



**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 THE
DURBAN MAIN CENTRE, RM DEPOT,
WENTWORTH DIESEL DEPOT, MASONS
MILL DEPOTS AND BAYHEAD WAGONS
DEPOT.**

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1. INTRODUCTION / SCOPE of Work

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 as backup, to mitigate effects of municipal water supply outages) at the Durban Main Centre, RM Depot, Wentworth Diesel Depot, Masons Mill Depots, and Bayhead Wagons 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 Environment

- The industrial environment.

5.2.1 Scope of work

Item no.	REQUIRED
5.2.1.1	Read this scope of work with Annexure 1 (Transnet contractor safety, health, and environmental management specification guidelines TRN-IMS-GRP-GDL-014. 2).
5.2.1.2	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.
5.2.1.3	<ul style="list-style-type: none"> • The purpose of this tender is to provide alternative method of supplying water to the ablution blocks in a case of municipality water outage. • Water will be supplied via tanks by making use of booster pumps.
5.2.1.4	<p>Each water tank shall:</p> <ul style="list-style-type: none"> • 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.
5.2.1.5	<ul style="list-style-type: none"> • 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.
5.2.1.6	<p><u>Electrical Panels</u></p> <ul style="list-style-type: none"> • The contractor shall correctly size the power cable, wires for the circuits (main and control). • The pumps shall be interlocked, if the main pump is running, the backup pump shall be locked / disabled to ensure that 1 pump is operating at a time. • Only IP66 rated pumps shall be used. • 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.
5.2.1.7	<p>The following must be supplied on commissioning:</p> <ul style="list-style-type: none"> • Electrical certificate of compliance. <p>The following documents to be submitted in 3 sets of hard copies and 1 set of pdf file in a USB memory stick</p> <ul style="list-style-type: none"> • Mechanical and electrical schematic drawings for all components. • Operational and Maintenance manuals • Parts catalogue. • Part numbers.

METHODOLOGY, EXECUTION PLAN, QUALITY CONTROL & DESIGN APPROACH.

(a). Durban Main Centre- Ablution Blocks

Item no.	REQUIRED
1.	Supply and place in position 20000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. • The tanks shall have dome opening for filling with water tanker truck.
2.	<u>Sensor</u> • Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
Item no.	REQUIRED
	<u>Valves</u>
3.	First valve - mechanical ball valve
4.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
5.	<u>Motor coupled with pump- Closed couple mono block.</u> • Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. • Power output: 15 kw. • Power supply: 3 phase 400V AC 50hz, Power factor :0.9 • Efficiency of 89% or more Speed: 2900 r/min speed. <u>Pump- Closed couple mono block.</u> • Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m ³ /h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm.
6.	<u>Accumulator pressure tank</u> • Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. • Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
7.	Piping, PVCu (CLASS 16).

(b). Durban Main Centre – Main supply line

Item no.	REQUIRED
1.	Supply and place in position 20000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. • The tanks shall have dome opening for filling with water tanker truck.
2.	<u>Sensor</u> • Radar technology level indicator sensor to control high and low water level and inlet electrical actuator ball valve.
	<u>Valves</u>

3.	ND250 gate valve x 6.
4.	ND150 gate valve x 6.
5.	65 mm ball valves with PVC flanges x 6.
6.	ND150 Electrical actuator ball valve controlled by level indicator sensor x 2.
Item no.	REQUIRED
7.	<p><u>Motor coupled with coupling to pump</u></p> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output : 55 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with Delivery specification of 15 bar @ 65m³/h Pump efficiency – 36.8 %-Discharge size:50 mm, Suction size: 65 mm Pump and motor base – with motor and pump readily coupled and aligned. Pump and motor coupling.
8.	Piping, PVCu (CLASS 16).

5000ℓ water tanks

Item no.	REQUIRED
9.	<p>Supply and place in position 5000ℓ water tanks and stands/plinths , as indicated under section 5.3, listed below.</p> <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
10.	<p><u>Sensor</u></p> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve. <p><u>Valves</u></p> <ul style="list-style-type: none"> Supply and Install inlet valves to the tank as follows: First valve - mechanical ball valve Second valve – electrical actuator ball valve controlled by level indicator sensor.
11.	First valve - mechanical ball valve
12.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
13.	<p><u>Motor coupled with pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed.

	<p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> • Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h • Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
14.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> • Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. • Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
15.	Piping, PVCu (CLASS 16).

(c). Rotating Machines Depot

Item no.	REQUIRED
1.	<p>Supply and place in position 20000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below.</p> <ul style="list-style-type: none"> • The tanks shall have dome opening for filling with water tanker truck.
2.	<p><u>Sensor</u></p> <ul style="list-style-type: none"> • Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
3.	<p><u>Valves</u></p> <ul style="list-style-type: none"> • Supply and Install inlet valves to the tank as follows: • First valve - mechanical ball valve • Second valve – electrical actuator ball valve controlled by level indicator sensor.
4.	First valve - mechanical ball valve
5.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
6.	<p><u>Motor coupled with pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> • Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. • Power output: 15 kw. • Power supply: 3 phase 400V AC 50hz, Power factor :0.9 • Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> • Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h • Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
7.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> • Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. • Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
8.	Piping, PVCu (CLASS 16).

10000ℓ water tanks

Item no.	REQUIRED
9.	Supply and place in position 10000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
10.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
11.	<u>Valves</u> Supply and Install inlet valves to the tank as follows:
12.	First valve - mechanical ball valve
13.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
14.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <u>Pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
15.	<u>Accumulator pressure tank</u> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
16.	Piping, PVCu (CLASS 16).

(d). Electrical Locomotives Depot

20000ℓ water tanks

Item no.	REQUIRED
1.	Supply and place in position 2000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
2.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
3.	<u>Valves</u>
4.	First valve - mechanical ball valve
5.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
6.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate.

	<ul style="list-style-type: none"> Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
7.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
8.	Piping, PVCu (CLASS 16).

10000ℓ water tanks

Item no.	REQUIRED
9.	Supply and place in position 10000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
10.	<p><u>Sensor</u></p> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
11.	<u>Valves</u>
12.	First valve - mechanical ball valve
13.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
14.	<p><u>Motor coupled with pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
15.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
16.	Piping, PVCu (CLASS 16).

(e). Bayhead Wagons

5000ℓ water tanks

Item no.	REQUIRED
1.	Supply and place in position 5000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
2.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
3.	<u>Valves</u>
4.	First valve - mechanical ball valve
5.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
6.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <u>Pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
7.	<u>Accumulator pressure tank</u> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
8.	Piping, PVCu (CLASS 16).

2000ℓ water tanks

Item no.	REQUIRED
9.	Supply and place in position 2000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
10.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
11.	<u>Valves</u>
12.	First valve - mechanical ball valve
13.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
14.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate.

	<ul style="list-style-type: none"> Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
15.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
16.	Piping, PVCu (CLASS 16).

(f). Wentworth Diesel Depot

10000ℓ water tanks

Item no.	REQUIRED
1.	Supply and place in position 1000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
2.	<p><u>Sensor</u></p> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
3.	<u>Valves</u>
4.	First valve - mechanical ball valve
5.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
6.	<p><u>Motor coupled with pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
6.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
7.	Piping, PVCu (CLASS 16).

5000ℓ water tanks

Item no.	REQUIRED
8.	Supply and place in position 5000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
9.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
	<u>Valves</u>
10.	First valve - mechanical ball valve
11.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
12.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <u>Pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
13.	<u>Accumulator pressure tank</u> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
14.	Piping, PVCu (CLASS 16).

(g). Masons' mills (Wagons & Locomotive)

10000ℓ water tanks

Item no.	REQUIRED
1.	Supply and place in position 10000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
2.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
3.	<u>Valves</u>
4.	First valve - mechanical ball valve
5.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
6.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw. Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <u>Pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
7.	<u>Accumulator pressure tank</u> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
8.	Piping, PVCu (CLASS 16).

5000ℓ water tanks

Item no.	REQUIRED
9.	Supply and place in position 5000ℓ water tanks and stands/plinths, as indicated under section 5.3, listed below. <ul style="list-style-type: none"> The tanks shall have dome opening for filling with water tanker truck.
10.	<u>Sensor</u> <ul style="list-style-type: none"> Radar technology level indicator sensor to control high and low water level and inlet ball actuator valve.
11.	<u>Valves</u>
12.	First valve - mechanical ball valve
13.	Second valve – electrical actuator ball valve controlled by level indicator sensor.
14.	<u>Motor coupled with pump- Closed couple mono block.</u> <ul style="list-style-type: none"> Motor shall have the SABS approval and the manufacturer shall have the recognized and valid ISO 9001: Quality certificate. Power output: 15 kw.

	<ul style="list-style-type: none"> Power supply: 3 phase 400V AC 50hz, Power factor :0.9 Efficiency of 89% or more Speed: 2900 r/min speed. <p><u>Pump- Closed couple mono block.</u></p> <ul style="list-style-type: none"> Pump type – centrifugal pump with closed couple mono block – 10 bar @ 20m³/h Pump efficiency – 36.8 %-Discharge size: 40 mm, Suction size: 65 mm
15.	<p><u>Accumulator pressure tank</u></p> <ul style="list-style-type: none"> Supply and install a Vertical accumulator pressure tank for water to be installed for the above specified pump, to handle a minimum of 200 litres @ 10 bar. Supply and install accumulator tank accessories, including pressure switches, pressure gauges and all accessories required to operate together with the above specified pump, motor, and electrical control with VSD.
16.	Piping, PVCu (CLASS 16).

5.3 Locations of water tanks and stands/plinths.

5.3.1 Durban Main Centre

	Description	Size	Qty
1	A18	20000	1
2	A48	20000	1
3	HR	5000	1
4	A17	20000	1
5	A20	20000	1
6	A50	20000	1
7	Canteen	5000	1
8	A16	20000	1
9	A15	20000	1
10	A46	20000	1
11	A44	20000	1
12	A14	20000	1
13	A13	20000	1
14	A42	20000	1
15	A12	20000	1
16	A40	20000	1
17	A34	20000	1
18	A9	20000	1
19	A39	20000	1
20	A5	20000	1
21	A4	10000	1
22	A8	20000	1
23	Alstom Parkhomes (D5-D8)	5000	1
24	Nagoya opp new FOE	5000	1
25	A10	20000	1
26	A45	20000	1
	Description	Size	Qty

27	Admin A & Admin B	20000	1
28	Main Supply line	20000	10
29	Galvanized steel water tank	2000	2
30	Water Pumps	15kw	24
32	Water Pumps	55Kw	3
33	Water pipe connections	25m	27

5.3.2 Rotating Machines (RM)

	Description	Size	Qty
1	Ablution block next to Canteen Umbilo end	20000	2
2	Wash Bay Umbilo end	20000	1
3	Main building	10000	1
4	Water Pumps	15kw	4
5	Water pipe connections	25m	4

5.3.3 Electric Locomotive Depot (ELD)

	Description	Size	Qty
1	Ablution Block Umbilo end	20000	2
2	Ulundi Ablution next to soccer field ELD Bluff end	5000	1
3	Toilets outside Shedding Workshop Bluff end	5000	1
4	Toilets/Ablution (Female)	5000	1
5	Trade hands Ablution on the Fault Room side of Shedding	2000	1
6	Artisans Ablution on the Fault Room side of Shedding	2000	1
7	Water Pumps	15 kw	6
8	Water pipe connections	25m	7

5.3.4 Bayhead Wagons

	Description	Size	Qty
1	Bayhead Repair Siding	5000	2
2	Kings Rest Tank Washout	5000	1
3	Kings Rest Yard	5000	1
4	Bayhead Yard	5000	1
5	Bayhead out-services	2000	1
6	Water Pumps	15kw	6
7	Water pipe connections	25m	6

5.3.5 Wentworth Diesel Depot

	Description	Size	Qty
1	Next to canteen and boiler room	10000	3
2	New shed building	10000	1
3	Trade hands ablution by the gate	10000	1
4	Ablution block by sand house	10000	1
5	Breakdown section	5000	1
6	Water Pumps	15kw	1
8	Water pipe connections	25m	7

5.3.6 Masons' mills (Wagons & Locomotive)

	Description	Size	Qty
1	Next to main shed building	10000	2
2	Ablutions (Male &Female)	5000	4
3	Water pipe connections	25m	6
4	Water pumps	15kw	6

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.

5.10 Methodology, Execution plan, Quality Control and Design Approach

- The tenderer should be detailed in their approach paper when submitting the tender pack.
- The listed information above will form part of the evaluation criteria scores.

6. PENALTY CLAUSES

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

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. 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.

8.1 Safety Induction:

Prior to establishing on site, it is an explicit requirement of this contract that all 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.

8.2 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 Electrical and Mechanical work of the type and extent specified in this document should be engaged. 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.
- 9.2 The tender shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.
- 9.3 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.
- 10.2 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.
- 10.3 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 ABBEVIATIONS

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 will 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.