**TECHNICAL SPECIFICATIONS FOR**

**MATERIALS & WORKMANSHIP**

GENERAL AND SPECIAL For

Constructing New Water Yards in North Darfur State

Wadi El Ku Catchment Management Project-Phase 2

 2. Construction of Elevated Tank, Fence and other Utilities

2.1 Elevated steel tank

• The contract must submit first detailed working drawings of the tank for approval by the Engineer.

• The tanks can be fabricated from mild steel thickness 6mm.

• They can be cubical or cylindrical but of capacity 30m3 as designated.

• The tanks are mounted on steel towers and must be executed according to the approved drawings and as instructed by the Engineer.

• When proves necessary the contractor must carry out soil investigations (field and laboratory studies) for foundation design and construction. The investigations procedure and results of investigations must o be approved first by the Engineer.

2.2 Tank Body

Tank shall be manufactured from steel hot pressed plates banged or GR P bolted panels booted site. The sectional plate’s ore firmly bolted using leaking proof sealant. Tank body shall be according to the following specifications.

a) Bottom and wall plates shall not be less than 6 mm thick

b) Roof plates shall be 3mm thick.

c) Internal bracing using M.S .Angles or galvanized iron bracing & gusset plates.

d) Manhole opening at top of tank shall be 600X 600 mm complete with a lockable cover and located at same side of the external & internet ladders.

e) Cowl ventilator shall be manufactured from steel pipe 75 mm covered with bonnet and mosquito wire.

f) External and internal ladders shall be manufactured from 50X6mm Flat and 16 mm round bars. Span shall be 400 mm and Span between steps is 300 mm, the external ladder to rest on the ground through concrete foundation bolts.

g) Water level indicator shall comprise a float, a suitable flexible wire suitable weight, chancel and pulleys.

2.2.1 Connections for Water openings as follows:

• Inlet (250 mm) Threat to BS (21) with fittings

• Outlet (300 mm) Threat to BS (21) with fittings to connect the main network distribution pipe.

• Washout (100 mm) ,, ,,, (21)

• Overflow (100 mm),, ,,, (21)

Bolts, nuts, fittings and joining sealant shall be supplied with 10% extra.

2.2.2 Paint –For steel tank

- Tank shall be painted with antirust prime coat.

- Two other coat shall be applied as follows: -

o Internal coating shall be of bituminous non – toxic paint

o Externally shall be painted with aluminium approved paint

2.2.3 Tank Foundation

 Dimensions 11.00 ×11.00 depth 1.00 m width. 0.60m.

Strip Foundation: -

- Granite Stone with c/s mortar 1:6 mix .1m below ground level .0.40m above ground.

- Back filling & compaction.

- 10 cm plain concrete.

- 20 cm Reinforced slab.

- Inverted Beam 0.40×0.40 m.

2.2.4 Drawings Installation Manual:

Supplier shall supply drawings for identification of sections with clear dimensions of tank and tank installation.

2.3 Supporting Tower:

• Height of tower shall be 6 m.

• Span shall be 2.5m both ways.

• 7 Branch beams I PE 16cm × 8cm.

• Stanchions of 6m highlight shall be manufactured form IPE standard 20×10 cm (×22.4Kg/ m).

- Two bay each 3m all wind bracing shall be manufactured from 65x65×5 mm. M.S. Angles and tied with Bolts Nuts.

- Foot plate and top plate of min 20 mm. thick

- Gusset plate’s thickness shall not be less than 6mm.

- Holding down bolts (22 mm x 50 cm) with nuts and washer 4 no. for each column.

- Construction of 500mm walkway and handrail (Balcony) 50mm steel pipe post

900m height &1 1/2″ Angle tie and floor 3mm M.S. Plates 0.90m.

2.3.1 Tower Paints:

- Tower shall be painted with antirust prime coat.

- Two other coats shall be applied as follows: -

o Internal coating shall be of bituminous non – toxic paint

o Externally shall be painted with aluminium approved paint

- Tower shall be coated with black paint; water level indicator shall be yellow and red graduations.

2.4 Water Distribution Systems (fig)

• The length and size of pipes according to the layout drawings. All pipes and fitting are of galvanized iron.

• The main value should be heavy duty flanged cast iron 75 mm values.

• The 75 mm water meters with protection lockable box.

• 400mm depth tranche for the transmission pipes connection of pipes + fittings & backfill of trench.

• The overflow/ washout pipe to be extended to the yard fence.

• All 50mm valves should be of ball type.

• Use 10 No. gate valves 25mm for the distribution platforms.

• Pipe length connection points & civil works as shown in the drawing.

2.5 Fence (Drg.)

Metallic fence:

• 30m x 30 fences with complete separation between human & animal yard.

• Fence height 1.6 made of 3 mm dia galvanized iron mesh link wire fixed on 2″ steel pipe posts 2.0 m c/c. 1st post 1.0 m from gate.

• 8 mm M.S. round be welded at 0.50m & 1.00 m height of chain.

• 1.5” M.S angle to be welded at top & bottom of the chain link.

• The fence & double gates to be constructed as per drawings.

• The gate, steel posts & supporting angles to be painted with recommended good quality oil paint.

• The double gates to be manufactured from 65 mm M.S. Angles frame & expanded metal supported on 12 cm steel I section support. Each gate with lockable device.

• Construction of fence & gates as shown in the drawing.

• Fence corners should be supported with 50 mm strainer –Angle iron.

2.6 Animal Water Trough (Capacity 1 m3) total number 2

• Manufactured from 3 mm MS. Plates 3m.

• Top Frame M.S. Angles 1 1/2"× 1 1/2"× 4mm.

• Corner gusset from 3mm M.S. plate.

• All welded from inside & out site.

• The trough to be painted from inside & outside with double coat approved black paint.

• The trough to be placed on a P.C. platform

• Trough & Platform as shown in the drawing.

2.7 Distribution plat form

• Distribution platform tap stand with 5 No., 1" taps,

• One standpipe for filling tankers and carts.

2.7 Plant Operator Room

Room dimension 4m×4m×3m.

- Foundation of the operation room 0.6 m width x 0.7 m depth.

- Foundation: - from stone & C/S mortar 1:8 mix. - build stone strip foundation under the walls 0.6 m widthx0.4 m depth, in c/s mortar 1:6 mix

- Walls 1.5 red brick walls c/s mortor 1:8.

- Roof: - 3 × 6 hollow section pipe & zinc sheets (Gauge 26).

- Floor: - 10cm plain concrete 1:3:6.

- Plaster C/S mortar 1:6. - Material and apply cement sand plaster to the internal and external surfaces of the walls, of mix 1:6 cement sand mortar.

 - Cast reinforced concrete of mix 1:2:4, in the grade beam, lintels and tie beam, including the reinforcement and the formwork

- Paints: - Paint 3 coats emulsion paints

- Doors & window: - Manufactured from hollow section pipe frame 4 × 8 & 3×6 covered with steel sheets & with accessories (lock, hinges etc).

- One door: - 1.0 × 2.2 from hallow section pipe 4 × 8 &3 × 6 & steel sheets with accessing (Lock hinges etc.)

- Two widows: - 1.2 × 1.0 from hallow sectional 3 × 6 & steel sheets. a)

- build red bricks walls, 0.3 m thick in c/s mortar of 1:8 mix

2.8 pit latrine 1.7x1.7x3.2 m

- pit latrine foundation 1.7x1.7x3.2 m

- Walls 1.5 red brick walls c/s mortor 1:8. Cast reinforced concrete of

 - Mix 1:2:4, in the grade beam, lintels and tie beam, including the reinforcement and the formwork

- Roof: - 3 × 6 hollow section pipe & zinc sheets (Gauge 26).

- Plaster C/S mortar 1:6. - Material and apply cement sand plaster to the internal and external surfaces of the walls, of mix 1:6 cement sand mortar.

- One door: - .8 × 1.2 from hallow section pipe 4 × 8 &3 × 6 & steel sheets with accessing (Lock hinges etc.)