

TENDER DOCUMENT GOODS AND SERVICES		 CITY OF CAPE TOWN ISIXEKO SASEKAPA STAD KAAPSTAD
SUPPLY CHAIN MANAGEMENT		
SCM - 542	Approved by Branch Manager: February 2024	Version: 10

TENDER NO: 250S/2024/25
TENDER DESCRIPTION: MAINTENANCE SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEMS USED WITHIN BULK WATER INFRASTRUCTURE.
CONTRACT PERIOD: 36 MONTHS FROM THE COMMENCEMENT DATE OF THE CONTRACT (NOT PRIOR 01 JULY 2026)

CLOSING DATE	23 May 2025
CLOSING TIME	10:00 am
TENDER BOX NUMBER	218
TENDER FEE	R200

Non – refundable tender fee payable to the City of Cape Town (CCT) for a hard copy of the tender document. This fee is not applicable to website downloads of the tender document.

TENDERER	
NAME of Company/Close Corporation or Partnership / Joint Venture/ Consortium or Sole Proprietor /Individual (hereinafter the “Tenderer”)	
TRADING AS (if different from above)	
Registration number of Tenderer	
Physical address and chosen domicilium citandi et executandi of Tenderer	

NATURE OF TENDER OFFER (please indicate below)	
Main Offer (see clause 2.2.11.1)	
Alternative Offer (see clause 2.2.11.1)	

TENDER SERIAL NO.:
SIGNATURES OF CCT OFFICIALS AT TENDER OPENING
1
2
3

TABLE OF CONTENTS

THE TENDER.....	3
T.1 GENERAL TENDER INFORMATION	3
T.2 CONDITIONS OF TENDER	4
2.1 General.....	4
2.2 Tenderer’s obligations	7
2.3 The CCT’s undertakings.....	17
THE CONTRACT	25
C.1 DETAILS OF TENDERER/SUPPLIER	27
C.2 FORM OF OFFER AND ACCEPTANCE	28
C.2.1 OFFER (TO BE COMPLETED BY THE TENDERER AS PART OF TENDER SUBMISSION).....	28
C.2.2 ACCEPTANCE (TO BE COMPLETED BY THE CCT)	29
C.2.3 SCHEDULE OF DEVIATIONS (TO BE COMPLETED BY THE CCT UPON ACCEPTANCE)	30
C.2.4 CONFIRMATION OF RECEIPT (TO BE COMPLETED BY SUPPLIER UPON ACCEPTANCE).....	31
C.3 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT	32
C.4 PRICE SCHEDULE	33
C.5 SPECIFICATION(S).....	47
C.6 SPECIAL CONDITIONS OF CONTRACT	96
C.7 GENERAL CONDITIONS OF CONTRACT	108
C.8 ANNEXURES	118
ANNEXURE A – PRO FORMA INSURANCE BROKER’S WARRANTY	118
ANNEXURE B – MONTHLY PROJECT LABOUR REPORT	119
ANNEXURE C - PRO FORMA PERFORMANCE SECURITY/ GUARANTEE	121
ANNEXURE D - PRO FORMA ADVANCE PAYMENT GUARANTEE	122
ANNEXURE F - TENDER RETURNABLE DOCUMENTS.....	124
<i>Schedule F.1: Contract Price Adjustment</i>	<i>124</i>
<i>Schedule F.2: Certificate of Authority for Partnerships/ Joint Ventures/ Consortiums</i>	<i>137</i>
<i>Schedule F.3: Declaration for Procurement above R10 million.....</i>	<i>138</i>
<i>Schedule F.4: Preference Points Claim Form In Terms Of the Preferential Procurement Regulations 2022</i>	<i>139</i>
<i>Schedule F.5: Declaration of Interest – State Employees (MBD 4 amended).....</i>	<i>142</i>
<i>Schedule F.6: Conflict of Interest Declaration</i>	<i>144</i>
<i>Schedule F.7: Declaration of Tenderer’s Past Supply Chain Management Practices (MBD 8).....</i>	<i>145</i>
<i>Schedule F.8: Authorisation for the Deduction of Outstanding Amounts Owed to the CCT</i>	<i>147</i>
<i>Schedule F.9: Certificate of Independent Tender Determination</i>	<i>148</i>
<i>Schedule F.10: Proposed Deviations And Qualifications By Tenderer.....</i>	<i>149</i>
<i>Schedule F.11: List of Other Documents Attached By Tenderer.....</i>	<i>150</i>
<i>Schedule F.12: Record of Addenda to Tender Documents</i>	<i>151</i>
<i>Schedule F.13: Information to Be Provided With the Tender.....</i>	<i>152</i>
<i>Schedule F.13A1: Track Record of Service Provider</i>	<i>153</i>
<i>Schedule F.13A2: Track Record of Service Provider</i>	<i>154</i>
<i>Schedule F.13A3: Track Record of Service Provider</i>	<i>155</i>
<i>Schedule F.13B: Key Personnel Qualification and Experience.....</i>	<i>156</i>
<i>Schedule F.13C: Demonstration of Company’s Expertise.....</i>	<i>157</i>
<i>Schedule F.14: Appeal Application.....</i>	<i>158</i>

THE TENDER

T.1 GENERAL TENDER INFORMATION

TENDER ADVERTISED	:	17 April 2025
SITE VISIT/CLARIFICATION MEETING	:	Time: 12:00 on Date: 07 May 2025 (Not compulsory, but strongly recommended)
VENUE FOR SITE VISIT/CLARIFICATION MEETING	:	Platteklouf Reservoir Boardroom, Silverboom Road, Platteklouf 3, Cape Town, 7500. Teams Link: Join the meeting now GPS Co-ordinates : 33°51'49.4"S 18°34'39.0"E
TENDER BOX & ADDRESS	:	Tender Box as per front cover at the Tender & Quotation Boxes Office, 2nd Floor (Concourse Level), Civic Centre, 12 Hertzog Boulevard, Cape Town. : The Tender Document (which includes the Form of Offer and Acceptance) completed and signed in all respects, plus any additional supporting documents required, must be submitted in a sealed envelope with the name and address of the tenderer, the endorsement " TENDER NO. 250S/2024/25: - TENDER DESCRIPTION: Maintenance Service, Calibration, Supply, Installation and Replacement of Various Process Control Systems used within Bulk Water Infrastructure ", the tender box number. and the closing date indicated on the envelope. The sealed envelope must be inserted into the appropriate official tender box before closing time. If the tender offer is too large to fit into the abovementioned box or the box is full, please enquire at the public counter (Tender Distribution Office) for alternative instructions. It remains the tenderer's responsibility to ensure that the tender is placed in either the original box or as alternatively instructed.
CCT TENDER REPRESENTATIVE	:	Email: SCM.tenders24@capetown.gov.za

TENDERERS MUST NOTE THAT WHEREVER THIS DOCUMENT REFERS TO ANY PARTICULAR TRADE MARK, NAME, PATENT, DESIGN, TYPE, SPECIFIC ORIGIN OR PRODUCER, SUCH REFERENCE SHALL BE DEEMED TO BE ACCOMPANIED BY THE WORDS "OR EQUIVALENT"

T.2 CONDITIONS OF TENDER

2.1 General

2.1.1 Actions

2.1.1.1 The City of Cape Town (hereafter referred to as the "CCT") and each tenderer submitting a tender offer (hereinafter referred to as the "tenderer" or the "supplier") shall comply with item T.2 of this Tender Document Goods and Services (hereinafter referred to as these "Conditions of Tender"). The tenderer and the CCT shall collectively hereinafter be referred to as the "Parties" and individually a "Party"). In their dealings with each other, the Parties shall discharge their duties and obligations as set out in these Conditions of Tender, timeously and with integrity, and behave equitably, honestly and transparently, and shall comply with all legal obligations imposed on the Parties herein and in accordance with all applicable laws.

The Parties agree that this tender Tender Document Goods and Services (hereinafter referred to as the "Tender" / "Tender Document"), its evaluation and acceptance and any resulting contract shall also be subject to the CCT's Supply Chain Management Policy ("SCM Policy") that was applicable on the date the bid was advertised and as amended from time to time. If the CCT adopts a new SCM Policy which contemplates that any clause therein would apply to the Contract emanating from this tender (hereinafter referred to as the "Contract"), such clause shall also be applicable to that Contract. Please refer to this document contained on the CCT's website.

Abuse of the supply chain management system is not permitted and may result, inter alia, (1) in the tender being rejected; (2) cancellation of the contract; (3) restriction of the supplier, and/or (4) the exercise by the CCT of any other remedies available to it as provided for in the SCM Policy and/or the the Contract and/or this tender and/or any applicable laws .

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

2.1.1.3 The CCT shall not seek, and a tenderer shall not submit a tender, without having a firm intention and capacity to proceed with the contract.

2.1.2 Interpretation

2.1.2.1 The additional requirements contained in Annexure F to the contract (hereinafter referred to as the "returnable documents" / "Returnable Schedules") are part of these Conditions of Tender and are specifically hereby incorporated into these Conditions of Tender.

2.1.2.2 These Conditions of Tender and returnable Documents which are required for CCT's tender evaluation purposes herein, shall form part of the Contract arising from the CCT's corresponding invitation to tender.

2.1.3 Communication during tender process

Verbal or any other form of communication, from the CCT, its employees, agents or advisors during site visits/clarification meetings or at any other time prior to the award of the Contract, will not be regarded as binding on the CCT, unless communicated by the CCT in writing to suppliers / tenderers by its Director: Supply Chain Management or his nominee. Similarly, any communication of the tenderer / supplier that is not reduced to writing by the tenderer / supplier, its employees, agents or advisors, shall not be regarded as binding on the CCT, unless communicated to the CCT in writing by the suppliers / tenderers, or their duly authorised representatives.

2.1.4 The CCT's right to accept or reject any tender offer

2.1.4.1 The CCT may accept or reject any tender offer and may cancel the corresponding tender process or reject all tender offers at any time before the formation of a contract. The CCT may, prior to the award of the tender, cancel a tender if:

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

The CCT shall not accept or incur any liability to a tenderer for such cancellation or rejection, but will give written reasons for such action upon receiving a written request to do so.

2.1.5 Procurement procedures

2.1.5.1 General

Unless otherwise stated in the Conditions of Tender, a contract will be concluded with the tenderer who scores the highest number of tender adjudication points.

The CCT intends to appoint a main and alternative tenderer for the allocation of work per category (**A, B, C, D, E, F, G, and H**). If insufficient responsive bids are received, the CCT reserves the right to appoint fewer tenderers, or not to appoint any tenderers at all.

Suppliers, once appointed and subject to operational requirements, will be invited to deliver the goods and services after a secondary competitive process is undertaken based upon the rates tendered and the status level of contribution as verified during the awarding of the main tender. The order will always be offered and, if accepted, allocated to the highest ranked tenderer, and only if he refuses will the work be offered to the next ranked tenderer.

The contract period shall be for a period of **36** months from the commencement date of the contract.

2.1.5.2 Proposal procedure using the two stage-system

A two-stage system will not be followed.

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

2.1.5.2.2 The CCT shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the Conditions of Tender, and award the contract in terms of these Conditions of Tender.

2.1.5.3 Nomination of Standby Bidder

"Standby Bidder" means a bidder, identified by the CCT at the time of awarding a bid that will be considered for award should the contract be terminated for any reason whatsoever. In the event that a contract is terminated during the execution thereof, the CCT may consider the award of the contract, or non-award, to the Standby Bidder in terms of the procedures included its SCM Policy, as amended from time to time.

2.1.6 Objections, complaints, queries and disputes/ Appeals in terms of Section 62 of the Systems Act/ Access to court

2.1.6.1 Disputes, objections, complaints and queries

In terms of Regulations 49 and 50 of the Local Government: Municipal Finance Management Act, 56 of 2003 Municipal Supply Chain Management Regulations (Board Notice 868 of 2005):

- a) Persons aggrieved by decisions or actions taken by the CCT in the implementation of its supply chain management system, may lodge within 14 days of the decision or action, a written objection or complaint or query or dispute against the decision or action.

2.1.6.2 Appeals

- a) In terms of Section 62 of the Local Government: Municipal Systems Act, 32 of 2000 a person whose rights are affected by a decision taken by the CCT, may appeal against that decision by giving written notice of the appeal and reasons to the City Manager within 21 days of the date of the notification of the decision.
- b) An appeal must contain the following:
- i. Must be in writing
 - ii. It must set out the reasons for the appeal
 - iii. It must state in which way the Appellant's rights were affected by the decision;
 - iv. It must state the remedy sought; and
 - v. It must be accompanied with a copy of the notification advising the person of the decision
- c) The relevant CCT appeal authority must consider the appeal and **may confirm, vary or revoke** the decision that has been appealed, but no such revocation of a decision may detract from any rights that may have accrued as a result of the decision.

2.1.6.3 Right to approach the courts and rights in terms of Promotion of Administrative Justice Act, 3 of 2000 and Promotion of Access to Information Act, 2 of 2000

The sub- clauses above do not influence any affected person's rights to approach the High Court at any time or its rights in terms of the Promotion of Administrative Justice Act (PAJA) and Promotion of Access to Information Act (PAIA).

- 2.1.6.4 All requests referring to sub clauses 2.1.6.1 and 2.1.6.2 must be submitted in writing to:
The City Manager - C/o the Manager: Legal Compliance Unit, Legal Services Department, Office of the City Manager
Via hand delivery at: 20th Floor, Tower Block, 12 Hertzog Boulevard, Cape Town 8001
Via post at: Private Bag X918, Cape Town, 8000
Via email at: MSA.Appeals@capetown.gov.za

- 2.1.6.5 All requests referring to clause 2.1.6.3 must be submitted in writing to:
The City Manager - C/o the Manager: Access to Information Unit, Legal Service Department, Office of the City Manager
Via hand delivery at: 20th Floor, Tower Block, 12 Hertzog Boulevard, Cape Town 8001
Via post at: Private Bag X918, Cape Town, 8000
Via email at: Access2info.Act@capetown.gov.za

2.1.6.6 The minimum standards regarding accessing and 'processing' of any personal information belonging to another in terms of Protection of Personal Information Act, 2013 (POPIA).

For purposes of this clause 2.1.6.6, the contract and these Conditions of Tender, the terms "data subject", "Personal Information" and "Processing" shall have the meaning as set out in section 1 of POPIA, and "Process" shall have the corresponding meaning.

The CCT, its employees, representatives and sub-contractors may, from time to time, Process the tenderer's and/or its employees', representatives' and/or sub-contractors' Personal Information, for purposes of, and/or relating to, the tender, the contract and these Conditions of Tender, for research purposes, and/or as otherwise may be envisaged in the CCT's Privacy Notice and/or in relation to the CCT's Supply Chain Management Policy or as may be otherwise permitted by law. This includes the Processing of the latter Personal Information by the CCT's due diligence assurance provider, professional advisors and the Appeal Authority as applicable. The CCT's justification for the processing of such aforesaid Personal Information is based on section 11(1)(b) of POPIA, i.e., in terms of which the CCT's Processing of the said Personal Information is necessary to carry out actions for the conclusion and/or performance of the contract, to which the applicable data subject (envisaged in this clause 2.1.6.6 above) is a party.

All requests relating to data protection must be submitted in writing to:
The City Manager - C/o the Information Officer, Office of the City Manager
Via hand delivery at: 20th Floor, Tower Block, 12 Hertzog Boulevard, Cape Town 8001

Tender No.: 250S/2024/25

Via post at: Private Bag X9181, Cape Town, 8000

Via email at: Popia@capetown.gov.za.

2.1.6.7 Compliance to the CCTs Appeals Policy.

In terms of the CCT's Appeals Policy, a fixed upfront administration fee will be charged. In addition, a surcharge may be imposed for vexatious and frivolous or otherwise manifestly inappropriate tender related appeals.

The current approved administration fee is R300.00 and may be paid at any of the Municipal Offices or at the Civic Centre in Cape Town using the GL Data Capture Receipt attached as Annexure F.13: Appeal Application Form. Alternatively, via EFT into the CCT's NEDBANK Account: CITY OF CAPE TOWN and using Reference number: 198158966. You are required to send proof of payment when lodging your appeal.

The current surcharge for vexatious and frivolous or otherwise manifestly inappropriate tender related appeals will be calculated as $\frac{1}{2}$ (Administrative cost of the tender appeal) + 0.25 % (Appellant's tender price).

Should the payment of the administration fee of R300.00 or the surcharge not be received, such fee or surcharge will be added as a Sundry Tariff to the bidder's municipal account.

In the event where the bidder does not have a Municipal account with the CCT, the fee or surcharge may be recovered in terms of the CCT's Credit Control and Debt Collection By-law, 2006 (as amended) and its Credit Control and Debt Collection Policy.

2.1.7 CCT Supplier Database Registration

Tenderers are required to be registered on the CCT Supplier Database as a service provider. Tenderers must register as such upon being requested to do so in writing and within the period contained in such a request, failing which no orders can be raised or payments processed from the resulting contract. In the case of Joint Venture partnerships this requirement will apply individually to each party of the Joint Venture.

Tenderers who wish to register on the CCT's Supplier Database may collect registration forms from the Supplier Management Unit located within the Supplier Management / Registration Office, 2nd Floor (Concourse Level), Civic Centre, 12 Hertzog Boulevard, Cape Town (Tel 021 400 9242/3/4/5). Registration forms and related information are also available on the CCT's website www.capetown.gov.za (follow the Supply Chain Management link to Supplier registration).

It is each tenderer's responsibility to keep all the information on the CCT Supplier Database updated.

2.1.8 National Treasury Web Based Central Supplier Database (CSD) Registration

Tenderers are required to be registered on the National Treasury Web Based Central Supplier Database (CSD) as a service provider. Tenderers must register as such upon being requested to do so in writing and within the period contained in such a request, failing which no orders can be raised or payments processed from the resulting contract. In the case of Joint Venture partnerships this requirement will apply individually to each party of the Joint Venture.

Tenderers who wish to register on the National Treasury Web Based Central Supplier Database (CSD) may do so via the web address <https://secure.csd.gov.za>.

It is each tenderer's responsibility to keep all the information on the National Treasury Web Based Central Supplier Database (CSD) updated.

2.2 Tenderer's obligations

2.2.1 Eligibility Criteria

2.2.1.1 Tenderers are obligated to submit a tender offer that complies in all aspects to the conditions as detailed in this tender document and the Conditions of Tender. An ‘acceptable tender must “COMPLY IN ALL” aspects with the tender, Conditions of Tender, all Specifications (i.e., item C.5 below, hereinafter the “Specifications”), pricing instructions herein and the Contract including its conditions.

2.2.1.1.1 Submit a tender offer

Only those tender submissions from which it can be established, *inter alia* that a clear, irrevocable and unambiguous offer has been made to CCT, by whom the offer has been made and what the offer constitutes, will be declared responsive.

2.2.1.1.2 Compliance with requirements of CCT SCM Policy and procedures

Only those tenders that are compliant with the requirements below will be declared responsive:

- a) A completed **Details of Tenderer** to be provided (applicable schedule below to be completed);
- b) A completed **Certificate of Authority for Partnerships/ Joint Ventures/ Consortiums** to be provided authorising the tender to be made and the signatory to sign the tender on the partnership /joint venture/consortium’s (applicable schedule below to be completed);
- c) A copy of the partnership / joint venture / consortium agreement to be provided, where applicable.
- d) A completed **Declaration of Interest – State Employees** to be provided and which does not indicate any non-compliance with the legal requirements relating to state employees (applicable schedule below to be completed);
- e) A completed **Declaration – Conflict of Interest and Declaration of Bidders’ past Supply Chain Management Practices** to be provided and which does not indicate any conflict or past practises that renders the tender non-responsive based on the conditions contained thereon (applicable schedules below to be completed);
- f) A completed **Certificate of Independent Bid Determination** to be provided and which does not indicate any non-compliance with the requirements of the schedule (applicable schedule below to be completed);
- g) The tenderer (including any of its representatives, directors or members), has not been restricted in terms of abuse of the Supply Chain Management Policy,
- h) The tenderer’s tax matters with SARS are in order, or the tenderer is a foreign supplier that is not required to be registered for tax compliance with SARS;
- i) The tenderer is not an advisor or consultant contracted with the CCT whose prior or current obligations creates any conflict of interest or unfair advantage;
- j) The tenderer is not a person, advisor, corporate entity or a director of such corporate entity, who is directly or indirectly involved or associated with the bid specification committee;
- k) A completed **Authorisation for the Deduction of Outstanding Amounts Owed to the CCT** to be provided and which does not indicate any details that renders the tender non-responsive based on the conditions contained thereon (applicable schedules below to be completed);
- l) The tenderer (including any of its representatives, directors or members), has not been found guilty of contravening the Competition Act 89 of 1998, as amended from time to time;
- m) The tenderer (including any of its representatives, directors or members), has not been found guilty on any other basis listed in the Supply Chain Management Policy.

2.2.1.1.3 Compulsory clarification meeting

Not Applicable

2.2.1.1.4 Minimum score for functionality

Only those tenders submitted by tenderers who achieve the minimum score for functionality as stated below will be declared responsive.

The description of the functionality criteria and the maximum possible score for each is shown in the table below. The score achieved for functionality will be the sum of the scores achieved, in the evaluation process, for the individual criteria.

Schedule F.13A1, F.13A2, F.13A3 , F.13B, and F.13C (Returnable Schedule) must be completed in order for the Tenderer to be scored.

CATEGORY A FUNCTIONAL CRITERIA			Maximum possible Score
1. Track Record of Service Provider: information to be completed and attached to Schedule F.13A1. The Tender must provide evidence of successful completed projects within the Water and Waste Water Industry within a period of 1 year over the past 3 years with contactable references. All projects submitted shall be relevant to Process Control System discipline including Telemetry, a single project may consist of multiple disciplines (Instrumentation, PLC, SCADA, and Telemetry).			40
A. Installation, Replacement, and Upgrade of PLC, and SCADA Systems (minimum Project Value R100 000).		20	
• 0 – 1 Project	0		
• 2 – 3 Projects	5		
• 4 – 5 Projects	10		
• 6 – 7 Projects	15		
• 8 – 9 Projects	20		
B. Repairs, Replacement, or Installation of Instrumentation Systems (minimum Project Value R50 000).		10	
• 0 – 1 Project	0		
• 2 – 3 Projects	5		
C. Repairs, Replacement, or Installation of Telemetry Systems (minimum Project Value R50 000).		10	
• 0 – 1 Project	0		
• 2 – 3 Projects	5		
2. Key Personnel: information to be completed and attached to Schedule F.13B			40
A. Process Control System Project Manager : A minimum of NQF level 7 or equivalent qualification is required in Electrical Engineering specializing in Control and Instrumentation Systems, or Mechatronic Engineering.		15	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
• 6 – 8 years of Experience post qualification	15		
B. Control and Instrumentation Engineer/Technologist: A minimum of NQF level 7 or equivalent qualification is required in Electrical Engineering specializing in Control and Instrumentation Systems, or Mechatronic Engineering		15	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
• 6 – 8 years of Experience post qualification	15		
C. Control and Instrumentation Technician: A minimum of NQF level 6 or equivalent qualification is required in Electrical Engineering specializing in Control and Instrumentation Systems, or Mechatronic Engineering		5	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
D. Instrumentation Artisan/Instrument Mechanician/Electrical Artisan: A minimum of NQF level 5 or equivalent qualification is required in Electrical Engineering specializing in Control and Instrumentation Systems.		5	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
Demonstration of Tenderer's expertise Schedule F.13C: PLC, HMI, and SCADA Development/Integration OEM Partnership or Certification.			20
A. Proof of PLC Programming OEM Certification/Partnership: The Tenderer must provide evidence of PLC Certification/Partnership of existing Bulk Water Control System infrastructure either from Siemens or Schneider Electric demonstrating companies expertise.		10	
• No Partnership or Certification	0		
• Evidence of Partnership provided	10		
B. Proof of SCADA and HMI OEM Certification/Partnership: The Tenderer must provide evidence of SCADA, and HMI Certification/Partnership from Siemens, Schneider Electric, Ignition SCADA, or Siemens demonstrating companies expertise.		10	
• No Partnership or Certification	0		
• Evidence of Partnership provided	10		
Maximum Score Possible For Functionality			100

The minimum qualifying score for functionality is [60] out of a maximum of [100].

CATEGORY B, C, D, and E FUNCTIONAL CRITERIA			Maximum possible Score
1. Track Record of Service Provider: information to be completed and attached to Schedule F.13A2. The Tender must provide evidence of successful maintenance work within a period of 1 year over the past 3 years with contactable references. All maintenance work submitted shall be relevant to verification, calibration, and repairs of inline-analytical Instruments, pressure/temperature instruments, clamp-on flow meters, and load-cells.			40
2. Calibration, Verification, Replacement, and Installation of Instruments.			
• 1 – 10 Sites maintained	0	10	
• 11 – 20 Sites maintained	5		
• 21 – 30 Sites maintained	10		
A. Calibration, Verification, Replacement, and Installation of Pressure/Temperature.			
• 1 – 10 Sites maintained	0	10	
• 11 – 20 Sites maintained	5		
• 21 – 30 Sites maintained	10		
B. Calibration, Verification, Replacement, and Installation of Clamp-ON Flow Meters.			
• 1 – 10 Sites maintained	0	10	
• 11 – 20 Sites maintained	5		
• 21 – 30 Sites maintained	10		
C. Calibration, Verification, Replacement, and Installation of Load-cells, Platform scales, and Silo's.			
• 1 – 10 Sites maintained	0	10	
• 11 – 20 Sites maintained	5		
• 21 – 30 Sites maintained	10		
3. Key Personnel: information to be completed and attached to Schedule F.13B			40
A. Calibration Technician: A minimum of NQF level 6 qualification is required in Electrical Engineering (light current) , or Mechatronic Engineering.			
• 0 - 1 year of Experience post qualification	0	10	
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
B. Calibration Metrologiest: A minimum of metrology certificate is required in calibration of pressure, and temperature instruments.			
• 0 - 1 year of Experience post qualification	0	10	
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
C. Instrumentation Artisan/Instrument Mechanician/Electrical Artisan: A minimum of NQF level 5 qualification is required in Electrical Engineering,			
• 0 - 1 year of Experience post qualification	0	5	
• 2 – 3 years of Experience post qualification	5		
D. Number of Calibration Technician:			
• 0 - 1 Calibration Technicians	0	5	
• 2 – 3 Calibration Technicians	5		
E. Number of Calibration Metrologiest:			
• 0 - 1 Calibration Metrologiest	0	5	
• 2 – 3 Calibration Metrologiest	5		
F. Number of Artisan/Instrument Mechanician/Electrical Artisan:			
• 0 - 1 Calibration Artisan	0	5	
• 2 – 3 Calibration Artisan	5		
4. Demonstration of Tenderer's expertise Schedule F.13C: verification, calibration, and repairs of inline-analytical Instruments, pressure/temperature instruments, clamp-on flow meters, and load-cells.			20
A. SANAS Accreditation The Tenderer must provide evidence of SANAS accreditation.			
• No SANAS Accreditation	0	10	
• Evidence of SANAS Accreditation	10		
B. ISO 9001:2015 Accreditation: The Tenderer must provide evidence of ISO 9001:2015 accreditation.			
• No ISO 9001:2015 accreditation	0	10	
• Evidence of ISO 9001:2015 accreditation	10		
Maximum Score Possible For Functionality			100

The minimum qualifying score for functionality is [60] out of a maximum of [100].

CATEGORY F, G and H FUNCTIONAL CRITERIA			Maximum possible Score
1. Track Record of Service Provider: information to be completed and attached to Schedule F.13A3.			40
The Tender must provide evidence of successful maintenance work within a period of 1 year over the past 3 years with contactable references. All maintenance work submitted shall be relevant to off-site and on-site verification, calibration, and repairs of portable gas monitors, and fixed gas monitors.			
A. Calibration, Verification, and Repairs of Portable Gas Monitors.		20	
• 1 – 10 Sites maintained	5		
• 11 – 20 Sites maintained	10		
• 21 – 30 Sites maintained	15		
• 31 – 50 Sites maintained	20		
B. Calibration, Verification, Replacement, and Installation of Fixed Gas Monitors.		20	
• 1 – 10 Sites maintained	5		
• 11 – 20 Sites maintained	10		
• 21 – 30 Sites maintained	15		
• 31 – 50 sites maintained	20		
2. Key Personnel: information to be completed and attached to Schedule F.13B			30
A. Supervision/Management: A minimum of NQF level 6 qualification is required in Electrical, Chemical, or Mechanical Engineering.		10	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
B. Calibration Technical Personnel: A minimum of OEM training certificate in calibration, verification, and repairs of Portable and Fixed Gas Monitors.		10	
• 0 - 1 year of Experience post qualification	0		
• 2 – 3 years of Experience post qualification	5		
• 4 – 5 years of Experience post qualification	10		
C. Number of Calibration Technical Personnel:		10	
• 0 - 1 Calibration Technical Personnel	0		
• 2 – 3 Calibration Technical Personnel	5		
• 4 – 5 Calibration Technical Personnel	10		
3. Demonstration of Tenderer's expertise Schedule F.13C: Verification, Calibration, and Repairs of portable, and fixed gas monitors.			30
A. SANAS Accreditation The Tenderer must provide evidence of SANAS accreditation.		10	
• No SANAS Accreditation	0		
• Evidence of SANAS Accreditation	10		
B. ISO 9001:2015 Accreditation: The Tenderer must provide evidence of ISO 9001:2015 accreditation.		10	
• No ISO 9001:2015 accreditation	0		
• Evidence of ISO 9001:2015 accreditation	10		
C. OEM Distributor Authorization The Tenderer must provide evidence of OEM distributor approval (existing bulk water OEM Drager, MSA, and Honeywell).		10	
• No OEM Distributor Authorization	0		
• Evidence of OEM Distributor Authorization	10		
Maximum Score Possible For Functionality			100

The minimum qualifying score for functionality is [60] out of a maximum of [100].

Where the entity tendering is a Joint Venture, the tenderer's tender response must be accompanied by a statement describing exactly what aspects of the work will be undertaken by each party to the joint venture.

Tenderers shall ensure that all relevant information has been submitted with the tender offer in **F.13A1, F.13A2, F.13A3, F.13B, and F.13C (Returnable Schedule)** in the prescribed format to ensure optimal scoring of functionality points for each Evaluation Criteria. Failure to provide all information **IN THIS TENDER SUBMISSION** could result in the tenderer not being able to achieve the specified minimum scoring.

Tender No.: 250S/2024/25

2.2.1.1.7 Provision of samples

Not Applicable

2.2.2 Cost of tendering

The CCT will not be liable for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

2.2.3 Check documents

The documents issued by the CCT for the purpose of a tender offer are listed in the index of this tender document.

Before submission of any tender, the tenderer should check the number of pages, and if any are found to be missing or duplicated, or the figures or writing is indistinct, or if the Price Schedule contains any obvious errors, the tenderer must apply to the CCT at once to have the same rectified.

2.2.4 Confidentiality and copyright of documents

The tenderer shall treat as strictly confidential all matters arising in connection with the tender. Use and copy the documents issued by the CCT only for the purpose of preparing and submitting a tender offer in response to the invitation.

2.2.5 Reference documents

The tenderer shall obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, Conditions of Contract and other publications, which are not attached but which are incorporated into the tender document(s) by reference.

2.2.6 Acknowledge and comply with notices

The tenderer shall acknowledge receipt of notices to the tender documents, which the CCT may issue, and shall fully comply with all instructions issued in the said notices, and if necessary, apply for an extension of the closing time stated on the front page of the tender document, in order to take the notices into account. Notwithstanding any requests for confirmation of receipt of the said notices issued, the tenderer shall be deemed to have received such notices if the CCT can show proof of transmission thereof via electronic mail, facsimile, or registered post or other lawful means.

2.2.7 Clarification meeting

The tenderer shall attend, where required, a clarification meeting at which tenderers may familiarise themselves with aspects of the proposed work, services or supply and pose questions. Details of the meeting(s) are stated in the General Tender Information (i.e., in item T.1 above).

Tenderers should be represented at the site visit/clarification meeting by a duly authorised person who is suitably qualified and experienced to comprehend the implications of the work involved.

2.2.8 Seek clarification

The tenderer shall request clarification of the tender documents, if necessary, by notifying the CCT at least one week before the closing time stated in the General Tender Information (i.e., in item T.1 above), where possible.

2.2.9 Pricing the tender offer

2.2.9.1 The tenderer shall comply with all pricing instructions as stated on the Price Schedule.

2.2.10 Alterations to documents

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

2.2.11 Alternative tender offers

2.2.11.1 Unless otherwise stated in the Conditions of Tender, the tenderers may submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted.

If a tenderer wishes to submit an alternative tender offer, he/she/it shall do so as a separate offer on a complete set of tender documents. The alternative tender offer shall be submitted in a separate sealed envelope clearly marked "Alternative Tender" in order to distinguish it from the main tender offer.

Only the alternative of the highest ranked acceptable main tender offer (that is, submitted by the same tenderer) will be considered, and if appropriate, recommended for award.

Alternative tender offers of any but the highest ranked main tender offer will not be considered.

An alternative tender offer to the highest ranked acceptable main tender offer that is priced higher than the main tender offer may be recommended for award, provided that the ranking of the alternative tender offer is higher than the ranking of the next ranked acceptable main tender offer.

The CCT will not be bound to consider alternative tenders and shall have sole discretion in this regard.

In the event that the alternative is accepted, the tenderer warrants that the alternative offer complies in all respects with the CCT's standards and requirements as set out in the tender document.

2.2.11.2 Acceptance of an alternative tender offer by the CCT may be based only on the criteria stated in the Conditions of Tender or applicable criteria otherwise acceptable to the CCT.

2.2.12 Submitting a tender offer

2.2.12.1 The tenderer is required to submit one tender offer only on the original tender documents as issued by the CCT, either as a single tendering entity or as a member in a joint venture to provide the whole of the works, services or supply identified in the Conditions of Contract and described in the Specifications. Only those tenders submitted on the tender documents as issued by the CCT together with all Tender Returnable Documents duly completed and signed will be declared responsive.

2.2.12.2 The tenderer shall return the entire tender document to the CCT after completing it in its entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

2.2.12.3 The tenderer shall sign the original tender offer where required in terms of the Conditions of Tender. The tender shall be signed by a person duly authorised by the tenderer to do so. Tenders submitted by joint ventures of two or more firms shall be accompanied by the document of formation / founding document of the joint venture or any other document signed by all Parties, in which is defined precisely the conditions under which the joint venture will function, its period of duration, the persons authorised to represent and obligate it, the participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner.

2.2.12.4 Where a two-envelope system is required in terms of the Conditions of Tender, place and seal the returnable documents listed in the Conditions of Tender in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the CCT’s address and identification details stated in the General Tender Information (i.e., item T.1 above), as well as the tenderer’s name and contact address.

2.2.12.5 The tenderer shall seal the original tender offer and copy packages together in an outer package that states on the outside only the CCT’s address and identification details as stated in the General Tender Information. . If it is not possible to submit the original tender and the required copies (see 2.2.12.3) in a single envelope, then the tenderer must seal the original and each copy of the tender offer as separate packages marking the packages as “ORIGINAL” and “COPY” in addition to the aforementioned tender submission details.

2.2.12.6 The CCT shall 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.

2.2.12.7 Tender offers submitted by facsimile or e-mail will be rejected by the CCT, unless stated otherwise in the Conditions of Tender.

2.2.12.8 By signing the offer part of the Form of Offer (**Section 5, Part A hereto**) the tenderer warrants and agrees that all information provided in the tender submission is true and correct.

2.2.12.9 Tenderers shall properly deposit its bid in the designated tender box (as detailed on the front page of this tender document) on or before the closing date and before the closing time, in the relevant tender box at the Tender & Quotation Boxes Office situated on the 2nd floor, Concourse Level, Civic Centre, 12 Hertzog Boulevard, Cape Town. If the tender submission is too large to fit in the allocated box, please enquire at the public counter for assistance.

2.2.12.10 The tenderer must record and reference all information submitted contained in other documents for example cover letters, brochures, catalogues, etc. in the Returnable Schedule titled **List of Other Documents Attached by Tenderer**.

2.2.13 Information and data to be completed in all respects

Tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the CCT as non-responsive.

2.2.14 Closing time

2.2.14.1 The tenderer shall ensure that the CCT receives the tender offer, together with all applicable documents specified herein, at the address specified in the General Tender Information herein prior to the closing time stated on the front page of the tender document.

2.2.14.2 If the CCT extends the closing time stated on the front page of the tender document for any reason, the requirements of these Conditions of Tender apply equally to the extended deadline.

2.2.14.3 The CCT shall not consider tenders that are received after the closing date and time for such a tender (late tenders).

2.2.15 Tender offer validity and withdrawal of tenders

2.2.15.1 The tenderer shall warrant that the tender offer(s) remains valid, irrevocable and open for acceptance by the CCT at any time for a period of 120 days after the closing date stated on the front page of the tender document.

2.2.15.2 Notwithstanding the period stated in clause 2.2.15.1 above, bids shall remain valid for acceptance for a period of twelve (12) months after the expiry of the original validity period, unless the CCT is notified in writing of anything to the contrary by the bidder.

Tender No.: 250S/2024/25

The validity of bids may be further extended by a period of not more than six months subject to mutual agreement by the parties, administrative processes and upon approval by the City Manager, unless the required extension is as a result of an appeal process or court ruling.

In circumstances where the validity period of a tender has expired, and the tender has not been awarded, the tender process is considered "completed", despite there being no decision (award or cancellation) made. This anomaly does not fall under any of the listed grounds of cancellation and should be treated as a "non award". A "non award" is supported as a recommendation to the CCT's Bod Adjudication Committee ("BAC") for noting.

2.2.15.3 A tenderer may request in writing, after the closing date, that its tender offer be withdrawn. Such withdrawal will be permitted or refused at the sole discretion of the CCT after consideration of the reasons for the withdrawal, which shall be fully set out by the tenderer in such written request for withdrawal. Should the tender offer be withdrawn in contravention hereof, the tenderer agrees that:

- a) it shall be liable to the CCT for any additional expense incurred or losses suffered by the CCT in having either to accept another tender or, if new tenders have to be invited, the additional expenses incurred or losses suffered by the invitation of new tenders and the subsequent acceptance of any other tender;
- b) the CCT shall also have the right to recover such additional expenses or losses by set-off against monies which may be due or become due to the tenderer under this or any other tender or contract or against any guarantee or deposit that may have been furnished by the tenderer or on its behalf for the due fulfilment of this or any other tender or contract. Pending the ascertainment of the amount of such additional expenses or losses, the CCT shall be entitled to retain such monies, guarantee or deposit as security for any such expenses or loss, without prejudice to the CCT's other rights and/or remedies available to it in accordance with any applicable laws.

2.2.16 Clarification of tender offer, or additional information, after submission

Tenderer's shall promptly provide clarification of its tender offer, or additional information, in response to a written request to do so from the CCT during the evaluation of tender offers within the time period stated in such request. No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: This clause does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the CCT elect to do so.

Failure, or refusal, to provide such clarification or additional information within the time for submission stated in the CCT's written request may render the tender non-responsive.

2.2.17 Provide other material

2.2.17.1 Tenderer's shall promptly provide, upon request by the CCT, any other material that has a bearing on the tender offer, the tenderer's commercial position (including joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the CCT for the purpose of the evaluation of the tender. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the CCT's request, the CCT may regard the tender offer as non-responsive.

2.2.17.2 The tenderer shall provide, on written request by the CCT, where the transaction value inclusive of VAT **exceeds R 10 million**:

- a) audited annual financial statement for the past 3 years, or for the period since establishment if established during the past 3 years, if required by law to prepare annual financial statements for auditing;
- b) a certificate signed by the tenderer certifying that the tenderer has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days;

Tender No.: 250S/2024/25

- c) particulars of any contracts awarded to the tenderer by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract;
- d) a statement indicating whether any portion of the goods or services are expected to be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality or municipal entity is expected to be transferred out of the Republic.

Each entity to a Consortium/Joint Venture bid shall submit separate certificates/statements in the above regard.

2.2.17.3 Tenderers shall be required to undertake to fully cooperate with the CCT's external service provider appointed to perform a due diligence review and risk assessment upon receipt of such written instruction from the CCT.

2.2.18 Samples, Inspections, tests and analysis

Tenderers shall provide access during working hours to premises for inspections, tests and analysis as provided for in the Conditions of Tender or Specifications.

If the Specifications requires the tenderer to provide samples, these shall be provided strictly in accordance with the instructions set out in the Specification.

If such samples are not submitted as required in the bid documents or within any further time stipulated by the CCT in writing, then the bid concerned may be declared non-responsive.

The samples provided by all successful bidders will be retained by the CCT for the duration of any subsequent contract. Bidders are to note that samples are requested for testing purposes therefore samples submitted to the CCT may not in all instances be returned in the same state of supply and in other instances may not be returned at all. Unsuccessful bidders will be advised by the Project Manager or dedicated CCT Official to collect their samples, save in the aforementioned instances where the samples would not be returned.

2.2.19 Certificates

The tenderer must provide the CCT with all certificates as stated below:

2.2.19.1. Preference Points for Specific Goals

In order to qualify for preference points for HDI and/or Specific Goals, it is the responsibility of the tenderer to submit documentary proof (Company registration certification, Central Supplier Database report, BBBEE certificate, Proof of Disability, Financial Statements, commissioned sworn affidavits, etc.) in support of tenderer claims for such preference for that specific goal.

Tenderers are further referred to the content of the Preference Schedule for the full terms and conditions applicable to the awarding of preference points.

2.2.19.2 Evidence of tax compliance

Tenderers shall be registered with the South African Revenue Service (SARS) and their tax affairs must be in order and they must be tax compliant subject to the requirements of clause 2.2.1.1.2.h. In this regard, it is the responsibility of the Tenderer to submit evidence in the form of a valid Tax Compliance Status PIN issued by SARS to the CCT at the Supplier Management Unit located within the Supplier Management / Registration Office, 2nd Floor (Concourse Level), Civic Centre, 12 Hertzog Boulevard, Cape Town (Tel 021 400 9242/3/4/5), or included with this tender. The tenderer must record its Tax Compliance Status PIN number on the **Details of Tenderer** pages of the tender submission.

Each party to a Consortium/Joint Venture shall submit a separate Tax Compliance Status Pin.

Before making an award the CCT must verify the bidder's tax compliance status. Where the recommended bidder is not tax compliant, the bidder should be notified of the non-compliant status and be requested to submit to the CCT, within 7 working days, written proof from SARS that they have made arrangement to meet their outstanding tax obligations. The proof of tax compliance submitted by the bidder must be verified by the CCT via CSD or e-Filing. The CCT should reject a bid submitted by the bidder if such bidder fails to provide proof of tax compliance within the timeframe stated herein.

Only foreign suppliers who have answered "NO" to all the questions contained in the Questionnaire to Bidding Foreign Suppliers section on the **Details of Tenderer** pages of the tender submission, are not required to register for a tax compliance status with SARS.

2.2.20 Compliance with Occupational Health and Safety Act, 85 of 1993

Tenderers are to note the requirements of the Occupational Health and Safety Act, 85 of 1993. The Tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

In this regard the Tenderer shall submit **upon written request to do so by the CCT**, a Health and Safety Plan in sufficient detail to demonstrate the necessary competencies and resources to deliver the goods or services all in accordance with the Act, Regulations and Health and Safety Specification.

2.2.21 Claims arising from submission of tender

By responding to the tender herein, the tenderer warrants that it has:

- a) Inspected the Specifications and read and fully understood the Conditions of Contract.
- b) Read and fully understood the whole text of the Specifications and Price Schedule and thoroughly acquainted himself with the nature of the goods or services proposed and generally of all matters which may influence the Contract.
- c) visited the site(s) where delivery of the proposed goods will take place, carefully examined existing conditions, the means of access to the site(s), the conditions under which the delivery is to be made, and acquainted himself with any limitations or restrictions that may be imposed by the Municipal or other Authorities in regard to access and transport of materials, plant and equipment to and from the site(s) and made the necessary provisions for any additional costs involved thereby.
- d) requested the CCT to clarify the actual requirements of anything in the Specifications and Price Schedule, the exact meaning or interpretation of which is not clearly intelligible to the Tenderer.
- e) Received any notices to the tender documents which have been issued in accordance with the CCT's Supply Chain Management Policy.

The CCT will therefore not be liable for the payment of any extra costs or claims arising from the submission of the tender.

2.3 The CCT's undertakings

2.3.1 Respond to requests from the tenderer

2.3.1.1 Unless otherwise stated in the Conditions of Tender, the CCT shall respond to a request for clarification received up to one week (where possible) before the tender closing time stated on the front page of the tender document.

2.3.1.2 The CCT's duly authorised representative for the purpose of this tender is stated on the General Tender Information page above.

2.3.2 Issue Notices

If necessary, the CCT may issue addenda in writing that may amend or amplify the tender documents to each tenderer during the period from the date the tender documents are available until one week before the tender closing time stated in the Tender Data. The CCT reserves its rights to issue addenda less than one week before the tender closing time in exceptional circumstances. If, as a result a tenderer applies for an extension to the closing time stated on the front page of the tender document, the CCT may grant such extension and, shall then notify all tenderers who drew documents.

Notwithstanding any requests for confirmation of receipt of notices issued, the tenderer shall be deemed to have received such notices if the CCT can show proof of transmission thereof via electronic mail, facsimile or registered post.

2.3.3 Opening of tender submissions

2.3.3.1 Unless the two-envelope system is to be followed, CCT shall open tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the Conditions of Tender.

Tenders will be opened immediately after the closing time for receipt of tenders as stated on the front page of the tender document, or as stated in any Notice extending the closing date and at the closing venue as stated in the General Tender Information.

2.3.3.2 Announce at the meeting held immediately after the opening of tender submissions, at the closing venue as stated in the General Tender Information, the name of each tenderer whose tender offer is opened and, where possible, the prices indicated.

2.3.3.3 Make available a record of the details announced at the tender opening meeting on the CCT's website (<http://www.capetown.gov.za/en/SupplyChainManagement/Pages/default.aspx>.)

2.3.4 two-envelope system

2.3.4.1 Where stated in the Conditions of Tender that a two-envelope system is to be followed, the CCT shall open only the technical proposal of tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the Conditions of Tender and announce the name of each tenderer whose technical proposal is opened.

2.3.4.2 The CCT shall evaluate the quality of the technical proposals offered by tenderers, then advise tenderers who have submitted responsive technical proposals of the time and place when the financial proposals will be opened. The CCT shall open only the financial proposals of tenderers, who have submitted responsive technical proposals in accordance with the requirements as stated in the Conditions of Tender, and announce the total price and any preference claimed. Return unopened financial proposals to tenderers whose technical proposals were non responsive.

2.3.5 Non-disclosure

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

2.3.6 Grounds for rejection and disqualification

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

2.3.7 Test for responsiveness

2.3.7.1 Appoint a Bid Evaluation Committee and determine after opening whether each tender offer properly received:

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

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

- a) Detrimentially affect the scope, quality, or performance of the goods, services or supply identified in the Specifications,
- b) Significantly change the CCT's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of any material deviation or qualification.

The CCT reserves the right to accept a tender offer which does not, in the CCT's opinion, materially and/or substantially deviate from the terms, conditions, and specifications of the tender documents.

2.3.8 Arithmetical errors, omissions and discrepancies

2.3.8.1 Check the responsive tenders for:

- a) The gross misplacement of the decimal point in any unit rate;
- b) Omissions made in completing the Price Schedule; or
- c) Arithmetic errors in:
 - i) line item totals resulting from the product of a unit rate and a quantity in the Price Schedule; or
 - ii) The summation of the prices; or
 - iii) Calculation of individual rates.

2.3.8.2 The CCT must correct the arithmetical errors in the following manner:

- a) Where there is a discrepancy between the amounts in words and amounts in figures, the amount in words shall govern.
- b) If 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 tendered shall govern, and the unit rate shall be corrected.
- c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if Price Schedules apply) to achieve the tendered total of the prices.

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

2.3.8.3 In the event of tendered rates or lump sums being declared by the CCT to be unacceptable to it because they are not priced, either excessively low or high, or not in proper balance with other rates or lump sums, the tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the CCT is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it.

Tender No.: 250S/2024/25

The tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other related amounts as are agreed on by the CCT, but this shall be done without altering the tender offer in accordance with this clause.

Should the tenderer fail to amend his tender in a manner acceptable to and within the time stated by the CCT, the CCT may declare the tender as non-responsive.

2.3.9 Clarification of a tender offer

The CCT may, after the closing date, request additional information or clarification from tenderers, in writing on any matter affecting the evaluation of the tender offer or that could give rise to ambiguity in a contract arising from the tender offer, which written request and related response shall not change or affect their competitive position or the substance of their offer. Such request may only be made in writing by the Director: Supply Chain Management using any means as appropriate.

2.3.10 Evaluation of tender offers

2.3.10.1 General

2.3.10.1.1 The CCT may reduce each responsive tender offer to a comparative price and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the Conditions of Tender.

2.3.10.1.2 For evaluation purposes only, the effects of the relevant contract price adjustment methods will be considered in the determination of comparative prices as follows:

- a) If the selected method is based on bidders supplying rates or percentages for outer years, comparative prices would be determined over the entire contract period based on such rates or percentages.
- b) If the selected method is based on a formula, indices, coefficients, etc. that is the same for all bidders during the contract period, comparative prices would be the prices as tendered for year one.
- c) If the selected method is based on a formula, indices, coefficients, etc. that varies between bidders, comparative prices would be determined over the entire contract period based on published indices relevant during the 12 months prior to the closing date of tenders.
- d) If the selected method includes an imported content requiring rate of exchange variation, comparative prices would be determined based on the exchange rates tendered for the prices as tendered for year one. The rand equivalent of the applicable currency 14 days prior to the closing date of tender will be used (the CCT will check all quoted rates against those supplied by its own bank).
- e) If the selected method is based on suppliers' price lists, comparative prices would be the prices as tendered for year one.
- f) If the selected method is based on suppliers' price lists and / or rate of exchange, comparative prices would be determined as tendered for year one whilst taking into account the tendered percentage subject to rate of exchange (see sub clause (d) for details on the calculation of the rate of exchange).

2.3.10.1.3 Where the scoring of functionality forms part of a bid process, each member of the Bid Evaluation Committee must individually score functionality. The individual scores must then be interrogated and calibrated if required where there are significant discrepancies. The individual scores must then be added together and averaged to determine the final score.

2.3.10.2 Decimal places

Score financial offers, preferences and functionality, as relevant, to two decimal places.

2.3.10.3 Scoring of tenders (price and preference)

[2.3.10.3.1 Points for price will be allocated in accordance with the formula set out in this clause based on the price per item / rates as set out in the **Price Schedule (Section 7)**:

- Based on the sum of the prices/rates in relation to a typical project/job.]

2.3.10.3.2 Points for preference will be allocated in accordance with the provisions of **Preference Schedule** and the table in this clause.

2.3.10.3.3 The terms and conditions of **Preference Schedule** as it relates to preference shall apply in all respects to the tender evaluation process and any subsequent contract.

2.3.10.3.4 Applicable formula:

The 80/20 preference point system will apply to this tender

The 80/20 price/preference points system will be applied to the evaluation of responsive tenders up to and including a Rand value of R50'000'000 (all applicable taxes included), whereby the order(s) will be placed with the tenderer(s) scoring the highest total number of adjudication points.

Price shall be scored as follows:

$$Ps = 80 \times \left(1 - \frac{(Pt - Pmin)}{Pmin} \right)$$

Where: Ps is the number of points scored for price;
Pt is the price of the tender under consideration;
Pmin is the price of the lowest responsive tender.

Preference points shall be based on the Specific Goal as per below:

Table B1: Awards above R750 000 and up to R50 mil (VAT Inclusive)

#	Specific goals allocated points	Preference Points (80/20) <i>Equal/ below R50 mil</i>	Evidence	Additional Guidance
<i>Persons, or categories of persons, historically disadvantaged- (HDI) by unfair discrimination on the basis of</i>				
1	Gender are women (ownership)* >75% - 100% women ownership: 5 points >50% - 75% women ownership: 4 points >25% - 50% women ownership: 3 points >0% - 25% women ownership: 2 points 0% women ownership = 0 points	5	<ul style="list-style-type: none"> • Company Registration Certification • Central Supplier Database report 	<ul style="list-style-type: none"> • Issued by the Companies and Intellectual Property Commission • Report name: CSD Registration report
2	Race are black persons (ownership)* >75% - 100% black ownership: 5 points >50% - 75% black ownership: 4 points >25% - 50% black ownership: 3 points >0% - 25% black ownership: 2 points 0% black ownership = 0 points	5	<ul style="list-style-type: none"> • B-BBEE certificate; • Company Registration Certification • Central Supplier Database report 	<ul style="list-style-type: none"> • South African National Accreditation System approved certificate or commissioned sworn affidavit • Issued by the Companies and Intellectual Property Commission • Report name: CSD Registration report

Tender No.: 250S/2024/25

3	<p>Disability are disabled persons (ownership)*</p> <p>WHO disability guideline >2% ownership: 3 points >0% - 2% ownership: 1.5 point 0% ownership = 0 points</p>	3	<ul style="list-style-type: none"> • Proof of disability • Company Registration Certification 	<ul style="list-style-type: none"> • Medical certificate/ South African Revenue Services disability registration • Issued by the Companies and Intellectual Property Commission
<i>Reconstruction and Development Programme (RDP) as published in Government Gazette</i>				
4	<p>Promotion of Micro and Small Enterprises</p> <p>Micro with a turnover up to R20million and Small with a turnover up to R80 million as per National Small Enterprise Act, 1996 (Act No.102 of 1996)</p> <p>SME partnership, sub-contracting, joint venture or consortiums</p>	7	<ul style="list-style-type: none"> • B-BBEE status level of contributor; • South African owned enterprises; • Financial Statement to determine annual turnover 	<ul style="list-style-type: none"> • Specifically in line with the respective sector codes which the company operates, • South African National Accreditation System approved certificate or commissioned sworn affidavit • Certificate of incorporation or commissioned sworn affidavit • Latest financial statements (1 Year)
	Total points	20		

*Ownership: main tendering entity

2.3.10.5 Risk Analysis

Notwithstanding compliance with regard to any requirements of the tender, the CCT will perform a risk analysis in respect of the following:

- a) reasonableness of the financial offer
- b) reasonableness of unit rates and prices
- c) the tenderer's ability to fulfil its obligations in terms of the tender document, that is, that the tenderer can demonstrate that he/she possesses the necessary professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, capacity, experience, reputation, personnel to perform the contract, etc.; the CCT reserves the right to consider a tenderer's existing contracts with the CCT in this regard
- d) any other matter relating to the submitted bid, the tendering entity, matters of compliance, verification of submitted information and documents, etc.

The conclusions drawn from this risk analysis will be used by the CCT in determining the acceptability of the tender offer.

No tenderer will be recommended for an award unless the tenderer has demonstrated to the satisfaction of the CCT that he/she has the resources and skills required.

2.3.11 Negotiations with preferred tenderers

The CCT may negotiate the final terms of a contract with tenderers identified through a competitive tendering process as preferred tenderers provided that such negotiation:

- a) Does not allow any preferred tenderer a second or unfair opportunity;
- b) Is not to the detriment of any other tenderer; and
- c) Does not lead to a higher price than the tender as submitted.

Tender No.: 250S/2024/25

If negotiations fail to result in acceptable contract terms, the City Manager (or his delegated authority) may terminate the negotiations and cancel the tender, or invite the next ranked tenderer for negotiations. The original preferred tenderer should be informed of the reasons for termination of the negotiations. If the decision is to invite the next highest ranked tenderer for negotiations, the failed earlier negotiations may not be reopened by the CCT.

Minutes of any such negotiations shall be kept for record purposes.

The provisions of this clause will be equally applicable to any invitation to negotiate with any other tenderers.

In terms of the CCT's SCM Policy, tenders must be cancelled in the event that negotiations fail to achieve a market related price with any of the three highest scoring tenderers.

2.3.12 Acceptance of tender offer

Notwithstanding any other provisions contained in the tender document, the CCT reserves the right to:

2.3.12.1 Accept a tender offer(s) which does not, in the CCT's opinion, materially and/or substantially deviate from the terms, conditions, and specifications of the tender document.

2.3.12.2 Accept the whole tender or part of a tender or any item or part of any item or items from multiple manufacturers, or to accept more than one tender (in the event of a number of items being offered), and the CCT is not obliged to accept the lowest or any tender.

2.3.12.3 Accept the tender offer(s), if in the opinion of the CCT, it does not present any material risk and only if the tenderer(s):

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

If an award cannot be made in terms of anything contained herein, the CCT reserves the right to consider the next ranked tenderer(s).

2.3.12.4 The CCT reserves the right not to make an award, or revoke an award already made, where the implementation of the contract may result in reputational risk or harm to the CCT as a result of (inter alia):

- a) reports of poor governance or unethical behaviour, or both;
- b) association with known notorious individuals and family of notorious individuals;
- c) poor performance issues, known to the CCT;
- d) negative media reports, including negative social media reports;
- e) adverse assurance (e.g. due diligence) report outcomes; and
- f) circumstances where the relevant vendor has employed, or is directed by, anyone who was previously employed in the service of the state (as defined in clause 1.53 of the SCM Policy), where the person is or was negatively implicated in any SCM irregularity.

Tender No.: 250S/2024/25

2.3.12.5 The CCT reserves the right to nominate an StandbyBidder at the time when an award is made and in the event that a contract is terminated during the execution thereof, the CCT may consider the award of the contract, or non-award, to the Standby Bidder in terms of the procedures included its SCM Policy.

2.3.13 Prepare contract documents

2.3.13.1 If necessary, revise documents that shall form part of the contract and that were issued by the CCT as part of the tender documents to take account of:

- a) Notices issued during the tender period,
- b) Inclusion of some of the returnable documents, and
- c) Other revisions agreed between the CCT and the successful tenderer.

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

2.3.14 Notice to successful and unsuccessful tenderers

2.3.14.1 Before accepting the tender of the successful tenderer the CCT shall notify the successful tenderer in writing of the decision of the CCT's Bid Adjudication Committee to award the tender to the successful tenderer. No rights shall accrue to the successful tenderer in terms of this notice

2.3.14.2 The CCT shall, at the same time as notifying the successful tenderer of the Bid Adjudication Committee's decision to award the tender to the successful tenderer, also give written notice to the other tenderers informing them that they have been unsuccessful.

2.3.15 Provide written reasons for actions taken

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

TENDER DOCUMENT GOODS AND SERVICES		 CITY OF CAPE TOWN ISIXEKO SASEKAPA STAD KAAPSTAD
SUPPLY CHAIN MANAGEMENT		
SCM - 542	Approved by Branch Manager: February 2024	Version: 10 Page 25 of 80

TENDER NO: 250S/2024/25
TENDER DESCRIPTION: MAINTENANCE SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEMS USED WITHIN BULK WATER INFRASTRUCTURE.
CONTRACT PERIOD: 36 MONTHS FROM THE COMMENCEMENT DATE OF THE CONTRACT (NOT PRIOR 01 JULY 2026)

THE CONTRACT

THE CITY OF CAPE TOWN	
A metropolitan municipality, established in terms of the Local Government: Municipal Structures Act, 117 of 1998 read with the Province of the Western Cape: Provincial Gazette 5588 dated 22 September 2000, as amended ("the Purchaser") herein represented by	
AUTHORISED REPRESENTATIVE	

AND

SUPPLIER	
NAME of Company/Close Corporation or Partnership / Joint Venture/ Consortium or Sole Proprietor /Individual (The "Supplier" / "tenderer")	
TRADING AS (if different from above)	
REGISTRATION NUMBER	
PHYSICAL ADDRESS / CHOSEN DOMICILIUM CITANI ET EXECTUANDI OF THE SUPPLIER	
AUTHORISED REPRESENTATIVE	
CAPACITY OF AUTHORISED REPRESENTATIVE	

(HEREINAFTER COLLECTIVELY REFERRED TO AS “THE PARTIES” AND INDIVIDUALLY A “PARTY”)

NATURE OF TENDER OFFER (please indicate below)	
Main Offer (see clause 2.2.11.1)	
Alternative Offer (see clause 2.2.11.1)	

C.2 FORM OF OFFER AND ACCEPTANCE

TENDER 250S/2024/25: MAINTENANC SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEM USED WITHIN BULK WATER INFRASTRUCTURE

C.2.1 Offer (To Be Completed by the Tenderer as Part of Tender Submission)

The tenderer, identified in the offer signature table below,

HEREBY AGREES THAT by signing the *Form of Offer and Acceptance*, the tenderer:

1. confirms that it has examined the documents listed in the Index (including Schedules and Annexures) and has accepted all the Conditions of Tender;
2. confirms that it has received and incorporated any and all notices issued to tenderers issued by the CCT;
3. confirms that it has satisfied itself as to the correctness and validity of the tender offer; that the price(s) and rate(s) offered cover all the goods and/or services specified in the tender documents; that the price(s) and rate(s) cover all its obligations and accepts that any mistakes regarding price(s), rate(s) and calculations will be at its own risk;
4. offers to supply all or any of the goods and/or render all or any of the services described in the tender document to the CCT in accordance with the:
 - 4.1 terms and conditions stipulated in this tender document;
 - 4.2 specifications stipulated in this tender document; and
 - 4.3 at the prices as set out in the **Price Schedule**.
5. accepts full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on it in terms of the Contract.

SIGNED AT _____ (PLACE) ON THE _____ (DAY) OF _____ (MONTH AND YEAR)

For and on behalf of the Supplier
(Duly Authorised)
Name and Surname:

Witness 1 Signature
Name and Surname:

Witness 2 Signature
Name and Surname:

INITIALS OF CCT OFFICIALS		
1	2	3

FORM OF OFFER AND ACCEPTANCE (continued)

TENDER 250S/2024/25: MAINTENANC SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEM USED WITHIN BULK WATER INFRASTRUCTURE

C.2.2 Acceptance (To Be Completed by the CCT)

By signing this part of this *Form of Offer and Acceptance*, the CCT accepts the tenderer's (if awarded the Supplier's) offer. In consideration thereof, the CCT shall pay the Supplier the amount due in accordance with the conditions of contract. Acceptance of the Supplier's offer shall form an agreement between the CCT and the Supplier upon the terms and conditions contained in this document.

The terms of the agreement are contained in the Contract (as defined) including drawings and documents or parts thereof, which may be incorporated by reference.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the *Tender Returnable Documents* as well as any changes to the terms of the offer agreed by the tenderer and the CCT 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 the *Schedule of Deviations*.

The Supplier shall within 2 (two) weeks after receiving a complete, copy of the Contract, including the *Schedule of Deviations* (if any), contact the CCT to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documents to be provided in terms the *Special Conditions of Contract*. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation / breach of the agreement.

unless indicated otherwise in the Deviation Schedule, this agreement comes into effect on the Commencement Date, being the date upon which the Supplier confirms receipt from the CCT of 1 (one) complete, signed copy of the Contract, including amendments or deviations contained in the *Schedule of Deviations* (if any).

For and on behalf of the City of Cape Town
(Duly Authorised)
Name and Surname:

Witness 1 Signature
Name and Surname:

Witness 2 Signature
Name and Surname:

FORM OF OFFER AND ACCEPTANCE (continued)

TENDER 250S/2024/25: MAINTENANC SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEM USED WITHIN BULK WATER INFRASTRUCTURE

C.2.4 Confirmation of Receipt (To be Completed by Supplier upon Acceptance)

The Supplier identified in the offer part of the Contract hereby confirms receipt from the CCT of 1 (one) complete, signed copy of the Contract, including the *Schedule of Deviations* (if any) on:

The..... (Day)
Of..... (Month)
20..... (year)
At..... (Place)

For the Supplier: Signature(s)
Name(s)
Capacity
Signature and name of witness:
Signature Name

ONLY TO BE COMPLETED AT ACCEPTANCE STAGE

C.3 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

AGREEMENT MADE AND ENTERED INTO BETWEEN THE CCT (HEREINAFTER CALLED THE "CCT") AND

.....,
(Supplier/Mandatory/Company/CC Name)

IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993 AS AMENDED.

I,, representing

....., as an employer in its own right in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work will be performed, and all equipment, machinery or plant used in such a manner as to comply with the provisions of the Occupational Health and Safety Act (hereafter "OHS") and the Regulations promulgated thereunder.

I furthermore confirm that I am/we are registered with the Compensation Commissioner and that all registration and assessment monies due to the Compensation Commissioner have been fully paid or that I/We are insured with an approved licensed compensation insurer.

COID ACT Registration Number:

OR Compensation Insurer: Policy No:

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of OHS and the Regulations and to charge him/them with the duty of ensuring that the provisions of OHS and Regulations as well as the Council's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any subcontractors employed by me will enter into an occupational health and safety agreement separately, and that such subcontractors comply with the conditions set.

I hereby declare that I have read and understand the Occupational Health and Safety Specifications contained in this tender and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan submitted and approved in terms thereof.

Signed aton the.....day of.....20....

Witness

Mandatory

Signed at..... on the.....day of.....20

Witness

for and on behalf of
CCT

C.4 PRICE SCHEDULE

Bid specifications may not make any reference to any particular trade mark, name, patent, design, type, specific origin or producer, unless there is no other sufficiently precise or intelligible way of describing the characteristics of the work, in which case such reference must be accompanied by the words “or equivalent”.

TENDERERS MUST NOTE THAT WHEREVER THIS DOCUMENT REFERS TO ANY PARTICULAR TRADE MARK, NAME, PATENT, DESIGN, TYPE, SPECIFIC ORIGIN OR PRODUCER, SUCH REFERENCE SHALL BE DEEMED TO BE ACCOMPANIED BY THE WORDS ‘OR EQUIVALENT’

Tenderers must indicate which category for which they will be tendering by inserting a tick mark in the applicable box(s) in the table provided below (tenderers are referred to the award **clause 2.1.5.1**)

Table: C.4.1

Category A	
Category B	
Category C	
Category D	
Category E	
Category F	
Category G	
Category H	

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
Section 1	Labour & Travel rates		
1.1	Process Control System Project Manager Labour Rate	Per hour	R
1.2	PLC Engineer/Technologist Labour Rate	Per hour	R
1.3	PLC Technician Labour Rate	Per hour	R
1.4	After-Hours PLC Technician Labour Rate	Per Hour	R
1.5	SCADA & HMI Engineer/Technologist Labour Rate	Per hour	R
1.6	SCADA & HMI Technician Labour Rate	Per hour	R
1.7	After-Hours SCADA and HMI Technician Labour Rate	Per Hour	R
1.8	Telemetry Technician Labour Rate	Per hour	R
1.9	Instrumentation Technician Labour Rate	Per hour	R
1.10	After-Hours Instrumentation Technician Labour Rate	Per Hour	R
1.11	Training Facilitator (PLC, SCADA, Instrumentation, & Telemetry) Rate	Per hour	R
1.12	Instrumentation/ Instrument Mechanician/Electrical Artisan Labour Rate	Per hour	R
1.13	Artisan Assistant Labour Rate	Per hour	R
1.14	Travel Kilometre Rate (LDV 4x2)	Per Km	R
Section 2	Ad Hoc Supply of Level Measurement Instruments		
2.1	Ultrasonic type 1 Transducer 0 – 10m	each	R
2.2	Ultrasonic type 1 Transducer 0 – 15m	each	R
2.3	Ultrasonic type 1 Transducer 0 – 30m	each	R
2.4	Ultrasonic type 2 Transducer 0 – 10m	each	R

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
2.5	Ultrasonic type 2 Transducer 0 – 20m	each	R
2.6	Ultrasonic type 3 Transducer 0 – 25m	each	R
2.7	Ultrasonic Level Controller	each	R
2.8	Radar Level Transducer 0 – 40m	each	R
2.9	Radar Level Controller	each	R
2.10	Hydrostatic level sensor 0 – 5m	each	R
2.11	Hydrostatic level sensor 0 – 10m	each	R
2.12	Hydrostatic level sensor 0 – 16m	each	R
2.13	Capacitive level sensor	each	R
Section 3	Ad Hoc Supply of Pressure Measurement Instruments		
3.1	Differential Pressure Transmitter 0 - 20 bar	each	R
3.2	Differential Pressure Transmitter 0 - 40 bar	each	R
3.3	Pressure gauge 0 – 5 bar	each	R
3.4	Pressure gauge 0 – 16 bar	each	R
3.5	Pressure gauge 0 – 25 bar	each	R
3.6	Pressure gauge 0 – 40 bar	each	R
3.7	Pressure Transmitter 0 – 16 bar with display	each	R
3.8	Pressure Transmitter 0 – 25 bar with display	each	R
3.9	Pressure Transmitter 0 – 40 bar with display	each	R
3.10	Pressure Switch 0 – 20 bar	each	R
3.11	Pressure Switch 0 – 250 bar	each	R
Section 4	Ad Hoc Supply of Flow Measurement Instruments		
4.1	Monel or Hasloy Coriolis flow meter - Di.5	each	R
4.2	Monel or Hasloy Coriolis Flow meter - Di3	each	R
4.3	Monel or Hasloy Coriolis Flow meter – Di6	each	R
4.4	Monel or Hasloy Coriolis Flow meter – Di15	each	R
4.5	Monel or Hasloy Coriolis Flow meter – Di25	each	R
4.6	Monel or Hasloy Coriolis Flow meter – Di40	each	R
4.7	Mass Flow Transmitter compact wall mounting ex 24V DC	each	R
4.8	Mass Flow Transmitter compact wall mounting ex 230V AC	each	R
4.9	Magnetic Flow Transmitter remote compact wall mounting ex 24V DC	each	R
4.10	Magnetic Flow Transmitter remote compact wall mounting ex 230V AC	each	R
4.11	Air Flow Sensor	each	R
4.12	Air Flow sensor relay Controller	each	R
4.13	Differential Flow Transmitter	each	
Section 5	Ad Hoc Supply of Temperature Measurement Instruments		
5.1	Pt100 temperature transmitter including, insert and thermowell	each	R
5.2	Pt100 Thermowell	each	R
5.3	4 – 20mA Temperature Transmitter	each	R
Section 6	Ad Hoc Supply of Vibration and Speed Monitoring Instruments		
6.1	Vibration sensor	each	R
6.2	Vibration Sensor signal amplifier	each	
6.3	M12 speed sensor 12mm sensing range	each	R
6.4	M18 speed sensor 12mm sensing range	each	R

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
Section 7	Ad Hoc Supply of Paperless Chart Recorder		
7.1	paperless chart recorder 6 channel	each	R
7.2	paperless chart recorder 12 channel	each	R
Section 8	Ad Hoc Supply of Signal Isolators		
8.1	Signal isolator/splitter	each	R
8.2	Loop powered isolator 2-channel	each	R
8.3	Signal isolator/converter	each	R
Section 9	Ad Hoc Supply of Solenoid Valves		
9.1	Solenoid Valve 5/2 way 230V AC	each	R
9.2	Solenoid Valve 5/2 way 24V DC	each	R
9.3	Solenoid Valve 5/3 way 230V AC	each	R
9.4	Solenoid Valve 5/3 way 24V DC	each	R
9.5	Solenoid Valve 3/2 way 230V AC	each	R
9.6	Solenoid Valve 3/2 way 24V DC	each	R
Section 10	Ad Hoc Supply of IO-link Devices		
10.1	IO-link Master EtherNet/IP (4 digital inputs, 8 digital outputs)	each	R
10.2	IO-link Master EtherNet/IP (12 digital inputs, 12 digital outputs)	each	R
10.3	IO-link Master MQTT JSON (8 digital inputs, 4 digital outputs)	each	R
10.4	IO-link Master MQTT JSON (16 digital inputs, 8 digital outputs)	each	R
10.5	IO-link Master for Control Cabinets (Modbus TCP)	each	R
10.6	IO-link Master for Control Cabinets (EtherNet/IP)	each	R
10.7	IO-link to 4-20mA Converter	each	R
10.8	IO-link 4-20mA Analogue Threshold to NO/NC	each	R
10.9	IO-link for PT100/PT1000 converter 4-20mA output	each	R
10.10	IO-Link Display upto 4 process values	each	R
10.11	IO-Link G ¼" 0-10bar pressure sensor for hazardous areas	each	R
10.12	IO-Link G ¼" G 0-25bar pressure sensor	each	R
10.13	IO-Link G ¼" G 0-250bar pressure sensor	each	R
10.14	IO-Link ¼" NPT 0-10bar pressure sensor	each	R
10.15	IO-Link ¼" NPT 0-25bar pressure sensor	each	R
10.16	IO-Link ¼" NPT 0-250bar pressure sensor	each	R
10.17	IO-Link ½" NPT 0-10bar pressure sensor	each	R
10.18	IO-Link ½" NPT 0-25bar pressure sensor	each	R
10.19	IO-Link ½" NPT 0-250bar pressure sensor	each	R
10.20	IO-Link 1"NPT threaded Magnetic inductive flowmeter DN25	each	R
10.21	IO-Link 2"NPT threaded Magnetic inductive flowmeter DN50	each	R
10.22	IO-Link 1"NPT threaded Ultrasonic flow meter DN25	each	R
10.23	IO-Link 2"NPT threaded Ultrasonic flow meter DN50	each	R
10.24	IO-Link Dianotic Vibration monitoring unit Din Rail mounted	each	R
10.25	Switched mode power supply (5A)	each	R
10.26	IO-Link Accelerometer vibration sensor -25 to 25g range	each	R
10.27	IO-Link Accelerometer vibration sensor -50 to 50g range	each	R
10.28	IO-Link Inductive proximity speed sensor M18 non-flush, 12mm sensing range	each	R
10.29	IO-Link Radar level sensor, 0.15 to 2m range	each	R
10.30	Antenna Extension for Radar Level sensor	each	R
10.31	Mounting adapter for Radar Level sensor	each	R
10.32	IO-Link Non-contact Radar level Sensor, 0 to 10m range	each	R
10.33	IO-Link Point level sensor 273mm probe length	each	R

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
10.34	IO-Link Point level sensor 481mm probe length	each	R
10.35	IO-Link M12 Ethernet connection cable	Per meter	R
10.36	IO-Link Master starter kit EtherNet/IP	each	R
10.37	IO-Link USB set Master	each	R
10.38	IO-Link Master starter kit MQTT JSON	each	R
10.39	IO-link Configuration software including licence	each	R
10.40	IO-link Vibration monitoring software including licence	each	R
Section 11	Ad Hoc Supply of Data loggers and Remote Communication Devices		
11.1	Lithium Battery powered Data Logger	each	R
11.2	D Cell Alkaline Battery Powered Data Logger	each	R
11.3	IIoT Data Gateway Device	each	R
11.4	Extension 4G card compatible to IIoT Gateway Device	each	R
11.5	Extension IO Card compatible to IIoT Gateway Device	each	R
11.6	Remote Monitoring Station	each	R
11.7	Remote Access IIoT Data Starter Kit	each	R
Section 12	Ad Hoc Supply of PLC, HMI, SCADA		
12.1	PLC CPU Type 1 CPU	each	R
12.2	PLC CPU Type 1 4xDigital input card, 24V DC	each	R
12.3	PLC CPU Type 1 8xDigital input card, 24V DC	each	R
12.4	PLC CPU Type 1 4xDigital Output card, 24V DC	each	R
12.5	PLC CPU Type 1 8xDigital Output card, 24V DC	each	R
12.6	PLC CPU Type 1 8xDigital Input, 8xDigital Output card, 24V DC	each	R
12.7	PLC CPU Type 1 8xAnalog Input, 13bit	each	R
12.8	PLC CPU Type 1 2xAnalog Output, 14bits	each	R
12.9	PLC CPU Type 1 4xAnalog Input RTD, 16bit	each	R
12.10	PLC CPU Type 1 Communication Module modbus RS485	each	R
12.11	PLC CPU Type 1 Communication Processor LTE	each	R
12.13	PLC CPU Type 1 Power Supply, 230V AC/2.5A	each	R
12.14	PLC CPU Type 2 CPU	each	R
12.15	PLC CPU Type 2 8xDigital Input card, 24V DC	each	R
12.16	PLC CPU Type 2 16xDigital Input card, 24V DC	each	R
12.17	PLC CPU Type 2 32xDigital Input card, 24V DC	each	R
12.18	PLC CPU Type 2 8xDigital Output card, 24V DC	each	R
12.19	PLC CPU Type 2 16xDigital Output card, 24V DC	each	R
12.20	PLC CPU Type 2 32xDigital Output card, 24V DC	each	R
12.21	PLC CPU Type 2 16xDigital Input, 16xDigital Output card, 24V DC	each	R
12.22	PLC CPU Type 2 4xAnalog Input card, 16bit	each	R
12.22	PLC CPU Type 2 8xAnalog Input card, 16bit	each	R
12.23	PLC CPU Type 2 16xAnalog Input card, 16bit	each	R
12.24	PLC CPU Type 2 4xAnalog Input card, RTD, 16bit	each	R
12.25	PLC CPU Type 2 8xAnalog Input card, RTD, 16bit	each	R
12.26	PLC CPU Type 2 4xAnalog Output card, 16bit	each	R
12.27	PLC CPU Type 2 8xAnalog Output card, 16bit	each	R
12.28	PLC CPU Type 2 Profibus Communication Module	each	R
12.29	PLC CPU Type 2 TCP/IP Communication Processor 10/100/100Mbit/s	each	R
12.30	PLC CPU Type 2 Profinet, TCP/IP Communication Module 100/100Mbit/s	each	R
12.31	PLC CPU Type 2 Communication Module Modbus RS485	each	R
12.32	PLC CPU Type 2 Power Supply 230V, 25W	each	R
12.33	PLC CPU Type 2 Power Supply 230V, 60W	each	R
12.34	PLC CPU Type 2 Aluminum DIN rail 160mm	each	R

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
12.35	PLC CPU Type 2 Aluminum DIN rail 245mm	each	R
12.36	PLC CPU Type 2 Aluminum DIN rail 482mm	each	R
12.37	PLC CPU Type 2 Aluminum DIN rail 530mm	each	R
12.38	PLC CPU Type 3 (4 MByte internal memory)	each	R
12.39	PLC CPU Type 3 (8 MByte internal memory)	each	R
12.40	PLC CPU Type 3 Power Supply 230V, 36W	each	R
12.41	PLC CPU Type 3 Ethernet Backplane 6 slots	each	R
12.42	PLC CPU Type 3 Ethernet Backplane 8 slots	each	R
12.43	PLC CPU Type 3 Ethernet Backplane 12 slots	each	R
12.44	PLC CPU Type 3 Backplane Expander Module	each	R
12.45	PLC CPU Type 3 Backplane Expander Kit	each	R
12.46	PLC CPU Type 3 Backplane protective cover (for unoccupied slots)	each	R
12.47	PLC CPU Type 3 20-pin removable spring clamp terminal block	each	R
12.48	PLC CPU Type 3 40-way terminal	each	R
12.49	PLC CPU Type 3 16xDigital Input Card, 24V DC	each	R
12.50	PLC CPU Type 3 32xDigital Input Card, 24V DC	each	R
12.51	PLC CPU Type 3 16xDigital Output Card, 24V DC	each	R
12.52	PLC CPU Type 3 32xDigital Output Card, 24V DC	each	R
12.53	PLC CPU Type 3 8xDigital Input, 8xDigital Output Card, 24V DC	each	R
12.54	PLC CPU Type 3 4xAnalog Input Card	each	R
12.55	PLC CPU Type 3 8xAnalog Input Card	each	R
12.56	PLC CPU Type 3 4xRTD, Thermocouple Input Card	each	R
12.57	PLC CPU Type 3 8xRTD, Thermocouple Input Card	each	R
12.58	PLC CPU Type 3 2xAnalog Output Card	each	R
12.59	PLC CPU Type 3 4xAnalog Output Card	each	R
12.60	PLC CPU Type 3 2xInput, 2xOutput Frequency Module, 2 channels	each	R
12.61	PLC CPU Type 3 AS-Interface Communication Module, (62xDigital I/O, 31xAnalog I/O)	each	R
12.62	PLC CPU Type 3 Ethernet Module (3 port)	each	R
12.63	PLC CPU Type 3 OPC UA Module	each	R
12.64	PLC CPU Type 3 Ethernet/Serial RTU Module	each	R
12.65	Managed Switch 3-port copper, 1 port fibre optic Multimode		
12.66	Managed Switch 4-port copper, 1 port fibre optic Multimode	each	R
12.67	Managed Switch 4-port copper, 2 port fibre optic Multimode	each	R
12.68	Managed Switch 8-port copper, 2 port fibre optic Multimode	each	R
12.69	Type 1 HMI 7"	each	R
12.70	Type 1 HMI 9"	each	R
12.71	Type 1 HMI 12"	each	R
12.72	Type 1 HMI 15"	each	R
12.73	Type 2 HMI 7"	each	R
12.74	Type 2 HMI 10"	each	R
12.75	Type 2 HMI 12"	each	R
12.76	Type 2 HMI 15"	each	R
12.77	Type 2 HMI Open Box for universal Panel	each	R
12.78	SCADA System (Basic)	each	R
12.79	SCADA System Vision Runtime Clients Module	each	R
12.80	SCADA System Reporting Module	each	R
12.81	SCADA System Tag Historian Module	each	R
12.82	SCADA System Sequential Function Charts Module	each	R

Item No	CATEGORY A Description: Supply, Replace, Installation, Upgrades, and Commissioning of Process Control System equipment	Unit of measure	Price per unit (excl VAT)
12.83	SCADA System Web Development Module	each	R
12.84	SCADA System Alarm Notification Module	each	R
12.85	SCADA System SMS Notification Module	each	R
12.86	Type 1 HMI Programming Software License	each	R
12.87	Type 2 HMI Programming Software License	each	R
12.88	PLC Type 1 and PLC Type 2 Totally Integrated Programming Software Single Licence	each	R
12.89	PLC Type 1 and PLC Type 2 Totally Integrated Programming software Floating Licence (10 users)	each	R
12.90	PLC Type 3 Programming Software Single License	each	R
12.91	PLC Type 3 Programming Software Floating License (10 users)		R
12.92	Firewall 1 yearly Licence Renewal (Palo Alto Firewall)	each	R
Section 13	Provisional Sum for Category A		
13.1	<i>Total Provisional Sum</i>		R 600 000.00
13.2	<i>Tenderers to indicate the Mark up on Provisional Sum Items</i>	%	

Item No	CATEGORY B Description: Inspection, Calibration, Verification of Pressure and Temperature Instruments	Unit of measure	Price per unit (excl VAT)
Section 14	Calibration Service of Pressure and Temperature Instruments		
14.1	Adhoc Calibration Technician Labour rate	Per hour	R
14.2	Adhoc Travel Kilometre Rate (<i>LDV 4x2</i>)	Per Km	R
14.3	Pressure Gauge Up to 100mm	each	R
14.4	Pressure Gauge > 100 up to 150mm	each	R
14.5	Pressure Gauge > 150 up to 200mm	each	R
14.6	Chlorine Gas Cylinder Chemical Seal Gauge	each	R
14.7	Differential Pressure Transmitters	each	R
14.8	Pressure Transmitters 0 – 10 bar	each	R
14.9	Pressure Transmitters 0 – 16 bar	each	R
14.10	Pressure Transmitters 0 – 25 bar	each	R
14.11	Pressure Transmitters 0 – 40 bar	each	R
14.12	Pressure Transmitter 0 – 250 bar	each	R
14.13	Bearing Thermometer Sensors	each	R
14.14	Glass Thermometers – partially submerged (-25 to 50°C)	each	R
14.15	Glass Thermometers – fully submerged (-10 to 110°C)	each	R
14.16	Pt100 Resistance Temperature Detectors	each	R
Section 15	Adhoc Replacement items of Category B (INCLUDES INSTALLATION)		
15.1	Pressure Gauge Up to 100mm	each	R
15.2	Pressure Gauge > 100 up to 150mm	each	R
15.3	Pressure Gauge > 150 up to 200mm	each	R
15.4	Gauge Cocks: 15mm (1/4 inch)	each	R
15.5	Gauge Cocks: 25mm (1/2)	each	R
15.6	Gauge: 32mm (3/4)	each	R
15.7	Chlorine Gas Cylinder Chemical Seal gauge : (1/4 inch)	each	R
15.8	Chlorine Gas Cylinder Chemical Seal gauge : (1/2 inch)	each	R
15.9	Chlorine Gas Cylinder Chemical Seal gauge : (3/4 inch)	each	R
15.10	Pressure Transmitter ½ inch BSP – 10 bar with display	each	R
15.11	Pressure Transmitter ½ inch BSP – 16 bar with display	each	R
15.12	Pressure Transmitter ½ inch BSP – 25 bar with display	each	R
15.13	Pressure Transmitter ½ inch BSP – 10 bar without display	each	R
15.14	Pressure Transmitter ½ inch BSP – 16 bar without display	each	R
15.15	Pressure Transmitter ½ inch BSP – 25 bar without display	each	R

Item No	CATEGORY B Description: Inspection, Calibration, Verification of Pressure and Temperature Instruments	Unit of measure	Price per unit (excl VAT)
15.16	Differential Pressure Transmitter – 10 bar	each	R
15.17	Differential Pressure Transmitter – 16 bar	each	R
15.18	Differential Pressure Transmitter – 25 bar	each	R
15.19	Differential Pressure Transmitter – 40 bar	each	R
15.20	Bearing Thermometer Sensor: 100mm	each	R
15.21	Bearing Thermometer Sensor: 200mm	each	R
15.22	Bearing Thermometer Sensor: 300mm	each	R
15.23	Bearing Thermometer Sensor: > 300mm	each	R
15.24	Glass Thermometers – partially submerged (-25 to 50°C)	each	R
15.25	Glass Thermometers – fully submerged (-10 to 110°C)	each	R
Section 16	Provisional Sum for Category B		
16.1	<i>Total Provisional Sum for the contract</i>		R 100 000.00
16.2	<i>Tenderers to indicate the Mark up on Provisional Sum Items</i>	%	

Item No	CATEGORY C Description: Inspection, Calibration, Verification of inline Analytical Process Instruments	Unit of measure	Price per unit (excl VAT)
Section 17	Calibration Service of inline Analytical Process Instruments		
17.1	Adhoc Technician Labour Rate	Per Hour	R
17.2	Adhoc Travell kilometre Rate (LDV 4x2)	Per Km	R
17.3	Training Rate	Per Hour	R
17.4	Non-reagent residual Chlorine Analyser FC2 Type Monthly Minor Service	each	R
17.5	Non-reagent residual Chlorine Analyser FC2 3 Monthly Service	each	R
17.6	Non-reagent residual Chlorine Analyser FC2 6 Monthly Major Service	each	R
17.7	pH Meter Monthly Calibration Service	each	R
17.8	Conductivity Meter Monthly Calibration Service	each	R
17.9	Sigrist AquaScat-2 WTM Turbidity Meter 3 Monthly Calibraiton Service	each	R
17.10	Hach TU5300sc/TU5400sc Turbidity Meter 3 Monthly Service (Including Calibration)	each	R
17.11	Hach TU5300/TU5400 Turbidity Meter 1 Yearly Service (Including Calibration)	each	R
Section 18	Adhoc Replacement items for Category C inline Analytical Process Instruments		
18.1	Non-reagent free Chlorine FC2 Sensor Membrane Maintenance Parts kit (Membrane Cap, Lapping paper, Electrolyte E-FC, O-ring, and Elastomer Seal)	each	R
18.2	Non-reagent free Chlorine FC2 Sensor Membrane Cap	each	R
18.3	Non-reagent free Chlorine FC2 Sensor Electrolyte E-FC, 100ml Bottle	each	R
18.4	Non-reagent free Chlorine FC2 Sensor Spare Parts set (Lapping paper, O-ring, and Elastomer)	each	R
18.5	Non-reagent free Chlorine FC2 Membrane Sensor complete with electrolyte, and lapping paper	each	R
18.6	Non-reagent free Chlorine FC2 Sensor Analog plug-in Card	each	R

Item No	CATEGORY B Description: Inspection, Calibration, Verification of Pressure and Temperature Instruments	Unit of measure	Price per unit (excl VAT)
18.7	SFC A&B Board Electronic Module wall installation unit 100 – 240V AC	each	R
18.9	3V Battery CR3032	each	R
18.10	SD Memory Card 1GB	each	R
18.11	SFC A&C Board Fuse for 100-240V AC (1A time-lag)	each	R
18.12	Accessory Set (<i>Screws, dowels, multiple seal inserts, bolts, reducing sealing ring</i>)	each	R
18.13	SFC update cable with 9-pin RS232-DSUB plug	each	R
18.14	VariaSens flow block assembly, pressurized	each	R
18.15	Cell body VS-DF for SFC unit	each	R
18.16	Drainage Unit for SFC unit	each	R
18.17	Valve seat for SFC unit	each	R
18.18	non-return valve for SFC unit	each	R
18.19	Fine Filter for SFC unit	each	R
18.20	Flow body for SFC unit	each	R
18.21	Wallace & Tiernan non-reagent FC2 Free Chlorine Analyser complete unit or equivalent	each	R
18.20	Yokogawa non-reagent FC800D Free Chlorine Analyser or equivalent	each	R
18.21	Yokogawa FLXA402T Controller compatible with FC800D, TB820D, and TB830D Analysers.	each	R
18.22	Yokogawa FC800D Free Chlorine measuring electrode or equivalent	each	R
18.23	Yokogawa FC800D free Chlorine reference electrode or equivalent	each	R
18.24	Ceramic beads for Yokogawa FC800D or equivalent	each	R
18.25	Rotating shaft for Yokogawa FC800D or equivalent	each	R
18.26	Driven shaft assembly for Yokogawa FC800D or equivalent	each	R
18.27	Motor for Yokogawa FC800D or equivalent	each	R
18.28	Coupling for Yokogawa FC800D or equivalent	each	R
18.29	Activated charcoal filter for FC800D	each	R
18.30	Desiccant Cartridge for Hach TU5300sc/TU5400sc Turbidity Meter	each	R
18.31	Vial for Hach TU5300sc/TU5400sc Turbidity Meter	each	R
18.32	Automatic Cleaning Module for TU5300sc/TU5400sc	each	R
18.33	Flow Sensor for TU5300sc/TU5400sc	each	R
18.34	Manual Vial Wiper for TU5300sc/TU5400sc	each	R
18.35	Stablcal Turbidity Standard for TU5300sc/TU5400sc Turbidity meter 1 NTU without RFID	each	R
18.36	Stablcal Turbidity Standards for TU5300sc/TU5400sc Turbidity meter 10 NTU without RFID	each	R
18.37	Hach TU5300sc or equivalent Turbidity Meter with flow sensor, Automatic cleaning module, and system check, EPA version.	each	R
18.38	Hach TU5300sc or equivalent Turbidity Meter	each	R
18.39	Hach TU5400sc or equivalent Turbidity Meter with flow sensor, Automatic cleaning module, and system check, EPA version.	each	R
18.40	Hach TU5400sc Turbidity Meter or equivalent	each	R
18.41	Hach SC200 Universal Controller or equivalent	each	R
18.42	Sigrist AquaScat-2 WTM Turbidity Meter (<i>including wall mounting unit</i>)	each	R
18.43	Air Filter for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.44	Inlet tube stainless steel for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.45	Outlet tube for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.46	Inlet tube PVC for Sigrist AquaScat-2 WTM Turbidity Meter	each	R

Item No	CATEGORY B Description: Inspection, Calibration, Verification of Pressure and Temperature Instruments	Unit of measure	Price per unit (excl VAT)
18.47	Microfuse 250V AC 2AT RM5	each	R
18.48	Modbus RTU interface for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.49	Current Output card for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.50	I/O module Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.51	Ethernet cable for Sigrist AquaScat-2 WTM Turbidity Meter	each	R
18.52	Yokogawa TB830D Turbidity Meter or equivalent	each	R
18.53	Desiccant set for TB830 Turbidity Meter	each	R
18.54	Zero Turbidity filter case for TB830D	each	R
18.55	1µm filter element for TB830D/TB820 DTurbidity Meter	each	R
18.56	0.2µm filter element for TB830D/TB820D Turbidity Meter	each	R
18.57	O-ring for TB830 Turbidity Meter	each	R
18.58	Yokogawa TB820D Turbidity Meter or equivalent	each	R
18.59	Yokogawa pH Controller FLXA402 or equivalent	each	R
18.60	Yokogawa FU20 pH probe compatible with FLXA402 Controller	each	R
18.61	Yokogawa Differential pH probe compatible with FLXA402 Controller	each	R
18.62	Conductivity probe compatible with FLXA402 Controller or equivalent	each	R
18.63	Yokogawa dissolved Oxygen probe compatible with FLXA402 Controller or equivalent	each	R
18.64	Hach pH probe compatible with SC200 controller	each	R
18.65	Hach Differential pH probe compatible with SC200 Controller	each	R
18.66	Hach conductivity probe compatible with SC200 controller	each	R
18.67	Hach dissolved oxygen probe compatible with SC200 controller	each	R
Section 19	Adhoc Replacement items related to Category C Piping, Connectors, Mounting, and Sampling pump.		
19.1	2 in 1 Flow cell with ¼"NPT-Female inlet and Outlet connects to ¾"NPT-Male threads on sensor	each	R
19.2	1 in 1 Flow cell ¼"NPT-Female inlet and Outlet connects to ¾"NPT-Male threads on sensor	each	R
19.3	1"NPT, Stainless Steel 316 inline sensor adapter	each	R
19.4	PVC, schedule 80 ¾"NPT inline sensor Threaded Tee connector	each	R
19.5	PVC ¾"NPT inline sensor adapter	each	R
19.6	PVC 1"NPT inline sensor adapter	each	R
19.7	PVC 1.5"NPT inline sensor adapter		
19.8	¼"NPT, Stainless Steel 316 rotameter 1.5 – 19 L/hr	each	R
19.9	PVC-U 16mm pipe	Per Meter	R
19.10	PVC-U 20mm pipe	Per Meter	R
19.11	PVC-U 25mm pipe	Per Meter	R
19.12	PVC-U 90° 16mm Elbow	each	R
19.13	PVC-U 90° 20mm Elbow	each	R
19.14	PVC-U 90° 25mm Elbow	each	R
19.15	PVC-U 45° 16mm Elbow	each	R
19.16	PVC-U 45° 20mm Elbow	each	R
19.17	PVC-U 45° 20mm Elbow	each	R
19.18	PVC-U 16mm double socket	each	R
19.20	PVC-U 20mm double socket	each	R
19.21	PVC-U 25mm double socket	each	R
19.22	PVC-U 16mm 3-way Elbow	each	R
19.23	PVC-U 20mm 3-way Elbow	each	R
19.24	PVC-U 25mm 3-way Elbow	each	R

Item No	CATEGORY B Description: Inspection, Calibration, Verification of Pressure and Temperature Instruments	Unit of measure	Price per unit (excl VAT)
19.25	PVC-U 90° 16mm Tee	each	R
19.26	PVC-U 90° 20mm Tee	each	R
19.27	PVC-U 90° 25mm Tee	each	R
19.28	PVC-U 90° 20mm - 16mm Reduced Tee	each	R
19.29	PVC-U 90° 25mm – 16mm Reduced Tee	each	R
19.30	PVC-U 16mm Union with o-ring	each	R
19.31	PVC-U 20mm Union with o-ring	each	R
19.32	PVC-U 25mm Union with o-ring	each	R
19.33	PVC-U 16mm Double Union Valve	each	R
19.34	PVC-U 20mm Double Union Valve	each	R
19.35	PVC-U 25mm Double Union Valve	each	R
19.36	Pipe Support Clip 16mm	each	R
19.37	Pipe Support Clip 20mm	each	R
19.38	Pipe Support Clip 25mm	each	R
19.39	Pipe Support Bracket with Clamp 16mm	each	R
19.40	Pipe Support Bracket with Clamp 20mm	each	R
19.41	Pipe Support Bracket with Clamp 25mm	each	R
19.42	Sampling Self-priming pump single phase 230V AC, 1.1kW, max head 54m	each	R
Section 20	Provisional Sum for Category C		
20.1	Total Provisional Sum for the Category		R 300 000.00
20.2	Tenderers to indicate the Mark up on Provisional Sum Items	%	

Item No	CATEGORY D Description: Inspection, Calibration, maintenance of Ultrasonic Clamp-on Flow meters	Unit of measure	Price per unit (excl VAT)
Section 21	Calibration and Maintenance Service of Ultrasonic Clamp-on Meters (Tokyo Keike UFL-30 & UFW-100)		
21.1	Adhoc Technical Labour Rate	Per Hour	R
21.2	Adhoc Travell kilometre Rate (LDV 4x2)	Per Km	R
21.3	Training Rate	Per Hour	R
21.4	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:150 pipe	each	R
21.5	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:300 pipe	each	R
21.6	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:1000 pipe	each	R
21.7	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:1200 pipe	each	R
21.8	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:1500 pipe	each	R
21.9	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:16000 pipe	each	R
21.10	Ultrasonic Clamp-on flow meter Annual calibration and maintenance service on DN:18000 pipe	each	R
Section 22	Adhoc Replacement items for Category D Clamp-on Meters (Tokyo Keike UFL-30 & UFW-100)		
22.1	Special coaxial cable	Per Meter	R
22.2	Silicone couplant grease	each	R
22.3	Lithium battery CR2450	each	R
22.4	Ultrasonic transducers (DN>300mm)	each	R

Item No	CATEGORY D Description: Inspection, Calibration, maintenance of Ultrasonic Clamp-on Flow meters	Unit of measure	Price per unit (excl VAT)
22.5	Mounting fixture (DN>300mm)	each	R
22.6	Banded tension Strapping (DN>300mm)	each	R
22.7	Ultrasonic transducers (DN<250mm)	each	R
22.8	Mounting fixture (DN<250mm)	each	R
22.9	Banded tension strapping (DN<250mm)	each	R
22.10	Tokyo Keiki UFL-30 Flow converter unit or equivalent	each	R
22.11	Pulser module compatible with UFL-30	each	R
22.12	Analog output board	each	R
22.13	24V DC power supply	each	R
22.14	24V DC power filter board	each	R
22.15	110-230V AC supply	each	R
22.16	110-230V AC filter board	each	R
22.17	Multi-path junction box compatible with UFL-30	each	R
22.18	Programming cable and software	each	R
22.19	FlowConfig RS232 – USB brainbox cable	each	R
22.20	UFW-100 Main Unit	each	R
22.21	Coaxial cable	Per Meter	R
22.22	RS-485 modbus card	each	R
22.23	UFW config software	each	R
22.24	PR Electronics display	each	R
22.25	Totalizer unit	each	R
22.26	UPS 24V/2A PSU	each	R
22.27	Surge arrester – ATSUB-D M3/4 DIN/Imax = 15kA, 2P, 230V AC	each	R
22.28	Surge arrester - ATSUB D M 1/ DIN/Imax= 15kA	each	R
22.29	Surge arrester - ATSUB -2P 65TT Imax= 65kA; Un = 230V	each	R
22.30	Surge arrester - ATVOLT 24 Surge Protect mA Loop	each	R
22.31	50BNC coaxial 50Ohm surge protection device	each	R
22.32	Spark gap/Equipotential bonding connector lightning protection device	each	R
Section 23	Provisional Sum for Category D		
23.1	Total Provisional Sum for the contract		R 100 000.00
23.2	Tenderers to indicate the Mark up on Provisional Sum Items	%	

Item No	CATEGORY E Description: Inspection, Calibration, Verification of inline Load Cells	Unit of measure	Price per unit (excl VAT)
Section 24	Calibration Service of Load Cells		
24.1	Adhoc Technician Labour Rate	Per Hour	R
24.2	Adhoc Travell kilometre Rate (LDV 4x2)	Per Km	R
24.3	Load Cell: up to 2 000kg	each	R
24.4	Load Cell: up to 5 000kg	each	R
24.5	Load Cell: up to 50 000kg	each	R
24.6	Load Cell: up to 200 000kg	each	R
Section 25	Adhoc Replacement Items for Category E		
25.1	Load Cell: up to 2 000kg	each	R
25.2	Load Cell: up to 5 000kg	each	R
25.3	Load Cell: up to 50 000kg	each	R
25.4	Load Cell: up to 200 000kg	each	R
25.5	Load Cell Indicator : 6.5 digit panel mount (incl. tare function)	each	R
25.6	Platform scale up to 1000kg	each	R
25.7	Cradle – approx. size 680 x 1980mm	each	R

Section 26	Provisional Sum for Category E		
26.1	Total Provisional Sum for the contract		R 100 000.00
26.2	Tenderers to indicate the Mark up on Provisional Sum Items	%	

Item No	CATEGORY F Description: Inspection, Calibration, and Verification of MSA Gas Detectors	Unit of measure	Price per unit (excl VAT)
Section 27	Calibration Service of Gas Detectors		
27.1	Adhoc Calibration Technician Labour rate (callout)	Per Hour	R
27.2	Adhoc Adhoc Travel Kilometre Rate (LDV 4x2))	each	R
27.3	MSA Altair 5x Portable Gas Detector or equivalent	each	R
27.4	MSA PrimaX Fixed Gas CL2 sensor 0-10 ppm or equivalent	each	R
27.5	MSA Altair 4XR unit (LEL/O2/CO/H2S)	each	R
Section 28	Adhoc Replacement items of Category F (INCLUDES INSTALLATION)		
28.1	MSA Altair 5x O ₂ Sensor or equivalent	each	R
28.2	MSA Altair 5x CO ₂ Sensor or equivalent	each	R
28.3	MSA Altair 5x CL ₂ Sensor or equivalent	each	R
28.4	MSA Altair 5x H ₂ S Sensor or equivalent	each	R
28.5	MSA Altair 5x LeL Sensor or equivalent	each	R
28.6	MSA Primax Fixed CL ₂ Sensor 0-10 ppm (complete unit) or equivalent	each	R
28.7	MSA Altair 5x unit (LEL/O2/CO/H2S/CL2) (complete unit) or equivalent	each	R
28.8	MSA Altair 4XR unit (LEL/O2/CO/H2S) (complete unit) or equivalent	each	R
28.9	MSA Universal Pump Probe or equivalent	each	R
28.10	MSA Altair 5x unit (LEL/O2/CO/H2S/CL2) with probe assembly and 3m sampling line or equivalent	each	R
28.11	Fixed Chlorine gas Sensor 0-10ppm	each	R
28.12	Portable gas monitor	each	R
28.13	CO2 Leak Detector (Oxygen deficiency sensor)	each	R
28.15	10ppm Chlorine Gas Calibration Cylinder Size 1.6L	each	R
Section 29	Provisional Sum for Category F		
29.1	Total Provisional Sum for the contract		R 100 000.00
29.2	Tenderers to indicate the Mark up on Provisional Sum Items	%	

Item No	CATEGORY G Description: Inspection, Calibration, and Verification of honeywell Gas Detectors	Unit of measure	Price per unit (excl VAT)
Section 30	Calibration Service of Gas Detectors		
30.1	Adhoc Calibration Technician Labour rate (callout)	Per Hour	R
30.2	Adhoc Adhoc Travel Kilometre Rate (LDV 4x2))	each	R
30.3	Honeywell – BW Microclip portable Gas Monitor	each	R
30.4	Honeywell – Microclip 5 portable Gas Monitor	each	R
30.5	Honeywell – Fixed CL2 sensor 0-10ppm	each	R
30.6	Honeywell – Fixed CO2 Infra red sensor	each	R
Section 31	Adhoc Supply of items of Category G (INCLUDES INSTALLATION)		
31.1	Honeywell – BW Microclip portable Gas Monitor (Complete unit) or equivalent	each	R
31.2	Honeywell – BW Microclip 5 portable Gas Monitor (Complete unit) or equivalent	each	R
31.3	Honeywell – Fixed CL2 Monitor 0-10ppm (Complete unit)	each	R

Item No	CATEGORY G Description: Inspection, Calibration, and Verification of honeywell Gas Detectors	Unit of measure	Price per unit (excl VAT)
	or equivalent		
31.4	Honeywell – Fixed CO2 Infra red Monitor (<i>Complete unit</i>) or equivalent	each	R
31.5	LeL sensor compatible to BW Microclip	each	R
31.6	O2 sensor compatible to BW Microclip	each	R
31.7	CO2 sensor compatible to BW Microclip	each	R
31.8	CL2 sensor compatible to BW Microclip	each	R
31.9	H2S sensor compatible to BW Microclip	each	R
31.10	CO sensor compatible to BW Microclip	each	R
31.11	LeL sensor compatible to BW Microclip	each	R
31.12	O2 Sensor compatible to BW Microclip 5	each	R
31.13	CO2 Sensor compatible to BW Microclip 5	each	R
31.14	CL2 Sensor compatible to BW Microclip 5	each	R
31.15	H2S Sensor compatible to BW Microclip 5	each	R
31.16	CO Sensor compatible to BW Microclip 5	each	R
31.17	LeL Sensor compatible to BW Microclip 5	each	R
31.18	CL2 replacement sensor for Honeywell fixed CL2 Monitor	each	R
31.19	CO2 replacement sensor for Honeywell fixed CO2 Monitor	each	R
Section 32	Provisional Sum for Category G		
32.1	<i>Total Provisional Sum for the contract</i>		R 100 000.00
32.2	<i>Tenderers to indicate the Mark up on Provisional Sum Items</i>	%	

Item No	CATEGORY H Description: Inspection, Calibration, and Verification of Drager Gas Detectors	Unit of measure	Price per unit (excl VAT)
Section 33	Calibration Service of Gas Detectors		
33.1	Adhoc Calibration Technician Labour rate (callout)	Per Hour	R
33.2	Adhoc Adhoc Travel Kilometre Rate (<i>LDV 4x2</i>)	each	R
33.3	Drager X-am 5000 Portable Gas Detector	each	R
33.4	Drager PAC7000 Portable Gas Dectector	each	R
33.5	Drager X-am 5600 Portable Gas Dectector	each	R
Section 34	Adhoc Replacement items of Category H (INCLUDES INSTALLATION)		
34.1	Drager X-am 5000 Portable Gas Detector (<i>complete unit</i>)	each	R
34.2	Drager PAC7000 Portable Gas Dectector (<i>complete unit</i>)	each	R
34.3	Drager X-am 5600 Portable Gas Dectector (<i>complete unit</i>)	each	R
34.4	Drager X-am 7000 Portable Gas Dectector (<i>complete unit</i>)	each	R
34.5	Drager O2 sensor	each	R
34.6	Drager CO2 sensor	each	R
34.7	Drager CL2 sensor	each	R
34.8	Drager LeL sensor	each	R
34.9	Drager H2S sensor	each	R
34.10	Drager CO sensor	each	R
Section 35	Provisional Sum for Category H		
35.1	<i>Total Provisional Sum for the contract</i>	each	R 100 000.00
35.1	<i>Tenderers to indicate the Mark up on Provisional Sum Items</i>	%	

Pricing Instructions:

- 5.1 State the rates and prices in Rand unless instructed otherwise in the Conditions of Tender.
- 5.2 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the General Tender Information.
- 5.3 All prices tendered must include all expenses, disbursements and costs (e.g. transport, accommodation etc.) that may be required for the execution of the tenderer's obligations in terms of the Contract, and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the Contract as well as overhead charges and profit (in the event that the tender is successful). All prices tendered will be final and binding.
- 5.4 All prices shall be tendered in accordance with the units specified in this schedule.
- 5.5 Where a value is given in the Quantity column, a Rate and Price (the product of the Quantity and Rate) is required to be inserted in the relevant columns.
- 5.6 The successful tenderer is required to perform all tasks listed against each item. The tenderer must therefore tender prices/rates on all items as per the section in the Price Schedule. **An item against which no rate is/are entered, or if anything other than a rate or a nil rate (for example, a zero, a dash or the word "included" or abbreviations thereof) is entered against an item, it will also be regarded as a nil rate having been entered against that item, i.e. that there is no charge for that item. The Tenderer may be requested to clarify nil rates, or items regarded as having nil rates; and the CCT may also perform a risk analysis with regard to the reasonableness of such rates.**
- 5.7 Provide fixed rates and prices for the duration of the contract that are not subject to adjustment except as otherwise provided for in clause 17 of the Conditions of Contract and as amplified in the Special Conditions of Contract.
- 5.8 Tenderers are to price for all tender line items under each category they have indicated under table C.4.1 in order to be deemed responsive.
- 5.9 Failure to price for all items under a specific selected category, tenderer will be deemed non-responsive for that specific category.
- 5.10 Tenderers to note the non-response to a quotation within 3 calendar days from the day of request. Should the tenderer not respond within the stipulated period, the CCT will direct the quotation request to the alternative tenderer.
- 5.11 Tenderers are to price for the latest products on offer.

INITIALS OF CCT OFFICIALS		
1	2	3

C.5 SPECIFICATION(S)

5.1 Category A: Scope of Supply, Repairs, Installation and Commissioning

Tenderers will be required to supply, install and commission (or just supply) of process control system equipment such as PLC's, HMI's, SCADA, IIoT gateways, industrial PCs, flow sensors, level sensors, pressure sensors, temperature sensors, vibration sensors, etc. In cases where only the supply of equipment is required, it will be as per request by the project manager.

5.2 General requirements

- a) Instrumentation equipment shall be installed and tested by an experienced Instrumentation Technician to ensure high standards of operational reliability. Instruments mounted in field and on panels shall be suitable for continuous operation and all electronic components shall be adequately rated to suit the environment conditions.
- b) All newly installed instrumentation equipment shall be of proven design, reputed make, and shall be suitable for continuous operation. Where necessary, panel heaters, dust and waterproof cabinets shall be provided. Where applicable, Instruments offered shall be complete with all the necessary mounting and installation accessories.
- c) Electronic instruments shall utilize solid state electronic components, integrated circuits, microprocessors, etc., and shall be of proven design.
- d) For transmitting instruments with 4-20mA DC linear output signal shall be galvanically isolated having two wire system. Unless otherwise stated, overall accuracy of all measurement systems shall be less than $\pm 1\%$ of measured value, and repeatability shall be $\pm 0.5\%$. Electronic transmitters shall have integrated local display, where this is not possible a suitable separate local loop indicator shall be provided.
- e) After a power failure, when power supply resumes, the instruments and associated equipment shall reset and start working automatically.
- f) The instruments shall be designed to permit maximum interchangeability of parts and ease of access during inspection and maintenance.
- g) Unless otherwise stated, field mounted electrical and electronic instruments shall be weatherproof to IP65, and instruments that are susceptible to water submersion (pipeline chambers) shall be IP68 rated.
- h) Where applicable instruments shall be designed to work at humidity, saturated salt and chlorine contamination that may prevail. The instruments shall be given enough protection against corrosion.
- i) The performance of all instruments shall be unaffected by $\pm 15\%$ variation in power supply voltage and $\pm 5\%$ variation in frequency simultaneously.
- j) All wetted parts of sensors shall be made out of non-corrosive material capable of working with chlorine content of up to ± 10 ppm.
- k) Where applicable all instruments (transmitting analogue signals) installed in the field, surge protection devices shall be provided at both ends of the connecting cable for the protection against static discharges/lightning and electromagnetic interference.
- l) Pressure transmitters shall be provided with isolation valve and a test port, to enable ease of maintenance and calibration and prevent unnecessary removal of pressure instruments from the process.
The operating range of all instruments shall be adequate and suitable for the applicable process.

5.2.1 Data Loggers

- a) Shall operate with an internal battery for more than 3 years.
- b) Must be a complete unit housed inside an IP 68 rated enclosure.
- c) Operating Temperature (-10 to 85 Deg C) or better.
- d) Bultiband(2G/3G/4G) enabled
- e) Must operate through the GSM network, also be able to operate using the Wi-Fi technology.
- f) Standard MODBUS protocol between Sensors and RTU using RS485 interface.
- g) The IO Module must have a minimum of two (2) Digital inputs and two (2) Analogue Inputs.

- h) 5min sampling time of all parameters.
- i) Data must be downloadable manually from the remote location with a field device or laptop.
- j) The system shall have a built-in Server to allow the remote stations to communicate direct-ly to the master station OPC server (via GSM network).
- k) Must provide the data to the SCADA software.
- l) Must be able save up to 60 000 data values with time stamping.
- m) Bluetooth enabled for wireless data transfer.
- n) The RTU unit shall be capable to interface.

5.3 Level Measurement

5.3.1 Ultrasonic level measurement

- a) The ultrasonic Level measurement system shall consist of level transducer, level transmitter/controller, digital level indicator or any other items required to complete the level measuring system.
- b) The selection of the ultrasonic level transducer shall take into account the application and the process where the level measurement will be required such consideration shall factor in reservoir/tank/silo design, size, shape, environment, process fluid, the presence of foam, or any substance that may affect the accuracy of the level measurement.
- c) Ultrasonic transducer design and installation shall avoid any degradation of instrument performance due to spurious reflections, absorption, sound velocity variations, sensor detection area, temperature fluctuations, and condensation.
- d) The ultrasonic level transducer shall be suitable for flange or bracket mounting as and when required.
- e) The ultrasonic level transducer shall be chemical resistant and hermetically sealed
- f) The transducer shall be suitable for flange or bracket mounting as required and shall be rated IP65.

5.3.1.1 Type 1 Transducer

- a) The type 1 transducer shall be compatible with existing Siemens infrastructure or equivalent (Software/Controller)

5.3.1.2 Type 2 Transducer

- a) The type 2 transducer shall be compatible with existing Endress and Hauser infrastructure or equivalent (Software/Controller).

5.3.2 Ultrasonic Level Controller

- a) The Ultrasonic level controller shall have a local display with the capabilities of being configurable locally with zero and span adjustments.
- b) The level controller shall have the versatility to be configurable for various application, such as level, volume, and flow measurement.
- c) The level controller shall have wall and panel mounting options
- d) The level controller shall have removable terminal blocks for ease of wiring.
- e) The level controller shall have the capabilities of using built-in Modbus RTU via RS 485.
- f) The level controller shall be mounted in suitable weatherproof enclosures within reasonable distance from the level transducer. The level controller shall have an ingress protection of IP65.

The Ultrasonic level measuring system shall conform to the following:

Table 1: Ultrasonic level transducer and Controller

Ultrasonic level Transducer	
Internal Temperature sensor	Required
Operating frequency	44kHz
Cable	2-wire copper conducted, shielded and twisted.
Ultrasonic Level Controller	
Power Supply	230V AC or 24V DC
Number of relays	1, 3, or 6.
Communication	Modbus RS-485
output	Isolated 4-20mA
Calibration	Adjustable zero and span
Resolution	0,1% of Range or 2mm whichever is greater
Measurement Error	0,25% of range or 6mm whichever is better

5.3.3 Radar Level Measurement

- a) The radar Level measurement system shall consist of level transducer, level transmitter, digital level indicator and any other items required to complete the level measuring system.
- b) The selection of the radar level transducer shall take into account the application and the process where the level measurement will be required such consideration shall factor in reservoir/tank/silo design, size, shape, environment, process fluid, the presence of foam, or any substance that may affect the accuracy of the level measurement.
- c) The transducer shall be suitable for flange or bracket mounting as required and shall be rated IP65.
- d) The radar level measurement system shall have the capabilities for dampening/averaging the effect of radar waves, ripples on the water surface and discriminate the rate of change of the level to provide steady readings.

5.3.3.1 Radar Level Controller

- a) The radar level controller shall have a local display with the capabilities of being configurable locally with zero and span adjustments.
- b) The radar level controller shall be versatile such that it can transit radar level transducers or any level measurement device generating 4-20mA signal.
- c) The level controller shall have wall and panel mounting options
- d) The level controller shall have removable terminal blocks for ease of wiring.
- e) The level controller shall have the capabilities of using built-in Modbus RTU via RS 485.
- f) The level controller shall be mounted in suitable weatherproof enclosures within reasonable distance from the level transducer. The level controller shall have an ingress protection of IP65.
- g) The level controller shall have the capability to store programmed parameters in non-volatile flash memory
- h) The Level controller shall have auto false-echo suppression functionality for fixed obstruction avoidance.

The radar level measuring system shall conform to the following:

Table 2: Radar level Transducer and Controller

Radar level Transducer	
Operating frequency	80GHz
Accuracy	±2mm
Communication	Modbus RTU RS-485
IP rating	IP66
Radar Level Controller	
Power Supply	230V AC or 24V DC
Number of relays	1, 3, or 6
Communication	HART 7.0, Modbus RTU, Profibus PA or Profibus DP
output	Isolated 4-20mA
Accuracy	Adjustable zero and span
Resolution	0,1% of Range
Measurement Error	0,25% of range or 6mm whichever is better

5.3.4 Hydrostatic Level Measurement

- a) The hydrostatic level sensor shall be high performance, reliable, submersible pressure sensor scalable for a variety of measuring range.
- b) The hydrostatic sensor shall be suitable for a variety of applications namely: deep wells, boreholes, Reservoirs, and settling ponds.
- c) The sensor shall have a slim design, hermetically sealed, and made up of robust design from stainless steel and resistant against harsh environment conditions with an Ingress protection of IP68.
- d) The hydrostatic sensor shall have an option of having an additional temperature sensor to measure water temperature where operationally required.
- e) The sensor shall output 4-20mA with an option of 4-20mA HART communication signal output.

5.3.5 Capacitive Level Measurement

- a) The capacitive sensor shall be used as level or proximity sensor depending on the application.
- b) The capacitive sensor shall be able to detect water level without direct contact to the medium and only suitable for non-metallic tanks.
- c) The capacitive sensor shall have a mounting adapter.
- d) The capacitive sensor shall have an LED indicating the active output contact/current level
- e) The capacitive sensor shall automatic adjustment to the medium to be detected by means of programming buttons.
- f) The capacitive sensor shall be powered by 24V DC.
- g) The capacitive sensor shall be compatible with existing IO-link and IFM infrastructure or equivalent

Table 3: Capacitive Level Sensor

Capacitive level Sensor	
Electrical Design	PNP
Output contacts	Normally open/ normally closed
Power Supply	24V DC
Short Circuit protection	Non-latching
Communication	IO-link
Sensing range	12mm
IP protection	IP65
housing	Rectangular
Dimensions	20 X 14 X 48 mm
Resolution	0,1% of Range

5.4 Pressure Measurement

- a) Pressure measuring system shall consist of pressure transducer and transmitter and digital pressure indicator and any other items required to complete the pressure measuring system.
- b) Pressure transmitters shall be provided with a test port so that in-site calibration can be carried out.
- c) Pressure transmitter shall be rugged in construction and shall be suitable for continuous operation. Pressure Transmitters shall be capable of withstanding surge pressures likely to occur in the monitored system.
- d) Pressure transmitters shall be suitable for field mounting. They shall provide 4-20mA DC output proportional to pressure. Transmitter output shall be isolated and shall be suitable for transmitting over long distance. Pressure transmitters shall have high degree of weatherproof protection as specified in technical particular.
- e) Pressure sensor shall be capable of operating in the range of pumps discharge pressure, and be of the diaphragm type. It shall be provided complete with impulse tubing's, fittings, two valve manifolds with drain cock/calibration valve. Local and remote display units shall be provided

5.4.1 Pressure measurement via capacitance

- a) Pressure transmitter and gauge shall be separated from the measured fluid by a liquid filled diaphragm chemical seal for measurement using capacitance means.
- b) Pressure switches shall be used where the pressure measurement of discrete pressure or no-pressure measurement is required. These switches shall operate by means of piezoelectric sensing complete with a metal type seal, porous seals (i.e. ceramic) shall not be accepted.
- c) In addition to the pressure transmitter a pressure gauge shall also be provided at each of the pressure instruments.

5.4.2 Pressure Measurements for Diaphragm type

- a) A chemical seal shall be used on a pressure gauge, and on pressure of flow transmitter when the flowing media is viscous, corrosive or contains suspended solids.
- b) The unit shall have a stainless-steel body, bolting and diaphragm. Unit pressure rating shall be nominal pressure 10bar or higher as application dictates.
- c) Seals and filling liquid shall be suitable for temperatures from 0 to 150°C. Process and instrument connections shall be BSP or NPT compatible.
- d) Seal diaphragm must be able to withstand twice the maximum pressure range of the system to which it is connected and be corrosive resistant to the process medium.
- e) Where diaphragm seals require capillary extensions, the capillary shall be 316 stainless steel and be shielded by flexible stainless steel tubing with a neoprene or PVC cover.

5.4.3 Pressure Measurement using Differential Pressure Transmitter

- a) Transmitter shall be indicating, electronic type based on capacitance principle.
- b) Preference shall be given to a unit that is "smart" in that calibration and diagnostic checking shall be by hand held calibrator.

Differential Pressure Transmitter	
Sensor	Diaphragm
Transmitter	316 Stainless Steel
Body material	316 Stainless Steel
Process connection	½" BSP or NPT
Range	Adjustable over full span
Zero and Span Adjustment	Required
Accessories	Impulse tubings, fittings, valve manifold
Enclosure IP Rating	IP65
Accuracy	Less than 0,5% of Span
Resolution	0,1% of Range

5.4.4 Pressure gauges

- a) The pressure gauge shall be of various sizes 40mm, 63mm, 100mm, 150mm and 200mm bottom entry liquid filled.
- b) The gauge shall be offered in variety of BSP or NPT process connections depending on the application.
- c) Pressure gauges shall be stainless steel, furthermore, wetted parts shall be stainless steel.
- d) Allowance shall be made for chemical seals that can deal with corrosive gasses and media, and chlorine Chemicals seals shall be of the Hasloy C or Monel type.
- e) Allowance shall also be made for chemical seals to be able to withstand oxygen deficient water.

5.4.5 Pressure Transmitter

- a) The pressure transmitter shall be compatible with a variety of BSP and NPT process connection depending on the application.
- b) The pressure shall be available in variety of ranges between 0 – 250 bar maximum.
- c) Transmitters shall be stainless steel. Furthermore, wetted parts shall be stainless steel.
- d) Allowance shall be made for chemical seals that can deal with corrosive gasses and media, like chlorine and sewer media.
- e) The unit shall be available in 4-20mA output loop powered and external powered, with or without display.
- f) Chlorine Chemicals seals shall be of the Hasloy C or Monel type.
- g) The pressure transmitters are split up for pressure ranges in the pricing schedule.

5.4.6 Pressure Switch

- a) The pressure switch shall have a manually adjustable set point and differential switching level.
- b) The nominal pressure values at which the pressure switches operate shall be fully adjustable over the whole range of the instrument and the set value shall be clearly indicated by means of a scale and pointer.
- c) Pressure switches shall have over range protection.
- d) Pressure switches shall be housed in cast aluminium alloy enclosures providing weather protection to IP 65.
- e) When necessary a diaphragm seal shall be used to segregate the switch from the corrosive fluid media. In chlorine applications, the diaphragm shall be in silver or tantalum. For other fluids an appropriate non-corrosive diaphragm material shall be used.
- f) Where applicable the pressure switch shall be provided complete with impulse tubing, two valve manifold with drain cock, fittings, and test port.

5.5 Flow Measurement

5.5.1 Coriolis Mass flow Measurement

- a) The Coriolis mass flow sensor shall measure mass flow, density, and temperature.
- b) The Coriolis mass flow meter shall be available in a variety of sizes ranging from DN2 to a DN65, and shall be able to handle pressures up to 40bar.
- c) The temperature range of operation should allow for range of -50 degrees Celsius to 200 degrees Celsius or higher.
- d) The sensor shall be resistant to corrosive fluids.
- e) Shall have process connection either flange or threaded.
- f) The unit shall have ATEX EEx approval.
- g) The Coriolis mass flow meter shall allow for the mass flow transmitter to be installed remotely or directly on the meter.
- h) The Coriolis flow meter should further more cater for special applications where the wetted parts of the meter shall be manufactured of Alloy 22 material in order to withstand chlorine gas in specific.

5.5.1.1 Mass Flow meter Transmitter

- a) The transmitter shall be able to deliver true multi parameters in the form of mass flow, volume flow, density, temperature and totalizers based on the mass flow and volume flow.
- b) The transmitter shall have a mass flow accuracy of $\pm 0.2\%$ or better, and a density accuracy of $\pm 0.5\text{kg/m}^3$.
- c) The transmitter shall have an easy setup wizard, micro SD card, and self-verification functionality.
- d) The transmitter shall allow for Modbus RS485, HART, or PROFIBUS PA communication.

5.5.2 Air Flow Sensor

- a) The Air flow sensor shall be used in hazardous areas applications
- b) The unit shall be able to reliably monitor air flow of aggressive liquids in pipes
- c) The air flow sensor shall have ceramic material for contact with medium
- d) The unit shall have a robust design for use in harsh environments.
- e) The unit shall be compatible with VS2000 Exi relay controller monitor or equivalent.
- f) The Air flow sensor shall be compatible with existing IFM infrastructure or equivalent.

5.5.2.1 Air Flow Sensor Controller

- a) The Air flow sensor controller shall be used in hazardous areas applications
- b) The Controller shall have integrated flow monitoring and wire-break monitoring
- c) The Controller shall be compatible and complies with intrinsically safe sensors
- d) The Controller shall have clear visible bar graph multi-colour LED display

Table 4: Air Flow Sensor and Controller

Air Flow Sensor	
Probe length	30m
Process Connection	G1/2 external Thread
Media	Liquid, aggressive medium
temperature	5°C – 70 °C
Pressure rating	30 bar max
Setting range	3 – 60 cm/s
EX rating	EX II 2G, ia IIC T4 Gb
IP Rating	IP67
Electrical Connection	Up to 100m, 5 x 0.34mm ²
Controller Monitor	
Operating Voltage	110V AC, 230V AC
Operating temperature	-20°C - 60°C
Voltage Tolerance	10%
Terminal protection	IP20
Housing Protection	IP40
Output	Relay

5.5.3 Differential pressure flow

- a) The unit shall have a display which can be operated via pushbuttons and have zero span adjustments.
- b) The transmitter shall be loop powered.
- c) The unit shall be capable of being applied in flow measurement.

5.6 Temperature Measurement

5.6.1 Resistive Temperature Detectors

- a) Temperature measurement shall be provided for measurement of bearing temperature on pumps, motors and centrifuge and integrated to a control system for monitoring and protection of machinery and personnel.
- b) The measurement principle shall be by means of Resistive Temperature Detector (RTD).
- c) The temperature sensor shall be embodied in a thermowell to protect the temperature sensor from harsh process conditions.
- d) The Temperature sensor shall be integrated with a transmitter to convert the resistance due to change in temperature to a 4-20mA out signal compatible with Pt100 and Pt1000 temperature sensors.

5.7 Vibration Monitoring

- a) Vibration protection shall be provided by vibration transmitters, of type piezoelectric accelerometers, measuring the tri-axis vibration in the x, y, and z axis of selected motor and pumps.
- b) The vibration sensor should consist of a vibration sensor as well as output electronics, which is embedded in a stainless steel housing.

Table 5: Vibration Sensor

Vibration Sensor	
Sensor type	Accelerometer
Sensing Element	Piezo-electric, shear
Cabling	Shielded twisted pair
Measuring parameter	Velocity (mm/s), Peak-Peak
Measuring Accuracy	0,2%
Maximum range	±80g
Frequency Range	1Hz – 6000Hz
Amplitude Linearity	1%
Nominal Resonance Frequency	30kHz
Sensitivity	100mV/g or better
Vibration Limit	500g peak
Electromagnetic sensitivity	70µg/gauss
Sealing	Hermetic
Power Supply	18 – 30V DC
Constant Current Diode	1 – 10mA
Case Material	316 Stainless Steel
Connector and Mounting	M12, Threaded stud, M 8mm

5.8 Paperless Chart Recorder

- The unit shall be able to take up to 12 analog inputs max, and 6 digital inputs max.
- The unit shall have a 5.7" TFT screen for displaying measured values in a maximum of four groups, with digital, bar graph and curve display.
- The unit shall have 6 output relays max, and 1 transmitter power supply. The unit shall have communications interface RS232/485 (optional), Ethernet, USB and Modbus RTU/TCP Slave (optional).
- The unit shall have storage/recording capabilities; internal memory, SD card and USB flash drive. The unit shall be able to operate from a 100...230 V AC +/-10% power supply or a 24V (-10%, +15%) AC/DC power supply.

5.9 Signal Isolators

5.9.1 Signal isolator/Splitter

- The signal isolator shall allow for Isolation and 1:1 conversion of current signals within the range 0 - 20 mA/4 - 20mA.
- The signal isolator shall provide a Splitter function: 1 input and 2 output, with Response time: <7 ms and Accuracy < 0.05%.
- The unit must be able to be powered via terminal.

5.9.2 Loop powered isolator – 2 Channel

- The signal isolator shall allow Isolation and 1:1 conversion of current signals within the range 4 - 20 mA of which the unit is powered by the input loop shall be made available.
- The unit shall have 2 channels with a Response time: <5 ms and a Low voltage drop: ≤1.2 V with Accuracy < 0.05% of span.

5.9.3 Signal Isolator/converter

- The signal isolator shall handle Isolation and conversion of standard dc signals at a response time of less than 7 ms, which is dip - switch configured shall be made available.
- The unit must be able to be powered via terminal or from a busbar power supply.

6 Solenoid valves

- a) The valve shall be pneumatic operated (6 bar minimum, and 10 bar maximum) with electrical spring return solenoid valve, and can be manual overridden by a flat screw driver.
- b) The solenoid valve shall have a G1/8 connection, with 6mm nominal size.
- c) The pneumatic air shall be filtered, oil free, and dried compressed air, with a minimum operating temperature of -10°C and maximum of 70°C.
- d) The solenoid valve shall energized electrical and offered with a variety of electrical options 24V DC, 115V AC, and 230V AC.
- e) The solenoid valve ports shall be offered in a variety of 3/2-way, 5/2-way, and 5/3-way valve ports.

7 IO-Link Devices

7.1 IO-link Master Ethernet/IP

- a) The unit shall be capable of daisy chain power supply or fieldbus interface with standardized L-coded M12 connection technology.
- b) The unit shall be configurable current limitation for each port to ensure safe operation.
- c) The unit shall have voltage and current measurement per port for energy monitoring
- d) The IO-link Master inputs/output shall be configurable.
- e) The unit shall be short circuit proof.
- f) The IO-link master shall be configurable with Moneo configuration software

Table 6: IO-link Master Ethernet/IP

IO-Link Master Ethernet/IP Protocol	
Supply Voltage	20 – 30V DC
Current Consumption	300mA
Maximum current load	8A
Current Rating per port	2A
Digital Inputs	IO-link Port Class A
Communication Interface	Ethernet, IO-link
Transmission rate	10MBit/s; 100MBit/s
Operating Temperature	-25 °C - 60°C
Material Housing	PA orange
Socket	Brass nickel-plated
Sealing Material	FKM
Mounting	Backplane

7.1.2 IO-link Master MQTT JSON

Table 7: MQTT JSON

IO-Link Master MQTT Protocol	
Supply Voltage	20 – 30V DC
Current Consumption	300mA
Maximum current load	3.6A
Digital Inputs	IO-link Port Class A
Communication Interface	Ethernet, IO-link
Transmission rate	10MBit/s; 100MBit/s
Operating Temperature	-25 °C - 60°C
Material Housing	PA orange
Socket	Brass nickel-plated
Sealing Material	FKM
Mounting	Backplane

7.1.3 **IO-link Master for Control Cabinets**

- a) The IO-link master for control cabinets shall connect up to 8 IO-link devices.
- b) The unit shall have reliable transmission of data, process parameters and diagnostic data capabilities.
- c) The unit shall be capable of simultaneous data exchange with PLC controllers.
- d) The unit shall have a small design with little space for control panel mounting.
- e) The unit shall be short circuit proof.
- f) The IO-link master shall be configurable with Moneo configuration software.

Table 8: IO-link Master for Control Cabinets Modbus TCP

IO-Link Master Modbus TCP Protocol	
Supply Voltage	20 – 30V DC
Current Consumption	300mA
Maximum current load	3.6A
Current Rating per port	2A
Inputs/outputs	Configurable
Communication Interface	Ethernet, IO-link
Transmission rate	10MBit/s; 100MBit/s
Operating Temperature	-25 °C - 65°C
Material Housing	PA orange
Socket	Brass nickel-plated
Sealing Material	FKM
Mounting	DIN rail
Ingress Protection	IP20
Dimensions (mm)	125.7 x 50 x 105.3

Table 9: IO-link Master for Control Cabinets Ethernet/IP

IO-Link Master Ethernet IP Protocol	
Supply Voltage	20 – 30V DC
Current Consumption	300mA
Maximum current load	3.6A
Current Rating per port	2A
Inputs/outputs	Configurable
Communication Interface	Ethernet, IO-link
Transmission rate	10MBit/s; 100MBit/s
Operating Temperature	-25 °C - 65°C
Material Housing	PA orange
Socket	Brass nickel-plated
Sealing Material	FKM
Mounting	DIN rail
Ingress Protection	IP20
Dimensions (mm)	125.7 x 50 x 105.3

7.2 **IO-link PT100/PT1000 temperature sensor Converter**

- a) The unit shall have an operating voltage of 18 to 30Vdc.
- b) The unit shall be able to convert PT100/PT1000 resistive temperature detector signal an IO-link or analogue signal.
- c) The unit shall have a communications interface compatible with IO-Link.
- d) The unit shall be compatible with the existing IFM infrastructure or equivalent.
- e) The analogue output shall be configurable to either IO-link, analogue, or switching signal
- f) The NO/NC output signals shall be configurable, and the contacts shall be gold plated.
- g) The temperature sensor converter shall be configurable with Moneo configuration software

7.3 Converter 4-20mA output

- a) The unit shall have an operating voltage of 18 to 30Vdc.
- b) The unit shall be able to accept 2 analogue 4 to 20mA outputs.
- c) The unit shall have a communications interface compatible with IO-Link.
- d) The unit shall be compatible with the existing IFM infrastructure or equivalent.
- e) The converter shall be configurable with Moneo configuration software

8 Display Unit External Mount

- a) The unit shall have an operating voltage of 18 to 30Vdc.
- b) The unit shall be able to display upto 4 process values
- c) The unit shall have a communications interface compatible with IO-Link.
- d) The unit shall have a 1.44-inch LED display, and shall be compatible with the existing IFM infrastructure or equivalent.
- e) The unit shall be supplied with Y-splitter.
- f) The display unit shall be configurable with Moneo configuration software

9 IO-Link Pressure Sensors

9.1 Pressure sensors

- a) The pressure sensors shall have a sensing element of ceramic-capacitive pressure measuring cell with a variety of process connection sizes and pressure ranges as required in C.4 price schedule.
- b) The pressure sensors shall have 2 switching outputs, and one of them programmable as IO-link and the other as an analogue signal
- c) The process connection of the sensor shall be rotateable for optimum alignment.
- d) The pressure sensors shall have a robust design and overload protection.
- e) The pressure sensors shall have reverse polarity protection, and short circuit protection
- f) The pressure sensors shall be configurable with Moneo configuration software.

Table 10: IO-link Pressure Sensor (ceramic-capacitive measuring cell)

IO-Link Pressure sensor	
Supply Voltage	20 – 30V DC
Electrical Connection	M12 Connector
Current Consumption	35mA
Minimum insulation resistance (MΩ)	100
Number of Inputs	2 digital
Number of Outputs	1 analogue output (4-20mA)
Electrical Design	PNP/NPN
Accuracy (% of the span)	±0.4%
Repeatability (% of the span)	±0.1%
Response Time	1.5ms
Communication Interface	IO-link
Operating Temperature	-25°C - 80°C
Material	Stainless Steel

10 IO-Link Flow Sensors

10.1 Electro-Magnetic flow Sensors

- a) The IO-link electro-magnetic flow meters shall measure precise volumetric flow, total consumption and medium temperature with various process connection sizes as required in C.4 price schedule.

- b) The IO-link electro-magnetic flow meters shall have high accuracy, and repeatability
- c) The IO-link electro-magnetic flow meters shall have a clear 4-digit LED display
- d) The IO-link electro-magnetic flow meters shall have switching output, analogue and pulse output.
- e) The IO-link electro-magnetic flow meters shall have NO/NC parameterable outputs.
- f) The IO-link electro-magnetic flow meters shall have reverse polarity protection and short circuit protection.
- g) The IO-link electro-magnetic flow meters shall be configurable with Moneo configuration software

Table 11: IO-link Electro-magnetic flow sensors (inductive)

IO-Link Electro-magnetic flow sensor	
Supply Voltage	20 – 30V DC
Current Consumption	< 80mA
Maximum Load	500Ω
Inputs	2 (digital)
Output	1 (analogue 4-20mA)
Measuring Range	0.3 – 63 m ³ /h
Medium	conductive liquids
Medium conductivity	≥ 20 μS/cm
Medium viscosity	< 70 mm ² /s at 40°C
Medium Temperature	-20°C - 90°C
Pressure Rating	16bar
Process Connection	Threaded
Accuracy	±0.8% of meas.value, & 0.2% of meas.range
Repeatability	±0.2% of meas.range
Qmin	0.3 m ³ /h
Qmax	60 m ³ /h
Material	316 Stainless steel, EPDM rubber lining
Dimensions	100 x 48 x 73 (mm)

10.2 Ultrasonic flow Sensors

- a) The IO-link ultrasonic flow meters shall measure precise volumetric flow, total consumption and medium temperature with various process connection sizes as required in C.4 price schedule.
- b) The IO-link ultrasonic flow meters shall be suitable to measure conductive fluids.
- c) The IO-link ultrasonic flow meters shall have high accuracy, and repeatability
- d) The IO-link ultrasonic flow meters shall be made of robust design and component-free.
- e) The IO-link ultrasonic flow meters shall have switching output, analogue and pulse output.
- f) The IO-link ultrasonic flow meters shall have NO/NC parameterable outputs.
- g) The IO-link ultrasonic flow meters shall have reverse polarity protection and short circuit protection.
- h) The IO-link ultrasonic flow meters shall be configurable with Moneo configuration software.

Table 12: IO-link Ultrasonic flow sensors

IO-Link Ultrasonic flow sensor	
Supply Voltage	20 – 30V DC
Current Consumption	< 75mA
Maximum Load	500Ω
Inputs	2 (digital)
Output	2 – configurable (pulse, totalizer, analogue out 4-20mA, IO-link, frequency, diagnostic)
Pulse Length	0.002 – 2s
Accuracy	±1% of meas.value, & 0.5% of meas.range
Repeatability	±0.2% of meas.range
Diagnostic function	Flow direction, signal quality
Process Connection	Threaded
Material	316 Stainless steel
Dimensions	231.8 x 60.7 x 91 (mm)

11 **Diagnostic unit for IO-link Vibration Sensors**

11.1 **Diagnostic unit for IO-link Vibration Sensors**

- a) The IO-link vibration diagnostic unit shall offer reliable vibration monitoring of machine and equipment
- b) The IO-link vibration diagnostic unit shall be capable of monitoring condition-based maintenance of unbalance and rolling element of bearings.
- c) The IO-link vibration diagnostic unit shall simultaneously detect up to 4 vibration sensors.
- d) The IO-link vibration diagnostic unit shall have two switching outputs for pre-alarm and main alarm.
- e) The IO-link vibration diagnostic unit shall have short circuit protection and overload protection.
- f) The IO-link vibration diagnostic unit shall have a real-time clock.
- g) The IO-link vibration diagnostic unit shall be configurable with IFM or equivalent parameter setting software.

Table 13 Diagnostic unit for IO-link Vibration Sensors

Diagnostic unit for IO-link Vibration Sensors (Modbus TCP)	
Supply Voltage	24V DC
Current Consumption	200mA
Maximum Load	500Ω
Inputs	6 (digital)
Output	2 (switch signal, analogue 4-20mA)
Dynamic input frequency range	0.1 – 12kHz
Input sampling rate	100
Communication Protocol	Modbus TCP
Ingress Protection	IP20
Mounting	DIN rail
Material	Polyamide (PA)
Dimensions	114.2 x 50 x 105.3 (mm)

11.2 **IO-link Accelerometer Vibration Sensors**

- a) The vibration sensors shall offer reliable vibration monitoring of machine and equipment
- b) The vibration sensors shall have compact and robust stainless steel housing.
- c) The vibration sensors shall have a good repeatability and low linearity deviation.
- d) The IO-link vibration diagnostic unit shall have two switching outputs for pre-alarm and main alarm.
- e) The IO-link vibration diagnostic unit shall have short circuit protection and overload protection.
- f) The IO-link vibration diagnostic unit shall have a real-time clock.
- g) The IO-link vibration diagnostic unit shall be configurable with IFM VSE or equivalent parameter setting software.

Table 14 IO-link Accelerometer Vibration Sensor

IO-link Accelerometer Vibration Sensor	
Supply Voltage	10 – 12V DC
Measuring principle	piezo-electric
Current Consumption	< 15mA
Min. insulation resistance	100MΩ @ 500V DC
Frequency range	1 – 10kHz
Measuring sensitivity	100 mV/g
Number of measurement axis	1
Minimum measuring time	2s
Maximum transverse sensitivity	±5%
Accuracy	±5%
Mounting	Screw
Housing Material	316 Stainless Steel

12 **Switched Mode Power Supply**

12.1 **Switched Mode Power Supply**

- a) The switched mode power supply shall supply IO-link devices such as, controllers, sensors, actuators and industrial electronics.
- b) The power supply shall have low power losses and high power reserves.
- c) The power supply shall have automatic input voltage selection.
- d) The power supply shall have adjustable DC output voltage.
- e) The power supply shall have an inrush current limit protection.
- f) The power supply shall have short circuit protection and overload protection.

Table 15 Switched Mode Power Supply

Switched Mode Power Supply	
Supply Voltage range	100 - 230V AC
Operating Voltage tolerance	10%
Max. output current @ min. output voltage	5A
Max. output current @ max. output voltage	4.3A
Max. output current peak @ min. output voltage	6A
Max. output current peak @ max. output voltage	5.1A
Output power	120W
Power factor @ nominal voltage 230V AC/50Hz	0.56
Power reserve	20%
Max. residual ripple	50mV
Switch ON peak current @ nominal Voltage 230V AC/50Hz	3A
Efficiency @ nominal Voltage 230V AC/50Hz	90%
Operating temperature	-25°C - 70°C
Mounting	DIN rail
Dimensions	124 x 40 x 122.5 (mm)

13 **IO-link Speed Sensor**

13.1 **IO-link Inductive Speed Sensors**

- a) The speed sensors shall offer reliable speed monitoring of machines and equipment
- b) The speed sensors shall have compact and robust brass anti-spatter housing.
- c) The speed sensors shall be immune to external magnetic field interferences.
- d) The speed sensors shall have a constant sensing range for most metals.
- e) The speed sensors shall have a high switching range.
- f) The Speed sensors shall have short and overload protection.

Table 16 IO-link Inductive Speed Sensors

IO-link Speed Sensors (inductive)	
Supply Voltage	10-30V DC
Current Consumption	< 20mA
Sensing range	12mm
Max. voltage drop switch output	2.5V
Output	1 (NO)
Switching frequency	2kHz
Ingress Protection	IP67
Mounting	M18 Threaded non-flush
Material	Brass anti-spatter

13 IO-link level sensor

13.1 IO-link Radar level sensor

- a) The level sensor shall use radar non contact measuring principle
- b) The level sensor shall be capable of measuring the level by means of direct application or through measure level through non-metallic walls.
- c) The Level sensor shall be capable of 80GHz frequency to enable high level of accuracy.
- d) The Level sensor shall incorporate an extension antenna and mounting adaptor.
- e) The radar level sensor shall be compatible with Moneo or LR device software for configuration purposes.

Table 17 IO-link Radar level Sensors

IO-link Radar level sensors	
Supply Voltage	18-30V DC
Current Consumption	< 80mA
Sensing range	0 - 10mm
Max. Speed of change of the level	200mm/s
Input	1 (digital)
Output	2 (1 digital, 1 analogue)
Switching frequency	2kHz
Sampling rate	> 3Hz
Accuracy	± 2mm
Resolution	1mm
Response time	330ms
Communication Interface	IO-link
Process Connection	G 1 Aseptoflex vatio
Ingress Protection	IP68
Mounting	M18 Threaded non-flush
Material	316 Stainless steel

13.2 IO-link point level sensor

- a) The point level sensor shall be able to measure point level on tanks and containers
- b) The point level sensor shall be capable of measuring minimum level, and overflows.
- c) The point level sensor shall have short circuit, and overload protection.
- d) The point level sensor shall have the capability of measuring the medium temperature.
- e) The point level sensor shall be adjustable through a local button or through Moneo or LR device software.

Table 18 IO-link Point level Sensors

IO-link Point level sensors	
Supply Voltage	18 - 30V DC
Current Consumption	< 15mA
Measuring principle	capacitive
Medium	Oil based
Output	2 (digital)
Analogue process data	5
Binary process data	2
Pressure rating	0.5 bar
Max. voltage drop switching output	2.5V DC
Permanent switching current	100mA
Operating temperature	-25°C - 85°C
Response time	0.3s
Communication Interface	IO-link
Ingress Protection	IP68
Material	polypropylene reinforced fibre

14 **PLC (Programmable Logic Controller)**

14.1 **Type 1 PLC CPU**

Type 1 PLC shall be suitable for small size application with low performance range, programmable via integrated Ethernet interface and programmable according to IEC 61131 standard. Type 1 PLC shall have the following system functions:

- a) Shall have one engineering framework for automation tasks such as PLCs, HMI, Drives, and communication with integrated digital I/O's, and analogue I/O's.
- b) Shall be scalable and modular extension with I/O's via signal modules, signal board, technology modules and additional communication capabilities.
- c) Must be flexible and space saving.
- d) Shall have extendable CPU memory with optional memory card up to 32GB.
- e) The PLC CPU shall support various communication protocols such as Profinet, Modbus TCP/IP, S7-communicaton.
- f) Shall have trace function for all CPU variables, for diagnois in real-time and sporadic fault detection, and shall store up to 1000 traces on the memory card.
- g) Shall have integrated function for counting, measuring, controlling and motion control, and integrated high speed counting inputs and pulse train outputs or pulse width modulation.
- h) Shall have profinet I/O controller, and Profinet I/O device capabilities
- i) Shall have integrated security function such as know how protection, protected access to the CPU and copy protection.
- j) Shall have a removable clamp for an easy and fast exchange of modules with no wiring effort.
- k) Shall have integrated diagostic function with consistent notification in clear text.
- l) Shall have integrated functions such as PID control, real-time clock, and I/O trace.
- m) Shall have expandable functions via additional modules, Profibus, Master/Slave Modbus, Serial Interface RS232/RS485.
- n) The Type 1 PLC CPU shall be programmable with STEP 7.

Table 19 CPU Capabilities

CPU Memory	
Supply Voltage	24V DC
Memory	125 kByte
Load Memory	4 MByte
Expandable load memory	32 GByte
Number of Counters	6
Retentive Data	10 kByte
CPU processing Times	
Bit operation	0.085 µs
Word operation	1,7 µs
Floating point arithmetic	2,3 µs
I/O's	
Expandable	Yes
Number of digital Inputs	14
Number of Digital Outputs	10
Number of Analog Inputs	2
Number of Analog Outputs	2
Ingress Protection	IP20

14.2 **Type 1 PLC Digital Input Card**

- a) The digital input card for type 1 PLC shall supplement to the integrated I/O of the CPU, and shall serve as an expansion of the system with additional inputs.
- b) The digital input card shall have an ingress protection of IP20.
- c) Shall have easier and stationary wiring, and replaceable connectors.
- d) Shall have LED status signal display for each channel.
- e) Shall be compatible with the S7-1200 series.

Table 20 Digital Input Card

Digital Input Card	
Supply Voltage	24V DC
Input Current from backplane bus 5V DC	105mA
Parameterized Input Delay	Yes
Alarm Diagnostics	Yes
Input Voltage for Signal 0	5V DC, @ 1mA
Input Voltage for Signal 1	15 V DC, @ 2.5mA
Operational Temperature	-20°C to 60°C
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.3 Type 1 PLC Digital Output Card

- a) The digital output card for type 1 PLC CPU shall supplement to the integrated I/O of the CPU, and shall serve as an expansion of the system with additional inputs.
- b) The digital output card shall have an ingress protection of IP20.
- c) Shall have easier and stationary wiring, and replaceable connectors.
- d) Shall have LED status signal display for each channel.
- e) Shall be compatible with the S7-1200 series.

Table 21 Digital Output Card

Digital Output Card	
Supply Voltage	24V DC
Input Current from backplane bus 5V DC, max	120mA
Switching capacity with resistive load	0,5A, 5W
Alarm Diagnostics	Yes
Output Voltage for Signal 0, max	0,1V DC, with 10kOhm load
Output Voltage for Signal 1, min	20 V DC
Output Voltage for Signal 0, rated value	0,5A
Output Voltage for Signal 1, rated value	10µA
Operational Temperature	-20°C to 60°C
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.4 Type 1 PLC Analog Input Card

- a) The analog input card for PLC type 1 CPU shall supplement to the integrated I/O of the CPU, and shall serve as an expansion of the system with additional inputs.
- b) The analog input card shall be modular and shall have ingress protection of IP20
- c) Shall be compatible with S7-1200 series.

Table 22 Analog Input Card

Analog Input card	
Supply Voltage	24V DC
Current consumption	45mA
Permissible input voltage	35V
Permissible input current	40mA
Cycle time on all channels	625µs
Input Voltage ranges	±10V, ±5V, ±2,5V
Input Current	4-20mA, 0-20mA
Output Voltage for Signal 1, rated value	10µA
Resolution	12 bit, +sign
Diagnoses of supply voltage and wire-break	Yes
Status LED of the inputs	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.5 Type 1 PLC Analog Output Card

- The analog output card for PLC type 1 CPU shall supplement to the integrated I/O of the CPU, and shall serve as an expansion of the system with additional inputs.
- The analog input card shall be modular and shall have ingress protection of IP20
- The analog output card shall have short conversion times.
- Shall be connected to analog signals without additional amplifiers
- The terminal block shall have 7 gold plated pins
- Shall be compatible with S7-1200 series.

Table 23 Analog Output Card

Analog Output card	
Supply Voltage	24V DC
Current consumption	45mA
Current consumption from backplane bus 5V DC	80mA
Output voltage range	-10V to +10V
Output current range	4-20mA, 0-20mA
Voltage Output load impedance	1000Ω
Current Output load impedance	600Ω
Resolution	15bit, + sign
Interference Voltage Suppression	85dB, @ 50Hz
Error Deviation	±0,1% @ 25°C, ±0,2% @ 55°C of measurement range
Accuracy	0,05%
Diagnoses of supply voltage, and wire-break	Yes
Status LED of the inputs	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.6 Type 1 PLC Analog Input Card for RTD

- a) The RTD (Resistive Temperature Detector) module shall record temperatures with an accuracy of 0,05% at ambient temperature.
- b) Must be compatible with most RTD's, and must be able to be retrofitted to an existing installation

Table 24 Analog Input Card RTD

Analog Input Card RTD	
Supply Voltage	24V DC
Current consumption	45mA
Current consumption from backplane bus 5V DC	80mA
Configurable Resistance Measurement Input ranges	150Ω, 300Ω, 600Ω
Resistive Thermometer Types	Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
Voltage Output load impedance	1000Ω
Current Output load impedance	600Ω
Voltage error limit	±3%
Current error limit	±3%
Diagnoses of supply voltage, Short-Circuit and wire-break	Yes
Status LED of the inputs	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.7 Type 1 PLC Communication Module RS-485

- a) The communication module shall have a fast, high performance serial data exchange via point to point connection.
- b) The communication module must have an integrated protocol driver that supports Modbus RTU, Freeport, ASCII, and universal serial interface protocol (USS).
- c) Shall be compatible with S7-1200 series.

Table 25 Communication Module RS-485

Analog Input card	
Supply Voltage	24V DC
Current consumption from backplane bus 5V DC	50mA
Maximum cable length	1000m
Supported communication Protocols	Freeport, ASCII, Modbus RTU master, Modbus RTU slave, USS
Diagnostic Status LED	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.8 Type 1 PLC Power Supply

- a) The power supply shall be a single phase with automatic range selection of the input voltage to match to match the Simatic S7-1200 PLC.
- b) Shall provide constant 24V DC to the CPU, signal modules, and to 24V loads connected to the signal module.
- c) Shall be compatible with S7-1200 series.

Table 26 Power Supply

Power Supply	
Primary Voltage	230V AC
Secondary Voltage	24V DC
Automatic range selection	Yes
Current range	0 – 2,5A
Efficiency	83%
Output over voltage protection	< 33V DC
Current limit	2,65A
Leakage Current limit	3.5mA
Operational Temperature	0 - 60°C
Explosion Proof Protection	ATEX (EX) II 3G Ex nA II T4, Class 1, Div 2.
Ingress Protection	IP20
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, CB approval, Marine Approval

14.9 Type 2 PLC CPU

- a) The type 2 PLC CPU shall be suitable for medium to large size application with medium to high performance range.
- b) The type 2 PLC CPU shall be modular, scalable, and universally operable in dust areas.
- c) Shall be programmable according to IEC 61131 standard and consistent data storage if user program and documentation on CPU.
- d) Shall automatically report on system events, alarms, diagnostic buffer, watch tables, cycle time, and used memory on it's local mini display.
- e) Shall comprehensively trace functions of all CPU tags for real-time diagnostics and sporadic error detection.
- f) The PLC CPU shall support various communication protocols such as Profinet, Modbus TCP, UDP, SNMP, DCP, LLDP, OPC UA.
- g) Shall have a decentralized peripheral with CPU functioning as master controller
- h) The CPU shall have extended communication functionality through expandable expansion modules.

Table 27 Type 2 CPU Capabilities

CPU Memory	
Supply Voltage	24V DC
Program memory	500 kByte
Work memory	3000 kByte
Load Memory	32 GByte
Number of timers	2048
Number of Counters	2048
Retentive Data	512 kByte
CPU processing Times	
Bit operation	0,03 µs

Word operation	0,036 μ s
Fixed point arithmetic	0,048 μ s
Floating point arithmetic	0,192 μ s
I/O's	
Expandable	Yes
Periphery address area Inputs	32 kByte
Periphery address area Outputs	32 kByte
Display Resolution	128*160
Ingress Protection	IP20

14.10 Type 2 PLC Digital Input Card

The type 2 PLC digital input card shall have protection class of IP20 for installation in the control cabinet for automation applications, with input characteristic according to IEC 61131, type 3. The type 2 PLC digital input card shall have the following features:

- a) Supply voltage between 19,2 – 28,8 V DC with a nominal value of 24V DC.
- b) Reverse polarity protection against destruction.
- c) Replaceable front connector wiring screw or push in
- d) Push-In terminals for tool-free wiring.
- e) Pre-wiring position of the front connector for easier wiring.
- f) Stationary wiring.
- g) Suitable for solid cables with cable cross sections from 0,25 to 1,5 mm².
- h) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² with ferrule.
- i) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² without ferrule.
- j) Must have a labelable front door with labeling strips.
- k) Re-parameterizable during operation.
- l) LED Status display for signal status of each channel.
- m) LED diagnostics display on the device
- n) Supports isochronous mode from 250 μ s.
- o) Input delay parameterizable by channel: 0,05ms to 20ms.
- p) Supports diagnostic and process alarms.
- q) Parameterizable diagnoses by channel, and be able to detect missing supply voltage, wire break and process alarm.
- r) Shall be configurable with the totally integrated automation portal.
- s) Shall be suitable for S7-1500 series.

Table 28 Digital Input Card

Digital Input Card	
Supply Voltage	24V DC
Current consumption	20mA
Power consumption from backplane	1,1W
Parameterizable Inputs	Yes
Input Voltage for Signal 0	-30 to 5V DC
Output Voltage for Signal 1, min	11 to 30V DC
Input current for signal 1	2.5mA
Diagnostics, and hardware interrupts	Yes
Diagnostic LED indication	Yes
Ambient conditions	-30 to 60°C

14.11 Type 2 PLC Digital Output Card

The type 2 digital output card shall have a protection class IP20 for installation in the control cabinet for automation applications, shall be suitable for the connection of solenoid valves, DC contactors, indicator lights, etc. Type 2 PLC output card shall have the following features:

- a) Supply voltage between 19,2 – 28,8 V DC with a nominal value of 24V DC.
- b) Reverse polarity protection against destruction.
- c) Replaceable front connector wiring screw or push in
- d) Push-In terminals for tool-free wiring.
- e) Pre-wiring position of the front connector for easier wiring.
- f) Stationary wiring.
- g) Suitable for solid cables with cable cross sections from 0,25 to 1,5 mm².
- h) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² with ferrule.
- i) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² without ferrule.
- j) Must have a labelable front door with labeling strips.
- k) Re-parameterizable during operation.
- l) LED Status display for signal status of each channel.
- m) LED diagnostics display on the device
- n) Supports isochronous mode from 250µs.
- o) Input delay parameterizable by channel: 0,05ms to 20ms.
- p) Supports diagnostic and process alarms.
- q) Parameterizable diagnoses by channel, and be able to detect missing supply voltage, wire break and process alarm.
- r) Shall be configurable with Step 7 totally integrated automation portal.
- s) Shall be suitable for S7-1500 series.

Table 29 Digital Output Card

Digital Output Card	
Supply Voltage	24V DC
Input Current from backplane bus 5V DC, max	120mA
Switching capacity with resistive load	0,5A, 5W
Alarm Diagnostics	Yes
Output Voltage for Signal 0, max	0,1V DC, with 10kOhm load
Output Voltage for Signal 1, min	20 V DC
Output Voltage for Signal 0, rated value	0,5A
Output Voltage for Signal 1, rated value	10µA
Operational Temperature	-20°C to 60°C
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.12 Type 2 PLC Analog Input Card

The type 2 analog input card shall have a protection class IP20 for installation in the control cabinet for automation applications. Suitable for the precise measurement of voltages and currents via 2 and 4-wire measuring transducer. Type 2 PLC output card shall have the following features:

- a) Supply voltage between 19,2 – 28,8 V DC with a nominal value of 24V DC.
- b) Reverse polarity protection against destruction.
- c) Replaceable front connector wiring screw or push in.
- d) Push-In terminals for tool-free wiring.
- e) Pre-wiring position of the front connector for easier wiring.
- f) Stationary wiring.
- g) Suitable for solid cables with cable cross sections from 0,25 to 1,5 mm².
- h) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² with ferrule.

- i) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² without ferrule.
- j) Must have a labelable front door with labeling strips.
- k) Re-parameterizable during operation, and calibratable during operation.
- l) LED Status display for signal status of each channel.
- m) LED diagnostics display on the device.
- n) Input type/range can be parameterized per channel.
- o) Signal-conversion time (per channel): 4ms.
- p) Potential separation between the channels.
- q) Parameterizable diagnoses by channel, and be able to detect missing supply voltage, wire break and process alarm.
- r) Scaling of the measured values and measuring range adjustment to increase the resolution.

Table 30 Analog Input Card

Analog Input card	
Supply Voltage	24V DC
Current consumption	45mA
Permissible input voltage	28,8V
Permissible input current	40mA
Filtering and processing time	80µs
Bus Cycle Time	250µs
Input Voltage ranges	-5 - 5V, -10 - 10V
Input Current ranges	4-20mA, 0-20mA
Output Voltage for Signal 1, rated value	10µA
Resolution	16 bit
Reverse polarity protection	Yes
Diagnoses of supply voltage and wire-break	Yes
Status LED of the inputs	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.13 Type 2 PLC Analog Output Card

- a) Supply voltage between 19,2 – 28,8 V DC with a nominal value of 24V DC.
- b) Reverse polarity protection against destruction.
- c) Replaceable front connector wiring screw or push in.
- d) Push-In terminals for tool-free wiring.
- e) Pre-wiring position of the front connector for easier wiring.
- f) Stationary wiring.
- g) Suitable for solid cables with cable cross sections from 0,25 to 1,5 mm².
- h) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² with ferrule.
- i) Suitable for flexible cables with cable cross sections from 0,25 to 1,5 mm² without ferrule.
- j) Must have a labelable front door with labeling strips.
- k) Re-parameterizable during operation, and calibratable during operation.
- l) LED Status display for signal status of each channel.
- m) LED diagnostics display on the device.
- n) Input type/range can be parameterized per channel.
- o) Signal-conversion time (per channel): 4ms.
- p) Potential separation between the channels.
- q) Parameterizable diagnoses by channel, and be able to detect missing supply voltage, wire break and process alarm.
- r) Signal conversion time per channel shall be not less than 50µs
- s) Supports isochronous time not less than 250µs
- t) Supports oversampling.

Table 31 Analog Output Card

Analog Output card	
Supply Voltage	24V DC
Permissible input voltage	28,8V
Output Voltage ranges	1 - 5V, -10 - 10V, 0 – 10V
Output Current ranges	4-20mA, 0-20mA
Error Limit (voltage and current related to output range)	0.2%
Resolution	16 bit
Reverse polarity protection	Yes
Diagnoses of supply voltage and wire-break	Yes
Run LED, Error LED, Channel Status display, module diagnostics	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.14 Type 2 PLC Analog Input Card for RTD

- c) The RTD (Resistive Temperature Detector) module shall record temperatures with an accuracy of 0,05% at ambient temperature.
- d) Must be compatible with most RTD’s, and must be able to be retrofitted to an existing installation.
- e) Shall be compatible with S7-1500 series

Table 32 Analog Input Card RTD

Analog Input Card RTD	
Supply Voltage	24V DC
Current consumption	45mA
Current consumption from backplane bus 5V DC	80mA
Configurable Resistance Measurement Input ranges	150Ω, 300Ω, 600Ω
Resistive Thermometer Types	Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
Voltage Output load impedance	1000Ω
Current Output load impedance	600Ω
Voltage error limit	±3%
Current error limit	±3%
Diagnoses of supply voltage, Short-Circuit and wire-break	Yes
Status LED of the inputs	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.15 Type 2 PLC Communication Module RS-485

- d) The communication module shall have a fast, high performance serial data exchange via point to point connection.
- e) The communication module must have an integrated protocol driver that supports Modbus RTU, Freeport, ASCII, and universal serial interface protocol (USS).
- f) Shall be compatible with S7-1500 series.

Table 33 Communication Module RS-485

Analog Input card	
Supply Voltage	24V DC
Maximum transmission rate	19.2kbit/s
Maximum cable length	1000m
Modbus RTU Master Address Area	1 – 247, extended to 1 - 65535
Modbus RTU Slave Address Area	1 – 247, extended to 1 - 65535
Supported communication Protocols	Freeport, ASCII, Modbus RTU master, Modbus RTU slave, USS
Diagnostic Status LED	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.16 Type 2 PLC Communication Module Profibus

- a) The Profibus communication module shall expand the Type 2 CPU controller to include profibus connection for communication with lower-level profibus devices in bandwidths from 9.6kpbs to 12 Mbps.
- b) The profibus module must have the capabilities to control a number of different field devices via a number of profibus segments.
- c) The profibus module must have the capabilities to take over all communication tasks, thus reducing PLC CPU controller work load.
- d) Shall support connection up to 16 distributed inputs and output modules as block I/O.
- e) Shall be compatible with S7-1500 series.

Table 34 Communication Profibus Module

Profibus Module	
Maximum transmission rate	19.2kbit/s – 12Mbit/s
Profibus DP Master	Yes
DP connection Plug	9-pin Sub-D socket RS-485
Supply Voltage from backplane	15V
Protection Class	IP20
Diagnostic Status LED	Yes
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, RCM, KC approval, Marine Approval

14.17 Type 2 PLC Communication TCP/IP Processor

- (a) The communication processor shall securely connect to Type 2 CPU PLC using a variety of security features such as state pocket inspection firewalls and VPNs, and data encryption protocols such as FTPS, and SNMPv3.
- (b) The communication processor shall protect the Type 2 CPU PLC against unauthorized access.
- (c) The communication processor shall be used to link Type 2 CPU PLC to IPv6-based network, and all functions shall be configured via totally integrated engineering portal.
- (d) The communication processor must have the capabilities to take over all communication tasks, thus reducing PLC CPU controller work load.
- (e) Shall enable setup of identical machines with the same IP addresses through network separation/segmentation.
- (f) Shall have secure open user communication over TCP/IP.
- (g) Shall enable accessibility of the controller from an IPv6-based infrastructure.
- (h) Shall have simple diagnostics via the central Web server.
- (i) Shall have time synchronization via NTP (Network Time Protocol) or secured NTP.
- (j) Shall have simple, cost-effective module replacement in the event of a fault such that all configuration information can be stored on the CPU memory card.
- (k) IP routing (IPv4) to other communication modules in the system
- (l) Shall have data transmission rate at 10/100/1000 Mbit/s.
- (m) Supply voltage from backplane bus: 15 V DC.
- (n) Ambient temperature during operation : 40°C.
- (o) Shall have Protection class: IP20.

14.18 Type 2 PLC Communication Profinet IO, TCP/IP Module

- (a) The communication module shall securely connect to Type 2 CPU PLC using a variety of security features such as state pocket inspection firewalls and VPNs, and data encryption protocols such as FTPS, and SNMPv1.
- (b) Easy system extension by additional profinet lines through a modular concept
- (c) High system availability through support of media redundancy (MRP)
- (d) Shall have simple, cost-effective module replacement in the event of a fault such that all configuration information can be stored on the CPU memory card.
- (e) Shall have separation of profinet lines for separate automation tasks
- (f) Shall have secure open user communication over TCP/IP.
- (g) Shall have IP routing to other communication modules in the system via IPv4.
- (h) Shall have simple diagnostics via the central Web server.
- (p) The communication module shall have simple, cost-effective module replacement in the event of a fault such that all configuration information can be stored on the CPU memory card.
- (i) IP routing (IPv4) to other communication modules in the system
- (j) Shall have data transmission rate at 10/100Mbit/s.
- (k) Profinet IO controller with real-time functions (RT/IRT) with Flexible connection of up to 128 and also supports third party manufactures.
- (l) Profinet devices Supply voltage from backplane bus: 15 V DC.
- (m) Ambient temperature during operation : 40°C.
- (n) Shall have Protection class: IP20.

14.19 Type 2 PLC Power Supply

- d) The power supply shall be a single phase with automatic range selection of the input voltage to match to match the Simatic S7-1200 PLC.
- e) Shall provide constant 24V DC to the CPU, signal modules, and to 24V loads connected to the signal module.
- f) Shall be compatible with S7-1500 series.

Table 35 Power Supply

Power Supply	
Primary Voltage	230V AC
Secondary Voltage	24V DC
Automatic range selection	Yes
Current range	0 – 2,5A
Efficiency	83%
Output over voltage protection	< 33V DC
Current limit	2,65A
Leakage Current limit	3.5mA
Operational Temperature	0 - 60°C
Explosion Proof Protection	ATEX (EX) II 3G Ex nA II T4, Class 1, Div 2.
Ingress Protection	IP20
Standards, Approvals, Certificates	CE mark, CSA approval, UL approval, cULus, FM Approval, CB approval, Marine Approval

14.20 Type 3 PLC Power Supply

- The power supply shall have an internal fuse not accessible for primary circuit.
- Shall have an overload and overvoltage protection for secondary circuit.
- Shall have a short circuit protection for secondary circuit.
- Shall have modularity, scalability, robustness, and reliability.
- Shall be compatible with Modicon X80 range.

Table 36 Power Supply

Power Supply	
Primary Voltage	230V AC
Secondary Voltage	24V DC
Secondary Power	31.2W, @24V DC
Secondary Current	4.5A, @3.3V DC
Efficiency	86%
Primary Voltage limit range	85 – 264V AC
Frequency range limit	47 – 63Hz
Maximum Power Dissipation	8.5W
Operational Temperature	0 - 60°C
Status LED	Yes
Ingress Protection	IP20

14.21 Type 3 PLC Ethernet X-Bus backplane

- The backplane must be compatible with Modicon M580 series
- Shall have a stable in-rack module mounting way.
- Shall be capable to hot-swap I/O modules
- Shall be scalable with a variety selectable slots e.g (4 slots, 8 slots, 12 slots, etc)
- Shall have an Ethernet backplane with a current of 118mA at 24V DC, and 49mA at 3.3V DC.
- Shall be compatible with the Modicon X80 series.

14.22 Type 3 PLC CPU

- a) The type 3 PLC CPU shall be suitable for medium to large size application with medium to high performance range.
- b) The type 3 PLC CPU shall be modular, scalable, and universally operable in dust areas.
- c) Shall be programmable according to IEC 61131 standard and consistent data storage if user program and documentation on CPU.
- d) Shall comprehensively trace functions of all CPU tags for real-time diagnostics and sporadic error detection.
- e) The PLC CPU shall support various cybersecurity functions such as Achilles certified, Dos prevention, IPsec, SNMP logging, Syslog protocol, Transport layer security, Audit Trail, Embedded Firewall, Firmware signature, Password protection, Port hardening, Secure comms (HTTS), and security log.
- f) Shall have a decentralized peripheral with CPU functioning as master controller
- g) The CPU shall have extended communication functionality through expandable expansion modules.
- h) Shall have 1 x Ethernet TCP/IP for service port, 2 x Ethernet TCP/IP for device network, and USB type mini B for programmable port.
- i) Shall have status LED for processor running, processor fault, I/O module fault, program download, CPU flash fault or memory card fault, Ethernet port configuration, and Ethernet network status
- j) Shall have the CE marking.
- k) Shall be programmable with EcoStructure Control Expert.

Table 37 Type 3 CPU Capabilities

CPU Memory	
Supply Voltage	24V DC
Program memory	4 MByte
System Memory	10 kByte
Expandable	4 GByte
Discrete I/O Capacity	1024
Analog I/O Capacity	256
Number of Racks Capacity	4
Application Specific I/O's	
Expandable	Yes
Motion Control	Yes
Counter	Yes
HART	Yes
SSI Encoder	Yes
Serial Link	Yes
Ingress Protection	IP20

14.23 Type 3 PLC Backplane expander module

- a) The backplane expander module must be compatible with Modicon M580 series.
- b) Shall be used as an extension for multi-racks configuration with a 2 x 9-way Sub-D female connector.
- c) Shall be a Ethernet backplane rack with a current limit of 160mA at 24V DC, and 22mA at 3.3V DC.
- d) Shall be robust and made of high quality material.

14.24 Type 3 PLC Digital Input Card

The type 3 PLC digital input card shall have protection class of IP20 for installation in the control cabinet in automation applications, with input characteristic according to IEC 61131-3, type 3 standard. The type 3 PLC digital input card shall have the following features:

- a) Supply voltage between 19-30V DC with a nominal value of 24V DC.
- b) Discrete input current of 3.9mA at 24V DC.
- c) Input compatibility with 2-wire/3-wire proximity sensors as per IEC 60947-5-2 standard for inductive proximity switches.
- d) Shall be connected via 20-way removable terminal block.
Shall be suitable for Modicon M580 series.

Table 38 Digital Input Card

Digital Input Card	
Supply Voltage	24V DC
Input Current from backplane bus 3.3V DC	76mA
Alarm Diagnostics	Yes
Input Current for Signal 0	0.5mA
Input Current for Signal 1	2mA
Input impedance	6kΩ
Insulation resistance	>10MΩ, @ 500V DC
LED Status	RUN, Channel diagnostics, module error, module I/O
Operational Temperature	0°C to 60°C

14.25 Type 3 PLC Digital Output Card

The type 3 PLC digital input card shall have protection class of IP20 for installation in the control cabinet in automation applications, with input characteristic according to IEC 61131-2, type 2 standard. The type 3 PLC digital output card shall have the following features:

- a) Supply voltage between 19-30V DC with a nominal value of 24V DC.
- b) The outputs shall be solid state transistor type.
- c) Shall have reverse polarity diode for protection against reverse polarity.
- d) Shall be connected via 20-way removable terminal block.
- e) Shall have short circuit, overload, and overvoltage protection.
- f) Shall support paralleling of outputs to a maximum of 2.
- g) Shall be suitable for Modicon M580 series.

Table 39 Digital Output Card

Digital Output Card	
Discrete Output Voltage	19-30V DC, 24V DC nominal
Input Current from backplane bus 3.3V DC	79mA
Discrete Output Current	0.5A
Current per Channel	0.625A
Maximum Current per Module	10A
Output Response time	1.2ms
Maximum Leakage Current @ State 0	0.5mA
Maximum Voltage Drop @ State 1	<1.2V
Load impedance	>48Ω
LED Status	RUN, Channel diagnostics, module error, module I/O
Operational Temperature	0°C to 60°C

14.25 Type 3 PLC Analog Input Card

The type 3 PLC Analog Input card shall have protection class of IP20 for installation in the control cabinet in automation applications, with input characteristic according to IEC 61010-2-201, IEC 61131-2. The type 3 PLC analog input card shall have the following features:

- All analog inputs shall be isolated.
- Shall support a variety of analog signals (voltage and current).
- Shall have a the first order digital filtering.
- Shall be connected via 20-way removable terminal block.
- Shall have short circuit, overload, and overvoltage protection.
- Shall support paralleling of outputs to a maximum of 2.
- Shall be suitable for Modicon M580 series.

Table 40 Analog Input Card

Analog Input Card	
Supply Voltage	24V DC
Input Current range	$\pm 20\text{mA}$, 0-20mA, 4-20mA
Input Voltage range	$\pm 10\text{V}$, $\pm 5\text{V}$, 0-10V, 0-5V, 1-5V
Permitted Overload on inputs	$\pm 30\text{V}$, $\pm 10\text{V}$ $\pm 30\text{V}$, $\pm 5\text{V}$ $\pm 30\text{V}$, 0...10V $\pm 30\text{V}$, 0...5V $\pm 30\text{V}$, 1...5V $\pm 90\text{mA}$, $\pm 20\text{mA}$ $\pm 90\text{mA}$, 0...20mA $\pm 90\text{mA}$, 4...20mA
Input Impedance	10M Ω in voltage mode, 250 Ω +3.6...50 Ω internal protective resistor in current mode
Measurement Error	0.1% @ +/- 10V, 0...60 °C 0.1% @ +/- 5V, 0...60 °C 0.1% @ 0...10V, 0...60 °C 0.1% @ 0...5V, 0...60 °C 0.1% @ 1...5V, 0...60 °C 0.3% @ +/- 20mA, 0...60 °C 0.3% @ 0...20mA, 0...60 °C 0.3% @ 4...20mA, 0...60 °C 0.075% @ +/- 10V, 25 °C 0.075% @ +/- 5V, 25 °C 0.075% @ 0...10V, 25 °C 0.075% @ 0...5V, 25 °C 0.075% @ 1...5V, 25 °C 0.15% @ +/- 20mA, 25 °C 0.15% @ 0...20mA, 25 °C 0.15% @ 4...20mA, 25 °C
Maximum Cross Walk Attenuation	80dB
Common Mode rejection	90dB
Resolution	0.35 mV +/- 10 V 0.35 mV +/- 5 V 0.35 mV 0...10 V 0.35 mV 0...5 V 0.35 mV 1...5 V 0.92 μA +/- 20 mA 0.92 μA 0...20 mA 0.92 μA 4...20 mA
Load impedance	>48 Ω
LED Status	RUN, Channel diagnostics, module error, module I/O
Operational Temperature	0°C to 60°C
Product Certification	CE, RCM, CSA, EAC, Merchant Navy, and UL

14.26 Type 3 PLC Analog Output Card

The type 3 PLC Analog output card shall have protection class of IP20 for installation in the control cabinet in automation applications, with input characteristic according to IEC 61010-2-201, IEC 61131-2. The type 3 PLC analog output card shall have the following features:

- a) All analog outputs shall be isolated.
- b) Shall support a variety of analog output signals (voltage and current).
- c) Shall have a the first order digital filtering.
- d) Shall be connected via 20-way removable terminal block.
- e) Shall have short circuit, overload, and overvoltage protection.
- f) Shall be suitable for Modicon M580 series.

Table 41 Analog Output Card

Analog Output Card	
Supply Voltage	24V DC
Output Current range	0-20mA, 4-20mA
Output Voltage range	±10V
Permitted Overload on inputs	±30V, ± 10V ±30V, ± 5V ±30V, 0...10V ±30V, 0...5V ±30V, 1...5V ±90mA, ±20mA ±90mA, 0...20mA ±90 mA, 4...20mA
Load Impedance	600Ω, @ 0...20 mA 600, @ 4...20 mA 1000Ω, @ +/- 10 V
Measurement Error	0.2 % @ 0...60 °C 0.1 % @ 25 °C
Maximum Cross Walk Attenuation	90dB
Common Mode rejection	100dB
Maximun Conversion value	+/- 11.25, V +/- 10 V 0...24 mA, 0...20 mA 0...24 mA, 4...20 mA
Coverision Time	<= 1ms
Detection Type	Open circuit 0...20 mA Open circuit 4...20 mA Short circuit +/- 10 V
LED Status	RUN, Channel diagnostics, module error, module I/O
Operational Temperature	0°C to 60°C
Product Certification	CE, RCM, CSA, EAC, Merchant Navy, and UL

14.27 Type 3 PLC RTD, Thermocouple Input Card

The type 3 PLC RTD, Thermocuple Input card shall have protection class of IP20 for installation in the control cabinet in automation. The type 3 PLC RTD, Thermocouple input card shall have the following features:

- a) Shall support a variety of analog signals such as voltage, thermocouple, RTD, and resistor inputs.
- b) Shall Analog inputs shall be isolated.
- c) Shall have a the first order digital filtering.
- d) Shall be connected via 40-way removable terminal.
- e) Shall have internal re-calibration.

Table 42 Analog RTD, Thermocouple Card

Analog RTD, Themocouple Input Card	
Supply Voltage	24V DC
Permitted Overload on inputs	+/- 7.5 V +/- 1.28 V +/- 7.5 V +/- 160 mV +/- 7.5 V +/- 320 mV +/- 7.5 V +/- 40 mV +/- 7.5 V +/- 640 mV +/- 7.5 V +/- 80 mV
Input Impedance	10M Ω in voltage mode, 250 Ω +3.6...50 Ω internal protective resistor in current mode
Measurement Error	+/- 0.7 °C Ni 1000 25 °C +/- 1.3 °C Ni 1000 0...60 °C +/- 2 °C Pt 100 0...60 °C +/- 2 °C Pt 1000 0...60 °C +/- 2.1 °C Ni 100 25 °C +/- 2.1 °C Pt 100 25 °C +/- 2.1 °C Pt 1000 25 °C +/- 2.7 °C thermocouple U 25 °C +/- 2.8 °C thermocouple J 25 °C +/- 3 °C Ni 100 0...60 °C +/- 3 °C thermocouple L 25 °C +/- 3.2 °C thermocouple R 25 °C +/- 3.2 °C thermocouple S 25 °C +/- 3.5 °C thermocouple B 25 °C +/- 3.7 °C thermocouple E 25 °C +/- 3.7 °C thermocouple K 25 °C +/- 3.7 °C thermocouple N 25 °C +/- 3.7 °C thermocouple T 25 °C +/- 4 °C Cu 10 0...60 °C +/- 4 °C Cu 10 25 °C +/- 4.5 °C thermocouple J 0...60 °C +/- 4.5 °C thermocouple L 0...60 °C +/- 4.5 °C thermocouple R 0...60 °C +/- 4.5 °C thermocouple S 0...60 °C +/- 4.5 °C thermocouple U 0...60 °C +/- 5 °C thermocouple B 0...60 °C +/- 5 °C thermocouple E 0...60 °C +/- 5 °C thermocouple K 0...60 °C +/- 5 °C thermocouple N 0...60 °C +/- 5 °C thermocouple T 0...60 °C 0.15 % of full scale +/- 1.28 V 0...60 °C 0.15 % of full scale +/- 160 mV 0...60 °C 0.15 % of full scale +/- 320 mV 0...60 °C 0.15 % of full scale +/- 40 mV 0...60 °C 0.15 % of full scale +/- 640 mV 0...60 °C 0.15 % of full scale +/- 80 mV 0...60 °C 0.2 % of full scale 400 Ohm 0...60 °C 0.2 % of full scale 4000 Ohm 0...60 °C 0.05 % of full scale +/- 1.28 V 25 °C 0.05 % of full scale +/- 160 mV 25 °C 0.05 % of full scale +/- 320 mV 25 °C 0.05 % of full scale +/- 40 mV 25 °C 0.05 % of full scale +/- 640 mV 25 °C 0.05 % of full scale +/- 80 mV 25 °C 0.12 % of full scale 400 Ohm 25 °C 0.12 % of full scale 4000 Ohm 25 °C
Differential Mode rejection	120dB @50Hz
Common Mode rejection	60dB @50Hz
Resolution	0.1 °C Cu 10 0.1 °C Ni 100

	0.1 °C Ni 1000 0.1 °C Pt 100 0.1 °C Pt 1000 0.1 °C thermocouple B 0.1 °C thermocouple E 0.1 °C thermocouple J 0.1 °C thermocouple K 0.1 °C thermocouple L 0.1 °C thermocouple N 0.1 °C thermocouple R 0.1 °C thermocouple S 0.1 °C thermocouple T 0.1 °C thermocouple U 1280/2exp14 mV +/- 1.28 V 160/2exp14 mV +/- 160 mV 320/2exp14 mV +/- 320 mV 40/2exp14 mV +/- 40 mV 12.5 mOhm 400 Ohm 125 mOhm 4000 Ohm 640/2exp14 mV +/- 640 mV 80/2exp14 mV +/- 80 mV
Dection Type	Open circuit Cu 10 Open circuit Ni 100 Open circuit Ni 1000 Open circuit Pt 100 Open circuit Pt 1000 Open circuit thermocouple B Open circuit thermocouple E Open circuit thermocouple J Open circuit thermocouple K Open circuit thermocouple L Open circuit thermocouple N Open circuit thermocouple R Open circuit thermocouple S Open circuit thermocouple T Open circuit thermocouple U
Maximum conversion Value	+/- 100 % 400 Ohm +/- 100 % 4000 Ohm +/- 102.5 % +/- 1.28 V +/- 102.5 % +/- 160 mV +/- 102.5 % +/- 320 mV +/- 102.5 % +/- 40 mV +/- 102.5 % +/- 640 mV +/- 102.5 % +/- 80 mV
LED Status	RUN, Channel diagnostics, module error, module I/O
Operational Temperature	0°C to 60°C
Product Certification	CE, RCM, CSA, EAC, Merchant Navy, and UL

14.28 Type 3 AS-Interface Master Module

The type 3 PLC AS-Interface have protection class of IP20 for installation in the control cabinet in automation,. The type 3 PLC AS-Interface master module shall be suitable for installation in hazadours locations with the following features:

- a) Shall support up to 62 discrete I/O devices, and up to 31 analog devices.
- b) Shall have a current consumption of 160mA at 3.3V DC.
- c) Shall have a robust, and high quality design based on lastest technology.
- d) Shall support a maximum cable distance of 100m, with 200m line extension.
- e) Shall meet EN 61131-2, EN 61000-6-2, and EN 61010-2-201 standards.

Table 43 AS-Interface Card

AS-Interface Card	
Actuator Sensor Interface	M4 master profile S7.3 slave profile S7.A.7 slave profile S7.A.A slave profile S7.A.8 slave profile S7.A.9 slave profile S6.0.X slave profile
Electrical Connection	1 male connector SUB-D, 3 pins
Number of Server Devices	124 server device(s) for discrete inputs and outputs - standard 124 server device(s) for analog inputs and outputs - standard 496 server device(s) for discrete inputs and outputs - extended 124 server device(s) for analog inputs and outputs - extended
Maximum Cable Distance between Devices	100m, 200m line extension, 300m 2 repeaters 500m 2 repeaters and the master at the middle
Local Signalling	1 LED (green) for module active (RUN) 1 LED (red) for module error (ERR) 1 LED (green) for displays the group of 31 slaves (A/B) 1 LED (red) for I/O module fault (I/O) 32 LEDs for diagnostics of the AS-Interface and each slave 1 LED (green) for ASI power 1 LED (red) for fault
Current Consumption	160mA @ 3,3V DC
	2014/35/EU - low voltage directive 2014/30/EU - electromagnetic compatibility 2014/34/EU - ATEX directive
Product Certification	CE, RCM, CSA, EAC, Merchant Navy, and UL
Environmental Characteristics	Class I division 2
Operational Temperature	0°C to 60°C

14.29 Type 3 PLC Ethernet Communication Module

The type 3 PLC ethernet communication module shall have protection class of IP20 for installation in the control cabinet in automation applications, with characteristic according to EN 61131-2, EN 61000-6-4, EN 61000-6-2 and EN 61010-2-201 standards. The type 3 PLC ethernet communication module shall have the following features:

- Shall have 3 subnets with IP forwarding function.
- Shall be integrated with 3 ethernet RJ45 connectors.
- Shall have communication services that are bandwidth managed, FDR server, Modbus TCP I/O scanner and messaging, RSTP, and IP forwarding function.
- Shall have internal power supply with current consumption of 555mA.
- Shall be compatible with X-bus backplane.
- Shall be suitable for Modicon M580 series.

Table 44 Ethernet Communication Module

Ethernet Communication Module	
Connection type	3 x RJ45
Transmission rate	10/100/1000 Mbit/s
Communication service	Bandwidth management FDR server Modbus TCP I/O Scanner and Messaging Ethernet/IP I/O Scanner and Messaging Embedded 4-port switch RSTP support IP forwarding
Current Consumption	1800mA @ 3.3V DC
Local signalling	1 LED (green) for processor running (RUN) 1 LED (red) for processor or system fault (ERR) 1 LED (green/red) for ETH MS (Ethernet port configuration status) 1 LED (green/red) for Eth NS (Ethernet network status) 1 LED (green/red) for Eth NS1 (Ethernet network status) 1 LED (green/red) for Eth NS2 (Ethernet network status)
Ingress Protection	IP20
Operating Temperature	0°C to 60°C

14.30 Type 3 PLC OPC UA Communication Module

The type 3 PLC OPC UA communication module shall have protection class of IP20 for installation in the control cabinet in automation applications, with characteristic according to EN 61131-2, EN 61000-6-5, EN 61010-2-201 and EN 61010-2-201 standards. The type 3 PLC ethernet communication module shall have the following features:

- a) Shall have built-in Ethernet communication with an embedded OPC UA server for communication with OPC UA clients and SCADA.
- b) Shall provide complete Ethernet transparency when connected to the Ethernet backplane.
- c) Shall support HTTPS protocol with cyber security setting service.
- d) Shall be compatible with Ethernet and X-bus backplane.
- e) Shall be compatible with Modicon M580 series.

Table 45 OPC UA Communication Module

OPC UA Communication Module	
Device Application	OPC UA server and IT control network
Transmission rate	10/100/1000 Mbit/s
OPC UA Functions	OPC UA server 10 clients connection max 50000 monitored item max in standard sampling mode 2000 monitored item max in fast sampling mode 40 maximum subscriptions per session 250 ms, minimum publishing interval in standard sampling mode 20 ms, minimum sampling interval in fast sampling mode 20 ms, minimum publishing interval in fast sampling mode 125 ms, sampling interval in standard sampling mode 100000, maximum number of nodes of data dictionary Warm redundancy mode
Timestamping	250ms minimum polling buffer, 5000ms maximum polling buffer
Cybersecurity	Secure communication (HTTPS) Built-in firewall

	Certificate based authentication Certificate management (self-signed and PKI) System hardening Role-based access control (web interface) Syslog protocol support IPSec (initiator and responder role) Network physical isolation
Functions	CCOTF (configuration change on the fly) Hot swappable module Export & import webpage configuration Advanced diagnostic information (DDT, web pages, OPC UA objects) SCADA connection via communication protocol forwarding
Local Signalling	1 LED (green) for processor running (RUN) 1 LED (red) for processor or system fault (ERR) 1 LED (green/red) for ETH MS (Ethernet port configuration status) 1 LED (green/red) for Eth NS (Ethernet network status) 1 LED (green/red) for status (STS) 1 LED (yellow) for communication data bus
Operating Temperature	0°C to 60°C
Product Certification	CE, CULus, RCM, UKCA, EAC, Merchant Navy

14.31 Type 3 PLC RTU Communication Module

The type 3 PLC RTU communication module shall have protection class of IP20 for installation in the control cabinet in automation applications, with characteristic according to EN 61131-2, EN 61000-6-4, EN 61000-6-2 and EN 61010-2-201 standards. The type 3 PLC RTU communication module shall have the following features:

- a) Shall have use RTU telemetry protocols to communicate with remote stations.
- b) Shall have remote monitoring and telecontrol functions.
- c) Shall support data logging and Web HMI
- d) Shall be compatible with X-bus backplane.
- e) Shall be compatible with Modicon M580 series.

Table 46 RTU Communication Module

RTU Communication Module	
Connction Type	Ethernet RJ45 10/100 Mbit/s 1 twisted pair transparent ready class C30, Serial RS232/485 RJ45 300/38400 bit/s 1 twisted pair transparent ready class C30
Transmission rate	10/100 Mbit/s
Functions	Bandwidth management Modbus TCP messaging DNP3/DNP3 IP protocol IEC 60870-5 -101/-104 protocol Time stamped events management External modem management (serial, PSTN, GSM, GPRS/3G) Data logging in CSV files Email/SMS notifications Web server, rack viewer, data editor BootP, DHCP, FDR client SMTP server, FTP client/server, NTP client, SNMP agent, Automatic events backup on power loss Multi-protocols support in a single module (master and slave)

	Transparent events routing from remote slaves to SCADA
Supply Voltage	24V DC, @ 95mA via rack
Environmental Characteristics	Gas resistant class Gx conforming to ISA S71.04 Gas resistant class 3C4 conforming to IEC 60721-3-3 Dust resistant class 3S4 conforming to IEC 60721-3-3 Sand resistant class 3S4 conforming to IEC 60721-3-3 Salt resistant level 2 conforming to IEC 68252 Mold growth resistant class 3B2 conforming to IEC 60721-3-3 Fungal spore resistant class 3B2 conforming to IEC 60721-3-3 Hazardous location class I division 2
Ingress Protection	IP20
Local Signalling	1 LED (green) for activity on Ethernet network (ETH ACT) 1 LED (green) for processor running (RUN) 1 LED (green) for status of Ethernet network (ETH STS) 1 LED (red) for memory card fault (CARD ERR) 1 LED (red) for processor or system fault (ERR) 1 LED (red) for download in progress (DL) 1 LED (yellow) for serial communication (SER COM) 1 LED (green) for data rate (ETH LINK)
Operating Temperature	-27°C to 70°C
Product Certification	CE, CULus, RCM, UKCA, EAC, Merchant Navy, ATEX zone 2/22, IECEx zone 2/22

14.32 Managed Switch

The managed switch shall have high performance and robust hardware design and shall provide simple connectivity for multiple Ethernet devices, with characteristic according UL 61010-2-201, EN/IEC 61131-2, EN/IEC 62368-1 standards. The managed switch shall have the following features:

- a) Shall have Ethernet TCP/IP protocol .
- b) Shall be suitable for simple and complex connectivity for multiple Ethernet devices, network management, and enhanced cybersecurity.
- c) Shall be suitable for copper cable transmission and fibre optic for multimode communication.
- d) Shall be suitable for 25mm symmetrical DIN rail.
- e) Shall provide multi level connectivity from device level, control network, and IT network.

Table 47 Managed Switch

Managed Switch	
Connection Type	Ethernet RJ45 10/100 Mbit/s 1 twisted pair transparent ready class C30, Serial RS232/485 RJ45 300/38400 bit/s 1 twisted pair transparent ready class C30
Port Ethernet	100BASE-FX - fiber optic 10/100BASE-TX - copper cable
Communication Protocol	Ethernet TCP/IP SSH HTTP HTTPS SNMP RS232 SFTP SCP LLDP Telnet SNTP
Supply Voltage	12-24V DC

Cybersecurity	Port hardening IP-based port security MAC-based port security Port-based access control Role-based access control RADIUS assignment HTTPS DoS prevention VLAN-based ACL Audit trail SNMP logging Pre-login banner
Transmission Support Medium	Multimode optical fiber for fiber optic Twisted shielded pairs cable, CAT 5E for copper cable
Optic fibre length	4km 62.5/125µm, 5km 50/125µm
Ethernet Functions	Configuration via web server VLAN Multicast filtering Data stream control IGMP Snooping SNMP-Traps and SYSLOG
Communication Functions	TFTP Quality of Service (QoS) Port monitoring Port mirroring Address conflict detection
Local Signalling	1 dual colour LED (green/yellow) for P1 P2 power supplies 1 dual colour LED (green/red) for device status 1 dual colour LED (green/yellow) for memory key status 1 dual colour LED (green/yellow) for channel diagnostic
Operating Temperature	0°C to 60°C
Product Certification	CE, UL, RCM, DNV, ATEX

14.33 Supervisory Control And Data Acquisition (SCADA) System

The SCADA software shall have basic package with unlimited tags, unlimited designer clients, unlimited SQL Database connectivity. The SCADA software needs to be compatible with Windows 11, Windows Server and Linux RHEL Operating systems. The SCADA must:

- (a) Support unlimited remote Designer/Developer connections via HTTPS/HTTP
- (b) Support for unlimited tags, users, and concurrent clients
- (c) Web-based deployment and HTML5-compliant visualization
- (d) Support for scripting (Python) and SQL database integration.
- (e) Support real-time data acquisition and visualization.
- (f) Configurable dashboards and trends.
- (g) Alarm management with notifications via email/SMS.
- (h) Historical data logging and reporting.
- (i) Mobile and web-based HMI access.
- (j) Integration with existing PLCs and field devices.
- (k) System configuration, graphics development, and database integration.
- (l) User authentication and role-based access control.
- (m) Data logging, reporting, and alarm management features.
- (n) Role-based access control with authentication.
- (o) Secure data encryption and network communication.
- (p) The SCADA upgrade licence must allow for upgrading Inductive Automation Ignition platform
- (q) Audit logging of system activities.
- (r) Seamless integration with existing **PLCs (Siemens, Allen-Bradley, Schneider, etc.).
- (s) Support for third-party database integration (MySQL, PostgreSQL, MSSQL).

- (t) Compatibility with industrial IoT protocols.
- (u) System must comply with ****ISA-95**** and ****ISA-99 (IEC 62443)**** cybersecurity standards.
- (v) The SCADA architecture must support installation of modules for new feature addition e.g MQTT Engine, Alarm Module, Web Developer module to develop against the Web Server directly

The Firewall must have the following features:

- a) Firewall Throughput > 1Gbps
- b) Threat Prevention Throughput > 100 Mbps
- c) IPSec VPN Throughput > 400 Mbps
- d) Maximum Concurrent Sessions > 64000
- e) Maximum Policies > 2500
- f) Interfaces 8 x 1GbE
- g) Application-based Policy Enforcement (App-ID™)
- h) User and Device Visibility (User-ID™)
- i) Threat Prevention (IPS, Anti-malware, Anti-spyware)
- j) Advanced URL Filtering & DNS Security
- k) WildFire® Cloud-Based Threat Analysis
- l) Decryption (SSL/TLS Inspection)
- m) Secure SD-WAN Capabilities
- n) GlobalProtect™ for Remote Access VPN
- o) VLANs & Sub-Interfaces
- p) Static & Dynamic Routing (BGP, OSPF, RIP)
- q) High Availability (Active/Passive)
- r) L2/L3 Mode, NAT, DHCP, PPPoE
- s) IPSec VPN & SSL VPN (GlobalProtect)
- t) Web-based GUI & CLI
- u) Panorama™ Centralized Management Support
- v) Syslog, SNMP, NetFlow
- w) Cloud-Delivered Security Services
- x) Common Criteria (CC) Certified
- y) FIPS 140-2 Compliance
- z) SOC 2, GDPR, PCI-DSS
- aa) Operating Temperature: 0°C to 40°C
- bb) Power Supply: External AC Adapter
- cc) Typical Power Consumption: 15W–30W (varies by model)
- dd) IoT subscription.

14.33.1 Human Machine Interface (HMI) Type 1

Type 1 HMI Operator panel shall have a TFT display, multi-touch and functional expandability for future-proof applications. Type 1 HMI shall have the following features:

- a) Shall form part of the WinCC Unified System, the visualization shall be based on WinCC Unified Technology with a high level of reusability across platforms (HMI Unified Panels and WinCC Unified PC systems).
- b) The visualization shall be used on PC systems with WinCC Unified (no changes necessary) or HMI Unified Basic Panels .
- c) Shall be configurable in the TIA Portal or WinCC.
- d) Shall have a runtime scripting with JavaScript.
- e) Shall have a remote control via up to three HTML5 web clients (independent of the operator on site), one web client for remote monitoring as well as one web client for remote operation.
- f) Shall have remote control possible via SmartClient (VNC).
- g) Shall have integrated multimedia and office functions (e.g. media player, PDF viewer).
- h) Shall have the capabilities to automatically backup to system card, plant data to separate SD data card.
- i) Shall have the capabilities to login using SIMATIC RF10x0R RFID card readers
- j) Shall be Industrial Edge enabled.

Table 48 type 1 HMI

Type 1 HMI	
Display Type	Widescreen TFT
Number of Colors	16 Mio
Multi-touch	Yes
Backlighting Mode	Yes (LED Dimmable)
Portrait Mode	Yes
Number of messages:	6000
Message Buffer	Yes
Number of recipes / recipe memory	750
Number of process images	1200
Number of variables per unit	8000
Zero Voltage Safety	Yes
Number Ethernet Interfaces	2
Profinet/Ethernet	RJ45
Micro SD Card Slot	Yes
USB 3.0	Yes
Ingress Protection	IP65 Front, IP20 back
Product Certification	CE, ABS, BV/Bureau Veritas, DNV, KRS, LRS, Class, NK, CCS, cULus, cULus class I Zone 2 Div.2, cULus, class II Div.2, IECEx Zone 2/22, ATEX Zone 2/22, CCC, RCM, KC, EAC, FM class I Div.2, FM class II Div.2

14.33.2 Human Machine Interface (HMI) Type 2

Type 2 HMI Operator panel shall have a high-resolution display with modern 16:9 or standard 4:3 aspect ratio. Type 2 HMI shall have the following features:

- Shall have up to 2 separate Ethernet ports, serial communication, and fieldbus options capable to be integrated with IoT.
- Shall have be multi-touch and fully coated for industrial applications .
- Shall have removable memory for PC-free box replacement.
- Shall be easily installed with integrated mounting fasteners and andidrop lock
- Shall have multi-display capanility with open box using DVI interface or multi-dispay adapter.
- Shall be programmable with EcoStructure Operator Terminal Expert or Vijeo Designer.

Table 49 type 2 HMI

Type 2 HMI	
Display Type	Colour TFT LCD
Rated Voltage	12-24V DC
Multi-touch	Yes
Display Colour	16 million colours
Backlight Life Span	50000 hours
Touch Panel	Multi touch analogue resistive
Number Ethernet Interfaces	2 x RJ45
Connection Type	Ethernet TCP/IP
Micro SD Card Slot	Yes
Integrated Connection Type	USB 2.0 Type A, USB 2.0, Type B
Ingress Protection	IP66 Front, IP67 back
Product Certification	CULus, RCM, KC, CE, UKCA, UKEX

15 **Installation and Commissioning**

- a) The tenderer shall maintain up to date documentation of the control system architecture, configuration, procedures, drawings, operation and maintenance manuals.
- b) Modification to existing systems shall be thoroughly documented this includes PLC logic, HMI and SCADA face plates, Instrumentation parameters and shall be submitted to the CCT's project manager for review.
- c) When installation new, or upgrading a control system, instrumentation system, or telemetry. The tenderer shall submit a proposal of the system architecture which shall include hardware configuration, drawings, number of I/O's to be used, type of PLC CPU, anticipated CPU memory use, communication topology, and Instrumentation to be used including instrument parameters and setpoints.
- d) Where necessary process flow diagrams, flow charts shall be submitted in order to visualize, identify decision points, and to provide a clear high level overview of the proposed system.
- e) Calibration/verification certificates shall be provided after installation and commissioning of new instrumentation equipment.
- f) The tenderer shall offer the latest licenced software for all PLC programming, SCADA and HMI development softwares.
- g) All Instrumentation must be accompanied by a calibration/verification certificate which must be traceable to the applicable standard for the service category such as accredited SANAS / ISO 17025 standards.

16 **Labour & Provisional Sum**

- b) Where key staff are not employed directly by the tendering entity a memorandum of undertaking (MOU) is to be provided.
- c) The provisional sum portion is to be used for ancillary equipment or parts that are not specified in the Price List that will be required for the installation of the purchased equipment only.
- d) Allowance for outsourced repairs (including parts and labour) and general items. Supplier to typically invite three quotations from suitably qualified sub-contractors for services for which the accepted quotation does not exceed R300 000 (including VAT). Where the sub-contracted services are likely to exceed R300 000, the Supplier shall follow an open tender procurement process.
- e) As per Supply Chain Management Policy **Clause 188.1** an **open competitive bidding process** in which bid documents are prepared by a consultant or a City employee in collaboration with the Responsible Person(s) in consultation with and to the approval of the supplier, invitations to bid are advertised in the media by the consultant or City employee or responsible person(s) on behalf of the supplier, and whereby the **selected sub-contractor/supplier** is chosen in consultation between the consultant, City employee or Responsible Person(s), together with the supplier from the responses received. The supplier must satisfy him/herself that the selected sub-contractor/supplier can meet the requirements of the sub-contract/supply agreement, and assumes the risk for the performance of the sub-contractor/supplier. The supplier may, on reasonable grounds, elect not to employ a particular sub-contractor/supplier.

17 **Training**

- a) The tenderer shall provide on-going training on Process Control Systems to CCT personnel.
- b) The tenderer shall collaborate with OEM's to provide certificated Control System, Instrumentation, and Telemetry system training to CCT personnel.
- c) The tenderer shall provide training (post installation) of any system, to ensure system familiarity and best practices.

18 Scope of Inspection, Verification and Calibration Service (Category B, F, G, and H only)

Category B, F, G, and H, requires a Calibration Service from a **SANAS** (South African National Accreditation System) approved service provider or contracted party in terms of ISO 17025 to conduct periodic inspections, maintenance service and **on-site** calibration of the pressure gauges, pressure transmitters, thermometers, and chlorine gas detectors as per the Original Equipment Manufacturer (OEM). The glass thermometers can be done off-site and traceable to a SANAS approved master certificate. The Tenderers will also be required to execute the replacement of the gauges, pressure transmitters, thermometers and chlorine gas detectors as and when required, in agreement with the Project Manager.

The Contractor will be required to remove the gauge or sensor and execute the required service and calibration service and replace / restore it to a functional mode on-site.

The Contractor is required to obtain the relevant worksite permits from the various site management prior to performing the service.

Should the Contractor note that the gauge, sensor or load cell indicator is no longer maintainable, it must be reported to the Project Manager (PM, or their designate) for replacement and communicate this to the Site Manager.

After approval from the PM, the purchase and installation of replacement items can be implemented.

A SANAS approved calibration certificate where applicable (in terms of ISO 17025) must be provided each time the equipment is calibrated and the original certificate is to be handed to the Site Manager and an electronic copy sent to the PM.

The maintenance and calibration must be done at least annually, but may be required on an ad hoc basis should the equipment be replaced or a new gauge or sensor is installed.

For the verification services, which should be done at least annually, a propriety certificate must be issued after each calibration

After an instrument is calibrated, a sticker label containing the following must be attached as follows:

- Traceable certificate number
- Serial number
- Calibration date
- Date of next calibration / expiry date
- Vendors Service Technician Name

19 Chlorine leak detectors

19.1 Chlorine Sensor

- g) The chlorine detection system shall consist of a chlorine sensor, 4 digit LCD display, keypad with a cover for configuration and a detachable back plate for installation on wall or pipes.
- a) The chlorine detector shall be scalable from 0 – 10 ppm scale which shall represent an isolated 4-20mA output.
- b) The gas detector shall have an intrinsically safe flame proof aluminium enclosure for the detection of combustible or toxic gases.
- c) The Chlorine sensor shall be capable of easy removal/replacement from the main unit.
- d) The chlorine sensor shall have built-in alarm and failure relay output that can be easily integrated to a gsm unit.

19.2 Gas Calibration Cylinder for chlorine gas testing

- a) The calibration gas cylinder shall provide information necessary for successful calibration, gas composition expiry date, and pressure level.

TENDER NO: 250S/2024/25

- b) The cylinder shall include a pressure regulating valve with a cylinder pressure gauge, adaptor hose, and sensor adapter.
- c) The gas cylinder shall contain 10ppm of chlorine gas of concentration with nitrogen gas as a balancing gas between 110L – 120L gas content.

The estimated number of equipment to be serviced is as follows: This is not an exhaustive list and may change:

#	Depot	Contact Person	Contact Number	Approx. Number of pressure gauges	Approx. Number of portable gas Sensors	Approx. Number of Pressure Transmitters	Approx. Number of fixed gas sensor.
1	Atlantis WTP	Zwelethu Piliso	021-444 7688	50	2	10	6
2	Blackheath WTP	Ashraf Abrahams	021 444 8645	105	3	20	7
3	Blackheath Reservoir	Sayed Stoffels	021 400 4404	20	3	5	2
4	Brooklands WTP	Thurston Appels	021 417 0503	30	1	10	2
5	Constantia Nek WTP	Daniel Lucas	021 794 6577	20	1	5	2
6	Faure WTP & Reservoir	Allen Blanckenberg	021 444 7047	150	7	30	7
7	Helderberg WTP	Aubrey Vaaltyn	021 444 7047	30	1	3	2
8	Firlands Pump Station	Senzeni Nhlebeza	021 4447050	12	1	20	0
9	Newlands Res.	Lwando Boyce	021 686 3408	20	3	6	2
10	Kloof Nek WTP	Willem De Kock	021 424 7348	30	2	5	2
11	Molteno reservoir	Luyanda Mangina	021 424 4906	30	2	4	2
12	Steenbras WTP	Philip Jacobs	021 444 8030	100	2	10	2
12	Steenbras Dam	Ismail Waryawa	021 444 7973	0	2	2	2
13	Wemmershoek WTP	Anthony Ramncwana	021 444 7825	150	3	9	2
14	Voëlvele WTP	Patricia Gone	021 417 4834	150	3	10	2
15	Platteklouf Res	Tashwell Meyer	021 444 9929	15	2	4	2
16	Tygerberg Res	Jerome Muller	021 939 4003	20	2	6	2
17	Glengarry Res	Winston Stanley	021 444 7811	20	2	6	2

19.3 Operational Ranges and Uncertainty Tolerances

Pressure gauges:	0.2% ± 0.6kPa
Resistance Thermometer Detectors:	-30°C to 200°C (± 0.7 K)
Mechanical Dial Thermometers:	-25°C to 300°C (± 3.0 K)
Digital Thermometers:	-25°C to 300°C (± 4.0 K)
Differential Pressure sensors:	0.05% of range

20 Site Location and Contact

The tenderers is required to familiarize with various locations prior to commencement of the contract. The Contractor will be a required to calibrate and test equipment that is not listed in the Table below if additional schemes are introduced, e.g. desalination, re-use, etc. The Contractor shall familiarize themselves with the relevant site procedures, Permit to Work procedures and Site Inductions before engaging in work activities. The relevant contact persons are as follows (contact the Project Manager)

21 Service Delivery Arrangements

Services must be delivered within 7 days from the date of the purchase order. The Tenderer shall draw up a Service Schedule with the Project Manager (or their designate) for all the sites listed to ensure that all the sites are serviced at least once per annum. Changes to the plan must be recorded and updated as and when required and reported to the Site Manager. Services shall be executed during normal work hours (08h00 to 16h00) on weekdays excluding public holidays. Special arrangements will be negotiated with the Project Manager (or their designate) to provide work on weekends or after hours at no additional cost. In the event that the arranged service is not able to be

implemented within the planned timeframes, the Contractor shall inform the Project Manager (or their designate) within 24 hours.

In the event of damage to the City Property caused by the Contractor during the course of the operations, the Contractor shall repair or replace the damaged items at their own cost.

The Tenderer shall have agreements with supplier(s) for components of the work that is to be done by other parties for the duration of the contract.

22 Scope of Inspection, Verification and Calibration Service (Category C, D, and E)

22.1 Introduction

The City's Water and Sanitation Department has several in-line instrumentation meters installed at various locations within its operational area, namely, FC2 type residual chlorine analysers, pH meters, conductivity meters, load cells, flow meters, gas monitors and turbidity meters.

These units are used to measure and monitor chemical or non-chemical parameters in the in water to ensure that optimal disinfection or chemical dosages are applied at the various Water Treatment Plants (WTPs), Storage reservoirs or within the water distribution network. Bulk Water Treatment plants (WTPs), Storage reservoirs and pipelines also have an extensive number of field instrumentation such as scales, gas sensors and flow meters that requires periodic calibration and maintenance services.

For the calibration services, residual chlorine pH, Conductivity, Turbidity and gas monitoring instrumentation the service provider will require an agency authorization letter from the equipment manufacturer or distribution agent as appropriate certificate must be issued after each calibration service. Alternatively, the service provider can outsource this work to an approved vendor (authorisation letter to be provided). For Load Cell services, the service provider will require an agency authorisation letter from the equipment manufacturer or distribution agent and will have to provide traceability certificates to a SANAS approved signatory for the calibration of the various scales. Alternatively, the service provider can outsource this work to an approved vendor (authorization letter to be provided) The service provider for each section is required to have a minimum of 2 years demonstrated experience in the testing and calibration of the section for which they tendered, namely load cells or gas sensor calibration. Alternatively, they must demonstrate at least 2 years experience in the management and supply of vendors who have the relevant experience in the specified field. A maintenance and calibration service of the Micro 2000 residual chlorine analysers and pH, turbidity , conductivity and flow meters is required on a periodic basis to ensure optimal functionality and accuracy of the in-line units.

22.2 SCOPE OF WORK

22.2.1 Maintenance and calibration services are required on an as-and-when basis, either ad hoc, monthly, quarterly or annually in accordance with the OEM manual. Calibration or verification certificates must be supplied after servicing as determined by the Project Manager.

22.2.2 The Supplier shall be responsible for identifying and advising on the replacement parts in consultation with the Project Manager.

22.2.3 The Supplier shall also conduct troubleshooting exercises in consultation with the Project Manager where there are malfunctions or discrepancies with manual laboratory readings or dosing unit control systems.

22.2.5 The Supplier will ensure that the instrument measurements are visually displayed on the HMI unit as agreed with the Project Manager.

22.2.6 Types of residual chlorine analysers currently installed: Micro 2000, FC2, Yokogawa.

22.2.7 Types of pH Meters currently installed include: Yokogawa, Hach, Signet, Thermo Scientific.

22.2.8 Types of Turbidity meters currently installed include: GLI, Hach, Sirgtist, Endress and Hauser.

22.2.9 Types of Conductivity meters currently installed include: ABB; Honeywell; Baumer, Hach

22.2.10 Types of Clamp on Ultrasonic meters currently installed include: Tokyo Keiki dn 300 to 8000mm.

The estimated number of equipment to be serviced is as follows: This is not an exhaustive list and may change:

Analytical Inline Instruments				
Depot	pH Meters	Conductivity	Turbidity	Residual Chlorine Analysers
Blackheath WTP	8	3	3	3
Brooklands WTP	4	3	2	1
Constantia Nek WTP	4	0	2	1
Faure WTP	9	3	27	3
Kloof Nek WTP	7	0	2	1
Steenbras WTP	5	0	2	1
Wermershoek WTP	7	3	2	1
Voelvie WTP	3	3	3	1
Witzands WTP	10	0	2	6
Helderberg WTP	0	0	0	1
Blackheath Reservoir	0	0	0	1
Tygerberg Reservoir	0	0	0	3
Glen Garry Reservoir	0	0	0	4
Molteno Reservoir	0	0	0	3
Wynberg Reservoir	0	0	0	3
Newlands Reservoir	0	0	0	3
Total	57	15	45	36

Chlorine Scales, & Loadcells				
Depot	Chlorine Scales (1000kg)	Day Hoppers (1000kg)	Lime Silo's(200 ton)	Platform Scale (1000kg)
Blackheath WTP	6	9	3	1
Brooklands WTP	2	0	0	0
Constantia Nek WTP	6	0	0	0
Faure WTP	10	2	6	0
Kloof Nek WTP	2	0	0	0
Steenbras WTP	4	0	2	0
Wermershoek WTP	4	6	4	0
Voelvie WTP	4	0	2	0
Witzands WTP	6	0	0	0
Helderberg WTP	2	0	0	0
Blackheath Reservoir	2	0	0	0
Tygerberg Reservoir	2	0	0	0
Glen Garry Reservoir	2	0	0	0
Molteno Reservoir	6	0	0	0
Wynberg Reservoir	6	0	0	0
Newlands Reservoir	6	0	0	0
Total	70	17	17	1

Tokyo Keiki Clamp-ON Meters							
Depot	PIPE Diameter (150mm)	PIPE Diameter (300mm)	PIPE Diameter (1000mm)	PIPE Diameter (1200mm)	PIPE Diameter (1500mm)	PIPE Diameter (1600mm)	PIPE Diameter (1800mm)
Blackheath WTP	1	1	0	2	1	1	0
Faure WTP	0	0	0	0	0	0	1
Wermmershoek WTP	0	0	3	0	0	0	0
Total	1	1	3	2	1	1	1

23 SERVICE FREQUENCIES AND PARTS

The service intervals as per OEM manual provided below are a general guideline but should there be a need, additional parts or more frequent calibration may be required on an ad hoc basis to ensure improved functionality of the analyser. Parts to be supplied as per OEM agent.

23.1 Monthly services: **Chlorine Residual Analysers** Visually check the functioning and operation of the analyser; clean instrument sensors and replace or top up phosphate buffer; replenish electrolyte, calibrate instrument.

23.2 Quarterly Service: **Chlorine Residual Analysers** Visual Check or Replacement: U-cup seal; Shaft; Electrolyte; porous element Replenish buffer, cell grit and electrolyte; shift buffer and water pipes; calibrate instrument.

23.3 Biannual (6 monthly) Service: **Chlorine Residual Analysers** Visual Check or Replacement: Marpene tubings; U-cup seal; shaft; porous element; cell grit; sample tube and reagent tube; change buffer and electrolyte ; impellar shaft; manifold tubing.

23.4 Monthly / Quarterly Service: **pH, Conductivity and Turbidity Meters** Visual Check, test, calibrate, reset in accordance with OEM or replacement of faulty parts.

23.5 Biannual (Annual) Service: **Clamp on Ultrasonic Flow Meters** Visual Check, test, reset in accordance with OEM or replacement of faulty parts.

23.6 Annual Service: **Load cells** Visual Check, test, reset in accordance with OEM or replacement of faulty parts.

23.7 The Supplier shall ensure that the calibration and traceability of methods used for the service is linked to accepted standards as determined by the ISO audits and specifications.

23.8 The Contractor will be required to remove the sensor and execute the required service and calibration service and replace / restore it to a functional mode on-site. The Contractor is required to obtain the relevant worksite permits from the various site management prior to performing the service.

23.9 Should the Contractor note that an instrument is no longer maintainable, it must be reported to the Project Manager (PM, or their designate) for replacement and communicate this to the Site Manager. After approval from the PM, the purchase and installation of replacement items can be implemented.

23.10 A calibration certificate (in terms of ISO 17025) must be provided each time the equipment is calibrated and the original certificate is to be handed to the Site Manager and an electronic copy sent to the PM.

23.11 The maintenance and calibration must be done as indicated, but may be required on an ad hoc basis should the equipment be replaced or a new gauge or sensor is installed. After an instrument is calibrated or serviced, a sticker label containing the following must be attached:

TENDER NO: 250S/2024/25

- Traceable certificate number or link (if applicable)
- Serial number
- Calibration / service date
- Date of next calibration or service / expiry date
- Vendors / technician Name
- Fail or faulty notice

23.12 The Load cells and associated Indicators are in use at various sites: Pivot type, Circular.

23.13 The Ultrasonic meters – clamp on type.

24 AD HOC MAINTENANCE REPLACEMENT ITEMS:

24.1 Replacement items needs to match the existing equipment at various sites and equipment items must be SABS or CE certified.

24.2 Replacement parts must be accompanied by warranties or installation guarantees and O&M manuals (where applicable)

25 SAFETY, HEALTH, RISK, ENVIRONMENT AND QUALITY

25.1 The Supplier will be required to work at Water Treatment Plants, Reservoirs, large pipelines and unmanned locations within the City boundaries. Some of the depots are classified as hazardous installations due to the proximity and use of chlorine gas installations and the storage of large amounts of chlorine within the boundary of the depot.

25.2 Other risks include but are not limited to: entering confined spaces, pressurised pipeline bursts; working on live electrical connections; exposure to chemical spillages; hijacking and theft in remote or isolated locations; uneven surfaces; poor lighting conditions.

25.2 The Supplier and their staff shall familiarise themselves with the site specific HIRA schedules, safety plans and emergency evacuation procedures.

25.3 The Supplier and their staff shall be required to undergo a safety induction process at each depot.

25.4 The Supplier and their staff shall familiarise themselves with the electrical lockout procedures and permit to work systems that are in place at each depot.

25.5 The Bulk Water Branch is ISO 9001:2015 certified and may require a supplier audit be conducted on the Supplier. The Supplier will be required to provide the necessary information and participation in the audit which will be arranged via the Project Manager and the Supplier representative.

26 TRADE NAMES OR PROPRIETARY PRODUCTS

Tenderers/Suppliers must note that wherever this document refers to any particular trade mark, name, patent, design, type, specific origin or producer, such reference shall be deemed to be accompanied by the words "or equivalent".

27 EMPLOYMENT OF SECURITY PERSONNEL

All security staff employed by the Supplier on behalf of the CCT or at any CCT property must be registered with Private Security Industry Regulatory Authority (PSiRA). Proof of such registration must be made available to the CCT or its agent, upon request.

28 FORMS FOR CONTRACT ADMINISTRATION

The Supplier shall complete, sign and submit with each invoice, the following:

- a) Monthly Project Labour Report (described below)

TENDER NO: 250S/2024/25

The Monthly Project Labour Report must include details of all labour (including that of sub-contractors) that are South African citizens earning less than [R] per day, as adjusted from time to time (excluding any benefits), who are employed on a temporary or contract basis on this contract in the month in question.

In addition to the Monthly Project Labour Report the Supplier shall simultaneously furnish the CCT's Agent with copies of the employment contracts entered into with such labour, together with certified copies of identification documents, proof of attendance in the form of attendance register or timesheets as well as evidence of payments to such labour in the form of copies of payslips or payroll runs. If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it and proof of such acknowledgement shall be furnished to the CCT's Agent.

C.6 SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract, referring to the National Treasury – Conditions of Contract (revised July 2010), are applicable to this agreement.

1. Definitions

Insert new clause 1.1A with the following:

- 1.1A “Commencement Date” means the date the Supplier confirms receipt from the Purchaser of 1 (one) complete, signed copy of the Contract, the *Schedule of Deviations* (if any).
- 1.1B “Conditions of Contract” means the general conditions of contract and special conditions of contract including all other contract data incorporated by reference.

Delete Clause 1.15 and substitute with the following

- 1.15 The word ‘Goods’ is to be replaced everywhere it occurs in the GCC with the phrase ‘Goods and / or Services’ which means all of the equipment, machinery, materials, services, products, consumables, etc. that the Supplier is required to deliver to the Purchaser under the agreement. This definition shall also be applicable, as the context requires, anywhere where the words “supplies” and “services” occurs in the GCC.

Delete Clause 1.19 and substitute with the following

- 1.19 The word ‘Order’ is to be replaced everywhere it occurs in the GCC with the words ‘Purchase Order’ which means the official purchase order authorised and released on the Purchaser’s SAP System.

Delete Clause 1.21 and substitute with the following:

- 1.21 ‘Purchaser’ means the City of Cape Town. The address of the Purchaser is 12 Hertzog Boulevard, Cape Town, 8001 (chosen domicilium citandi et executandi).

Add the following after Clause 1.25:

- 1.26 ‘Supplier’ means the provider of Goods and / or Services with whom the Contract is concluded also referred to as “contractor” in the GCC.
- 1.27 "Intellectual Property" means any and all intellectual property rights of any nature anywhere in the world whether registered, registerable or otherwise, including patents, trademarks, registered designs and domain names, applications for any of the foregoing, trade or business names, copyright and rights in the nature of copyright, design rights, rights in databases, know-how, trade secrets and any other intellectual property rights which subsist in computer software, computer programs, websites, documents, information, techniques, business methods, drawings, logos, instruction manuals, lists and procedures and particulars of customers, marketing methods and procedures and advertising literature, including the "look and feel" of any websites
- 1.28 “Working Day” means Monday to Friday excluding weekends and Public Holidays (in the Republic of Sotuh Africa).

3. General Obligations

Delete Clause 3.2 in its entirety and replace with the following clauses.

- 3.2 The Parties will be liable to each other arising out of or in connection with any breach of the obligations detailed or implied in this contract, subject to clause 28.
- 3.3 If the Supplier is a joint venture, all parties in a joint venture or consortium shall be jointly and severally liable to the Purchaser in terms of the Contract and shall carry individually the minimum levels of insurance stated in the Contract, if any.

TENDER NO: 250S/2024/25

- 3.4 The Parties shall comply with all laws, regulations and bylaws of local or other authorities having jurisdiction regarding the Delivery of the Goods and/or Services and give all notices and pay all charges required by such authorities.
- 3.4.1 The Parties agree that this Contract shall also be subject to the CCT's Supply Chain Management Policy ("SCM Policy") that was applicable on the date the bid was advertised as amended from time to time. If the Purchaser adopts a new SCM Policy which contemplates that any clause therein would apply to the Contract emanating from this tender, such clause shall also be applicable to the Contract. Please refer to this document contained on the CCT's website.
- 3.4.2 Abuse of the supply chain management system is not permitted and may result in termination of the Contract, restriction of the Supplier, and/or the exercise by the CCT of any other remedies available to it as described in the SCM Policy or in law.
- 3.5 The Supplier shall:
- 3.5.1 Arrange for the documents listed below to be provided to the Purchaser prior to the issuing of the Purchase Order by the Purchaser and no later than the periods as set out in the Contract:
- a) Proof of Insurance (Refer to Clause 11) or Insurance Broker's Warrantee,
 - b) Letter of good standing from the Compensation Commissioner, or a licensed compensation insurer (Refer to Clause 11),
 - c) Initial delivery programme, and
 - d) Other requirements as detailed in the Contract.
- 3.5.2 Only when notified of the acceptance of the bid on the Date of Commencement of Contract, the Supplier shall commence with and carry out the Delivery of the Goods and/or Services in accordance with the Contract, to the satisfaction, of the Purchaser.
- 3.5.3 Provide all of the necessary materials, labour, plant and equipment required for the delivery of the Goods and/or Services including any temporary services that may be required.
- 3.5.4 Insure his workmen and employees against death or injury arising out of the delivery of the Goods.
- 3.5.5 Be continuously represented during the Delivery of the Goods and/or Services by a competent representative duly authorised to execute instructions.
- 3.5.6 In the event of a loss resulting in a claim against the insurance policies stated in clause 11, pay the first amount (excess) as required by the insurance policy.
- 3.5.7 Comply with all written instructions from the Purchaser subject to clause 18.
- 3.5.8 Complete and Deliver the goods within the period stated in clause 10, or any extensions thereof in terms of clause 21.
- 3.5.9 Make good at his own expense, all incomplete and defective Goods during the warranty period.
- 3.5.10 Pay to the Purchaser any penalty for delay as due on demand by the Purchaser. The Supplier hereby consents to such amounts being deducted from any payment due to the Supplier.
- 3.5.11 Comply with the provisions of the OHAS Act & all relevant regulations.
- 3.5.12 Comply with all laws relating to wages and conditions generally governing the employment of labour in the Cape Town area and any applicable Bargaining Council agreements.
- 3.5.13 Deliver the Goods in accordance with the Contract and with all reasonable care, diligence and skill in accordance with generally accepted professional techniques and standards.
- 3.6 The Purchaser shall:
- 3.6.1 Issue Purchaser Orders for the Goods and/or Services required under this Contract. No liability for payment will ensue for arising out of the Delivery of the Goods and/or Services, unless a Purchase Order has been issued to the Supplier.

- 3.6.2 Make payment to the Supplier for the Goods and/or Services as set out herein.
- 3.6.3 Take possession of the Goods and /or Services upon Delivery by the Supplier.
- 3.6.4 Regularly inspect the Goods to establish that it is being delivered in compliance with the Contract.
- 3.6.5 Give any instructions and/or explanations and/or variations to the Supplier including any relevant advice to assist the Supplier to understand the Contract.
- 3.6.6 Grant or refuse any extension of time requested by the Supplier of the period stated in clause 10.
- 3.6.7 Inspect the Goods and/or Services to determine if, in the opinion of the Purchaser, it has been delivered in compliance with the Contract, alternatively in such a state that it can be properly used for the purpose for which it was intended.
- 3.6.8 Brief the Supplier and issue all documents, information, etc. in accordance with the contract.

5. Use of contract documents and information; inspection, copyright, confidentiality, etc.

Add the following after clause 5.4:

- 5.5 Copyright of all documents prepared by the Supplier in accordance with the relevant provisions of the Copyright Act (Act 98 of 1978) relating to the Contract shall be vested in the Purchaser. Where copyright is vested in the Supplier, the Purchaser shall be entitled to use the documents or copy them only for the purposes for which they are intended in regard to the agreement and need not obtain the Supplier's permission to copy it for such use. Where copyright is vested in the Purchaser, the Supplier shall not be liable in any way for the use of any of the information other than as originally intended in terms of the agreement and the Purchaser hereby indemnifies the Supplier against any claim which may be made against it by any person / entity, arising from the use of such documentation for other purposes.

The ownership of data and factual information collected by the Supplier and paid for by the Purchaser shall, after payment, vest with the Purchaser.

- 5.6 **Publicity and publication**
The Supplier shall not release public or media statements or publish material related to the services or agreement within two (2) years of Delivery of the Goods, without the written approval of the Purchaser, which approval shall not be unreasonably withheld.
- 5.7 **Confidentiality**
Both Parties shall keep all information obtained by them in the context of the agreement, confidential and shall not divulge it without the written approval of the other Party.
- 5.8 **Intellectual Property**
 - 5.8.1 The Supplier acknowledges that it shall not acquire any right, title or interest in or to the Intellectual Property of the Purchaser.
 - 5.8.2 The Supplier hereby assigns to the Purchaser, all Intellectual Property created, developed or otherwise brought into existence by it for the purposes of the agreement, unless the Parties expressly agree otherwise in writing.
 - 5.8.3 The Supplier shall, and warrants that it shall:
 - 5.8.3.1 Not be entitled to use the Purchaser's Intellectual Property for any purpose other than as contemplated in the agreement;
 - 5.8.3.2 not modify, add to, change or alter the Purchaser's Intellectual Property, or any information or data related thereto, nor may the Supplier produce any product as a result of, including and/or arising from any such information, data and Intellectual Property, and in the event that it does produce any such product, the product shall be, and be deemed in law to be, owned by the Purchaser;

TENDER NO: 250S/2024/25

- 5.8.3.3 Not apply for or obtain registration of any domain name, trademark or design which is similar to any Intellectual Property of the Purchser;
- 5.8.3.4 Comply with all reasonable directions or instructions given to it by the Purchaser in relation to the form and manner of use of the CCT Intellectual Property, including without limitation, any brand guidelines which the Purchaser may provide to the Supplier from time to time;
- 5.8.3.5 Ensure that its employees, directors, members and contractors comply strictly with the provisions of this Clause 5.5.8.4 above unless the Purchaser expressly agrees to the contrary, in writing and only after obtaining due internal authority for such agreement.
- 5.8.4 The Supplier represents and warrants to the Purchaser that, in providing Goods and/or Services for the duration of the agreement it will not infringe or make unauthorised use of the Intellectual Property rights of any third party and hereby indemnifies the Purchaser from any claims, liability, loss, damages, costs, and expenses arising from the infringement or unauthorised use by the Supplier of any third party's Intellectual Property rights.
- 5.8.5 Upon expiry of the contract period and in the event that the Contract is terminated, ended or is declared void, any and all of the Purchaser's Intellectual Property, and any and all information and data related thereto, shall be immediately handed over to the Purchaser by the Supplier and no copies thereof shall be retained by the Supplier unless the Purchaser expressly and in writing, after obtaining due internal authority, agrees otherwise.

Add the following after clause 5.8:

5.9 Protection of Personal Information Act of 2013

By submitting a tender to the Purchaser, (and by concluding any ensuing related agreement with the City of Cape Town, if applicable), the Tenderer thereby acknowledges and unconditionally agrees:

- 5.9.1 that the tenderer has been informed of the purpose of the collection and processing of its personal information as defined in the Protection of Personal Information Act of 2013 ("POPIA"), which, for the avoidance of doubt is for, and in relation to, the tender process and the negotiation, conclusion, performance and enforcement of the ensuing agreement, if applicable, as well as for the City of Cape Town's reporting purposes;
- 5.9.2 to the collection and processing of the tenderer's personal information by the City of Cape Town and agrees to make available to the City of Cape Town, all information reasonably required by the City of Cape Town for the above purposes;
- 5.9.3 that the personal information the City of Cape Town collects from the tenderer or about the tenderer may be further processed for other activities and/or purposes which are lawful, reasonable, relevant and not excessive in relation to the purposes set out above, for which it was originally collected;
- 5.9.4 that, the tenderer indemnifies the City of Cape Town and its officials, employees, and directors and undertakes to keep the City of Cape Town and its officials, employees, and directors indemnified in respect of any claim, loss, demands, liability, costs and expenses of whatsoever nature which may be made against the City of Cape Town (including the costs incurred in defending or contesting any such claim) in relation to the tenderer or the tenderer's employees', representatives' and/or sub-Suppliers' non-compliance with POPIA and/or the City of Cape Town's failure to obtain the tenderer's consent or to notify the tenderer of the reason for the processing of the tenderer's personal information;
- 5.9.5 to the disclosure of the tenderer's personal information by the City of Cape Town to any third party, where the City of Cape Town has a legal or contractual obligation to disclose such personal information to the third party (or a legitimate interest exists therein);
- 5.9.6 that, under POPIA, the tenderer may request to access, confirm, request the correction, destruction, or deletion of, or request a description of, personal information held by the City of Cape Town in relation to you, subject to applicable law; and

that under POPIA, subject to applicable law, the tenderer also has the right to be notified of a personal information breach and the right to object to, or restrict, the City of Cape Town's processing of its personal information.

5.10 **PERFORMANCE MONITORING**

- 5.10.1 As required by section 116(2)(b) of the Local Government: Municipal Financial Management Act 56 of 2003, the CCT shall monitor the performance of the Supplier on at least a monthly basis, and the Supplier agrees to provide the CCT with its full cooperation in this regard.

7. Performance Security

Not Applicable. Tenderers must disregard the **Pro Forma Performance Security/ Guarantee** and are not required to furnish same.

8. Inspections, tests and analyses

Delete Clause 8.2 and substitute with the following:

- 8.2 If it is a bid condition that Goods and/or Services to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or Supplier shall be open, at all reasonable hours, for inspection by a representative of the Purchaser or an organisation acting on behalf of the Purchaser.

10. Delivery and documents

Delete clauses 10.1 and 10.2 and replace with the following:

- 10.1 Delivery of the goods shall be made by the Supplier in accordance with the terms specified in the contract. The time for Delivery of the goods shall be the date as stated on the Purchase Order. In the case of agreements for Delivery of goods in terms of framework or panel agreements, Purchase Orders for the supply and delivery of goods may be raised up until the expiry of a framework or panel agreement, provided that the goods can be delivered within 30 (thirty) days of expiry of the framework or panel agreement. In this context, the "goods" does not include services and carries its ordinary meaning. All Purchase Orders other than for the supply and Delivery of goods (i.e. supply of services, professional services or constructions works), must be completed prior to the expiry of the contract period.
- 10.2 The Purchaser shall determine, in its sole discretion, whether the Goods and/or Services have been delivered in compliance with the Contract, alternatively in such a state that it can be properly used for the purpose for which it was intended. When the Purchaser determines that the Goods and/or Services have been satisfactorily delivered, the Purchaser must issue an appropriate certification, or written approval, to that effect. Invoicing may only occur, and must be dated, on or after the date of such written acceptance of the Goods.

11. Insurance

Add the following after clause 11.1:

- 11.2 Without limiting the obligations of the Supplier in terms of this Contract, the Supplier shall effect and maintain the following additional insurances:
- 11.2.1 Public liability insurances, in the name of the Supplier, covering the Supplier and the Purchaser against liability for the death of or injury to any person, or loss of or damage to any property, arising out of or in the course of this Contract, in an amount not less than **[R20 million]** for any single claim;
- 11.2.2 Motor Vehicle Liability Insurance, in respect of all vehicles owned and / or leased by the Supplier, comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability Indemnity;
- 11.2.3 Registration / insurance in terms of the Compensation for Occupational Injuries and Disease Act, Act 130 of 1993. This can either take the form of a certified copy of a valid Letter of Good Standing issued by the Compensation Commissioner, or proof of insurance with a licenced compensation insurer, from either the Supplier's broker or the insurance company itself (see the Pro Forma Insurance Broker's Warranty).

TENDER NO: 250S/2024/25

- 11.2.4 In the case of Contracts for delivery of professional services, Professional indemnity insurance providing cover in an amount of not less than **[R5 million]** in respect of each and every claim during the contract period.
- 11.2.5 In the event of under insurance or the insurer's repudiation of any claim for whatever reason, the Purchaser will retain its right of recourse against the Supplier.
- 11.3 The Supplier shall be obliged to furnish the Purchaser with proof of such insurance as the Purchaser may require from time to time for the duration of this Contract. Evidence that the insurances have been effected in terms of this clause, shall be either in the form of an insurance broker's warranty worded precisely as per the pro forma version contained in the Pro forma Insurance Broker's Warranty or copies of the insurance policies.

15. Warranty

Add to Clause 15.2:

- 15.2 The warranty for this Contract shall remain valid for **six (6) calender months** from date of Delivery of the Goods and/or Services.
- 15.3 All newly installed and supplied equipment, and parts shall carry a minimum warranty of **twelve (12) calender months** from date of acceptance by City of Cape Town's site representative

16. Payment

Delete Clause 16.1 in its entirety and replace with the following:

- 16.1 Payment of invoices will be made:
- 16.1.1 Within 30 (thirty) days of receiving the relevant invoice or statement from the Supplier, unless otherwise prescribed for certain categories of expenditure or specific contractual requirements in accordance with any other applicable policies of the Purchaser.
- 16.1.2 Notwithstanding anything contained above, the Purchaser shall not be liable for payment of any invoice that pre-dates the date of delivery of any Goods and/or Services.

Delete Clause 16.2 in its entirety and replace with the following:

- 16.2 The Supplier shall furnish the purchaser's Accounts Payable Department with an original tax invoice, clearly showing the amount due in respect of each and every claim for payment.

Add the following after clause 16.4

- 16.5 Notwithstanding any amount stated on the Purchase Order, the Supplier shall only be entitled to payment for Goods and/or Services actually delivered in terms of the Specification and Drawings, or any variations thereof made in accordance with clause 18. Any contingency sum included shall be for the sole use, and at the discretion, of the Purchaser.
- 16.6 The Purchaser will only make advanced payments to the Supplier in strict compliance with the terms and conditions as contained in the Pro forma Advanced Payment Guarantee and only once the authenticity of such guarantee has been verified by the Purchaser's Treasury Department.
- 16.6.1 The Advance Payment Schedule applicable to this Contract is set out below. The items of plant and materials which have been identified by the Purchaser as being suitable for advance payment in terms of this Contract are listed in the table below, and for which the Purchaser is prepared to make advance payment to the Supplier, subject to the conditions below. Should an item or items be added to the list at tender stage by a tenderer, no obligation to advance payment shall be incurred by the Purchaser, for such items added by the tenderer except as provided for herein.

Plant and materials which have been manufactured and are stored by the supplier	Plant and materials yet to be manufactured and for which a deposit with order is required from the supplier by a third party manufacturer/supplier, and which may be stored by the supplier:
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- 16.6.2 The Supplier can only rely on advance payment being permitted by the Purchaser in respect of the plant and materials listed in the table above. The Purchaser may, however, permit advance payment for other plant and materials in exceptional circumstances and at its sole discretion, during the course of the Contract, and upon reasonable request from the Supplier.
- 16.6.4 The Supplier shall provide the Purchaser with documentary evidence of the terms and conditions for which a deposit with order is required by a third party manufacturer/supplier, together with the advance payment guarantee.
- 16.6.5 The Supplier will also be permitted to obtain advance payment for the balance of the value of the plant and materials in respect of which he has paid a deposit, for an item which after manufacture is stored by the Supplier. The Supplier shall, in respect of such payment, provide an advance payment guarantee, either for such balance or, if the advance payment guarantee in respect of the deposit is to be returned by the Purchaser upon request, for the whole value of the item.

17. Prices

Add the following after clause 17.1

- 17.2 If as a result of an award of a contract beyond the original tender validity period, the contract execution will be completed beyond a period of twelve (12) months from the expiry of the original tender validity period, then the contract may be subject to contract price adjustment for that period beyond such twelve (12) months. An appropriate contract price adjustment formula will be determined by the Purchaser delegated authority if such was not included in the bid documents.
- 17.3 If as a result of any extension of time granted, the contract execution will be completed beyond a period of twelve (12) months from the expiry of the original tender validity period, then contract price adjustment may apply to that period beyond such twelve (12) months. An appropriate contract price adjustment formula will be determined by the Director: Supply Chain Management if such was not included in the bid documents.
- 17.4 The prices for the goods and/or Services delivered and services performed shall be subject to contract price adjustment in terms of Schedule F.1 Contract Price Adjustment and/or Rate of Exchange Variations and the following conditions will be applicable:

18. Contract Amendments

Delete the heading of clause 18 and replace with the following:

18. Contract Amendments and Variations

Add the following to clause 18.1:

Variations means changes to the Goods and/or Services, extension of the contract period or increases in the value of the Contract as a result of written instructions issued by the Purchaser to the Supplier. Such changes are subject to prior approval by the Purchaser's delegated authority. Should the Supplier deliver any Goods not described in a written instruction from the Purchaser, the Purchaser's liability for payment shall no arise until such time as the change has been duly approved and such approval communicated to the Purchaser.

20. Subcontracts

Add the following after clause 20.1:

- 20.2 The Supplier shall be liable for the acts, defaults and negligence of any subcontractor, his agents or employees as fully as if they were the acts, defaults or negligence of the Supplier.

20.3 Any appointment of a subcontractor shall not amount to a contract between the Purchaser and the subcontractor, or a responsibility or liability on the part of the Purchaser to the subcontractor and shall not relieve the Supplier from any liability or obligation under the Contract.

21. Delays in the supplier's performance

Delete Clause 21.2 in its entirety and replace with the following:

21.2 If at any time during the performance of obligations contained in the Contract the Supplier or its subcontractors should encounter conditions beyond their reasonable control which impede the timely delivery of the Goods and/or Services, the Supplier shall notify the Purchaser in writing, within 7 (seven) days of first having become aware of these conditions, of the facts of the delay, its cause(s) and its probable duration. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation, and may at his discretion extend the time for Delivery.

Where additional time is granted, the Purchaser shall also determine whether or not the Supplier is entitled to payment for additional costs in respect thereof. The principle to be applied in this regard is that where the Purchaser or any of its agents are responsible for the delay, reasonable costs shall be paid. In respect of delays that were beyond the reasonable control of both the Supplier and the Purchaser, additional time only (no costs) will be granted.

The Purchaser shall notify the Supplier in writing of his decision(s) in the above regard.

21.3 No provision in this Contract shall be deemed to prohibit the obtaining of Goods and/or Services from a national department, provincial department, or a local authority.

22. Penalties

Delete clause 22.1 and replace with the following:

22.1 Subject to GCC Clause 25, if the Supplier fails to deliver any or all of the Goods and/or Services within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from amounts payable, as a penalty, a sum as stated herein for each day of the delay until actual Delivery or performance.

The penalty for this contract shall be 2% of the Purchase Order per day up to a maximum of 20% of the Purchase Order value, which will be deducted should the delay in provision of the service within stipulated period have resulted in a plant malfunction, plant shut down or a non-compliance external audit finding.

22.2 The Purchaser shall, without prejudice to its other remedies under the contract, deduct from amounts payable, financial penalties as contained on the Preference Schedule for breaches of the conditions upon which preference points were awarded.

23. Termination for default

Delete the heading of clause 23 and replace with the following:

23. Termination

Add the following to the end of clause 23.1:

If the Supplier fails to remedy the breach in terms of such notice.

Add the following after clause 23.7:

23.8 In addition to the grounds for termination due to default by the Supplier, the Contract may also be terminated:

23.8.1 Upon the death of the Supplier who was a Sole Proprietor, or a sole member of a Close Corporation, in which case the contract will terminate forthwith.

23.8.2 If the Parties, by mutual agreement, terminate the Contract.

23.8.3 If a material irregularity vitiates the procurement process leading to the conclusion of the Contract, rendering the procurement process and the conclusion of the resulting Contract unfair, inequitable, non-transparent, uncompetitive or not cost-effective the Contract may be terminated by the Purchaser (upon conclusion of applicable processes by the City Manager as described in the Purchaser's SCM Policy).

23.8.4 Reputational risk or harm to the Purchaser

The Purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, may terminate the contract if the implementation of the contract may result in reputational risk or harm to the Purchaser as a result of (inter alia):

- a) reports of poor governance and/or unethical behaviour;
- b) association with known notorious individuals and family of notorious individuals;
- c) poor performance issues, known to the Purchaser
- d) negative social media reports;
- e) adverse assurance (e.g. due diligence) report outcomes; or
- f) circumstances where the relevant vendor has employed, or is directed by, anyone who was previously employed in the service of the state (as defined in clause 1.53), where the person is or was negatively implicated in any SCM irregularity.

By or in relation to the Supplier, the Contract may be terminated by the Purchaser after providing notice to the Supplier.

23.9 If the Contract is terminated in terms of clause 23.8, all obligations that were due and enforceable prior to the date of the termination, must be performed by the relevant Party.

26. Termination for insolvency

Delete clause 26.1 and replace with the following:

- 26.1 In the event of the Supplier becoming bankrupt or otherwise insolvent the Purchaser may elect to:
- 26.1.1 At any time, terminate the Contract by giving written notice to the Supplier; or
- 26.1.2 Accept a Supplier's proposal (via the liquidator) to render delivery utilising the appropriate contractual mechanisms or takes steps to ensure its rights are protected and any negative impact on service delivery is mitigated.
- 26.2 In the event of the Purchaser electing to cancel the Contract in accordance with clause 26.1.1 above, the Purchaser shall make payment of all verified and signed off invoices. In the event of there being any dispute in respect of any outstanding invoices such dispute shall be dealt with in accordance with the dispute resolution mechanism in the Contract.

27. Settlement of Disputes

Amend clause 27.1 as follows:

- 27.1 If any dispute or difference of any kind whatsoever, with the exception of termination in terms of clause 23 arises between the Purchaser and the Supplier in connection with or arising out of the Contract, the Parties shall make every effort to resolve such dispute or difference amicably, by mutual consultation.

Delete Clause 27.2 in its entirety and replace with the following:

- 27.2 Should the Parties fail to resolve any dispute by way of mutual consultation, either party shall be entitled to refer the matter for mediation before an independent and impartial person appointed by the City Manager in accordance with Regulation 50(1) of the Local Government: Municipal Finance Management Act, 56 of 2003 – Municipal Supply Chain Management Regulations (Notice 868 of 2005). Such referral shall be done by either party giving written notice to the other of its intention to commence with mediation. No mediation may be commenced unless such notice is given to the other party.

Irrespective whether the mediation resolves the dispute, the Parties shall bear their own costs concerning the mediation and share the costs of the mediator and related costs equally.

The mediator shall agree the procedures, representation and dates for the mediation process with the Parties. The mediator may meet the Parties together or individually to enable a settlement.

Where the Parties reach settlement of the dispute or any part thereof, the mediator shall record such agreement and on signing thereof by the Parties the agreement shall be final and binding.

Save for reference to any portion of any settlement or decision which has been agreed to be final and binding on the Parties, no reference shall be made by or on behalf of either party in any subsequent court proceedings, to any outcome of an amicable settlement by mutual consultation, or the fact that any particular evidence was given, or to any submission, statement or admission made in the course of amicable settlement by mutual consultation or mediation.

28. Limitation of Liability

Delete clause 28.1 (a) and (b) and replace with the following:

- (a) notwithstanding any provision to the contrary contained in this contract, neither the supplier nor any of its officers, directors, employees, agents contractors, consultants or other representatives shall be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect, incidental, special or consequential loss or damage of any kind, including without limitation the loss of use, loss of production, or loss of profits or interest costs, loss of goodwill, lost or damaged data or software, costs of substitute products/services and/or loss of business or business opportunities (whether foreseeable or unforeseeable), provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser;

TENDER NO: 250S/2024/25

- (b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the sums insured in terms of clause 11 in respect of insurable events, or where no such amounts are stated, to an amount equal to twice the Contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

Add the following after clause 28.1:

28.2 Without detracting from, and in addition to, any of the other indemnities in this Contract, the Supplier shall be solely liable for and hereby indemnifies and holds harmless the Purchaser against all claims, charges, damages, costs, actions, liability, demands and/or proceedings and expense in connection with:

- a) personal injury or loss of life to any individual;
- b) loss of or damage to property;

arising from, out of, or in connection with the performance by the Supplier in terms of this Contract, save to the extent caused by the gross negligence or wilful misconduct of the Purchaser.

28.3 The Supplier and/or its employees, agents, concessionaires, suppliers, sub-contractors or customers shall not have any claim of any nature against the purchaser for any loss, damage, injury or death which any of them may directly or indirectly suffer, whether or not such loss, damages, injury or death is caused through negligence of the Purchaser or its agents or employees.

28.4 Notwithstanding anything to the contrary contained in this Contract, under no circumstances whatsoever, including as a result of its negligent (including grossly negligent) acts or omissions or those of its servants, agents or contractors or other persons for whom in law it may be liable, shall any party or its servants (in whose favour this constitutes a *stipulatio alteri*) be liable for any indirect, extrinsic, special, penal, punitive, exemplary or consequential loss or damage of any kind whatsoever, whether or not the loss was actually foreseen or reasonably foreseeable), sustained by the other party, its directors and/or servants, including but not limited to any loss of profits, loss of operation time, corruption or loss of information and/or loss of contracts.

28.5 Each party agrees to waive all claims against the other insofar as the aggregate of compensation which might otherwise be payable exceeds the aforesaid maximum amounts payable.

31. Notices

Delete clauses 31.1 and 31.2 and replace with the following:

- 31.1 Any notice, request, consent, approvals or other communications made between the Parties pursuant to the Contract shall be in writing and forwarded to the addresses specified in the Contract and may be given as set out hereunder and shall be deemed to have been received when:
- a) hand delivered – on the day delivery of delivery or the next Working Day,
 - b) sent by registered mail – five (5) Working Days after mailing,
 - c) sent by email or telefax – one (1) Working Day after transmission.

32. Taxes and Duties

Delete the final sentence of 32.3 and replace with the following:

. In this regard, it is the responsibility of the Tenderer to submit evidence in the form of a valid Tax Compliance Status PIN issued by SARS to the CCT at the Supplier Management Unit located within the Supplier Management / Registration Office, 2nd Floor (Concourse Level), Civic Centre, 12 Hertzog Boulevard, Cape Town (Tel 021 400 9242/3/4/5), or included with this tender.

Add the following after clause 32.3:

32.4 The VAT registration number of the CCT is 4500193497.

ADDITIONAL CONDITIONS OF CONTRACT

Add the following Clause after Clause 34:

35. Reporting Obligations

35.1 The Supplier shall complete, sign and submit with each delivery note, all the documents as required in the Specifications including Monthly Project Labour Reports (Annexure B). Any failure in this regard may result in a delay in the processing of payments.

C.7 GENERAL CONDITIONS OF CONTRACT

(National Treasury - General Conditions of Contract (revised July 2010))

TABLE OF CLAUSES

1. Definitions
2. Application
3. General
4. Standards
5. Use of contract documents and information; inspection
6. Patent rights
7. Performance security
8. Inspections, tests and analysis
9. Packing
10. Delivery and documents
11. Insurance
12. Transportation
13. Incidental services
14. Spare parts
15. Warranty
16. Payment
17. Prices
18. Contract amendments
19. Assignment
20. Subcontracts
21. Delays in the supplier's performance
22. Penalties
23. Termination for default
24. Dumping and countervailing duties
25. Force majeure
26. Termination for insolvency
27. Settlement of disputes
28. Limitation of liability
29. Governing language
30. Applicable law
31. Notices
32. Taxes and duties
33. National Industrial Participation Programme (NIPP)
34. Prohibition of restrictive practices

1. Definitions

1. The following terms shall be interpreted as indicated:

- 1.1 'Closing time' means the date and hour specified in the bidding documents for the receipt of bids.
- 1.2 'Contract' means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the Parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- 1.3 'Contract price' means the price payable to the supplier under the contract for the full and proper performance of his or her contractual obligations.
- 1.4 'Corrupt practice' means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
- 1.5 'Countervailing duties' are imposed in cases in which an enterprise abroad is subsidised by its government and encouraged to market its products internationally.

TENDER NO: 250S/2024/25

- 1.6 'Country of origin' means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognised new product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 1.7 'Day' means calendar day.
- 1.8 'Delivery' means delivery in compliance with the conditions of the contract or order.
- 1.9 'Delivery ex stock' means immediate delivery directly from stock actually on hand.
- 1.10 'Delivery into consignee's store or to his site' means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.
- 1.11 'Dumping' occurs when a private enterprise abroad markets its goods on its own initiative in the RSA at lower prices than that of the country of origin, and which action has the potential to harm the local industries in the RSA.
- 1.12 'Force majeure' means an event beyond the control of the supplier, not involving the supplier's fault or negligence, and not foreseeable. Such events may include, but are not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- 1.13 'Fraudulent practice' means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial, non-competitive levels and to deprive the bidder of the benefits of free and open competition.
- 1.14 'GCC' means the General Conditions of Contract.
- 1.15 'Goods' means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.
- 1.16 'Imported content' means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.
- 1.17 'Local content' means that portion of the bidding price which is not included in the imported content, provided that local manufacture does take place.
- 1.18 'Manufacture' means the production of products in a factory using labour, materials, components and machinery, and includes other, related value-adding activities.
- 1.19 'Order' means an official written order issued for the supply of goods or works or the rendering of a service.
- 1.20 'Project site', where applicable, means the place indicated in bidding documents.
- 1.21 'Purchaser' means the organisation purchasing the goods.
- 1.22 'Republic' means the Republic of South Africa.
- 1.23 'SCC' means the Special Conditions of Contract.

1.24 'Services' means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance, and other such obligations of the supplier covered under the contract.

1.25 'Written' or 'in writing' means handwritten in ink or any form of electronic or mechanical writing.

2. Application

2.1 These general conditions are applicable to all bids, contracts and orders, including bids for functional and professional services, sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.

2.2 Where applicable, special conditions of contract are also laid down to cover specific supplies, services or works.

2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.

3. General

3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable, a non-refundable fee for documents may be charged.

3.2 With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria 0001, or accessed electronically from www.treasury.gov.za.

4. Standards

4.1 The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.

5. Use of contract documents and information; inspection.

5.1 The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as may be necessary for the purposes of such performance.

5.2 The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 5.1, except for purposes of performing the contract.

5.3 Any document, other than the contract itself, mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.

5.4 The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.

6. Patent rights

6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from the use of the goods or any part thereof by the purchaser.

7. Performance Security

7.1 Within 30 (thirty) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in the SCC.

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

8. Inspections, tests and analyses

- 8.1 All pre-bidding testing will be for the account of the bidder.
- 8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organisation acting on behalf of the Department.
- 8.3 If there are no inspection requirements indicated in the bidding documents and no mention of such is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.
- 8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.
- 8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.
- 8.6 Supplies and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.
- 8.7 Any contract supplies may on or after delivery be inspected, tested or analysed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies shall be held at the cost and risk of the supplier, who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with supplies which do comply with the requirements of the contract. Failing such removal, the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.
- 8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 23 of the GCC.

9. Packing

- 9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in the SCC, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

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

10.2 Documents to be submitted by the supplier are specified in the SCC.

11. Insurance

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

12. Transportation

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

13. Incidental Services

13.1 The supplier may be required to provide any or all of the following services, including additional services (if any) specified in the SCC:

- (a) performance or supervision of on-site assembly, and/or commissioning of the supplied goods;
- (b) furnishing of tools required for the assembly and/or maintenance of the supplied goods;
- (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;
- (d) performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the Parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and
- (e) training of the purchaser's personnel, at the supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.

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

14. Spare parts

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

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

15. Warranty

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

TENDER NO: 250S/2024/25

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

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

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

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

16. Payment

16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified in the SCC.

16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of any other obligations stipulated in the contract.

16.3 Payments shall be made promptly by the purchaser, but in no case later than 30 (thirty) days after submission of an invoice or claim by the supplier.

16.4 Payment will be made in Rand unless otherwise stipulated in the SCC.

17. Prices

17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices tendered by the supplier in his bid, with the exception of any price adjustments authorized in the SCC or in the purchaser's request for bid validity extension, as the case may be.

18. Contract Amendments

18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the Parties concerned.

19. Assignment

19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.

20. Subcontracts

20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

21. Delays in the supplier's performance

21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.

21.2 If at any time during the performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his or her discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the Parties by amendment of contract.

TENDER NO: 250S/2024/25

- 21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority.
- 21.4 The right is reserved to procure, outside of the contract, small quantities of supplies; or to have minor essential services executed if an emergency arises, or the supplier's point of supply is not situated at or near the place where the supplies are required, or the supplier's services are not readily available.
- 21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.
- 21.6 Upon any delay beyond the delivery period in the case of a supplies contract, the purchaser shall, without cancelling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and, without prejudice to his other rights, be entitled to claim damages from the supplier.

22. Penalties

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

23. Termination for default

- 23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:
- (a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;
 - (b) if the supplier fails to perform any other obligation(s) under the contract; or
 - (c) if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.
- 23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.
- 23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.
- 23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than 14 (fourteen) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated 14 (fourteen) days the purchaser may regard the intended penalty as not objected against and may impose it on the supplier.
- 23.5 Any restriction imposed on any person by the Accounting Officer/Authority will, at the discretion of the Accounting Officer/Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person is or was, in the opinion of the Accounting Officer/Authority, actively associated.

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

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

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

23.7 If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, Act 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period of not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction, and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Anti-dumping and countervailing duties and rights

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

25. Force majeure

25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if, and to the extent that, his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

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

26. Termination for insolvency

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

27. Settlement of Disputes

27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the Parties shall make every effort to resolve such dispute or difference amicably, by mutual consultation.

27.2 If, after 30 (thirty) days, the Parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.

27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.

27.4 Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.

27.5 Notwithstanding any reference to mediation and/or court proceedings herein,

- (a) the Parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
- (b) the purchaser shall pay the supplier any monies due to the supplier.

28. Limitation of Liability

28.1 Except in cases of criminal negligence or wilful misconduct, and in the case of infringement pursuant to Clause 6:

- (a) the supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and
- (b) the aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

29. Governing language

29.1 The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the Parties shall also be written in English.

30. Applicable Law

30.1 The contract shall be interpreted in accordance with South African laws, unless otherwise specified in the SCC.

31. Notices

31.1 Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail, and any other notice to him shall be posted by ordinary mail, to the address furnished in his bid or to the address notified later by him in writing; and such posting shall be deemed to be proper service of such notice.

31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.

32. Taxes and Duties

32.1 A foreign supplier shall be entirely responsible for all taxes, stamp duties, licence fees, and other such levies imposed outside the purchaser's country.

32.2 A local supplier shall be entirely responsible for all taxes, duties, licence fees, etc., incurred until delivery of the contracted goods to the purchaser.

32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax clearance certificate submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.

33. National Industrial Participation (NIP) Programme

33.1 The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.

34 Prohibition of Restrictive practices

34.1 In terms of section 4 (1) (b) (iii) of the Competition Act, Act 89 of 1998, as amended, an agreement between or concerted practice by firms, or a decision by an association of firms, is prohibited if it is between Parties in a horizontal relationship and if a bidder(s) is/are or a contractor(s) was/were involved in collusive bidding (or bid rigging).

34.2 If a bidder(s) or contractor(s), based on reasonable grounds or evidence obtained by the purchaser, has/have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in the Competition Act, Act 89 of 1998.

34.3 If a bidder(s) or contractor(s) has/have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and/or terminate the contract in whole or part, and/or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding 10 (ten) years and/or claim damages from the bidder(s) or contractor(s) concerned.

C.8 ANNEXURES

Annexure A – Pro Forma Insurance Broker’s Warranty



Letterhead of supplier’s Insurance Broker

Date _____

CCT
City Manager
Civic Centre
12 Hertzog Boulevard
Cape Town
8000

Dear Sir

TENDER NO.: 250S/2024/25

TENDER DESCRIPTION: MAINTENANCE SERVICE, CALIBRATION, SUPPLY, INSTALLATION AND REPLACEMENT OF VARIOUS PROCESS CONTROL SYSTEMS USED WITHIN BULK WATER INFRASTRUCTURE

NAME OF SUPPLIER: _____

I, the undersigned, do hereby confirm and warrant that all the insurances required in terms of the abovementioned contract have been issued and/or in the case of blanket/umbrella policies, have been endorsed to reflect the interests of the CCT with regard to the abovementioned contract, and that all the insurances and endorsements, etc., are all in accordance with the requirements of the contract.

I furthermore confirm that all premiums in the above regard have been paid.

Yours faithfully

Signed: _____

For: _____ (Supplier’s Insurance Broker)

MONTHLY PROJECT LABOUR REPORT



BENEFICIARY DETAILS AND WORK INFORMATION

CONTRACT OR WORKS PROJECT NUMBER:
--

Year	Month

Sheet		
1	of	

No.	(8) First name	(8) Surname	(8) ID number	(9) New Beneficiary (Y/N)	Gender (M/F)	Disabled (Y/N)	(10) Job seeker database (Y/N)	Contract start date (DDMMYY)	(11) Contract end date (DDMMYY)	(12) No. days worked this month (excl. training)	(13) Training days	(14) Rate of pay per day (R - c)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

0 0 R -

Declared by Contractor or Vendor to be true and correct:	Name	Signature
	Date	

Received by Employer's Agent / Representative:	Name	Signature
	Date	

Tender No.: 250S/2024/25

Annexure C - Pro Forma Performance Security/ Guarantee

Not Application

Tender No.: 250S/2024/25

Annexure D - Pro Forma Advance Payment Guarantee

Not Applicable

Tender No.: 250S/2024/25

Approved Financial Institution as at 28 February 2023:

1.1 National Banks

ABSA Bank Limited
Firststrand Bank Limited
Investec Bank Limited
Nedbank Limited
Standard Bank of South Africa Limited

1.2 International Banks (with branches in South Africa)

Barclays Bank PLC
Citibank NA
Credit Agricole Corporate and Investment Bank
HSBC Bank PLC
JPMorgan Chase Bank
Societe Generale
Standard Chartered Bank

1.3 Insurance Companies

American International Group Inc (AIG)
Bryte Insurance Company Limited
Coface SA
Compass Insurance Company Limited
Credit Guarantee Insurance Corporation of Africa Limited
Guardrisk Insurance Company Limited
Hollard Insurance Company Limited
Infiniti Insurance Limited
Lombard Insurance Company Limited
Mutual and Federal Risk Financing Limited
New National Assurance Company Limited
PSG Konsult Ltd (previously Absa Insurance)
Regent Insurance Company Limited
Renasa Insurance Company Limited
Santam Limited...]

Annexure F - Tender Returnable Documents

Schedule F.1: Contract Price Adjustment

1. TENDER CONDITIONS

- 1.1 The Contract Price Adjustment (CPA) mechanism and/or provisions relating to Rate of Exchange (RoE) Variation, contained in this schedule is compulsory and binding on all Tenderers/Suppliers and this schedule (the parts relevant to the particular tender) must be completed by all Tenderers / Suppliers.
- 1.2 Tenderers/Suppliers are not permitted to amend, vary, alter or delete this schedule or any part thereof unless otherwise stated in this schedule.
- 1.3 Tenderers are not permitted to offer fixed and firm prices except as provided for in the Price Schedule.

2. CPA PROVISIONS SELECTION

- 2.1 The prices stipulated on the Price Schedule are subject to adjustment as set out below.
- 2.2 Tenderer to indicate the specific CPA and/or RoE provisions applicable to their bid by marking the relevant checkboxes below. Tenderers to note that the CPA and/or RoE provisions are not exclusive and multiple CPA Types can exist if the bid contains both local and foreign exchange based pricing. In such cases the CPA and/or ROE provision applies only to that particular portion of the tendered price.
- 2.3 The CPA and/or RoE provisions applicable to this tender and resulting contract are to be indicated below by checking the relevant boxes (with multiple selections only where indicated permissible):

	<u>Indicate option</u>	<u>CPA Type</u>	<u>Period</u>	<u>Refer to Section</u>
A	<div style="text-align: center;"> <p>↓</p> <div style="border: 1px solid black; padding: 5px; width: 40px; margin: 0 auto;"><u>N/A</u></div> </div>	FIRM PRICES as per Pricing Schedule	Annual	<i>Pricing Schedule C.4 and Schedule F.1 (A)</i>
<u>LOCAL (RSA) TENDER CONTENT:</u>				
EITHER				
B	<input type="checkbox"/>	Manufacturers Pricelist / Quotation Based CPA	Ad-Hoc	<i>Schedule F.1 (C)</i>
OR				
C	<input type="checkbox"/>	STATS SA CPI Index Based CPA	Annually	<i>Schedule F.1 (D)</i>
<u>IMPORTED GOODS AND / OR COMPONENTS (IF APPLICABLE)</u>				
D	<input type="checkbox"/>	ROE based CPA	Ad-Hoc	<i>Schedule F.1 (F)</i>
AND (IF REQUIRED), EITHER				
G	<input type="checkbox"/>	Manufacturers Pricelist / Quotation based CPA	Ad-Hoc / Periodic	<i>Schedule F.1 (G)</i>

Tender No.: 250S/2024/25

- 2.4 CPA and/or RoE provisions marked as **not applicable** is not relevant and will not apply to this tender and resulting contract.

3. CONTRACT CPA APPLICATIONS AND ADMINISTRATION

- 3.1 Any claim for variation in the contract price (either CPA or RoE adjustments) must be submitted in writing:

- i. By letter to: Director **Water and Sanitation Director**, City of Cape Town,
P O Box 655, Cape Town, 8000 or
- ii. By email to: **Sibusiso.Linda@capetown.gov.za**

at least 14 days prior to the month upon which the adjustment would become effective in the case of prices being set in advance, and as soon as relevant indices are available and no later than 60 days after the date of delivery of goods or the completion of the project (i.e. date of issue of the Taking-Over Certificate, if applicable) in the case of adjustments being claimed retrospectively for Goods or Services. The latter case is only applicable where specifically provided for in the CPA provisions.

- 3.2 When submitting a request for CPA and/or RoE adjustment the Supplier shall indicate the Rand Value claimed for each item listed on C.4 - Price Schedule, clearly indicating the item number as per C.4 - Price Schedule. Percentage increases will not be considered. A mere notification of a request for CPA without stating the new price claimed for each item shall, for the purpose of this clause, not be regarded as a valid request.
- 3.3 The CCT reserves the right to request the Supplier to submit auditor's certificates or such other documentary proof as it may require in order to verify a claim for CPA or RoE adjustments. Price adjustments will not be processed until such time as the Supplier submits such auditor's certificates or other documentary proof to the CCT. Should the Supplier fail to submit the auditor's certificates or other documentary proof to the CCT within 30 days from the written request, it shall be presumed that the Supplier has abandoned his request.
- 3.4 The CCT reserves the right to withhold payment of any claim for adjustment while only provisional figures are available and until such time as the final (revised) figures are issued by the relevant authority.
- 3.5 The CCT will confirm in writing once processing of the CPA or RoE adjustments have been completed including the effective date of the adjustments.
- 3.6 Where pricelist-based and other non-index based CPA requests are investigated and found to be not reasonable and market related, the CCT reserves the right to reject such requests. Where disputes arise with respect to such rejected requests the CCT reserves the right to procure the Goods from other available Suppliers until such time as the dispute is resolved.
- 3.7 Unless indicated otherwise in the relevant schedule below, all Purchase Orders issued on or after the effective date of the adjustment shall be issued at, and the Goods or Services supplied, invoiced and paid for at the adjusted prices. The relevant adjustment will not be applied to Purchase Orders issued prior to the effective date.

3.8 CONTRACT PRICE ADJUSTMENT MECHANISM

Tenderers must choose by placing an “X” in the applicable column to indicate the Contract Price Adjustment (CPA) mechanism as listed in the table below, and must adhere to the CPA instructions described in **Schedule F.1**. The CPA mechanism chosen by the tenderer shall remain effective for the duration of the contract period.

Category	Section	Price item	Consumer Price Index	Supplier/Manufacturer Price List Variations (local goods)	Rate of Exchange (imported goods)	Supplier/Manufacturer Price List Variations (imported goods)
A	Section 1	1.1 – 1.14				
A	Section 2	2.1 – 2.13				
A	Section 3	3.1 – 3.11				
A	Section 4	4.1 – 4.13				
A	Section 5	5.1 – 5.3				
A	Section 6	5.1 – 5.3				
A	Section 7	7.1 – 7.2				
A	Section 8	8.1 – 8.3				
A	Section 9	9.1 – 9.6				
A	Section 10	10.1 – 10.40				
A	Section 11	11.1 – 11.4				
A	Section 12	12.1 – 12.92				
B	Section 14	14.1 – 14.16				
B	Section 15	15.1 – 15.25				
C	Section 17	17.1 – 17.11				
C	Section 18	18.1 – 18.87				
C	Section 19	19.1 – 19.42				
D	Section 21	21.1 – 21.4				
D	Section 22	22.1 – 22.32				
E	Section 24	24.1 – 24.6				
E	Section 25	25.1 – 25.7				

Tender No.: 250S/2024/25

F	Section 27	27.1 – 27.5				
F	Section 28	28.1 – 28.10				
G	Section 30	30.1 – 30.6				
G	Section 31	31.1 – 31.19				
H	Section 33	33.1 – 33.5				
H	Section 34	34.1 – 34.10				

F.1 (A) – FIRM PRICES

No Contract Price Adjustment is applicable or permitted for this contract. The prices are fixed and firm.

F.1 (C) LOCAL SOUTH AFRICAN CONTENT - SUPPLIER/ MANUFACTURER PRICE LIST/QUOTATIONS

1. Tenderers /Suppliers that are not the manufacturer or original supplier of the tendered goods and whose tender prices are based on the price list/quotation of another company (manufacturer or other supplier) may apply Supplier / Manufacturer Pricelist / Quotation based CPA.
2. In such cases the Tenderer is required to submit with his tender a copy of the original Supplier / Manufacturer Pricelist / Quotation upon which his tender prices are based. Such pricelist / Quotation is required to be on the Letterhead of the Supplier / Manufacture, is to be dated, referenced and signed, and is to provide clear reference to the tender number and is required to clearly reference each item quoted to the respective Tender Item Number indicated in C.4 Price Schedule.
3. The tenderer shall further confirm the Manufacturer / supplier, Quotation date and reference number and applicable tender Items by completing Table F.1(C).1 below.

Table F.1(C).1: Price Schedule information for Manufacturers/Suppliers Price List(s)/Quotation

Manufacturer/ Supplier Name	Price List Information		
	Price List/Quotation Date.	Price List/Quotation Reference Number	Pricelist applicable to Items as per C.4 Price Schedule

4. During the contract period, the Tenderer (now Supplier) must submit the request for price adjustment based on increases in pricelists of manufacturers/suppliers prior to the effective date of the increase in the pricelist.
5. The effective date of any price adjustment granted will be the first day of the month following the month during which the fully substantiated application for contract price adjustment is submitted or, by agreement

Tender No.: 250S/2024/25

between the Tenderer/Supplier and the CCT, a subsequent date on which the price adjustment will become effective.

6. In instances where the Supplier's price adjustment claimed is less than entitled, the lesser price will be accepted.
7. Purchase orders placed prior to the effective date of any price increase shall be placed at the previously agreed price, not the claimed adjusted price.
8. Only the difference in source supplier / manufacturer pricelist (actual cost, not percentage) may be adjusted and under no circumstances may the Tenderer/Supplier increase their profit margin.
9. The Tenderer/Supplier shall, when submitting claims for contract price adjustment, submit all of the documentation indicated below a minimum of two weeks prior to the effective date of the contract price adjustment:
 - a) Copies of price lists upon which original tender prices were based (refer to clause 2, Table F.1(C).1 above) clearly indicating the item(s) according to C.4 Price Schedule.
 - b) The new price list (*from the same Supplier / Manufacturer as originally tendered*) on the relevant manufacturer/suppliers letterhead (with pamphlets, brochures and e-mail communication) clearly indicating the item(s) according to C.4 Price Schedule.
 - c) Detailed calculations indicating how the "adjusted" price was calculated. The calculations must be submitted in Excel, together with a signed, "PDF" version of the Excel spreadsheet. The example below – Table F.1(C).2, is what is required.
 - d) A covering letter on the Supplier's letterhead requesting the CPA with the effective date of the claim.
10. The CCT will consider the request and either refer the request back for correction or additional information or approve the request.
11. The CCT will assess such pricelist based CPA claims against market pricing and indices and other input pricing indicators and will only approve such claims that are confirmed to be reasonable and market related with reference to the source pricing information provided with the tender and with the CPA application
12. Approval of the CPA request including confirmation of the effective date, will be communicated to the Supplier in writing together with a list of the approved adjusted rates. The effective date will be as per clause 3 above.
13. The successful Tenderer/Supplier shall immediately upon notification of the commencement date of contract submit written application for approval of any adjusted unit prices for the Goods that may have been notified by the Supplier / Manufacturer of the Goods, together with the required supporting documentation. This application will be assessed in accordance with the process laid out above in order to determine approved contract prices at the commencement of the contract.
14. Failure to submit such application within two working weeks of commencement of contract shall result in the tendered unit prices being applied for initial orders placed following commencement of the contract.
15. In the event of a Supplier changing their Supplier / Manufacturer during the tenure of the contract, no request for price variations will be considered unless the Supplier has obtained prior approval from the City for the change of Supplier / Manufacturer. Such approval shall include technical approval by the Engineer of the goods supplied by the replacement Supplier / Manufacturer. Technical approval by the Engineer shall be a prerequisite for any change of Supplier / Manufacturer.

Table F.1(C).2 – Pro Forma Table for Adjustments in price where the Supplier is not the Manufacturer)

C.4 Price Schedule Item No.	Original Tender Price	Previous and New Price List Information					New Contract Price (Excl. VAT)
		Manufacturer/Supplier	Material no.	Price as per previous Manufacturer/Supplier Price List (Excl. Vat) Price List Date:_____	Price as per new Supplier/Manufacturer Price List (Excl. Vat) Price List Date:_____	Difference between the previous and new manufacturer Price list (C)-(B)	
	(A)			(B)	(C)	(D)	(A)+(D)

**When submitting the first request for price adjustment, use the tender price as per C.4 Price Schedule.*

F.1 (D) LOCAL SOUTH AFRICAN CONTENT - STATS SA CONSUMER PRICE INDEX

1. Applicable where the Tenderer/Suppliers has indicated their tendered prices are subject to adjustment based on changes in the Statistics South Africa (STATS SA) Consumer Price Indices.
2. A minimum of 10% of the tender price as per C.4 Pricing Schedule shall be fixed and free of variation for the duration of the contract.
3. A total of 90% of the tender price as per C.4 Pricing Schedule shall be adjusted annually in accordance with clause 5 below.
4. The Contract Price(s) shall remain FIRM for the first 12 calendar months from date of Commencement Date of Contract and Suppliers are not permitted to requests CPA during this period.
5. The Contract Price(s) will thereafter be subject to adjustment annually based on the average percentage of change over 12 months as published by STATS SA: Consumer Price Index (P0141–Table B2 – CPI headline year-on-year rates) as follows:
 - 5.1 CPA applicable from the start of the 13th month to the end of the 24th month calculated as follows:
 - a) The base month for the price adjustment being three (3) calendar months prior to Commencement Date of Contract; and
 - b) The end month shall be three (3) calendar months prior to the 12th month.
 - 5.2 CPA applicable from the start of the 25th month to end of the 36th month calculated as follows:
 - a) The base month for the price adjustment shall be three (3) calendar months prior to the 13th month; and
 - b) The end month shall be three (3) calendar months prior to 24th month.
 - 5.3 The average CPI percentage will be calculated using the base month to the end month (both included) divided by the number of months. (12 months totalled/12 to achieve the average CPI)
6. Subject to prior approval by the CCT delegated authority, in the event of any extension of the contract period, the CPA applicable beyond month 36th of the contract will follow the same principle in determining the base month (i.e. 3 calendar months prior to 25th month) and end date (3 calendar months prior to 36th month) as outlined above.

**F.1. (F) GOODS AND/OR COMPONENTS IMPORTED FROM OUTSIDE OF SOUTH AFRICA
RATE OF EXCHANGE PRICE VARIATIONS**

- Subject to the above, when tendered prices of certain items in C.4 Price Schedule are subject to adjustment for changes in the cost of goods and/or components imported from outside of South Africa, the Tenderer must (as part of the bid submission) provide a list of such items and other information as required in Table F.1 (F).2 below and include it in the bid submission.
- Only tenderers who are the direct importer of the goods may claim rate of exchange price variations.

Table F.1 (F).1: Information required for prices subject to Rate of Exchange adjustments

Exchange Rate on which tender is based:	_____ 1 : Rand _____
Exchange Rate on which tender is based: (if more than one currency)	_____ 1 : Rand _____
Exchange Rate on which tender is based: (if more than one currency)	_____ 1 : Rand _____
Name of Bank	
Date of quoted rate of exchange	
Documentation relevant to calculation of adjustments based on Rate of Exchange (Mark with "x")	
Bill of Lading	
Waybill	
Customs invoice	
Other: _____	

TABLE F.1 (F).2: Price Basis for Imported Resources

C.4 Price Schedule Detail		Rand Value Calculation for Foreign Content (FOB)			Customs Surcharge		Customs Duty			Rand Value for South African Content (FOR)	Total Tender Price in Rand of (C) + (D) + (E) + (F) included in Price Schedule C.4
C.4 Price Schedule Item No.	Description of Resources	Value in Foreign Currency denomination	Rate of Exchange as at Base Date*	Value in Rand for Foreign currency content (A) x (B)	%	Rand	%	Rand	Customs Duty Tariff Reference	Value in Rand for South African Content	(G)
		(A)	(B)	(C)		(D)		(E)		(F)	

* Base Date: 7 (seven) calendar days before tender closing.

- Any items/resources not inserted in Table F.1 (F).2 above, are deemed to be manufactured / supplied in South Africa and is not subject to adjustment in terms of variation in rate of exchange.
- The price adjustment for variations in the cost of plant and materials imported from outside of South Africa shall be based on the information contained on the schedule titled "Price Basis for Imported Resources" (Table F.1 (F).2). The Rand value of goods and components comprising entirely or partly imported content that is inserted on the Table F.1(F).2 titled "Price Basis for Imported Resources" (column (G)) shall be the rate tendered in the Pricing Schedule C.4, and shall be the value in foreign currency (column (A)) converted to South African Rand (column (C)) by using the closing spot selling rate on the Base Date (seven calendar days before tender closing date) rounded to the second decimal place (column (B)), to which shall be added any Customs Surcharge and Customs Duty applicable at that date (columns (D) and (E)) and any South African manufactured or added content (column (F)).

Tender No.: 250S/2024/25

5. Any mark-up by the Tenderer or other costs not detailed above shall be entirely contained within the South African Content (Column (F)).
6. Column A of Table F.1 (F).2 shall detail the actual quotation for the imported Goods or components, and shall be substantiated by the original source quotation for such Goods or components. (Source quotation from foreign supplier/manufacturer, see Schedule F.1 (G), Table F.1 (G).1 below). No Supplier mark-up on the foreign currency value of such imported Goods or components is permissible. All Supplier mark-up shall be included in the South African content, Column F of Table F.1 (F).2 above.
7. Based on the evidence provided in Clause 5 above, the value in Rand inserted in column (C) on the schedule titled "Price Basis for Imported Resources" shall be recalculated using the forward cover rate obtained, and any increase or decrease in the Rand value defined in this clause shall be adjusted accordingly, subject to Clause 7 below.
8. The adjustments shall be calculated upon the value in foreign currency in the Supplier's forward cover contract, provided that, should this value exceed the value in foreign currency inserted in column (A) of on the schedule titled "Price Basis for Imported Resources", then the value in column (A) shall be used (or any adjusted value approved in accordance with Schedule F.1 (G) below).
9. Any increase or decrease in the Rand value between the amounts of Customs Surcharge and Customs Duty inserted in on the schedule titled "Price Basis for Imported Resources" and those amounts actually paid to the Customs and Excise Authorities, which are due to changes in the percentage rates applicable or to the foreign exchange rate used by the authorities, shall be adjusted accordingly.
10. The Tenderer shall state the Customs Duty Tariff Reference applicable to each item and the Supplier shall advise the CCT's Agent of any changes which occur.
11. Suppliers shall take out Forward Cover covering the foreign exchange component of the cost of any imported portion of the Goods ordered on each purchase order issued by the Employer.
12. The process to be followed by Suppliers for claims for Rate of Exchange Variations shall be as follows:
 - a) The Supplier shall within seven working days from the date of receipt of the purchase order arrange for cover or recovering forward by way of a contract with a bank which is an authorised foreign exchange dealer, the foreign exchange component of the cost of any imported goods and components inserted by the Tenderer on the scheduled titled "Price Basis for Imported Resources" (Table F.1 (F).2), and submit such Forward Cover quotation to the City for approval.
 - b) Upon receipt of the quotation for Forward Cover from the bank, the Supplier must forward the quote ideally, within 15 minutes of receiving it from their banker to the CCT: CPA.Request@capetown.gov.za and Contract Manager: **Sibusiso.Linda@capetown.gov.za**. This is to ensure that the time difference from generation of the quotation for Forward Cover to finalising the Forward Cover with the Bank, is kept to a minimum due to the change in the exchange rate throughout the day.
 - c) The Contract Manager will forward the quotation to the CCT Treasury Department immediately for their consideration and approval. The cut-off time for receipt of quotations for Forward Cover will be 14h00. It must be noted that if this deadline will not be achieved, it is recommended that the quotation process be undertaken on the following day which should fall within the 7 days of receipt of the purchase order.
 - d) Only once the Forward Cover quotation rate has been approved by CCT Treasury Department, may the Supplier finalise the Forward Cover contract with their bank at the rate approved by the CCT Treasury Department for that Purchase Order and forward a copy of the contract to the CCT via email: CPA.Request@capetown.gov.za and Contract Manager: **Sibusiso.Linda@capetown.gov.za**
 - e) The Forward Cover quotation envisaged above shall have the CCT purchase order number and a Forward Cover Contract (FCC) Value Date that is directly based upon the required delivery date for the imported Goods or components necessary in order to meet the Contract Delivery Period. Future FCC Value Dates beyond the Contract Delivery Period shall not be acceptable.

Tender No.: 250S/2024/25

13. On delivery of the goods to the City the Supplier shall submit the following documentation to the CCT via email: CPA.Request@capetown.gov.za and Contract Manager: Sibusiso.Linda@capetown.gov.za:
- a) The Bill of Lading/Waybill/Customs Invoice (clearly indicating the items as identified on the purchase order).
 - b) Calculations detailing the difference in the rate of exchange at the time of entry and the date of tender. These shall be submitted on a covering letter.
 - c) The invoice / credit note for the Rate of Exchange adjustment applicable to the specific order.
14. In exceptional circumstances, and subject to the Employer's explicit approval, Rate of Exchange variations on Goods or components that are imported in bulk in advance in fulfilment of the contract requirements or to create buffer stocks, but not specifically in response to specific purchase orders placed by the Employer in accordance with the contract, shall be based upon whichever of the following two methodologies is more advantageous to the Employer:
- a) Methodology 1: A spot quotation for the Forward Cover Contract rate for the imported portion of the Goods, based upon the FCC Value Date for the particular purchase order(s), as outlined in clause 11 above.
 - b) Methodology 2: The actual Rate of Exchange cost variations incurred in fulfilment of the purchase order(s), fully substantiated by detailed Bills of Lading and Customs Invoice applicable to the particular Goods delivered. The applicable Rate of Exchange shall be the rate as defined on the Customs Invoice for the imported Goods.
 - c) Determination of the more advantageous methodology shall be conducted and approved following delivery of the imported Goods or components to the Supplier but prior to delivery of the Goods to the Employer.
15. Approval of the process detailed in Clause 13 and sub-clauses above shall be on an order by order basis and application shall be submitted, with required supporting documents, immediately on receipt of the relevant purchase order(s).

F.1. (G) GOODS AND/OR COMPONENTS IMPORTED FROM OUTSIDE OF SOUTH AFRICA - MANUFACTURER/SUPPLIER PRICE/QUOTATION LIST

- 1. Manufacturer's / Supplier's Pricelist / Quotation Based CPA – Imported Goods or Components:**
- 1.1 Tenderers with imported Goods or Components may claim contract price adjustment based on the overseas SUPPLIER'S / MANUFACTURER'S PRICE LISTS/ QUOTATION from the supplier or manufacturer of the tendered items.
 - 1.2 In such cases the Tenderer is required to submit with his tender a copy of the original overseas Supplier / Manufacturer Pricelist / Quotation upon which his tender prices are based. Such pricelist / Quotation is required to be on the Letterhead of the Supplier / Manufacture, is to be dated, referenced and signed, and is to provide clear reference to the tender number or unambiguously indicate the relevant component.
 - 1.3 The Tenderer is required to clearly reference each item quoted to the respective Tender Item Number indicated in C.4 Price Schedule by completing Table F.1 (G).1 below.

Table F.1 (G).1: Price Schedule information for Imported Goods or Components - Manufacturers/Suppliers Price List(s)/Quotation

Manufacturer/ Supplier Name	Price List Information		
	Price List/Quotation Date.	Price List/Quotation Reference Number	Pricelist applicable to Items as per C.4 Price Schedule

- 1.4 During the contract period, the Tenderer (now Supplier) must submit the request for price adjustment based on increases in pricelists of manufacturers/suppliers prior to the effective date of the increase in the pricelist.
- 1.5 The effective date of any price adjustment granted will be the first day of the month following the month during which the fully substantiated application for contract price adjustment is submitted or, by agreement between the Tenderer/Supplier and the CCT, a subsequent date on which the price adjustment will become effective.
- 1.6 In instances where the Supplier's price adjustment claimed is less than entitled, the lesser price will be accepted.
- 1.7 Only the difference in source supplier / manufacturer pricelist (actual cost, not percentage) may be adjusted and under no circumstances may the Tenderer/Supplier increase their profit margin.
- 1.8 The Tenderer/Supplier shall, when submitting claims for contract price adjustment, submit all of the documentation indicated below a minimum of two weeks prior to the effective date of the contract price adjustment:
 - a) Copies of price lists upon which original tender prices were based (refer to Clause 1.2, Table F.1 (G).1 above) clearly indicating the item(s) according to C.4 Price Schedule.
 - b) The new price list (*from the same Supplier / Manufacturer as originally tendered*) on the relevant manufacturer/suppliers letterhead (with pamphlets, brochures and e-mail communication) clearly indicating the item(s) according to C.4 Price Schedule.
 - c) Submit detailed calculations indicating how the "new" price is calculated. The calculations must be submitted in Excel, together with a signed, "PDF" version of the Excel spreadsheet. The example below – Table F.1(G).2, is what is required.
 - d) A covering letter on the Supplier's letterhead requesting the CPA with the effective date of the claim.
- 1.9 The CCT will consider the request and either refer the request back for correction or additional information or approve the request.
- 1.10 The CCT will assess such pricelist based CPA claims and will only approve such claims that are confirmed to be reasonable and market related with reference to the source pricing information provided with the tender and with the CPA application
- 1.11 Approval of the CPA request including confirmation of the effective date, will be communicated to the Supplier in writing. The effective date will be as per clause 1.3 above.

Tender No.: 250S/2024/25

- 1.12 The successful Tenderer/Supplier shall immediately upon notification of the commencement date of contract submit written application for approval of any adjusted unit prices for the Goods that may have been notified by the Supplier / Manufacturer of the Goods, together with the required supporting documentation. This application will be assessed in accordance with the process laid out above in order to determine approved contract prices at the commencement of the contract.
- 1.13 Failure to submit such application within two working weeks of commencement of contract shall result in the tendered unit prices being applied for initial orders placed following commencement of the contract.
- 1.14 In the event of a Supplier changing their Supplier / Manufacturer during the tenure of the contract, no request for price variations will be considered unless the Supplier has obtained prior approval from the City for the change of Supplier / Manufacturer. Such approval shall include technical approval by the Engineer of the goods supplied by the replacement Supplier / Manufacturer. Technical approval by the Engineer shall be a prerequisite for any change of Supplier / Manufacturer.

Table F.1(G).2 – Pro Forma Table for Adjustments in price for Imported Goods or Components - Manufacturers/Suppliers Price List(s)/Quotation

C.4 Price Schedule Item No.	Original Tender Price	Previous and New Price List Information					New Contract Price (Excl. VAT)
		Manufacturer/Supplier	Material no.	Price as per previous Manufacturer/Supplier Price List (Excl. Vat) Price List Date:_____	Price as per new Supplier/Manufacturer Price List (Excl. Vat) Price List Date:_____	Difference between the previous and new manufacturer Price list (C)-(B)	
	(A)			(B)	(C)	(D)	(A)+(D)

OR

2. Supplier Price List Variations for Suppliers Supplying Goods Imported by Another Party

- 2.1 The Tenderers (now Supplier) that are not the director importer of the manufactured goods/components, and intend to purchase the goods from another supplier who in turn is importing the goods, may apply for Supplier / Manufacturer Pricelist / Quotation based CPA imported by a another Party.
- 2.2 In such cases the Tenderer is required to submit with his tender a copy of the original Supplier / Manufacturer Pricelist / Quotation upon which his tender prices are based. Such pricelist / Quotation is required to be on the Letterhead of the Supplier / Manufacture, is to be dated, referenced and signed, and is to provide clear reference to the tender number, exchange rate on which the quote is based and is required to clearly reference each item quoted to the respective Tender Item Number indicated in C.4 Price Schedule.
- 2.3 The tenderer shall further confirm the Manufacturer / supplier, Quotation date, exchange rate at date of quote and reference number and applicable tender Items by completing Table F.1(G).3 below.

Table F.1 (G).3: Price Schedule information for Imported Goods or Components, imported by Another Party Manufacturers/Suppliers Price List(s)/Quotation

Price List Information				
Manufacturer/ Supplier Name	Price List/Quotation Date.	Price List/Quotation Reference Number	Exchange Rate on which quote is based	Pricelist applicable to Items as per C.4 Price Schedule
			_____ 1 : Rand _____	
			_____ 1 : Rand _____	
			_____ 1 : Rand _____	
			_____ 1 : Rand _____	

- 2.4 During the contract period, the Tenderer (now Supplier) must submit the request for price adjustment based on increases in pricelists of manufacturers/suppliers within seven calendar days of the date of the purchase order date.
- 2.5 The price adjustment claim will be fully substantiated and the approval will be limited to the relevant Purchase Order.
- 2.6 In instances where the Supplier's price adjustment claimed is less than entitled, the lesser price will be accepted.
- 2.7 Only the difference in source supplier / manufacturer pricelist (actual cost, not percentage) may be adjusted and under no circumstances may the Tenderer/Supplier increase their profit margin.
- 2.8 The Tenderer/Supplier shall, when submitting claims for contract price adjustment, submit all of the documentation indicated below a minimum of seven (7) days from date of purchase order:
- a) Copies of price lists upon which original tender prices were based (refer to Clause 2.2, Table 2 above) clearly indicating the item(s) according to C.4 Price Schedule.
 - b) The new price list (*from the same Supplier / Manufacturer as originally tendered*) on the relevant manufacturer/suppliers letterhead (with pamphlets, brochures and e-mail communication) clearly indicating the item(s) according to C.4 Price Schedule.
 - c) Submit detailed calculations indicating how the "new" price is calculated.
 - d) A covering letter on the Supplier's letterhead requesting the CPA with the effective date of the claim.
- 2.9 The CCT will consider the request and either refer the request back for correction or additional information or approve the request.
- 2.10 The CCT will assess such pricelist based CPA claims and will only approve such claims that are confirmed to be reasonable and market related with reference to the source pricing information provided with the tender and with the CPA application
- 2.11 Approval of the CPA request for the relevant Purchase Order (refer to clause 2.5 above), will be communicated to the Supplier in writing.

Schedule F.2: Certificate of Authority for Partnerships/ Joint Ventures/ Consortiums

This schedule is to be completed if the tender is submitted by a partnership/joint venture/ consortium.

1. We, the undersigned, are submitting this tender offer as a partnership/ joint venture/ consortium and hereby authorize Mr/Ms _____, of the authorised entity _____, acting in the capacity of Lead Partner, to sign all documents in connection with the tender offer and any contract resulting from it on the partnership/joint venture/ consortium’s behalf.

2. By signing this schedule the partners to the partnership/joint venture/ consortium:
 - 2.1 warrant that the tender submitted is in accordance with the main business and objectives of the partnership/joint venture/ consortium;
 - 2.2 agree that the CCT shall make all payments in terms of this Contract into the following bank account of the Lead Partner:
 Account Holder: _____
 Financial Institution: _____
 Branch Code: _____
 Account No.: _____
 - 2.3 agree that in the event that there is a change in the partnership/ joint venture/ consortium and/or should a dispute arise between the partnership/joint venture/ consortium partners, that the CCT shall continue to make any/all payments due and payable in terms of the Contract into the aforesaid bank account until such time as the CCT is presented with a Court Order or an original agreement (signed by each and every partner of the partnership/joint venture/ consortium) notifying the CCT of the details of the new bank account into which it is required to make payment.
 - 2.4 agree that they shall be jointly and severally liable to the CCT for the due and proper fulfilment by the successful tenderer/supplier of its obligations in terms of the Contract as well as any damages suffered by the CCT as a result of breach by the successful tenderer/supplier. The partnership/joint venture/ consortium partners hereby renounce the benefits of excussion and division.

SIGNED BY THE PARTNERS OF THE PARTNERSHIP/ JOINT VENTURE/ CONSORTIUM		
NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
Lead partner		Signature..... Name..... Designation.....
		Signature..... Name..... Designation.....
		Signature..... Name..... Designation.....
		Signature..... Name..... Designation.....

Note: A copy of the Joint Venture Agreement shall be appended to *List of Other Documents Attached by Tenderer Schedule*.

Schedule F.3: Declaration for Procurement above R10 million

If the value of the transaction is expected to exceed R10 million (VAT included) the tenderer shall complete the following questionnaire, attach the necessary documents and sign this schedule:

1. Are you by law required to prepare annual financial statements for auditing? **(Please mark with X)**

YES		NO	
-----	--	----	--

If YES, submit audited annual financial statements:

- (i) For the past three years, or
- (ii) Since the date of establishment of the tenderer (if established during the past three years)

By attaching such audited financial statements to **List of Other Documents Attached by Tenderer Schedule**.

2. Do you have any outstanding undisputed commitments for municipal services towards the CCT or other municipality in respect of which payment is overdue for more than 30 (thirty) days? **(Please mark with X)**

YES		NO	
-----	--	----	--

2.1 If NO, this serves to certify that the tenderer has no undisputed commitments for municipal services towards any municipality for more than three (3) (three) months in respect of which payment is overdue for more than 30 (thirty) days.

2.2 If YES, provide particulars:

3. Has any contract been awarded to you by an organ of state during the past five (5) years? **(Please mark with X)**

YES		NO	
-----	--	----	--

If YES, insert particulars in the table below including particulars of any material non-compliance or dispute concerning the execution of such contract. Alternatively attach the particulars to **List of Other Documents Attached by Tenderer** schedule in the same format as the table below:

Organ of State	Contract Description	Contract Period	Non-compliance/dispute (if any)

4. Will any portion of the goods or services be sourced from outside the Republic, and if so, what portion and whether any portion of payment from the CCT is expected to be transferred out of the Republic? **(Please mark with X)**

YES		NO	
-----	--	----	--

If YES, furnish particulars below

The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract, restriction of the tenderer or the exercise by the CCT of any other remedies available to it.

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.4: Preference Points Claim Form In Terms Of the 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

1.2 To be completed by the organ of state

The applicable preference point system for this tender is the 80/20 preference point system.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

The following definitions shall apply to this schedule:

- (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

POINTS AWARDED FOR PRICE

THE 80/20 PREFERENCE POINT SYSTEMS

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

80/20

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

POINTS AWARDED FOR PRICE

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

80/20

5. POINTS AWARDED FOR SPECIFIC GOALS

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

5.2 In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 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 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 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 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 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	To be Completed by the Organ of State		To be Completed by the Tenderer	
		Number of points Allocated (80/20 system)		Number of points claimed (80/20 system)
Gender		5		
Race		5		
Disability		3		
Promotion of Micro and Small Enterprises		7		

DECLARATION WITH REGARD TO COMPANY/FIRM

5.3 Name of company/firm.....

5.4 Company registration number:

5.5 TYPE OF COMPANY/ FIRM

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

State Owned Company

[Tick applicable box]

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

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 4.1 and 4.2, the Supplier may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or Supplier, 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.

<i>Signature of Tenderer</i>	<i>Date</i>	<i>Name and Surname</i>	<i>Address</i>

For official use.		
SIGNATURE OF CCT OFFICIALS AT TENDER OPENING		
1.	2.	3.

Schedule F.5: Declaration of Interest – State Employees (MBD 4 amended)

1. No bid will be accepted from:
 - 1.1 persons in the service of the state¹, or
 - 1.2 if the person is not a natural person, of which any director, manager or principal shareholder or stakeholder is in the service of the state, or
 - 1.3 from persons, or entities of which any director, manager or principal shareholder or stakeholder, has been in the service of the City of Cape Town (CCT) during the previous twelve (12) months, or
 - 1.4 from an entity who has employed a former CCT employee who was at a level of T14 or higher at the time of leaving the CCT's employ and involved in any of the CCT's bid committees for the bid submitted, if:
 - 1.4.1 the CCT employee left the CCT's employment voluntarily, during the previous twelve (12) months;
 - 1.5 a person who was a CCT employee, or an entity that employs a CCT employee, if
 - 1.5.1 the CCT employee left the CCT's employment whilst under investigation for alleged misconduct, or
 - 1.5.2 was facing disciplinary action or potential disciplinary action by the CCT, or
 - 1.5.3 was involved in a dispute against the CCT during the previous thirty six (36) months.

2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the tenderer or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

3. In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.
 - 3.1 Full Name of tenderer or his or her representative: _____
 - 3.2 Identity Number: _____
 - 3.3 Position occupied in the Company (director, trustee, shareholder²): _____
 - 3.4 Company or Close Corporation Registration Number: _____
 - 3.5 Tax Reference Number: _____
 - 3.6 VAT Registration Number: _____
 - 3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.
 - 3.8 Are you presently in the service of the state? **YES / NO**
 - 3.8.1 If yes, furnish particulars: _____
 - 3.9 Have you been in the service of the state for the past twelve months? **YES / NO**
 - 3.9.1 If yes, furnish particulars: _____
 - 3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid? **YES / NO**
 - 3.10.1 If yes, furnish particulars: _____
 - 3.11 Are you, aware of any relationship (family, friend, other) between any other tenderer and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? **YES / NO**
 - 3.11.1 If yes, furnish particulars: _____
 - 3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**
 - 3.12.1 If yes, furnish particulars: _____

- 3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**
 3.13.1 If yes, furnish particulars: _____
- 3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract? **YES / NO**
 3.14.1 If yes, furnish particulars: _____
- 3.15 Have you, or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company been in the service of the CCT in the past twelve months? **YES / NO**
 3.15.1 If yes, furnish particulars: _____
- 3.16 Do you have any employees who was in the service of the CCT at a level of T14 or higher at the time they left the employ of the CCT, and who was involved in any of the CCT's bid committees for this bid? **YES / NO**
 3.16.1 If yes, furnish particulars: _____

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

Full Name	Identity Number	State Employee Number

If the above table does not sufficient to provide the details of all directors / trustees / shareholders, please append full details to the tender submission.

The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract, restriction of the tenderer or the exercise by the CCT of any other remedies available to it.

 Signature
 Print name: _____ Date
 On behalf of the tenderer (duly authorised)

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

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

Schedule F.6: Conflict of Interest Declaration

1. The tenderer shall declare whether it has any conflict of interest in the transaction for which the tender is submitted. **(Please mark with X)**

YES		NO	
-----	--	----	--

1.1 If yes, the tenderer is required to set out the particulars in the table below:

2. The tenderer shall declare whether it has directly or through a representative or intermediary promised, offered or granted:

2.1 Any inducement or reward to the CCT for or in connection with the award of this contract; or

2.2 Any reward, gift, favour or hospitality to any official or any other role player involved in the implementation of the supply chain management policy. **(Please mark with X)**

YES		NO	
-----	--	----	--

If yes, the tenderer is required to set out the particulars in the table below:

Should the tenderer be aware of any corrupt or fraudulent transactions relating to the procurement process of the CCT, please contact the following:

The CCT's anti-corruption hotline at 0800 32 31 30 (toll free)

The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract, restriction of the tenderer or the exercise by the CCT of any other remedies available to it.

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.7: Declaration of Tenderer's Past Supply Chain Management Practices (MBD 8)

Where the entity tendering is a partnership/joint venture/consortium, each party to the partnership/joint venture/consortium must sign a declaration in terms of the Municipal Finance Management Act, Act 56 Of 2003, and attach it to this schedule.

- 1 The tender offer of any tenderer may be rejected if that tenderer or any of its directors/members have:**
- a) abused the municipality's / municipal entity's supply chain management system or committed any fraudulent conduct in relation to such system;
 - b) been convicted for fraud or corruption during the past five years;
 - c) willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004) or Database of Restricted Suppliers.
- 2 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
2.1	<p>Is the tenderer or any of its directors/members listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector?</p> <p>(Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied).</p> <p>The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.1.1	If so, furnish particulars:		
2.2	<p>Is the tenderer or any of its directors/members listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004) or Database of Restricted Suppliers?</p> <p>The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.2.1	If so, furnish particulars:		
2.3	<p>Was the tenderer or any of its directors/members convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.3.1	If so, furnish particulars:		

Item	Question	Yes	No
2.4	Does the tenderer or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.4.1	If so, furnish particulars:		
2.5	Was any contract between the tenderer and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.5.1	If so, furnish particulars:		

The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract,, restriction of the tenderer or the exercise by the CCT of any other remedies available to it.

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.8: Authorisation for the Deduction of Outstanding Amounts Owed to the CCT

To: THE CITY MANAGER, City of Cape Town

From: _____
(Name of tenderer)

RE: AUTHORISATION FOR THE DEDUCTION OF OUTSTANDING AMOUNTS OWED TO THE CCT

The tenderer:

- a) hereby acknowledges that according to SCM Regulation 38(1)(d)(i) the City Manager may reject the tender of the tenderer if any municipal rates and taxes or municipal service charges owed by the tenderer (or any of its directors/members/partners) to the CCT, or to any other municipality or municipal entity, are in arrears for more than 3 (three) months; and
- b) therefore hereby agrees and authorises the CCT to deduct the full amount outstanding by the Tenderer or any of its directors/members/partners from any payment due to the tenderer; and
- c) confirms the information as set out in the tables below for the purpose of giving effect to b) above;

Physical Business address(es) of the tenderer	Municipal Account number(s)	Inside the CCT municipal boundary (Yes/No)

If there is not enough space for all the names, please attach the information to **List of other documents attached by tenderer** schedule in the same format:

Name of Director / Member / Partner	Identity Number	Physical residential address of Director / Member / Partner	Municipal Account number(s)	Inside the CCT municipal boundary (Yes/No)

The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract, restriction of the tenderer or the exercise by the CCT of any other remedies available to it.

Signature
Print name:
On behalf of the tenderer (duly authorised)

Date

Schedule F.9: Certificate of Independent Tender Determination

I, the undersigned, in submitting this tender number **250S/2024/25/2023/24** and tender description: **Maintenance Service, Calibration, Supply, Installation and Replacement of Various Process Control Systems used within Bulk Water Infrastructure** in response to the tender invitation made by THE CCT, do hereby make the following statements, which I certify to be true and complete in every respect:

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

1. I have read and I understand the contents of this Certificate;
2. I understand that this tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorised by the tenderer to sign this Certificate, and to submit this tender, on behalf of the tenderer;
4. Each person whose signature appears on this tender has been authorised by the tenderer to determine the terms of, and to sign, the tender on behalf of the tenderer;
5. For the purposes of this Certificate and this tender, I understand that the word 'competitor' shall include any individual or organisation other than the tenderer, whether or not affiliated with the tenderer, who:
 - (a) has been requested to submit a tender in response to this tender invitation;
 - (b) could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer.
6. The tenderer has arrived at this tender independently from and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium¹ will not be construed as collusive price quoting.
7. In particular, without limiting the generality of paragraphs 5 and 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation);
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit a tender;
 - (e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - (f) tendering with the intention not to win the contract.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender invitation relates.
9. The terms of this tender have not been and will not be disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act, Act 89 of 1998, and/o/r may be reported to the National Prosecuting Authority (NPA) for criminal investigation, and/or may be restricted from conducting business with the public sector for a period not exceeding 10 (ten) years in terms of the Prevention and Combating of Corrupt Activities Act, Act 12 of 2004, or any other applicable legislation.

Signature

Print name:

On behalf of the tenderer (duly authorised)

Date

(¹ Consortium: Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the

Schedule F.11: List of Other Documents Attached By Tenderer
--

The tenderer has attached to this schedule, the following additional documentation:

	Date of Document	Title of Document or Description (refer to clauses / schedules of this tender document where applicable)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		

Attach additional pages if more space is required.

Signature

Print name:

On behalf of the tenderer (duly authorised)

Date

Schedule F.12: Record of Addenda to Tender Documents

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

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.13: Information to Be Provided With the Tender

The following information shall be provided with the Tender:

1. Schedule F.13A1, F.13A2, F.13A3 : Tendering entity track record
2. Schedule F.13B: key personnels together with their CV's
3. Schedule F.13C: Demonstration of Company's experties
4. Technical brochure of various range of Process Control System, and Instrumentation items being offered priced in C.4 price schedule.

Signature
Print name:
On behalf of the tenderer (duly authorised)

Date

Schedule F.13A1: Track Record of Service Provider

The Tenderer is referred to **Clause 2.2.1.1.4** of the tender data to provide details on this schedule of the Tendering entity to show proof of control and instrumentation projects/maintenance activities successfully completed in the past 3 years in order for the Tenderer to be deemed responsive

Where the entity is a joint venture, the tract record of each party to the joint venture must be submitted as part of this schedule (additional pages may be added if necessary).

Applicable to Category A					
item	Project Description <i>(Scope of work describing work undertaken)</i>	Client Details <i>(company name, contact name, and phone number)</i>	Start Date	End Date	Project Value <i>(Minimum Project Value R100 000)</i>
Installation, Replacement, and Upgrade of PLC, and SCADA Systems					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
Repairs, Replacement, or Installation of Instrumentation Systems					
1.					
2.					
3.					
4.					
5.					
Repairs, Replacement, or Installation of Telemetry Systems					
1.					
2.					
3.					
4.					
5.					

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.13A2: Track Record of Service Provider

The Tenderer is referred to **Clause 2.2.1.1.4** of the tender data to provide details on this schedule of the Tendering entity to show proof of off-site and on-site verification, calibration, and repairs of inline-analytical Instruments, pressure/temperature instruments, clamp-on flow meters, and load-cells activities successfully completed in the past 3 years in order for the Tenderer to be deemed responsive

Where the entity is a joint venture, the tract record of each party to the joint venture must be submitted as part of this schedule (additional pages may be added if necessary).

Applicable to Category B, C, D, and E						
item	Relevant Project/Contract Name	Client Details <i>(company name, contact name, and phone number)</i>	Number of Sites maintained <i>(Location where work was performed)</i>	Start Date	End Date	Contract Value
Calibration, Verification, Replacement, and Installation of Pressure/Temperature.						
1.						
2.						
3.						
4.						
5.						
Calibration, Verification, Replacement, and Installation of Clamp-ON Flow Meters.						
6.						
7.						
8.						
9.						
10.						
Calibration, Verification, Replacement, and Installation of Load-cells, Platform scales, and Silo's.						
6.						
7.						
8.						
9.						
10.						

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.13A3: Track Record of Service Provider

The Tenderer is referred to **Clause 2.2.1.1.4** of the tender data to provide details on this schedule of the Tendering entity to show proof of off-site and on-site calibration, verification of portable and fixed gas monitors successfully completed in the past 3 years in order for the Tenderer to be deemed responsive

Where the entity is a joint venture, the tract record of each party to the joint venture must be submitted as part of this schedule (additional pages may be added if necessary).

Applicable to Category F, G and H						
item	Relevant Project/Contract Name	Client Details <i>(company name, contact name, and phone number)</i>	Number of Sites maintained <i>(Location where work was performed)</i>	Start Date	End Date	Contract Value
Calibration, Verification, Replacement, and Repairs of Portable Gas Monitors						
6.						
7.						
8.						
9.						
10.						
Calibration, Verification, Replacement, and Installation of Fixed Gas Monitors						
11.						
12.						
13.						
14.						
15.						

 Signature
 Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.13B: Key Personnel Qualification and Experience

Position	Name and Surname	Qualification (eg: <i>BTech, Bsc, BEng, ND, ND.</i>)	Qualification Type (<i>Electrical Eng, Mechatronic</i>)	Year's of Relevent Experience
Process Control System Project Manager				
Control and Instrumentation Engineer/Technologist				
Control and Instrumentation Technician / Calibration Technician				
Instrument Artisa/Mechanician/Electrical Artisan				

 Signature Print name:
 On behalf of the tenderer (duly authorised)

 Date

Schedule F.13C: Demonstration of Company's Expertise

The Tenderer shall provide information for the functionality criteria listed in this Returnable Schedule.

The Tenderer is referred to **Clause 2.2.1.1.4** of the tender data to provide evidence of OEM certification/Partnership, SANAS accreditation, and/or ISO 9001:2015 certification. In addition to this schedule the Tenderer shall provide memorandum of agreement if some of the work will be outsourced.

Certification/Partnership/Accreditation	YES/NO	
Proof of PLC OEM Certification/Partnership (Applicable to Category A)		
Proof of SCADA Certification/Partnership (Applicable to Category A)		
Proof of SANAS Accreditation (Applicable to Category (B,C,D,E,F,G,H))		
Proof of ISO 9001:2015 Certification (Applicable to Category B,C,D,E,F,G,H)		
Proof of Memorandum of Agreement if some of the work will be outsourced		

 Signature Print name:
 On behalf of the tenderer (duly authorised)

 Date

