M and Secure Mobile Gateway)
- Stratus ZtC fault tolerant Servers or equivalent
- 3 X SCADA Clients or View node PCS
- Microsoft SQL server 2022 for reports
- Uninterruptible Power Supply. Alternatively supplied from the DC system provided
- Provision is made for the additional load in the sizing calculations.
- 3G/4G interface
- All Engineering, configuration, testing & commissioning
- Training
- As built documentation OEM documentation

3. ELPRO QUANTUM EDGE SERIES TELEMETRY SYSTEM OR EQUIVALENT

The latest model in ELPRO Technologies' next generation product line. The I/O Gateway, Controller, and/or Protocol Converter provides a powerful IIoT Gateway Solution in upcoming networking applications. The telemetry system that uses efficient communication methods that map data via an IP-based wireless network while simultaneously providing protocol conversion from the base radio to other nodes in the network or to the Cloud via industrial protocols such as DNP3, MQTT Sparkplug and LoRaWAN

The Quantum base model provides core Ethernet and short range 2.4Ghz & 5Ghz WiFi communication mediums with future release models to include Licensed UHF/VHF/900Mhz, Unlicensed 900Mhz FHSS & Fixed Frequency 869MHz wireless technologies, Long Range 2.4Ghz and 5. Ghz WiFi, Wide Band 900MHz OFDM, 5G Cellular and LoRa WAN for both 869Mhz or 900Mhz bands. The Quantum Series model variations are detailed on the last page, with some models having dual communication options.

4. Equipment

All equipment required for the complete installation is included in the scope of the successful Bidder, this includes all but is not limited to cables, circuit breakers, terminal strips, joints, terminations, software etc.

5. Documentation

The successful Bidder shall provide comprehensive as-built documentation upon completion of the project.

6. Labelling (General)

All cubicles, equipment and cables shall be clearly and permanently labelled. A uniform method of labelling shall be followed across the whole system. Each equipment item shall contain the original manufacturer's marking including the manufacturer's name, equipment type, model number, and serial number. In cases where this is not available an information plate must be manufactured attached to the device.

7. SCADA Functional Description

The successful supplier shall compile a functional design specification and once approved, followed by a detail design specification detailing the functionality for acceptance & approval by the client.

8. SCADA Functional design specification (FDS)

The successful supplier shall generate a functional design specification (FDS) document describing in sufficient detail how their system intends to offer the functionality specified and highlighting any aspect where the system offered deviates from the specification. The purpose of the FDS is for the supplier to prove that the proposed system complies with the minimum system requirements and/or to highlight where the system offered will provide the specified functionality in a different fashion. The document will detail the overall system composition, proposed communication system design, software configuration and related equipment to ensure compliance with the specification.

The FDS document shall be to the satisfaction of and be approved by the OWB engineer before the detail design specification (DDS) is compiled. The FDS shall include (but not be limited to) the following topics:

8.1. Project Overview

- Scope of Supply
- Detailed proposed Project Plan, including Milestones, FAT, SAT, etc.

- System Security
- Network Security/ Remote Access
- System Overview

8.2. System Configuration

- Communication Servers
- Master station equipment (SCADA Server, printers, etc.)
- Master Station software
- Plant Communication
- Plant SCADA equipment (PC, printer, RTUs / relays / IEDs / VSDs)
- Interfacing with legacy equipment (Schemes)
- Interfacing with equipment from another Plant or Scheme

8.3. System Functional Description

- Log-on page
- Overview
- Display pages/ Screens
- Design
- Page Layouts
- Navigation
- Switching / Control Functions
- Events
- Alarms
- Analogues
- Reports
- Trending
- Graphical Displays
- Archiving
- Security
- Authorization Rights
- Backups

8.4. Training

- Proposed Training Schedules
- Description of proposed content per module

9. Scada Detail Design Specification (DDS)

On acceptance of the FDS, the successful supplier shall generate a detail design specification (DDS) describing in detailing the functionality and deliverables of the system to be supplied. The purpose of the DDS is to document in detail exactly what the supplier will supply under this contract in terms

of hardware, software, functionality, training, documentation, etc. The DDS will also be used as the standard against which the factory acceptance testing & site acceptance testing will be performed / measured. The DDS document shall be to the satisfaction of the OWB engineer and shall be approved by the engineer before the SCADA system is configured / programmed. The DDS shall include (but not be limited to) the following topics:

Project Overview (As provided in FDS, but with latest updates)

10. Other Requirements

10.1. Equipment Installation in Enclosures

Subsystems and components shall be easily maintainable. It shall be possible to remove items of equipment for maintenance with minimal interference with respect to other equipment. Components which generate a lot of heat shall be adequately spaced from their mounting boards and from other components. All components shall be adequately supported and secured. Components shall not be mounted directly on wiring terminal blocks unless adequately protected from damage.

10.2. Cabling and Wiring

All multi-core cables shall be manufactured in accordance with SABS 1507-1990 (or SABS 150- 1970) and visibly identified as of flame retardant, low toxicity types. Where a cable is to be installed in a location that may render it liable to mechanical damage, it shall be protected by wire armouring, or by other approved means. All cabling shall be neatly run and fitted in or upon such cable trays, trenches, ducts or conduits as may be appropriate to the layout and equipment.

10.3. Warranty

The supplier will provide a warranty for a period of twelve months after handover of the system to RLM and shall provide the following services as part of the warranty support during this period: Repair or replace all faulty components damaged by normal operation or during first 12 months of operation. First line maintenance by trained and competent RLM personnel.

Respond to call out as follows:

Scheme equipment interface and communication faults. Modules have to be replaced within 5 working days of fault reports. Provide user support consisting of telephonic support for users who have successfully attended the relevant training course. The supplier shall regard the training courses as a method of minimizing their user support costs during this period. The response time for user support requests shall be no longer than eight working hours.

10.4. Spares

The supplier shall provide a list of spares for commissioning and maintenance within the scope of this project. The spares holding shall consider the probability of failure as well as the effect on the system should a spare item not be available. The supplier shall also provide prices of spares with a guaranteed availability of ten years.

10.5. Maintenance

OWB requires a system where the maintenance requirement is minimal. Hardware maintenance shall be no more than what is required for a normal personal computer installation and the communication equipment shall be virtually maintenance free. Apart from normal back-ups and limited software upgrades (vendor specific operating systems) no maintenance on the real-time database will be necessary once the systems is fully configured and operational.

10.6. Training

The supplier shall provide training that shall be directly applicable to the actual equipment and software to be provided as part of the system offered. Generalized training based upon roughly similar equipment shall not be accepted. Training shall be provided at the following levels:

10.7. Engineering / System Administrator level.

Full access to the system & database, including system configuration, programming, testing & commissioning, to enable the authorized engineer / administrator to add, delete and make changes to the system as required.

10.8. Operational & Maintenance level.

Training as required to enable personnel to operate the system confidently and to identify basic problems in order to perform first line maintenance on the system.

10.8.1. Executive level.

A basic overview with sufficient information to provide management with a clear understanding of the system functioning & capabilities. The supplier shall specify the following details of all courses included within the scope of the offer:

- Course Title
- Description of course content
- Duration of course
- Maximum number of attendees
- Prerequisites for attendees
- Location of course

The courses shall be run in a disciplined fashion to ensure that RLM personnel who successfully complete the training courses shall be deemed to be competent.

10.9. Documentation to be submitted:

The supplier shall supply all documentation, including manuals and drawings related to the design, installation and commissioning of the systems and equipment supplied as part of the contract. All drawings submitted to RLM shall be accompanied by an agreed drawing transmittal advice together with a master drawing register.

The training, operating and maintenance manuals shall be cross referenced and shall be the correct manual for the equipment installed and not for similar equipment items or systems.

RLM reserves the right to approve the format and content of all documentation. The supplier shall verify the quality of the document to ensure fitness for purpose both technically and typographically.

10.9.1. Documentation Software

The system documentation such as diagrams, functional specifications, training manuals, etc. shall be made available in commonly used software formats.

10.9.2. Documentation Synopsis

The supplier shall provide, together with his offer, shall provide an overview of the documentation to be supplied. This shall describe the structure and content of the documentation to be provided together with the offer. A list of required documentation is given below in this section.

10.9.3. Documents

The "as built" documents shall be updated and submitted to RLM not later than one month after the successful completion of the site acceptance test and system hand-over. The documents shall be supplied on electronic media at that stage. The final payment certificate will not be processed until it has been submitted.

10.10. Required Documents

Document Type

- System Functional & Detail Specifications
- System training manuals
- System test specification
- Computer hardware manuals
- Computer operating system manuals
- Computer database user manuals
- System user manuals
- System maintenance manual
- Communication training manual
- Communication user manual
- Communication configuration diagrams
- Modifications

The supplier shall provide additional and amended pages sufficient for all copies of manuals and drawing sets to ensure that all sets are complete. Amendment pages listing modifications and modification history shall be included in all documents. All changes to the system made during the warranty period shall be reflected in the documentation.

11. SCADA Testing

The supplier should ensure that the system and its parts are fully tested before delivery and installation and shall then perform a final test after commissioning but prior to handover. The testing shall consist of original subsystem tests, followed by a factory acceptance test (FAT) at the supplier's premises, finally culminating with the site acceptance test (SAT) in which the system as a whole is tested. The supplier shall give RLM notice in writing two weeks prior to any formal testing.

11.1. Factory Acceptance Tests (FAT)

Full factory acceptance tests shall be performed on subsystems during the manufacturing period. In this case full factory acceptance will be required on the complete individual substation SCADA system which will be shipped directly to site after their individual (subsystem) FAT.

11.2. Site Acceptance Test (SAT)

The system SAT shall be performed on all equipment in the scope of supply. The equipment shall be installed in the final location for its planned operation prior to performance of the SAT. The system SAT shall be conducted after all the various elements of the system have been installed in the field and have all successfully completed their individual subsystem SAT's. The system SAT shall be performed with equipment in the locations in which they will eventually operate. This test shall demonstrate that the overall design of the system meets the functional and performance requirements of the specification in the field, using the actual communications network and including equipment supplied by others, to which the system is designed to interface. Interface testing to the

remote control room shall be performed jointly with the responsible RLM engineer. The contractor shall take full responsibility for the interface at the substation level while RLM will take responsibility for the interface at the central control room level.

11.3. Final System Acceptance (FSA)

RLM will accept the system by means of a formal take-over certificate when:

- The system and all items of equipment have successfully completed all the specified tests.
- All failures, problems and reservations noted during the tests have been corrected to RLM's satisfaction or a plan of corrective action has been agreed between RLM and the supplier.
- Hand-over documentation and as built drawings have been submitted.

12. Performance Specification

This specification outlines the minimum performance and integration requirements for the monitoring and control system for the abstraction works, purification plant, pump stations, reservoirs, and pipeline network. The system must provide real-time telemetry and SCADA integration, enabling data-driven water utility operations.

12.1. Abstraction Works

- **Pump Control:** Ability to remotely start and stop two abstraction pumps.
- **Flow Monitoring:** Electromagnetic/Ultrasonic flow meters to measure discharge flow and detect anomalies.
- **Pressure Monitoring:** Suction and discharge pressure sensors to optimize pump where applicable

12.2. High Lift Pump Station

- **Pump Control:** Start/stop functionality for high-lift pumps.
- **Pump Monitoring:** Sensors for vibration, temperature, voltage, and current.
- **Flow and Pressure:** Electromagnetic/Ultrasonic/mechanical flow meters and pressure sensors at all critical discharge and suction points.

12.3. Booster Pump Station

- **Pump Control:** Remote operation of booster pumps.
- **Pump Monitoring:** Same sensor configuration as high lift station.
- **Flow and Pressure:** Comprehensive flow and pressure monitoring on both suction and discharge lines.

12.4. Reservoirs

- **Level Monitoring:**
 - Ultrasonic level sensors with non-contact measurement and integrated flow control.
- **Outflow:**
 - Flow and pressure sensors with automated control via SCADA.

12.5. Rising Main Pipeline

Flow and Pressure Monitoring:

- Continuous monitoring using electromagnetic or ultrasonic flow meters.
- High/low-pressure sensors for alarm conditions

12.6. Gravity Main Pipeline

- **Flow and Pressure Monitoring:**
 - Continuous monitoring using electromagnetic or ultrasonic flow meters.
 - High/low-pressure sensors for alarm conditions.
- **Leak Detection:**
 - Pressure transient sensors and flow discrepancy detection via SCADA logic.

12.7. General System Requirements

- **SCADA Integration:** All devices must communicate using Modbus RTU/TCP, HART, or equivalent. Data must be accessible remotely via secure web or 4G/VPN connection.

- **Power Supply:** Where applicable, devices must be battery-powered with a minimum 5–10-year lifespan or solar-ready.
- **Data Logging & Alarming:** Local data storage, real-time alarm thresholds, and integration with central SCADA dashboard.
- **Environmental Protection:** Minimum IP65 (field) and IP68 (sensor heads) ingress protection.
- **Certification:** All meters and sensors to be ISO or equivalent certified with calibration certificates.

This serves as a baseline for the procurement and installation of an integrated water system SCADA monitoring solution. The system must ensure operational reliability, regulatory compliance, and efficient resource management.

13. Software: Real-Time Monitoring and Control

This software specification defines the performance, visualization, and integration requirements for a SCADA-based software platform designed to monitor, control, and analyse a water distribution network in real time.

13.1. Real-Time Graphical Monitoring and Visualization

The software platform should provide a graphical user interface (GUI) for monitoring and controlling water infrastructure. It shall support the use of custom graphics and images to:

- Create schematic diagrams of the water distribution system, including pipelines, pump stations, reservoirs, flow meters, valves, and treatment facilities.
- Display water system status through real-time animations and tag-driven expressions to reflect flow, pressure, level, and valve status.
- Monitor complex flow switching schemes, bypass routes, or reservoir filling/emptying sequences in real time.

The platform shall allow full interactive monitoring using:

- Animated water distribution diagrams driven by live telemetry.
- Data overlays including pressure zones, flow rates, reservoir levels, and pump statuses.

13.2. Device Control and Actuation

The software platform shall allow the user to send commands to remote field devices for operations such as:

- Starting and stopping pumps.
- Opening and closing valves.
- Triggering flow diversion or flushing sequences.
- Activating alarms, adjusting setpoints, or toggling operational modes.

13.3. Real-Time Data Tables

A web-enabled interface shall provide side-by-side, real-time tabular displays of key operational data including:

- Flow, pressure, level, quality readings (pH, chlorine, turbidity).
- Pump and valve statuses.
- Alarm states and system diagnostics.

13.4. Trending and Historical Analysis

The software shall provide a data trending application for the real-time and historical visualization of parameters such as:

- Flow rates (L/s, m³/h), pressures (bar), levels (m), and chemical readings (mg/L).
- Energy usage data for pump stations (optional).

Graphs shall support zooming, time range selection, data export, and comparison between multiple variables.

13.5. Graphical Monitoring Capabilities

The platform shall support advanced graphical functions including:

- HTML5 graphics for cross-platform accessibility.
- Responsive design that adapts to any screen size or device.
- JavaScript integration to customize component behaviors.
- Import of Scalable Vector Graphics (SVG) for schematic creation.
- A built-in library of standard water infrastructure icons (e.g., valves, reservoirs, pumps).
- Intuitive navigation via clickable elements within the graphic (no menus required).
- Reusable components and JavaScript scripts stored in shared libraries.
- Multi-instance editing where updating one component updates all instances.
- Support for various image formats (gif, .png, .bmp, .jpeg, .tif) and CAD backgrounds with layered displays.

This software platform will enable operators and engineers to effectively visualize, manage, and optimize operations in real time across the water distribution network through a SCADA interface integrated with telemetry, control, and data analysis capabilities.

14. SOFTWARE: Alarm and Event Analysis and Notification

The software platform shall support the creation of standard and user-defined alarm hierarchies based on site-specific water network elements such as pump stations, pipelines, reservoirs, and treatment plants.

Alarm performance shall meet the following criteria:

- Alarms must be displayed in the operator interface within **10 seconds** of being triggered in the field device.
- Alarms with timestamps shall be retrievable directly from devices that support **onboard event logging**.
- The system shall support **1ms resolution** timestamps where available from field instrumentation.
- The platform shall support the creation of software-based alarms with 1ms timestamp precision based on real-time readings.
- Alarm types supported shall include timestamped digital (e.g., pump on/off), analog (e.g., high pressure), multi-digital (e.g., pump fault + valve closed), and compound alarms triggered by logic conditions.

A mobile notification module shall be available and shall leverage the platform's native **high- availability and hot-standby redundancy** features to ensure reliability. It shall not depend on standalone or third-party redundancy systems.

A web-based **event and alarm analysis interface** shall be included, with the following features:

- Intelligent grouping of related alarms into "incidents" to assist in root cause analysis (e.g., pump trip → pressure drop → reservoir low).
- Automatic categorization of alarms/incidents by severity, location, and cause.
- Filterable dashboards for browsing historical and active alarms, organized by source (e.g., zone, device), priority, and status.
- Pop-up detail windows for each alarm/incident showing location, timestamp, cause, and associated events.
- Thumbnail previews of pressure/flow/water quality data linked to each incident.

The system should offer a **timeline** for each incident:

- Alarms/events stacked in chronological order for sequence-of-event (SOE) analysis.
- Color-coded indicators for event start and end times.
- Highlighted zones to indicate where dense alarm activity occurred.
- Indicators showing linked trends or waveform data if applicable (e.g., sudden pressure drop).

A **Smart Data Analyzer** module shall allow operators to:

- Toggle visibility of data streams (e.g., flow, pressure, chlorine levels).

- Calculate and display RMS, min/max, and averages; zoom, pan, and export to CSV.
- View interactive time-aligned graphs of sensor inputs (e.g., pressure spikes vs. pump switching).
- Compare multiple data sets (e.g., inflow/outflow across different points) side-by-side for event diagnosis.

15. Software - Data Analytics and Visualization

The software platform shall include an interactive, web-based dashboard application with real-time updates for visualizing operational and analytical data related to the water distribution system. Dashboards may include flow, pressure, water quality (e.g., turbidity, pH, chlorine), reservoir levels, energy usage for pumps, system health indicators, historical trends, images, and content from accessible URLs.

Authorized users shall be able to create, edit, and share dashboards using only a web browser, without requiring any additional software for dashboard design or publication. This includes full control over graphic elements, units, time ranges, and layout customization.

The dashboard application shall support unattended kiosk-style display modes:

- Users may assign individual dashboards to a slideshow that cycles through specified views at user-defined time intervals.
- Multiple kiosk instances can operate independently on any web-capable device.

The dashboard shall include a library of standard visualization components (gadgets), including:

- Bar, pie, trend, real-time value display, and web page viewer gadgets.

The dashboard shall also offer advanced analytical widgets tailored for water network monitoring, such as:

- Period-over-period comparisons (e.g., daily or weekly flow trends),
- Geographic heat maps (e.g., chlorine levels across zones),
- Pareto charts showing top alarm contributors,
- Sankey diagrams to illustrate water transfer across pump stations or reservoirs.

16. Reporting and Performance Analysis

The platform shall include a web-based reporting module that allows authorized users to generate, edit, and manage reports based on pre-formatted templates (minimum 64). Reports may cover:

- Water billing or usage allocation (by zone or customer meter),
- Treatment plant performance and chemical dosing efficiency,
- Pump station and pipeline operating parameters,
- Water quality compliance (e.g., residual chlorine, pH, turbidity),
- Alarm and incident response logs.

The reporting module shall support scheduled, event-based, or manual distribution in common file formats: .csv, .xlsx, .pdf, .tiff, .html, and .xml.

17. Technical Infrastructure and Cybersecurity

The software should be installable on physical servers or virtual machines and support modern Windows Server and non-server operating systems.

Cybersecurity features shall include:

- Secure development lifecycle practices.
- Two-factor authentication (2FA), usable offline within isolated networks.
- Compatibility with environments enforcing deep packet inspection on Modbus traffic.
- TLS 1.3 encryption for all server-client communications.
- Certification authority (CA) based authentication.
- AES256 encryption and SHA-512 hashing for credentials.
- FIPS-compliant deployment support and application whitelisting.

The platform shall integrate with **Active Directory (AD)** for:

- Centralized user management across multiple domains.
- Enforcing Windows-based password and account policies.
- Role-Based Access Control (RBAC) for permission and access levels.

18. Data Logging and Redundancy

The system shall support logging up to **100,000 historical tags at 1-minute intervals** and store this data for a minimum of **2 years**.

Logged data shall be viewable and exportable via a web interface with report types such as single- site usage, multi-site comparison, trends, and tabular views, formatted in XML, Excel, Word, or PDF.

The software shall automatically acquire and archive high-resolution device data (alarms, trends, waveforms) without manual configuration. This includes:

- Timestamps accurate to 1ms with preservation of device clock sync information (e.g., GPS, NTP, PTP).
- Device-reported timestamp quality flags.

19. Communications and Protocol Support

The platform shall support Modbus RTU/TCP integration with:

- Dynamic scaling of values without requiring dedicated scaling registers.
- Master-mode polling and register writing.
- Custom device driver creation for third-party Modbus devices.

OPC integration shall include:

- **OPC AE Server** for alarm/event sharing.
- **OPC DA Server 2.01** with default tag mappings for native devices and support for custom tag creation.
- **OPC DA Client 2.01** for real-time interoperability.
- **OPC UA Client 1.01** for secure data exchange with OPC UA systems.

20. Web and Interoperability

The platform should support web content widgets for embedding external applications and enable direct access to reporting and dashboard modules via individual URLs.

Web services support shall include:

- A server interface to share real-time, historical, and alarm/event data.
- A secure, web-based configuration interface.

- Remote alarm acknowledgment by authorized users.

21. ETL, Synchronization, and Failover

An **Extract, Transform, Load (ETL)** engine shall support import/export of data from/to .csv, .xml, Wonderware Historian, and OLE DB-compatible databases.

Redundancy and failover capabilities shall include:

- Hot-standby secondary nodes with real-time data mirroring.
- Instant failover with historical data sync and backfill.
- Device-level redundancy (up to 8x) per endpoint.

The system shall maintain full functionality—including logging, alarming, and control—throughout failover events.

22. Device Support and Internationalization

A unified device integration tool shall support Modbus, IEC 61850, IEC 60870-5-104, and DNP3 protocols with:

- Default tag mapping via a common data model.
- Custom driver definition support.

Configuration management shall allow offline project setup and migration.

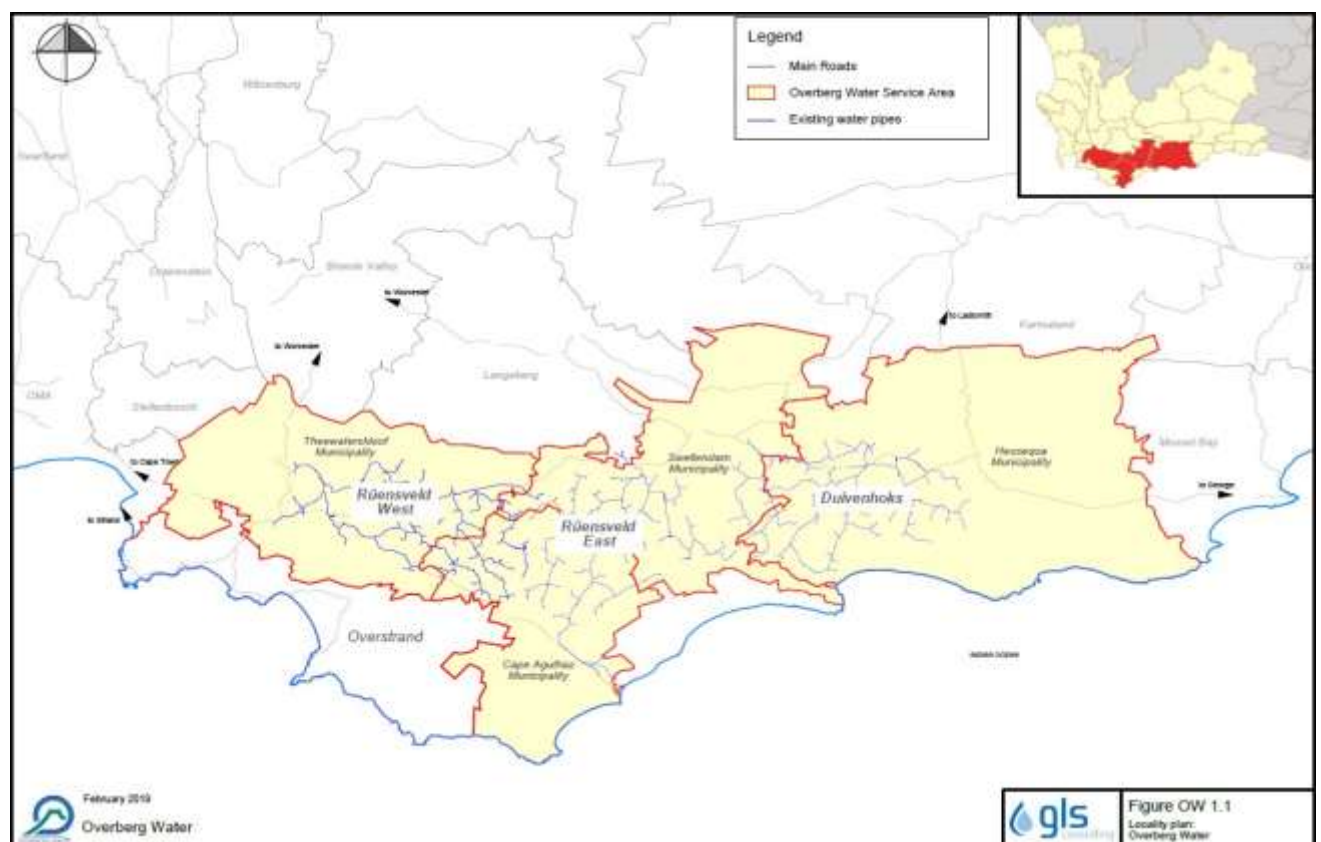
The platform shall support multiple languages and international formats, with factory support for **English** and others upon request.

PART C4: SITE INFORMATION

C4.1 LOCATION FOR THE WORKS

The project is located at the following Overberg Water Board offices; the Successful bidder will be required to perform work in the following operational areas.

OPERATIONAL AREA	WTW	Nearest Town	Coordinates
AREA 1	Rüensveld-West WTP	Caledon	34°05'42.97"S 19°18'52.46"E
	Rüensveld-West Workshop	7 New Cross Street, Caledon	34°14'01.77"S 19°25'50.26"E
	Rüensveld-West Admin Office	5 Demper Street, Caledon	34°13'59.69"S 19°25'32.04"E
AREA 2	Rüensveld-East WTP	Swellendam	34°04'34.69"S 20°14'44.63"E
	Duivenhoks WTP	Heidelberg	34°03'33.34"S 20°57'31.83"E
	Duivenhoks Admin Office	Heidelberg	34°05'17.52"S 20°57'21.43"E
AREA 3	Somerset West	3, Ground, Trident Park2, 1 Niblick Way, Somerset West Cape Town	34°05'12.38"S 18°49'14.20"E



23. PART C5: COMPILING THE TENDER DOCUMENT

Binding Method

The entire tender document must be securely *ring-bound* (preferably with a durable plastic or wire ring binder) to allow easy page turning and to keep pages intact.

Dividers

Clearly labelled *dividers* or *index tabs* must be inserted to separate the main sections of the tender. Each divider must be durable and easily visible when the document is closed.

Table of Contents

The document must include a detailed *Table of Contents* at the front, indicating all sections and sub-sections with corresponding page numbers.

No Loose Pages

No loose or stapled pages will be accepted — the entire submission must form a single, bound document.

Labelling

The cover page must clearly display the *Tender Name, Tender Number, and Bidder's Details*.

Additional Documents

Any annexures or supporting documents must be placed in the correct section and clearly referenced in the Table of Contents.

The tenderer shall provide costing for such SAT to be executed including all labor, transport, site recording, reporting and documentation.

Layout of Installation

All wiring shall be contained within an earthed conduit or trunking or within metal enclosed equipment.

When two or more parallel rows of terminal blocks are used, the clear space between the blocks shall be at least 120 mm.

Where two or more pieces of electrical equipment in close proximity have similar signal or supply conditions, use shall be made of a junction box to group the tail cables in order that a common multi-core cable may be run to the control room.

Cable entries into outdoor junction boxes shall be bottom entry only.

Cables carrying 230 VAC (power or ON/OFF signals) may only be run on the same cable tray as analogue signal cables if the spacing between the cables is at least 100 mm, or if individually and overall screened cables are used. Low voltage signals and power/audio output signals may not be run in the same cable without the permission of the Engineer.

LV cables shall be laid 600 mm and HV cables 1 000 mm below general ground level. All cables in soil trenches shall be bedded in river sand or sifted ground (no clay) 75 mm below and 75 mm over the cables before backfilling of excavations.

1.1 Installation of Equipment

Equipment should be mounted for maximum accessibility and visibility.

Workmanship shall be of good quality and all cutting, drilling, welding, etc, shall be neatly done. Each complete installation, including supports, brackets and wiring shall present a clean, compact appearance.

All fixing hardware for field mounted equipment shall be finished off free from burrs or jagged edges.

1.1.1 Training Requirements

The following minimum training shall be required under the contract:

1.1.2 MASTER Station SCADA Training

Comprehensive training with certification for 10 days for a minimum of 3 officials (if available) shall be done on the FULL SCADA Adroit software. This should include Operator training as well as engineering training.

Full training shall also be done on the OPC (Ole for Process Control) Server software by the original equipment manufacturer.

1.1.3 RTU Training:

A comprehensive training course which shall include certification for a minimum of 3 OW officials (if available) on hardware and the software of the RTU (Remote Terminal Unit) Controller system for a minimum period of 5 days needs to be supplied under this contract.

The training shall cover as a minimum the following:

- i) Circuit diagram and hardware interfacing.
- ii) Input requirements and wiring details.
- iii) Details on all IO (Input/Output) interfaces and communication ports.
- iv) Detail training on the firmware operation.
- v) Detail training on the Configuration toolbox.
- vi) Programming and configuration of a new system from scratch.
- vii) The programs and configuration of the TELEMETRY system.
- viii) Practical testing and programming classes on the equipment.

1.2 Standard Specifications for a Radio Communication System

3.1 SCADA SOFTWARE

SCADA software packages provide at least the following:

- a) ALL SCADA packages to be used shall be ADROIT with the most recent version.
- b) Capability to run in stand-alone or networked mode.
- c) True hot-standby capability.

- d) Dynamic information interchange with other platforms using OLE (Object Linking and Embedding), DDE (Dynamic Data Exchange), CSV (Comma Separated Value) files, SQL (Sequel) and OPC (OLE for Process Control).
- e) Extensive driver library for all popular PLC and telemetry systems.
- f) File structure to support true remote event time/date tagging.
- g) Full vector graphics display editor, generator and library.
- h) Comprehensive dynamic alarm logging and filtering functions.
- i) Comprehensive dynamic event logging, archiving and filtering functions.
- j) Trending capability for all analogue and digital inputs, with multiple trends per window.
- k) Scanning tasks to allow for polled as well as contention protocols.
- l) Full on-line configuration capability.
- m) Comprehensive facilities for time-based control parameter calculation and scaling and interlinked control.
- n) Multiple levels of security for individual or group access.

VANDAL RESISTANT SECURITY ENCLOSURES

Various sizes of security enclosures are required to house the telemetry electronics which must be protected against vandalism and theft in remote areas.

- a) Security enclosures to be manufactured from 3CR12 stainless steel, with suitable surface protection to protect against corrosion and provide a long service life.
- b) Surface treatment: Remove weld spatter and smooth welding marks. Pickle passivation, followed by electrocoat undercoat and powder coat with textured Ferrotex topcoat.
- c) The enclosure door design shall not show visible hinges on the outside of the enclosure.
- d) The door shall engage with the enclosure on multiple security hook points to provide high strength and interlocking security between the door and enclosure body.
- e) The door shall have multiple lips which interlock with the body to prevent opening by prying tools.
- f) The door shall have multiple internal stiffening ribs to add rigidity to the door and additional protection against attacks.
- g) The enclosure opening side to have multiple reinforcing bends or stiffening ribs to prevent damage.
- h) The lock system should protect the lock barrel from insertion of foreign objects or damage due to vandalism.
- i) The lock system is mechanical and should not require electricity to function.
- j) Keys can be master and slave coded and may provide an optional audit trail facility if required.
- k) The enclosure shall provide ventilation slots that are resistant to insertion of foreign objects, ingress of rainwater and limit bees from entering the enclosure.
- l) An enclosure is typically fitted with 4 ventilation slots on opposing ends, top and bottom.
- m) Ingress protection of minimum IP33, with natural convection cooling.
- n) The enclosure should provide multiple mounting options on a per-order basis to allow different mounting configurations, the most typical of which is mounting on a concrete floor or onto a standpipe. An option to mount the enclosure onto an inline pipe with flanges is also required.
- o) Typical tolerances of the enclosures shall be less than 1mm. All components shall be laser cut and CNC bent.
- p) Welding on the enclosures shall be a mixture of MIG and TIG welding.
- q) All items shall be designed and approved engineering drawings to be provided.

Enclosure sizes:

- a) **Telemetry Enclosure:** Enclosure sizes required are: Minimum 510mm wide x 950mm high x 270mm Deep
- b) **Data Logger Enclosure:** Enclosure sizes required are: Minimum 730mm wide x 580mm high x 400mm Deep
- c) **Flow Meter Cover:** Enclosure sizes required are: Minimum 450mm wide x 370mm high x 260mm high

16.1 Vandal Resistant ruggedized solar panel:

Solar panels are fragile and prime targets of theft and vandalism. A security enclosure should be designed and provided to prevent tampering or damage to the solar panels.

- a) The enclosure shall prevent the panel from sustaining damage due to vandalism. This should include throwing the panel with rocks or smashing the panel with heavy objects, such as pangas, axes or chisels.
- b) Resistance to angle grinders and cutting torches shall be advantageous.
- c) The thermal efficiency of the solar panels shall be adhered to.
- d) Solar panels shall be protected from all sides (top and bottom) and edges.
- e) Secure mounting of the solar panels onto an enclosure, standpipe or concrete roof shall be required based on the specific installation.
- f) The enclosure shall be manufactured from 3CR12 stainless steel, which is pickled and passivated, followed by an electrocoat and Ferrotex textured topcoat corrosion protection system.
- g) Electrical cables leading from the solar panel to the enclosure shall be provided.
- h) The ability of the enclosure to prevent damage to an attack must be proven with a track record.
- i) All items designed and approved of engineering drawings shall be provided.
- j) Suppliers shall be able to prove the origin of any intellectual property rights.

17 MASTER STATIONS SYSTEM

17.1.1 Protocol

The SCADA package support and include most commonly used telemetry protocols and drivers, e.g. existing RTU equipment, commonly used PLC drivers, Modbus and user defined device drivers. Tenderers should clearly state which protocol their equipment requires. The present outstation network utilizes the Elpro RTU protocol. Compatibility with the existing Telemetry protocols shall be guaranteed.

17.1.2 Database

The present database shall be extended to include the new stations, as per the price schedule.

17.1.3 Displays, Logging and Reports:

The following is an extract from the original SCADA configuration specification. The system has been set up in compliance with this as a minimum. These functions have to be retained and maintained and extended for the new stations:

17.1.4 VDU display layouts

VDU display layouts for the system shall be generated using the graphics tools available under the SCADA package. It shall be possible to configure VDU layouts while the system is on-line, to minimize data losses.

It shall be possible to open multiple VDU display windows simultaneously.

All layouts, displays, etc. shall be dynamically updated as telemetry outstation information is obtained upon polling.

17.1.5 Historical and trend displays:

It shall be possible to set up and configure trend screens to display historical data. Trends should be updated continuously while viewed. It shall be possible to change the time base and scale of the viewed trend. The time base for these trends shall be selectable per day, week, month etc. and be alterable by the operator.

17.1.6 Alarms and Logging:

It shall be possible to alarm digital and analogue configured signals and display them on several alarm pages. It shall be possible to set up routines on each individual alarm to perform a specific task, for example, to send a message to a paging or printer device. It shall be possible to set high, very high, low and very low alarm limits for all analogue values. It shall be possible to export historical logged data to a spreadsheet for statistical use.

17.1.7 Reports:

It should be possible to log all security data, applications data, systems data, digital and analogue change of state used within the SCADA package, to the local Windows operating systems event log for statistical and information retrieval.

17.1.8 VPN

The current VPN can be remotely accessed via Laptops. Future consideration is to install a ring fiber network system.

17.1.9 Database size:

It shall be possible to configure the period of logging (e.g. for a month) and time update interval (e.g. every 10 or 30 minutes) for each event to be logged.

17.1.10 Alarm Notification Devices:

It shall be possible to set up alarms, to generate predefined alarm messages or conditions and direct or route them to a pager or cellular phone device for transmission across the provided service network. The pager or cellular phone device driver for this purpose shall be included with the SCADA package.

17.1.11 Security:

The SCADA software should make use of the Windows Server operating system security mechanism, which requires every user to belong to one or more Windows Server Domain groups. This would mean that an operator could be blocked from selecting a menu item or prevented from opening a protected window or executing an operator's action. If he knows the Operator Password, he shall have one-shot access to the window or operating action. An engineer may "log on" as Administrator by using the Administrator Override password to access all menus, windows and configured operator actions.

17.1.12 External Program Language:

The SCADA software should provide and support a way for the user to execute complicated tasks such volumetric trending and custom-made reporting function

17.1.13 Scan Points:

Each package has 5000 scan points. The present spare capacity should allow for the inclusion of the new outstations.

17.1.14 Support

It is a requirement that all software is sufficiently and fully supported in SA. Tenderers shall clearly state their capabilities to this effect.

17.1.15 SCADA Configuration

The SCADA software is already configured to incorporate the existing outstations and their I/O. The layouts and displays are comprehensive and have been configured to fulfill the following min. requirements:

17.1.16 VDU display layouts

VDU display layouts for the system shall be generated using the graphics tools available under the SCADA package. The layout shall represent the Pump Station network and parameters symbolically. Exact and final layouts shall be agreed upon during the pre-commissioning stage.

An "Overview" visual display layout shall be created to display the entire water system on one screen.

Visual display layouts should be configured for each of the new outstations. These layouts shall display detailed reservoir and pump status as well as the reservoir control or water request signals.

Pump Status Colours:

Pump Main Breaker “OFF” or MOA selector “OFF”	Gray (“off” state)
Pump Available (Main Breaker “On” and “Auto” or “Manual”)	Yellow (“on” state)
Pump Running	Green (“on” state)
Pump Tripped (combined pump protection signals)	Red (“on” state)

The pump visual shall allow for all of the above statuses to be monitored, even if it is not possible to monitor or obtain all the required signals. The database shall include all the signals although it is not physically linked to the field.

The status of each telemetry outstation shall be visually displayed on a screen called “**Housekeeping**” with changing colours as indicated below:

Telemetry Status Colours:

Interrogate or poll control button (control)	Gray (“Off” state), Green (“On” state)
Communication status	Green (“Off” state), Red (“On” state)
Mains status	Green (“On” state), Red (“Off” state)
Battery voltage	Display value and set alarm limits.
Telemetry panel tamper	Green (“On” state), Red (“Off” state)
Building intruder	Green (“On” state), Red (“Off” state)

All reservoir levels shall be visually displayed on a screened called “reservoirs”. It shall be possible to set the high and low alarm limits for each reservoir from this screen. The reservoir percentage fill shall change colour according to the alarm limit as set out below:

Reservoir displays colours:

High-high limit	Red
High limit	Yellow
Normal	Blue
Low limit	Yellow
Low-low limit	Red

A visual display screen should be configured for all cellular phone users. It shall be possible to change or set the following from this screen:

- Change the “User” name and number.
- Enter a short “Message” and send the message to the appropriate user. Enable or disable alarm outputs to each of the Users.
- Display the different alarm routes for each of the alarm outputs.
- All layouts, displays, etc. shall be dynamically updated as outstation information is obtained upon polling.

17.1.17 Logging and Reports:

- Analogue signals shall be data logged and trend display screens shall be provided for each signal monitored.
- Digital change of state shall be logged and displayed on an “Event” page.

17.1.18 Historical and trend displays:

- Trend displays shall be configured for all reservoirs that display both the source and supply reservoir as well as the appropriate pump running signals. The time base for these trends shall be selectable per day, week or month and shall be alterable by the operator.

17.1.19 Alarms and Logging:

Each telemetry station should have an alarm agent, and this agent should handle all the alarms applicable.

A high, very high, low and very low limit shall be set for all analogue values. These values shall be alterable by the operator.

All alarm signals shall be displayed on an "Alarm" page, and only certain alarms shall be sent as "SMS" messages on the cellular network.

17.1.20 Reports:

The following reports shall be set up and be accessible in VDU and hardcopy format.

A daily, weekly and monthly report regarding the state of each pump station in the network

As above, for each reservoir level in the network

All analogue data shall be made available in MS Excel format for further processing.

17.1.21 Database size:

The database shall be sized or generated in accordance with the I/O schedule at the end of this Project Specification

ROUTINE MAINTENANCE REQUIREMENTS

This tender calls for extensive maintenance work to be done on the existing and new telemetry equipment over the period of the contract.

Routine maintenance shall include but not limited to the following inspections and tests will be conducted at all the remote telemetry outstations:

a. TELEMETRY ENCLOSURE

- i. External condition of enclosure
- ii. Internal condition of enclosure
- iii. Gland plate fixing and rust
- iv. Glands and rubber boots – general condition
- v. Water seepage at glands
- vi. Raw bolts and mounting brackets – fixing
- vii. Conduits/trunking/cable trays etc.

b. ANTENNA INSPECTION

- i) Forward Power
- ii) Reverse Power
- iii) Check RF connector at T-Piece
- iv) Check RF connector at Antenna
- v) Condition of Coax Cable
- vi) Surge arrestor i.e. ¼ stub, polyphaser
- vii) Antenna bracket mountings
- viii) Mast mounting onto bracket
- ix) Visual inspection of antenna – condition etc.

c. EARTHING INSPECTION

- i) Check earth pin still exists
- ii) Check earth clamp
- iii) Earth cable present and physical condition
- iv) Earth bar to earth pin
- v) Mast top to earth pin
- vi) Antenna to earth bar
- vii) Earth are to MCC earth bar
- viii) Check earthing of RF and telemetry surge arrestors
- ix) Measure earth impedance
- x) Earth bar
- xi) Mast top
- xii) Antenna earth

d. RADIO INSPECTION

- i) Voice communication
- ii) On power up to correct channel
- iii) Verify patch lead correctly inserted
- iv) Verify fly lead correctly inserted
- v) Verify radio and MIC bracket in order

e. GPRS MODEM INSPECTION

- i) Verify GPRS to base station
- ii) Polling of station from base

f. MAINS AND POWER SUPPLY INSPECTION

- i) Measure input voltage on Power supply
- ii) Measure open circuit voltage on power supply (pre-adjust)
- iii) Measure open circuit voltage on power supply (pre-adjust)
- iv) In circuit voltage
- v) Charging current
- vi) Check connectors are tight on P/S
- vii) Check supply voltage on
- viii) RTU
- ix) Radio
- x) 12/24-volt converter

g. BATTERY INSPECTION

- i) Open circuit voltage
- ii) In circuit voltage
- iii) Check for corrosion on terminals
- iv) Check battery terminal connectors
- v) Battery Load test (require load tester)
- vi) Voltage beginning of load test

- vii) Battery voltage after 15 min

All the tests shall be carefully recorded in the maintenance book and shall be reported to the client.

During the last cycle (third year) of routine maintenance, all batteries shall be replaced with new ones.

COMPLETION SCHEDULING

The appointment of a Contractor is proposed to take place at the end of August 2026. It is therefore necessary that all the new work be completed as soon as possible afterwards. A realistic proposed completion schedule shall be included with the tender.

The maintenance portion of the project shall stretch over three financial years.

MAINTENANCE PERFORMANCE

The intention of this contract is to ensure that the system is kept in 100% functional and reliable condition at all times. The contractor shall take full preventative, emergency and only rely on the Employer to maintain items outside the scope of this contract, such as pipework, pumps, switchgear and other fixed infrastructure.

MAINTENANCE MANAGEMENT

For proper management of the system of this nature, the contractor shall comply with the following:

- a) Appoint one dedicated project manager for the purpose of the maintenance of the project. The project manager shall be fully trained and certified to work on the existing telemetry, PLC and SCADA systems. Proof of certification to be provided with the tender.
- b) Appoint one preventative maintenance official who shall be properly trained and fully certified to work on the SCADA and spend a minimum of three hours per working day, going through the system by means of a checklist which includes identifying any continuous level drop of reservoirs.
- c) Appoint an official who is thoroughly trained and certified to check on the hardware, software and programming of the whole IT Network Infrastructure.
- d) Appoint minimum two trained and certified routine maintenance technicians for the sole purpose of verifying and detail testing of the conditions of the telemetry equipment as well as the accuracy of the equipment i.e. sensors, detectors etc. at the outstations