

## Annex C – Technical Specifications

**Subject:** CONSTRUCTION OF one Soakaway wells Al Buluk Hospital  
**Project:** Omdurman  
**Date:** 9<sup>th</sup> August 2025



**Project Title:** CONSTRUCTION OF one Soak away well Al Buluk Hospital Omdurman

**Technical Referents:** Ibrar Khawaja(WatSan TL); Abjad El Sarraj (WatSan Manager)

### **Purpose:**

Improved Sanitation system of the hospital. This Scope of Work outlines the tasks and responsibilities associated with the excavation and construction of one soakaway well and connect it with Al Buluk hospital drainage system in the Omdurman Karrari locality.

The Omdurman Karrari locality is situated on the Nubian sandstone formation, this Nubian sand stone basin is considered as one of the most productive ground water. Our project site lithology exhibits a three-layered aquifer. The first water-bearing layer is encountered at approximately 17 meters depth. A second, more substantial aquifer, suitable for wastewater infiltration, is present at a depth of 37 meters. And the third one located in a depth of 170m (for drinking water). The plan is to construct one soakaway wells to a total depth of 40 meters , with a diameter of 2.6 meters. The wells will be lined with bricks for structural support and stability.

### **MSF Engineer**

MSF designates 'Abjad Al Sarraj' as supervising engineer responsible for inspection and approval of works. Any changes to the agreed design must be approved in writing by the supervising engineer.

### **1. Objective:**

The objective of this activity is to construct one soakaway well for wastewater infiltration, tapping into the aquifer located at a depth of 37 meters, with a total depth of 40 metres (Depending on the depth of Aquafer). The well will be designed to provide a sustainable and environmentally method for wastewater disposal. This well will be connected to the existing hospital drainage system.

### **2. Well Excavation:**

- Excavate the well to a total depth of 40 meters (Depending on the depth of Aquafer), with a diameter of 2.6 meters, using appropriate drilling or excavation equipment.
- Properly dispose of excavated soil in accordance with local environmental regulations. Identify and designate a suitable disposal site.
- Implement appropriate shoring and safety measures to prevent collapse of the well during excavation and construction. Adhere to all relevant safety regulations and best practices.

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### 3. Well Lining:

- Supply sufficient quantities of high-quality bricks suitable for well lining. Ensure the bricks meet relevant quality standards.
- Line the entire interior of the well with bricks, using a fully sealed brick lining from 0 to 17 meters in depth, and a 'perforated brick wall with mortar joints' pattern from 17 to 40 meters, as per Annex-D Design. Ensure the lining is stable and structurally sound, using appropriate mortar (cement and sand) to securely bind the bricks together.
  - a- Material: Burnt clay bricks of suitable quality for waterproofing and durability.
  - b- Thickness of Lining: 20cm thickness from 0 to 17m depth and 30 cm thickness from 17-40m depth for brick lining.
  - c- Mortar: Cement mortar mix in a 1:3 ratio (cement to sand) for bricklaying.
  - d- Quality Control: Bricks must be first class (free of cracks, chips, and defects).
  - e- Curing: Proper curing of the brick lining for a minimum of 5- 7 days after completion.

### 4. Bottom Design (No Slab, Infiltration Allowance):

- Bottom Slab: No bottom slab to be constructed. The base of the well will remain open to allow groundwater infiltration via the aquifer.
- Surface Preparation: The base must be cleared of debris or loose material before allowing water infiltration.
- Infiltration Capacity: Ensure the surrounding soil and aquifer can support sufficient water infiltration.

### 5. RCC Top Slab Cover:

- Material: Reinforced Cement Concrete (RCC).
- Thickness of Slab: Minimum 200 mm thickness.
- Steel Reinforcement: Use T12 or T16 bars as per structural design, with appropriate spacing.
- Concrete Cover: Minimum 50 mm cover to reinforcement.
- Concrete: Concrete mortar mix in a 1:2:3 ratio (cement , sand and Gravel)

### 6. Backfilling and Compaction:

- Supply materials and backfilling the space between the wall and lining use selected materials ( sand or gravel ) with good compaction

### 6. Modifications inside 2 Septic Tanks and connection to soakaway well

- Install 3 FOG traps in each of the existing septic tank.
- Connect both existing septic tanks to a soakaway located 55 and 05 meters away.

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### 7. Safety and Site Management:

- Safety Measures: Provide necessary safety equipment for workers (helmets, gloves, etc.).
- Site Barricading: Secure the work area with proper barricades and warning signs.
- Environmental Protection: Ensure measures to prevent contamination of the surrounding environment, including wastewater management.

### 8. Site Restoration:

- Remove all equipment, materials, and debris from the well site.
- Restore the surrounding area to its original condition, as much as possible.
- Install a suitable well cap slab cover to prevent debris from entering the well.

### 9. Equipment:

1. Machines ( Drilling, Jack hammer and loader)
2. Dumper
3. 2 Vacuum trucks
4. Dewatering pump with Hoses and fittings
5. Shovels
6. Excavation equipment for the wells (backhoe or excavator)
7. Pickaxe
8. Buckets
9. Ropes

### 6. Schedule:

- 75 working Days