SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF ALTERNATIVE WATER RETICULATION INFRASTRUCTURE (TO SUPPLY WATER TO ABLUTION BLOCKS AS BACKUP, TO MITIGATE EFFECTS OF MUNICIPAL WATER SUPPLY OUTAGES) AT ROTATING MACHINES DEPOT.

150 EEL ROAD, UMBILO INDUSTRIAL, UMBILO.

REFERENCE NO.: FAI_DBN_ SPEC_020

Scope Revision: 1

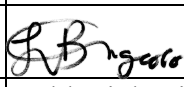
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1. INTRODUCTION

This specification is for the:

#	TASK	REQUIRED
1	Design	
2	Manufacture	
3	Supply	✓
4	Installation	✓
5	Documentation	✓
6	Testing	✓
7	Training	
18	Commissioning	✓

of the specified:

#	ITEM	REQUIRED
	Supply, delivery, installation, testing and commissioning of alternative water reticulation infrastructure (to supply water to ablution blocks and administration buildings as backup, to mitigate effects of municipal water supply outages) at RM Depot.	✓

This specification states the minimum requirements relating to the work and in no way absolves the contractor from responsibility for sound engineering/ethical practice.

Any omissions or sub-standard requirements of this specification must be brought to the attention of Transnet Engineering at tender stage and optional prices for addressing such omissions must be provided.

2. SITE INSPECTION

2.1 All prospective contractors shall be required to undertake a compulsory site inspection to fully acquaint themselves with all aspects involved.

2.2 Arrangements to visit the site and confirmation of the date and time of the site inspection shall be made with Transnet Engineering Contract Manager.

2.3 The site inspection certificate shall be completed and countersigned by the Contract Manager on the day of the visit and must be submitted with the tender documents.

3. INFORMATION REQUIRED

3.1 Offers will not be considered unless full particulars and sufficient literature are provided at the tendering stage to enable Transnet Engineering Technical Officers the opportunity to assess each technical offer properly.

3.2 Prospective Contractors will complete the relevant questionnaire in full and must indicate whether their offer complies with each item of the specification.

3.3 Should there be insufficient space for furnishing full details; contractors shall provide the additional details in their covering letter. The additional details shall be numbered in accordance with the applicable clause specified in the specification.

3.4 As prospective contractors are considered to be experts in their field, they are obliged to identify any shortcomings, such as omissions or sub-standard requirements, to the completeness of this specification. These must be brought to the attention of Transnet Engineering at tender stage with alternatives to address these shortcomings. However, each offer shall be quoted for separately.

4. TECHNICAL REQUIREMENTS

4.1 Except where otherwise provided for in the specification, all equipment offered will comply with the requirements of the relevant standard specifications of the SABS, if published, otherwise with the relevant standard of the British Standards Institution in force at the time of tendering.

4.2 Where equipment offered complies with the recognized standards of the country of manufacture and not specifically with the standards required by this specification, such equipment will be considered at the discretion of Management. In this case, tenders shall state fully all respects in which the equipment departs from the standard laid down in this specification.

4.3 The successful tender will at the conclusion of the installation provide a document along the lines "that the installation complies with national/international requirements and that all selected /designed items are compliant with Act 85 of 1993 and SABS practices applicable to the installation. The equipment has been commissioned/ calibrated and employees as specified have been trained and found competent to operate the plant."

The work shall be done in accordance to the following legislations, regulations and standards:

- **SANS 10142-1 The wiring of premises Part 1: Low-voltage installations.**
- **Occupational Health and Safety Act and Regulations 85 of 1993.**

5. SPECIFIC REQUIREMENTS

Any person with the intention of tendering shall ensure that the information below is complied with.

5.1 Scope of work

Item no.	REQUIRED
5.1.1	Read this scope of work with Annexure 1 (Transnet contractor safety, health and environmental management specification guidelines TRN-IMS-GRP-GDL-014. 2).
5.1.2	The service provider is required to submit a SHE Contractor Compliance file (Index to be provided to the successful service provider); - This file shall be submitted after the Purchase Order has been issued, not at tender stage.
5.1.3	• The purpose of this tender is to provide alternative method of supplying water to the ablution and administration blocks in a case of municipality water outage. • Water will be supplied via tanks by making use of booster pumps.
5.1.4	Each water tank shall:Come with a 10-year warranty.Be manufactured with virgin LLDPE. • Have UV-protected outer layers to withstand all weather conditions. • Be BPA-free, food-grade layer to prevent leaching of harmful chemicals and to protect the

	quality of the water stored. • Have inner layers to prevent algae formation and growth.
Item no.	**REQUIRED**
5.1.5	• Clear water level side gauge pipe, with readings to reflect the full capacity of water tank, depending on the size of water tank. It shall be possible to read water level to enable Transnet Engineering to quantify water inside each tank and water delivered by the supplier. • Information of the required plinths is documented on Annexure 2.
5.1.6	• The contractor shall correctly size the power cable, wires for the circuits (main and control). • Motors and pumps shall be installed with a VSD compatible to the motor and the rest of the installation. • Motors and pumps shall have necessary protection. • On completion, the contractor shall issue the certificates of compliance, in accordance with SANS 10142, for each installation.
5.1.7	**The following must be supplied on commissioning:** • Electrical certificate of compliance. **The following documents to be submitted in 3 sets of hard copies and 1 set of pdf file in a USB memory stick** • Mechanical and electrical schematic drawings for all components. • Operational and Maintenance manuals • Parts catalogue. • Part numbers.

5.2 The Required materials / spares and activities are as follows

Item	Quantity
RM – Ablutions and canteen areas	
1. Clear, prepare surface, construct new concrete slab (size 4m x 4m x 0.2m) not less than 25Mpa/19mm concrete slab on a compacted surface with Ref 245 mesh (galvanised) and water proofing membrane underneath	**2**
2.Water tank 10000ℓ	**2**
3.Top inlet, water tank filling socket	**2**
4. Outlet, draining socket discharge, 2 inch	**2**
5. Reducer, 54mm x 42mm	**2**
6. Mechanical ball valve, 2 inch galvanised with flanges to connect to 2 inch PVC pipe	**10**
7. T piece with flanges to connect to 2 inch PVC pipe	**2**
8. Ball valve @ 65mm with flanges for PVC pipe.	**2**
9. T compression fitting, 2 inch	**2**

10. Closed coupled pump with VSD and accumulator tank. The DAB K 55/200T Single-impeller centrifugal pump: Q: 6-20m^{3}h P1: 5.1 kW , P2: 5.5HP Flow Rate: 18 m³/h (300 l/min) Maximum Delivery Head: 54 m IP54 3 X 230D V 16.3A 100%η =84.6, 75% = 84η, 50% η =83 3 X 400Y V 9.4A 100%η =84.6, 75% = 84η, 50% η =83 ESCC, DNM=1" ¼ 2880 l/min Liquid Temperature Range: -15 °C to +110 °C Iin : 17.5A max, Iout : 13.3A max Pin : 6800W max PN max : 13 bar IP 55 TF 50 S1 **Accumulator tank** Model: PEB-24LX Type :MTPE-24XL-100BT-19-SSC-CSS-AMD-EW Max . working pressure : 10bar Test Pressure: 14.3bar Connection : 1" **Temp Max:** 90°C / 194°F **Temp Min: -10^{0}C** **Pressure Pre-charge:** 1.9 bar / 28 psi **Nominal Volume:** 24 Liter / 6.34 Gallon **Connection:** 1" BSPT (M) **Color:** Almond **Pressure Max:** 10 bar / 150 psi **Diameter:** 29 cm / 11.4 in	**2**
11. 2 inch non-return valve copper pipe compression fitting	**2**
12. 2 inch PVCu (Class 16)	**50m**
13. 65mm PVCu (Class 16)	**3m**
14. Gauge	**2**
15. Testing and commissioning	**2**
16. The electrical contractor shall do the electrical installation, test and issue the COC.	**2**

Item	Quantity
RM – Admin Building	
17. Clear, prepare surface, construct new concrete slab (size 4m x 4m x 0.2m) not less than 25Mpa/19mm concrete slab on a compacted surface with Ref 245 mesh (galvanised) and water proofing membrane underneath	**1**
18. Water tank 5000ℓ	**1**
19. Water tank 10000ℓ	**1**
20. Top inlet, water tank filling socket	**1**
21. Reducer, 54mm x 42mm	**1**
22. Mechanical ball valve, 2 inch galvanised with flanges to connect to 2 inch PVC pipe	**5**
23. T piece with flanges to connect to 2 inch PVC pipe	**1**
24. Ball valve @ 65mm with flanges for PVC pipe.	**1**
25. T compression fitting, 2 inch	**1**
26. Close coupled pump with VSD and accumulator tank. The DAB K 55/200T Single-impeller centrifugal pump: Q: 6-20m^3h P1: 5.1 kW , P2: 5.5HP Flow Rate: 18 m^3/h (300 l/min) Maximum Delivery Head: 54 m IP54 3 X 230D V 16.3A 100%η =84.6, 75% = 84η, 50% η =83 3 X 400Y V 9.4A 100%η =84.6, 75% = 84η, 50% η =83 ESCC, DNM=1” ¼ 2880 l/min Liquid Temperature Range: -15 °C to +110 °C Iin : 17.5A max, Iout : 13.3A max Pin : 6800W max PN max : 13 bar IP 55 TF 50 S1 Accumulator tank Model: PEB-24LX Type :MTPE-24XL-100BT-19-SSC-CSS-AMD-EW Max . working pressure : 10bar Test Pressure: 14.3bar Connection : 1” Temp Max: 90°C / 194°F Temp Min: -100C Pressure Pre-charge: 1.9 bar / 28 psi Nominal Volume: 24 Liter / 6.34 Gallon	**1**

Connection: 1" BSPT (M) Color: Almond Pressure Max: 10 bar / 150 psi Diameter: 29 cm / 11.4 in	
2 inch non-return valve copper pipe compression fitting	**3**
27. 2 inch PVCu (Class 16)	**25m**
28. 65mm PVCu (Class 16)	**1.5m**
29. Gauge	**1**
30. Testing and commissioning	**1**
31. The electrical contractor shall do the electrical installation, test and issue the COC.	**1**

5.4 Testing and commissioning

- Compliance inspections and tests shall be completed by a registered person in respect of an electrical installation or part of an electrical installation and a certificate of compliance with a unique number obtainable from the chief inspector, or a person appointed by the chief inspector in the form of annexure 1.

5.5 Commissioning

- **A testing period of 1 month (744 hours for 24/7 shifts and 248 hours for 8 hour shifts).**
- **Confirmation shall be given on site visits and minutes captured.**
- **No machinery will be accepted by Transnet without the satisfaction of the conditions above.**
- The contractor shall be fully responsible for any damage caused to all supplied equipment and to Transnet Engineering's assets during the installation, testing and commissioning.

5.6 Maintenance

- The maintenance plan shall be for 24 months. The tenderers shall include the maintenance plan. The quote for maintenance plan shall be added on the Schedule of prices.

5.7 Spares

- The tenderers shall indicate the availability and required lead times for the spares considered to be critical for the successful operation of the equipment.

5.8 Warranty

- **The warranty period shall be 2 years.**
- **A maintenance contract for the warranty period shall be included in the quoted price and shall involve Transnet employees to learn.**

5.9 After-Sales Service

- The successful tenderer shall provide Transnet Engineering with acceptable proof that spares can be easily and speedily procured for the equipment within 14 working days through agents locally.

6. PENALTIES

Due to the criticality of this project, penalties will be levied for late deliveries.

7. OTHER INFORMATION RELATED TO THE SCOPE

This specification states the minimum requirements relating to the work and in no way absolves the contractor from responsibility for sound engineering practice.

Any omissions or sub-standard requirements of this specification must be brought to the attention of Transnet Engineering at tender stage and optional prices for addressing such omissions must be provided.

7.1 Any matter relating to this work, which requires a decision from Transnet Engineering shall be presented to the Project Manager in charge.

7.2 All offers shall be completed in every respect with this specification. Only completed tenders shall be considered.
The Technical Officer reserves the right to have the proposal checked independently by a third party.

Tenders must allow for monthly progress and clarification meetings on site initially and after commissioning for defect meetings when required. A meeting will be held after issuing of the tender to establish the exact scope and magnitude of the contract. No tender will be considered unless it has this certificate signed by the Engineer or his representative.

8. HEALTH AND SAFETY REQUIREMENTS

8.1 All equipment and installation whether detailed in this specification or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended by applicable local authorities. All equipment shall be designed to **fail to safety**. Sudden power losses must not have an adverse effect on equipment and shall not unduly delay return to operation after power is restored.

8.1 and Safety Act, Act 85 of 1993. At all times during the manufacture, assembly and testing of the equipment the contractor will be responsible for the safety of all persons on site and the equipment.

8.2 **Safety Induction**:

Prior to establishing on site, it is an explicit requirement of this contract that all of the Contractor's personnel directly involved with this contract, including those of sub-contractors, attend a **Safety induction course**. Transnet will provide the course free of charge and attendance is compulsory for all personnel under the control of the Contractor who, during the duration of the contract, will be present on site whether on a full time or adhoc basis.

The contractor must allow for all additional charges because of these requirements as no claims for extras whatsoever will be entertained in connection with the foregoing.

8.3 **Risk Assessment**:

The successful contractor is required to conduct a Risk assessment to ascertain all potential risks associated with this project. The completed risk assessment is to be formally submitted to the Risk department via the project manager at least two weeks prior to the commencement of the actual project. A safety file and associated documents will be required from a successful tenderer and such will be communicated by the Risk department. The cost of medicals and related factors shall be allowed for in the tender.

9. SPECIALIST SUB-CONTRACTORS

9.1 Only specialist sub-contractors who have previously successfully completed work of the type and extent specified in this document should be engaged.

9.2 The tenderer shall provide the technical officer with sufficient proof of having suitable experience regarding the design and manufacturing of similar equipment. To this end, complete and detailed reference list shall be submitted with the tender.
Reference list shall include addresses as well as contact person who may be visited for inspection of the equipment during the adjudication period.

9.3 The tender shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.

9.4 The tenderer shall be prepared to commit themselves in writing to the technical officer with an adequate, experienced and stable project team for the duration of the contract.

9.4 Transnet Engineering will not consider any Tenderer's offer that, in the sole opinion of Transnet Engineering, does not have adequate experience in the design and manufacture of such equipment.

9.5 Contractors shall do the installation simultaneously with other contractors on-site busy with other work and shall plan work that it integrates with other work performed.

10. MATERIAL AND WORKMANSHIP

10.1 Machinery shall be offered complete in all respects, including all standard equipment normally offered by manufactures, all of which shall be specified in detail.

10.1 The equipment, as made and supplied, shall be complete in every respect, of modern design, using the most advanced proven technology extensively supported by reputable local companies, and be built to good engineering practices. Tenderers shall supply a list of all the main components (mechanical, electrical etc.) proposed as well as the addresses of local the support companies.

10.2 All parts and components shall be adequately protected against damage and corrosion during shipping, transport and storage. Should any of the items called for be standard equipment, then the words "Standard Equipment" shall appear against the item.

11. GENERAL REQUIREMENTS

Operation will be in the following conditions:

Altitude	Sea level
Ambient temperature	0˚C to 45˚C
Relative humidity	50% to 100%
Atmosphere	Heavy saline

11.1 Tenderers shall indicate clause-by-clause either that they comply in every respect with the specific requirements, or if not, exactly how it differs.

12. DEFINITIONS AND ABBERVIATIONS

CLIENT	Transnet Engineering Durban
TECHNICAL OFFICER	Project Manager, Transnet Engineering Durban
CONTRACTOR	Contractor appointed under this specification document
SABS	South African Bureau of Standards
BS	British Standard Specification
FEM	Federation of European Mechanical Handling Standard
ISO	International Organisation for Standardisation

13. GENERAL

13.1 The successful tenderer may be subjected to a workshop inspection by Transnet Engineering, to ensure that the facilities are to the satisfaction of the Transnet Engineering in terms of the quality control and equipment capabilities for manufacturing such type of equipment.

13.2 The tenderers shall guarantee that the rating and size etc. of the equipment offered, will be adequate to perform the duties required.

14. SITE ESTABLISHMENT

14.1 The contractor shall be solely responsible for safety of his staff and for Providing security to safeguard his works and material on site, until such a time.

14.2 The contractor shall be required to attend site meetings when convened by the Project Leader controlling the contract.

14.3 The contractor will be responsible for any damages caused by his staff to the building and civil works on site.