

World Vision Sudan

Term of Reference (TOR) for Water Desalination RO Plant

Date: 29 July 2026

Project: Disability Inclusive WASH and Protection Response Project in Port Sudan

Duration: 30 Days

1. Background:

Since the collapse of the Arbaat Dam in 2024, access to safe water has become a major challenge in Port Sudan, particularly for Public Health Units, the situation has become even more critical following the arrival of a large number of internally displaced persons (IDPs) due to the ongoing conflict, which has significantly increased the demand for safe drinking water and water for healthcare services.

World Vision Sudan aims to improve access to safe drinking water for the Hadal Public Health Unit, which serves both internally displaced persons (IDPs) and the host community in Port Sudan, the facility currently faces a severe shortage of safe water for drinking and medical use, to address this gap, the project proposes the construction of a Reverse Osmosis (RO) water desalination plant.

This Terms of Reference (ToR) outlines the technical requirements for the construction and installation of the proposed facility.

2. Purpose of Assignment:

The purpose of this assignment is to:

Construction of Water Desalination RO Plant in Port Sudan Locality Hadal PHU, ensuring: completeness, high quality implementation according to attached technical specifications and deliver of work in the contracted time.

3. Scope of Work:

The Contractor shall be fully responsible for the installation, completion, and handover of the Water Desalination RO Plant, this includes providing all necessary labor, materials, equipment, and supervision to perform the works, the scope includes but is not limited to, the following key areas of responsibility:

3.1 Project Management and General Responsibilities:

Overall Execution: The Contractor's primary responsibility is the full and satisfactory completion of all works as detailed in the attached Bill of Quantities (BoQ), technical specifications, and approved drawings.

Work Plan and Schedule: The Contractor shall prepare and submit a detailed Work Plan and Project Schedule for approval prior to the commencement of any site activities, this schedule must outline key milestones, critical path activities, and provide clear start and end dates for the project.

Material Logistics: The Contractor is responsible for the procurement, transportation, handling, and secure on-site storage of all materials required for the successful completion of the works.

3.2 Health, Safety, and Environmental (HSE) Management:

Site Security and Demarcation: The Contractor shall securely demarcate the entire work area to prevent unauthorized access adequate hazard warning signage must be erected to ensure the safety of the general public and site personnel.

Personal Protective Equipment (PPE): The Contractor must provide all necessary and appropriate PPE (e.g., helmets, safety footwear, gloves) for all their workers, supervisors, and engineers, and must enforce its proper use at all times.

Site Housekeeping and Waste Management: The site must be kept clean and organized on a daily basis, all construction waste and debris shall be disposed of in an environmentally responsible manner, strictly adhering to all local laws and regulations.

3.3 Quality Assurance and Control:

Contractor's Site Engineer: The Contractor must assign a qualified and competent Engineer to supervise the works, this engineer must possess a minimum of three years of experience in managing similar projects and will serve as the primary technical point of contact on-site.

Material Approval: All materials delivered to the site are subject to inspection and approval by the World Vision Engineer prior to their use in the works, any materials deemed non-compliant with the specifications will be rejected and must be removed from the site at the Contractor's expense.

Provision of Equipment: The Contractor is responsible for providing, maintaining, and operating all necessary tools and equipment required for the successful execution of the works.

Workforce Competency: The Contractor is solely responsible for ensuring that their workforce (laborers and tradesmen) is skilled, competent, and physically fit for the duties assigned, in compliance with all local labor laws.

3.4 Technical Scope of Works:

The Contractor shall execute all works required to complete the project. The principal activities shall include, but are not limited to, the following:

- Mobilization and setup of site facilities.
- Site clearance, preparation, and setting out.
- All required foundation and reinforced concrete works.
- All masonry works (blockwork/brickwork).
- All finishing works.
- All required plumbing and sanitation installation works.
- All required electrical works.
- All required operation tests work

4. Design details:

4.1. Design Capacity & Operating Conditions

Parameter	Value / Specification
Nominal Production Capacity	20 m ³ /day (0.84 m ³ /hr)
Operating Hours	24 hr/day (continuous)
Feed Water TDS	≤ 6,000 mg/L
Recovery Rate	40 %
Operating Temperature Range	10–60 °C
Feed Water Turbidity	≤ 3 NTU
SDI (Silt Density Index)	≤ 5
Power Supply	380–415 V, 3-phase
Chlorine Tolerance (RO Membrane)	0.1 ppm max (free chlorine)

4.2. Process Flow Components

Raw Water Intake & Pumping:

- Motor pump sized for required flow & head.
- Non-return valve, isolation valve, and flow meter.

Pre-treatment Stage:

- Media Filter (Sand/Multimedia): Removes turbidity, suspended solids.
 - Vessel: FRP, 16" dia × 65" height
 - Design Pressure: 10 bar
- Activated Carbon Filter: Removes chlorine, organics, and odor.
 - Vessel: FRP, 16" dia × 65" height
 - Design Pressure: 10 bar
- Cartridge Filter: 5 µm nominal filtration, PP filter cartridge, SS housing.

Chemical Dosing Systems:

- Antiscalant dosing unit (metering pump, tank 50 L, HDPE).
- pH correction dosing unit (acid/alkali as required).

RO System:

- High-Pressure Pump: SS 316, multistage centrifugal, VFD-controlled.
- RO Membranes: 4" × 40" brackish water elements (TFC), 1 element in pressure vessels (FRP).
- Pressure Vessels: FRP, design pressure 300 psi.
- Piping & Fittings: UPVC Sch. 80 (low pressure), SS 316 (high pressure).
- Instrumentation:
 - Pressure gauges (feed, reject, permeate)
 - Conductivity meter (permeate & feed)
 - Flow meters (feed, permeate, reject)
- Control panel with PLC and auto-flush function.

Post-treatment:

- Chlorination dosing unit for residual disinfection.
- Mineral dosing for taste adjustment.

Product & Reject Handling

- Potable water storage tank (HDPE, 10 m³).
- Reject water disposal pipeline to designated drainage or evaporation pond.

Control & Automation

PLC-based control panel with HMI display.

Auto-shutdown for low feed pressure, high permeate conductivity, or tank overflow.

Automatic flushing at start-up and shutdown.

4.3 Expected Performance

Parameter	Expected Value
Permeate TDS	≤ 300 mg/L
Recovery Rate	40 %
Salt Rejection	≥ 98 %
Daily Output	20 m ³ /day

4.4 Applicable Standards & Compliance

- WHO Guidelines for Drinking-water Quality (2017).
- ASTM and AWWA standards for pressure vessels and piping.

5. Minimum Eligibility Requirements:

The bidder must submit the following documents:

Company profile
Company registration (Mandatory)
Tax registration certificate(Mandatory)
Registration with contractor's union/other professional body or regulator (Mandatory)
Personnel CVs of key personnel- or List of personnel
List of equipments
List and value of projects performed for the last year, plus client's contact details.
Latest audited financial statement (income statement and balance sheet) including auditor's report for the last year (2025)
Detailed implementation plan (DIP)
Joint venture agreement if applicable
Detailed quotation and financial offer
Signed copy of World Vision policies, safeguarding and supplier code of conduct

6. Evaluation Criteria:

Bids will be evaluated based on:

- Compliance with technical specifications and quality requirements.
- Cost-effectiveness.
- Proven experience in similar assignments.
- Capacity to deliver at shortest time with clear work plan.
- Reputation and past performance with NGOs or humanitarian agencies.
- Human and equipment capacity.

7. General Terms and Conditions of the Contract:

- Retention: 10% of contract value retained for 3 months post-substantial completion.
- Defects Liability: Contractor to correct any defects identified during the DLP.
- Penalty for Delays: 1% of contract value per day, up to a maximum of 10%.

8. schedule of payment:

Milestone	Percentage	Time frame for Milestone
1 st Milestone installment	40%	1 st Milestone installment will be paid after Completion and approval 50% of work (Pay within 15 days)
2 nd Milestone installment	50%	2 nd Milestone installment will be paid after Completion and approval 100% of work (Pay within 15 days)
3 rd Milestone installment	10%	As Retention and will be paid After the completion of the defect liability period (DLP)

9. Declaration:

I, _____, the duly authorized representative of the supplier, hereby declare that I have read, understood, and reviewed the Terms of Reference (TOR) related to Hadal PHU RO.

I acknowledge all requirements, conditions, and specifications outlined in the TOR and confirm that the supplier will comply with them in the preparation and submission of the proposal.

I further confirm that all information provided on behalf of the supplier is accurate and complete to the best of my knowledge.

Supplier Name: _____

Representative Name: _____

Position/Title: _____

Signature: _____

Date: _____

Company Stamp: