
ANNEX A: STATEMENT OF WORK (SOW): RFP/HCR/KAD/SUP/2022/03

1. Background

Babanusa town is the capital of Babanusa locality and is home to 72,000 persons. About 4,000 are South Sudanese refugees. The entire population is served by 4 water sources 1 out of the four water sources is not functional. People and animals share the same water points. The average water supply is less than 10 liters per person per day and with the presence of livestock within the town and the surrounding rural villages, the supply needs to be increased to 25 liters per person per day. Generally, there are fewer households that are connected to the main town water network, most of the households fetch water from public standpipes connected to the storage facilities and transport it home through donkey carts or purchase water from water vendors brought near their homes. Refugees have settled on the outskirts of the villages approximately 1km from the nearest water source.

UNHCR intended to upgrade and rehabilitate the existing water supply systems and will include solarization of the water pumping system to improve its capacity, and performance and increase access to safe drinking water for refugees, IDPs, and host communities.

2. General Information

1. Objectives, Purpose & Expected Results

The objective of the project is to upgrade and rehabilitate the existing water yards to increase the water coverage thus improving access to safe drinking water for 72,000 persons targeted by this project also, it will contribute to strengthening social cohesion and promote peaceful coexistence between the refugees, IDPs and the host communities.

2. Location and Description of the Assignment

All the projects will be in Babanusa town.

3. Scope of Work (Work Assignment)

The scope of work for this tender includes all activities related to achieving the following interventions:

3.1 Dismantle the Existing Rising main of GI Pipe and the Submersible Pumps:

The contractor/supplier shall provide all necessary equipment for dismantling the existing rising GI pipe and the submersible pump.

3.2 Provision and installation of Submersible Pump:

- The contractor shall provide and install a 2.5" Submersible Pump System equivalent to PSk3-21 C-SJ17-26 in boreholes in strict compliance with the pumping test recommendations.
- The contractor shall install the submersible pump and related equipment in accordance with the instructions of the manufacturer, the Technical Drawings, and the Specifications and Installation Standards attached hereto.
- Please refer to the attached general layout of pumping equipment installation for an electrical submersible pump.
- All material and equipment should be checked and will conform to the specified national and, or international standards. The general guidelines and instructions of the manufacturer on the installation of pumping equipment shall always be followed.
- Check that the voltage, phase, and frequency are compatible with the power supply available.
- Check all cables: The motor cables and supply cables for damage. That the cables are adequately sized to ensure the correct voltage at the motor. The low-level cables and connection to the electrodes for damage and continuity. The low-level unit has a good earth return through a steel borehole casing, earthed rising main, or separate earth return.
- The contractor under the direct supervision of UNHCR assigned engineer must carry out insulation tests with the 500 V insulation resistance and continuity tester (megger) on the motor and on the supply cables. The resistance between any motor lead and the motor frame should be greater than 1 Mega-ohm.

- The resistance between the individual cores of the supply cables should be greater than 1 Mega-Ohms. If a megger is not available, carry out a careful visual check on all cable's insulation material.
- The contractor should provide and install run-dry protection to trips off the pump before the water level reaches the pump intake and protect the pump from running dry (that can damage the pump and the motor) and provide the upper-level control to re-start the pump once the water level recovers to an appropriate level.
- The contractor must install a tap at the discharge line to collect the water sample.
- All the electric cables must comply with established standards. The electrical cable used for submersible pumps must be able to withstand underwater conditions inside the borehole for that specific water quality and the submerged cable joints should be of the encapsulated epoxy type or similar watertight standard. – During the installation of pumps and operations any direct introduction of oil, grease, fuel, etc. should be avoided in the borehole.
- The equipment and assembly at the borehole head should be protected by a concrete structure of suitable design and size.
- Two non-return valves must be fitted; one at the pump and the one at the surface where the rising mains joins the discharge line.
- A flow meter must be fitted immediately after the non-return valve. The manufacturer's instructions should be followed for instructions to assure accuracy and limit the turbulence at the metering point.
- The meter must be calibrated and should be installed at least 1.2 m from any bend.
- The flow meter should be capable of measuring instantaneous discharge and cumulative volume with an accuracy of 5%.
- A gate valve should be installed after the flow meter to control the discharge.
- The contractor must ensure the make, model & serial number, type, motor capacity, and pump capacity should be marked on a steel plate and permanently installed at an appropriate place at the borehole head.
- Contractor should install a pressure gauge to give an indication of any obstruction in the delivery line.
- Cover the top of the borehole to prevent the ingress of any contaminants.

3.3 Supply, Install, Test and Commission of Distribution Pipeline from Existing 50 m³ Elevated Water Storage Tank to Tapstands and Women Centre:

- The contractor should supply, install, test, and commission the 700 m length UPVC 2" diameter from existing elevated water storage tank to the proposed tap stands and the women centre. The scope of work include bends, end caps, electrical connections, couplings, air release valves, gate valves, surface boxes or chambers with all needed accessories (flange adaptors, bolts, ladders, manhole covers, steps, etc.) and all fittings, trial pits, excavation and backfilling. The work shall include the disconnection and reconnection of existing services to the new water supply system, typical details, specifications and as instructed by the engineer.
- Pressure testing, flushing, chlorination, and disinfection of the new pipelines before connecting them to the existing network as per technical specifications and engineer's instructions.
- Supply and installation of gate valve with a diameter of 50 mm including excavations and pipe connections to the nearest drain manholes or as per instructions of the client's representative. The SOW shall include construction of a reinforced concrete chamber where needed, flanges, valves, surface boxes, dismantling pieces, flap valves, and all necessary fittings and civil works.
- Supply, cast and install ready mix reinforced concrete (250 kg/sq. cm after 28 days) for the encasements of the water and drainage pipes (RCE), including formworks, bricks, reinforcing steel, excavation, reinstatement, transfer of surplus etc. and all works necessary to complete the task.
- Supply and installation of all necessary pieces, tools, fittings, parts and works to connect the existing pipes to the new or proposed pipes including despite the type and the quality of the existing or proposed lines.

3.4 Water Storage Tank Rehabilitation:

- Lift water storage tank on existing 6 meters height tower, install inlet and outlet with 2 control valve 3". Painting of the tank internally and externally and erection of the tower and the tank satisfaction of the supervising engineer.

3.5 construction of 2 Public Tap stands:

- The public tap stand shall be constructed on-site, and it includes two side walls constructed of bricks or sand cement blocks. A concrete slab must be cast on top of the side walls to form the platform for resting the water containers for filling from the taps as illustrated in the drawings. The walls' dimensions shall be in accordance with the technical drawings. The platform concrete shall be in accordance with concrete class B specification, reinforced by 10mm diameter bars. The contractor shall supply and fabricate the distribution pipe system to connect 10, 1" diameter taps as shown on the drawings and specifications.

3.6 Animal Troughs:

- The troughs shall be fabricated of mild steel sheets of 3mm thickness. The standardized trough capacity is 1 m³. The construction standards for the animal trough will be in accordance with the Technical. Drawings, Bill of Quantities, and the General Specification and Construction Standards of Animal Trough
- The size of an animal trough is 3 m long, 0.9 m wide and 0.45m deep the trough should be fabricated from M.S. Plates 3 mm and the top frame M. S. Angles 1 ½ × 1 ½ × 4 mm and Gusset Plates M. S. Plates 3 mm. All welded from inside and outside and the edges of the cattle trough finely folded.

3.7 Cart and Truck Filling Points:

- Shall be constructed as per Technical Drawings, Bill of Quantities and Specifications provided below.
- The construction of Standpipes for Cart and Truck Filling involves the supply of materials (including gate-valve, connectors, reducers, elbows, tapes, pipes, connectors, elbows for drainage etc.), transport and storage, labor, and all necessary equipment for 53 completed of work.
- The construction works also include the drainage system as per standard drawing and as instructed by the Engineer on site.

3.8 Construction of Operators' rooms

- The room shall be 4mx4m exterior dimension and the clear headroom not less than 3.5m. The room comprises two windows on the opposite side as shown in the drawing. The room must be constructed of red bricks and mortar with proper ventilation.
- Red bricks shall be class (1) as specified under work brickwork and plastering paragraphs. Mortar shall be composed of one part cement and eight parts of sand.
- The foundation should be cleaned and wetted before bricks are laid, and all internal faces of brick walls should be plastered.
- For roofing corrugated sheeting must be fixed with drive screws to purlins through holes drilled on top of the corrugation. Drive screws shall be 300mm apart and bolts for fixing sheet together along the side corrugation shall be 450mm apart.
- Corrugated steel roofs shall be left clean and weather-tight on completion and to the satisfaction of the engineer.
- Gang boards shall be used while fixing corrugated sheets to avoid cracking or bending sheets.

3.9 Women Centre Water Connection

- Perform water connection from the main water pipeline to the women's centre. The SOW includes the provision of 50 meters, 2" UPVC pipeline, 2m³ horizontal plastic water storage tank, Height of tower shall be 3 meters to support 2 tonnes of water and own weight of the tank.
- The contractor shall provide the shuttering and all necessary items required to undertake the foundation and concrete works, and erection of the tower and the tank up to the satisfaction of supervising engineer.
- The SOW shall include the provision of all required fittings, valves, reducers, outlet and inlet, caps, taps, and any other necessary material and equipment for the completion of the work.

3.10 Training of the Pump Operators

- Training of the pump operators on smooth operation and maintenance of the water system including switching on and off the installed solar system and troubleshooting minor technical defects.

4. Key Deliverables

- Provide and install a 2.5" Submersible Pump System equivalent to PSk3-15 C-SJ17-18 in the borehole. The pump must work on solar power & Genset (hybrid).
- Provision and installation of solar power with a capacity of the 26,000-watt peak solar panels with tilted angle 11 degrees support structure.
- Provision and installation of fences for protection of solar panels & other components.
- Provision & installation of earthing system & lighting arrester.
- The contractor should supply, Install, test, and commission Of 700 m length UPVC 2" dia from exiting elevated water storage tank to the proposed taps stands and women centre
- Raise up, lift, and rehabilitation of exiting 50m³ exiting elevated water storage tank including welding of the storage tank to address any water leakage, construction of inlet and outlet, and painting the storage tank internally and externally
- Construction of 2 Public tap stands and perform distribution line connection from the existing water storage tank and tap stands.
- Manufacturing and installation of 4 animal troughs
- Construction and connection of Cart and Truck Filling Point.
- Construction of m4x4m exterior dimension and the clear headroom not less than 3.5m operator's room
- Perform water connection from the main water line to the women's Centre
- The contractor shall submit samples of the materials used in the project to UNHCR for approval before using them in the work.
- UNHCR may reject any material that does not comply with the specifications described in the BOQs and item 3 of this Statement of Work (SOW) (Location and Description of the assignment), in which case the contractor without any extra cost should replace the failed materials. The UNHCR or the delegated Supervision Committee can ask for any test to ensure the quality of the material used and work. Only approved materials and workmanship should be used.
- The Contractor shall be responsible for the preparation and actualization of detailed Health & Safety and Accident Prevention Plans, Detailed Time Schedules and Cash Flow Estimates, site Protection, and ensuring people and traffic mobility.
- The contractor shall transport and, at his expense, all demolished rubbles and exceeded building materials to locations minimum distance of 2-3 km or as specified by the municipality and shall be responsible for cleaning out the site and it is surrounding areas at the end of usage.
- The contractor should provide a written warranty for supplied equipment and materials, the warranty should cover a period of at least two (2) years inclusive of labour, transportation, and expenses that are needed for the repair/replacement of defective equipment.
- Up on completion and before acceptance of the work the contractor shall furnish UNHCR with a written warranty stating that all works executed under the project are free from material defects and workmanship

5. The Contractor Requisites

Experience

The contractor shall have done a similar number of works or projects. The similarity should be within the size and the nature of the requested works in this SOW. The previous contractor's clients can be UN agencies, NGOs, governmental organizations, or large-scale private sector companies, and they should be able to provide a reference for the contractor.

Minimum Staff

The contractor shall appoint a qualified project supervisor with at least five years of professional experience to work full time in supervising the implementation of work during the whole contract and warranty periods, and both the contractor and his/her engineer should work closely with the project supervisor for UNHCR.

The contractor shall appoint a qualified construction/water supply Engineer with at least five years of professional experience in construction, upgrading/rehabilitation, and solarization of water yards.

Minimum equipment

The bidder shall own or have access to all necessary tools and equipment needed to undertake the work. UNHCR may check the availability of the required equipment before launching the operations.

6. Bill of Quantity (BOQ)

The specified job is all provisional, including the provision of materials and workmanship, providing water and electricity for the implementation and all other requirements to implement the job perfectly. The bidder must visit the site prior to submission of bid documents. The cost of this item should be included /embedded in the other items. Below is the BOQ:

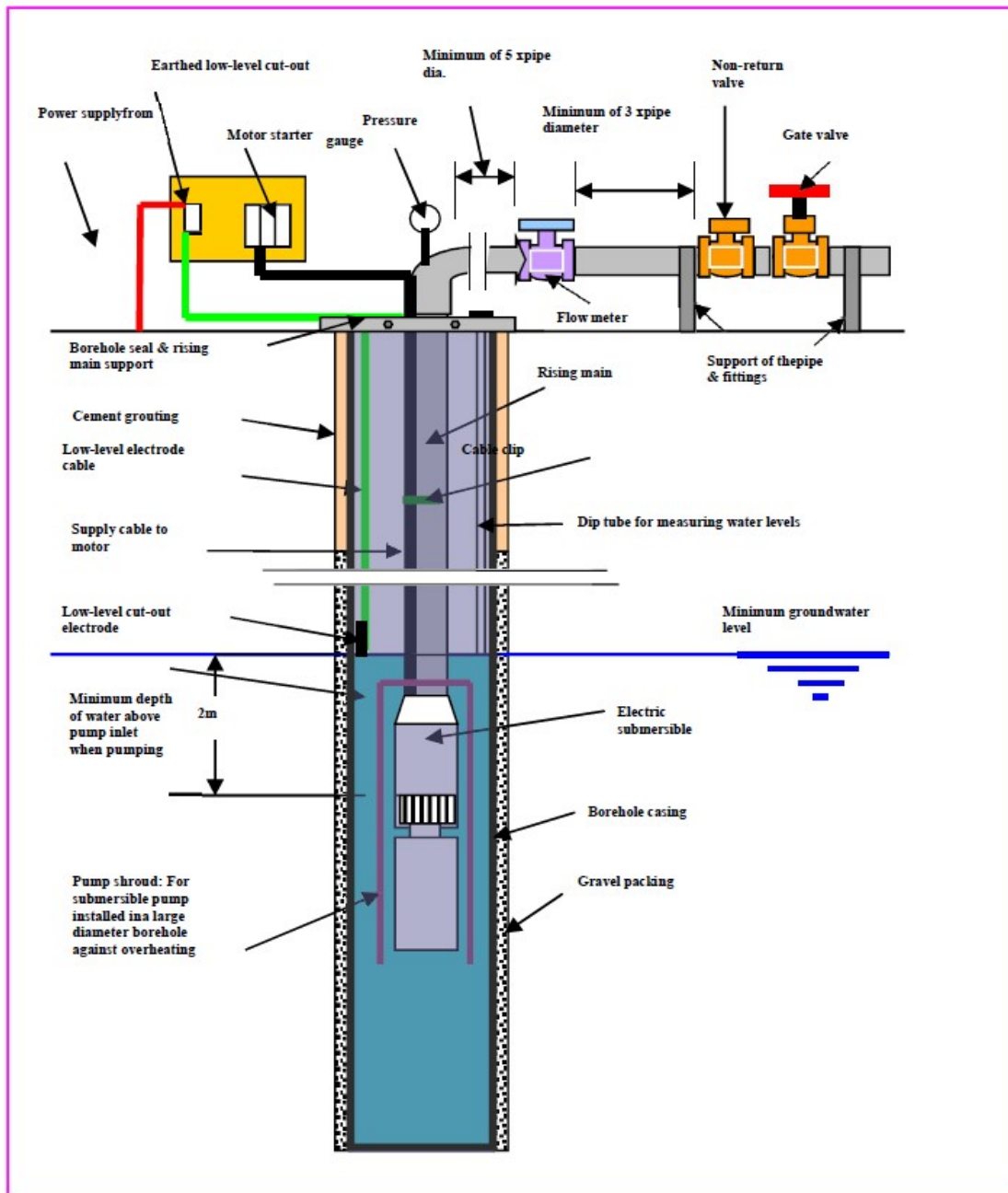
item	Description	Unit	Quantity
1	Mobilization of equipment, personnel, and construction materials to the project site	LS	1
2	Lift the water storage tank on the existing 6 meters high tower, install inlet and outlet pipes and 2 control valves 3", the cost includes painting of the tank, erection of the tower and the tank to satisfaction of the supervising engineer.	LS	1
3	Construction and Fabrication of tap -stand of 10 No 1" faucets. The tap stand shall be constructed on-site, and it includes two side walls constructed out of first-class burned bricks of 25cm*12cm*7cm dimension. A concrete slab will be cast on top of the side walls to form the platform for resting the water containers for filling the taps as illustrated in the drawings below.	NO	2
4	Fabrication of four water troughs connected to distribution pipeline up to the standpipe for filling tankers and donkey carts. Excavation of 0.4m deep trenches, pipe laying, backfilling, and as per the drawing.	LS	4
5	Provision and installation of distribution of UPVC pipeline system, 2" diameter with 2 water meters, 2" sluice control valve from elevated water tank up to the distribution points. Excavation of trenches for water line cost included in the unit cost.	m	700
6	Supply of local material, red bricks, gravel, and sand and construction of plant operator's room as per the attached drawing with 12mm, 1:6 plastering mix, 1:3:6 concrete mix for the floor, lime wash. The room shall be 4m x 4m in exterior dimensions and the clear headroom is not less than 3.5m. The room comprises two windows on the opposite side as shown in the drawing provided below.	NO	1
7	Perform water connection from the main water line to the women and mother childhood center the SOW includes provision of 90 meters 2" diameter UPVC pipeline, 2m ³ horizontal plastic water storage tank, the height of Tower shall be 3 meters to support 2 tons of water plus own weight of the tank.	NO	1
8	provide all necessary equipment for dismantling the exiting raising GI pipe and the submersible pump.	Job	1
9	Provide and install a 2.5" Submersible Pump System equivalent to PSK3-15 C-SJ17-18 Submersible pump system including a controller (inverter) (inverter compatible with proposed pump & solar panel configuration with Data Module, motor, and housing for the protect controller from severe weather. The pump must be provided with full accessories such as protection from dry run etc.	Each	1
10	Supply & installation of robust 260watt peak monocrystalline 24 volts,8,8 Amp, each solar panel must have one of these certificates such as ISO, CE RoHS, UL, IEC, and TUV	Each	100

	<p>module deployed must identification tag which should be able to withstand harsh environmental conditions and shall consist of the following information:</p> <ul style="list-style-type: none"> * Name of the manufacturer of the Solar panels (PV modules). * Month and year of manufacture for each solar Panel. * Panels (modules) Wattage, I_{max}, V_{max}, FF etc. * Unique serial number of the Panels (PV modules). 		
11	Support structure to hold 100 Pcs of 260Watt peak- Supply, Fabricated, construction, and installation of the Bolted support structure for modules, the support should be anchored to a concrete base, and the structure withstand wind speed (40 m/sec), the support structure should be from galvanized steel or heavy pipe & angles with pre-coated anti-rust as base paint. if it's a ground-mounted concrete base (40*40*50) cm. The tilted angle of the support structure is 11 degrees.	Set	1
12	Supply DC cables (100 yards) single core one roll will be red and one roll is black colour. The cables must be hosing with conduit or plastic (PVC) pipe for protection, cables shall meet the requirements of one of these certifications ISO, RoHS, IEC, and TUV.	Roll	2
13	AC cables 16 mm- 4-core Supply must be hosing with conduit or plastic (PVC) pipe for protection (one rolls length 100 yards). Cables shall meet the requirements of one of these certifications ISO, RoHS, IEC, and TUV.	Roll	2
14	Junction boxes (combiner Box) for Solar Panels with Dc Fuses- DC -Fuses (8) pcs (25 Amp 1000 Volt) with provided cable glands and conduits. The combiner box must be manufactured from fiberglass reinforced plastic (FRP)/ thermoplastic with IP65 protection and shall be waterproof, and dustproof. The terminals should be connected to copper bus bar arrangement of proper sizes to connect cables from solar modules arrays and controller (inverter).	Each	1
15	Change over switch (200 Amp, 415 volts, 3 phase).	Each	1
16	Lighting arrester & Earthing system include star and the rod with cable 16 mm single core with colour green and yellow, 30 meters, equipotential busbar, earthing rods, set of joint cable, set of screws to the joint module via support structure.	Set	1
17	Provision of galvanized Iron poles 2 inches high, 2 m with concrete base 30*30*40 cm with chain-link wire with secure distance 3m for each direction (distance between fence & solar panels) to protect Solar panels.	Job	1
18	The cost of installation of pump and electrical work	Job	1
19	Training of the 5 pump operators and guards for two days on smooth operation and maintenance of the water supply system including switching on and off of the installed solar system and troubleshooting of minor technical defects.	Job	1

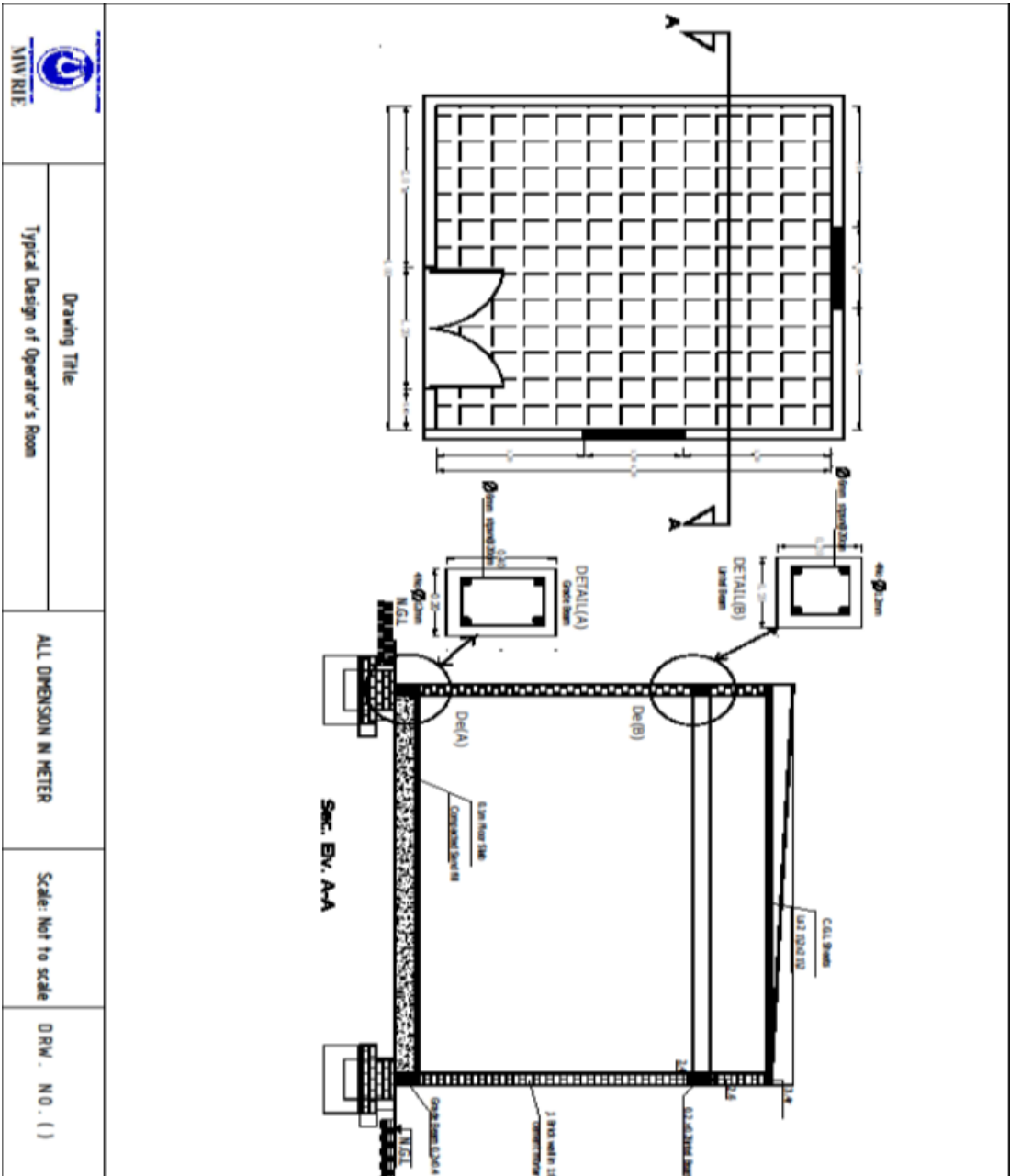
7. Site Drawings:

There are 10 sets of the site drawings as follows:

1. Technical drawing of the Electrical Submersible pump, Equipment, and installation -1
2. Technical drawing of the generator room 2
3. Technical drawing of the Animals Trough 3
4. Technical drawing of the Tanker Filling Points 4
5. Technical drawing of the Public Stands Pipes 5
6. Technical drawing of the Inlet & Outlet Pipes Arrangements 6
7. Technical drawing of the 50m³ of Elevated Water Tank 7
8. Technical drawing of the Solar pumping layout 8
9. Technical drawing of water storage tank at women/childhood and motherhood center
10. Technical drawing of the general Water Station- 9



General Layout of Electric Submersible Pump Equipment Installation



MVA RILE

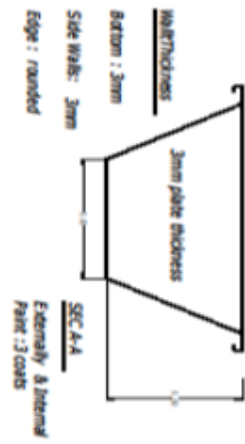
Drawing Title

Typical Design of Operator's Room

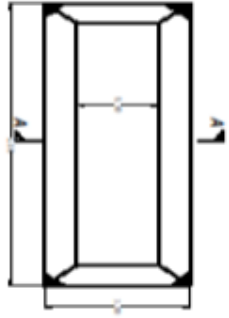
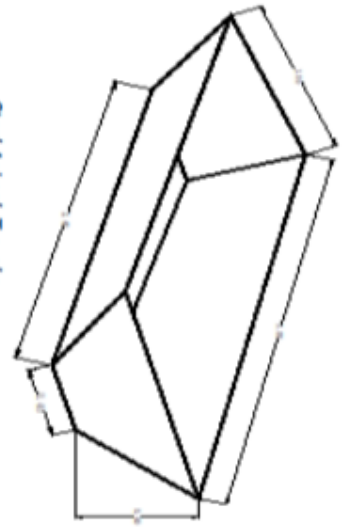
ALL DIMENSION IN METER

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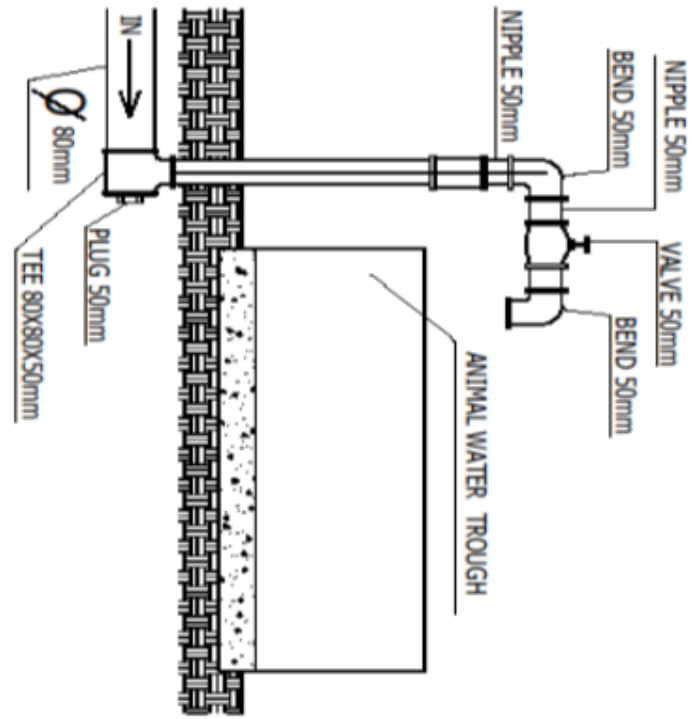
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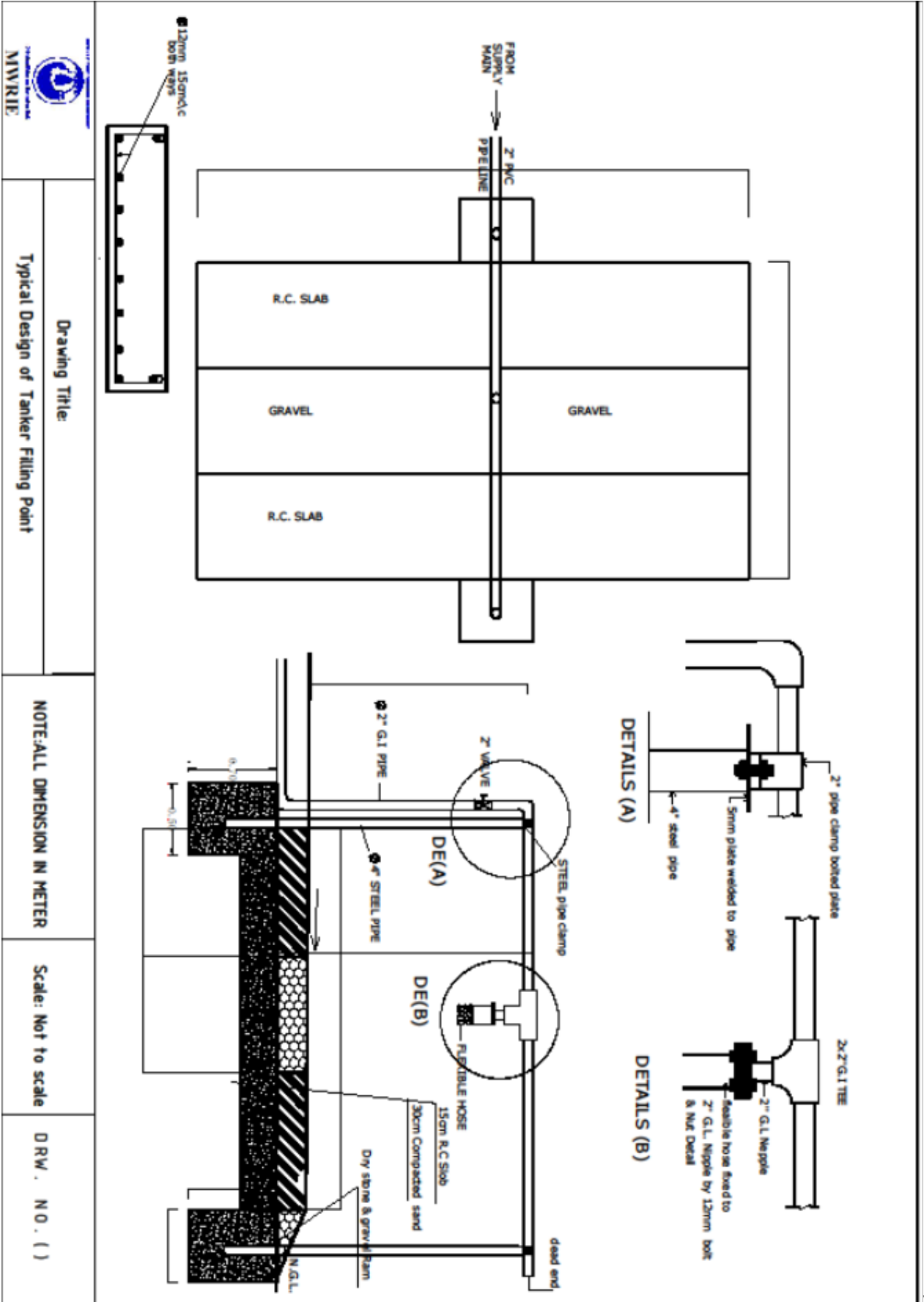
Steel Animal Troughs



Dimensions
 Top: 3.00*1.00m
 Bottom: 2.4*0.4 m
 Height: 0.6m



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	Typical Design of Animal Trough				

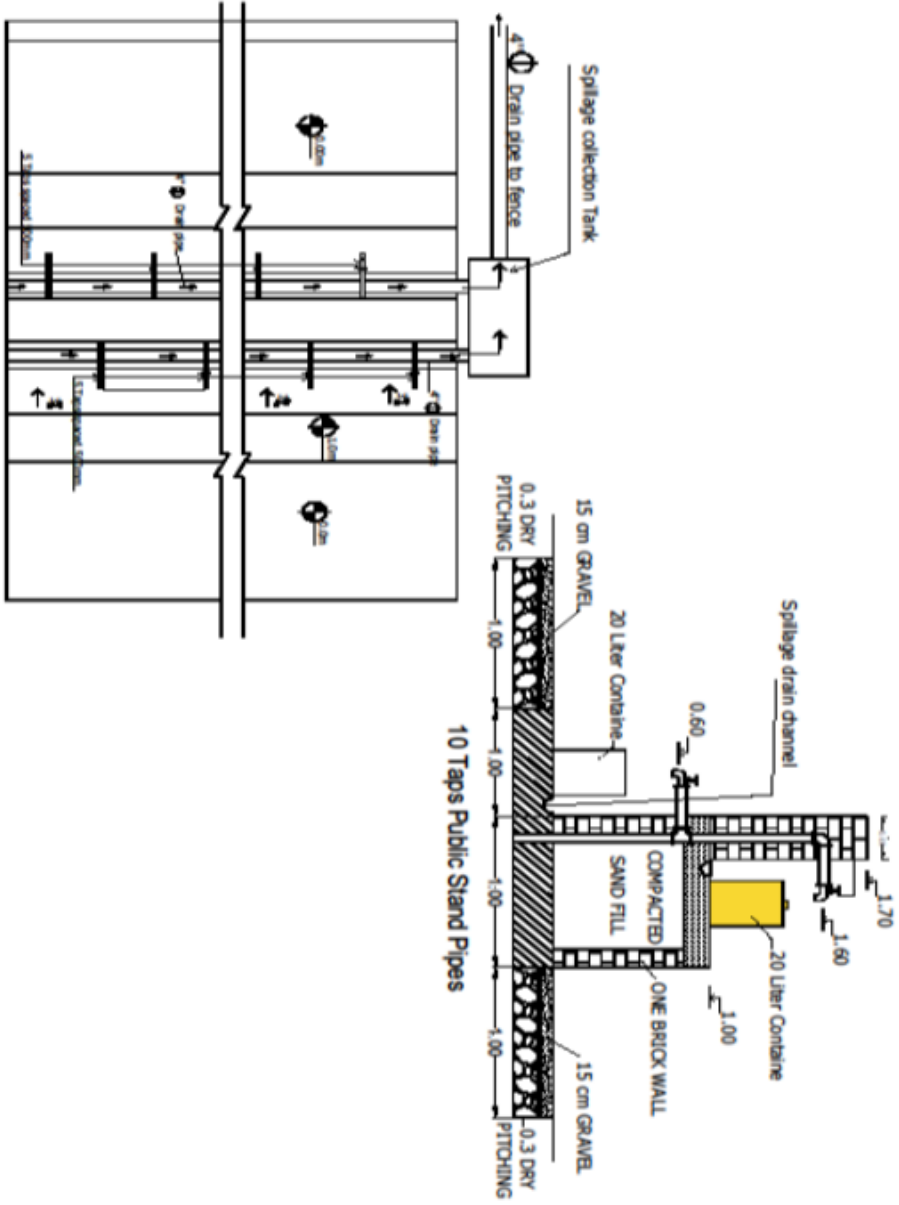



Drawing Title:
Typical Design of Tanker Filling Point

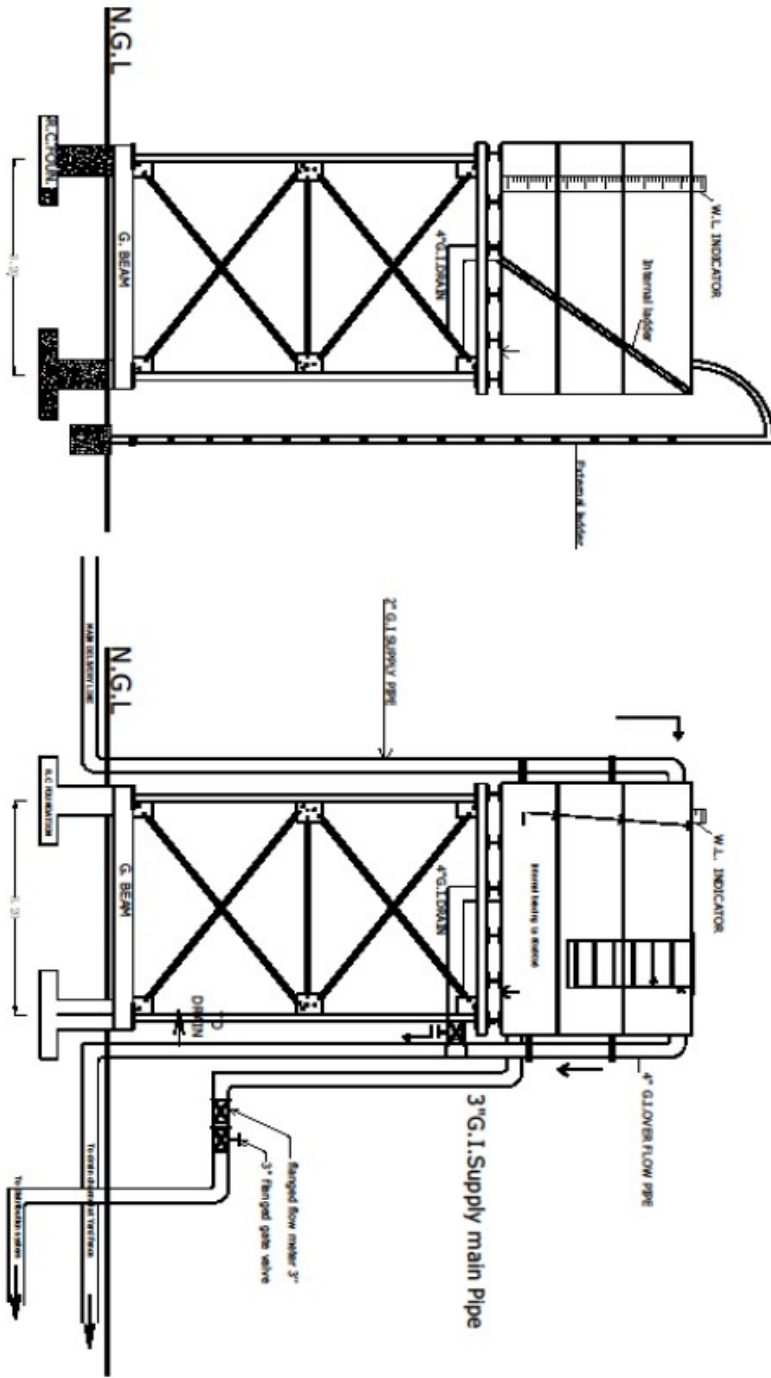
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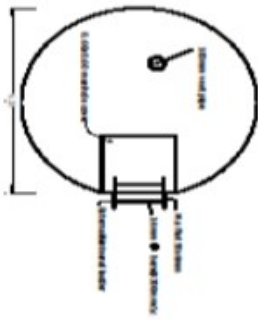
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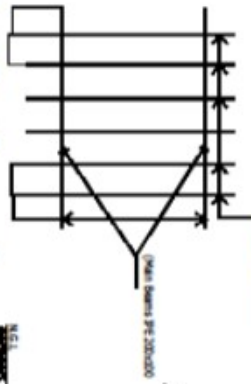
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	Typical Design of Public Stand Pipes				



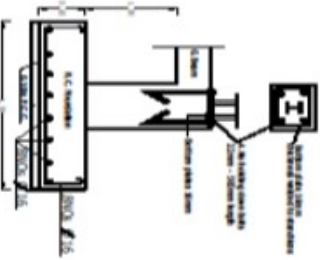
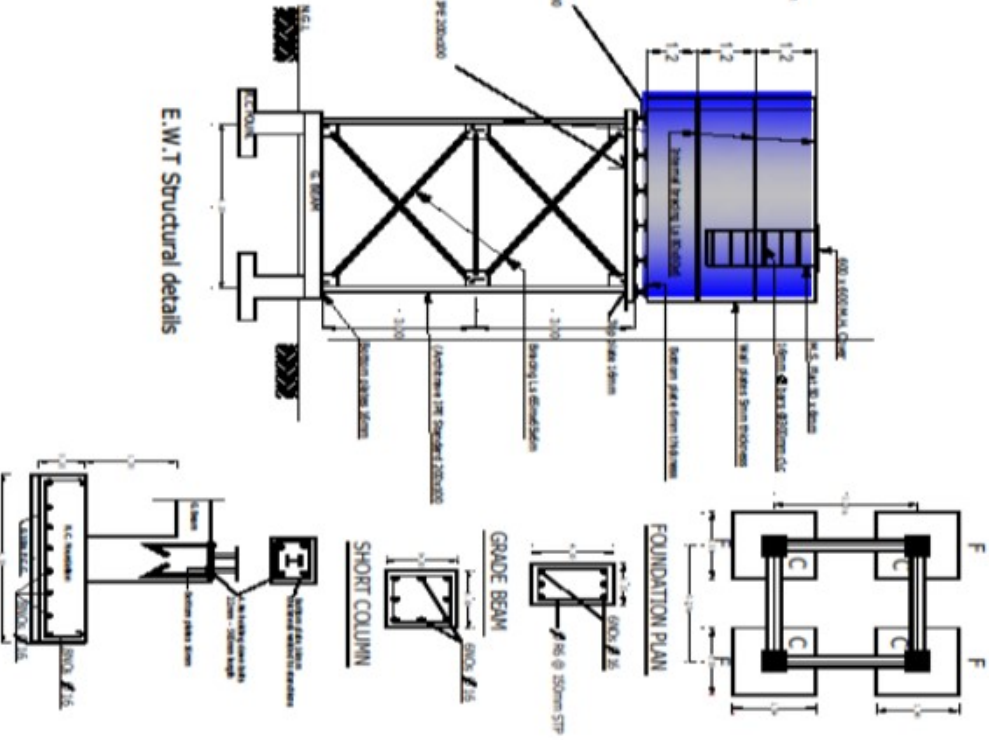
Tank Roof Plan



Main & Branch Beams Arrangement



E.W.T Structural details



GRADE BEAM



SHORT COLUMN



Drawing Title

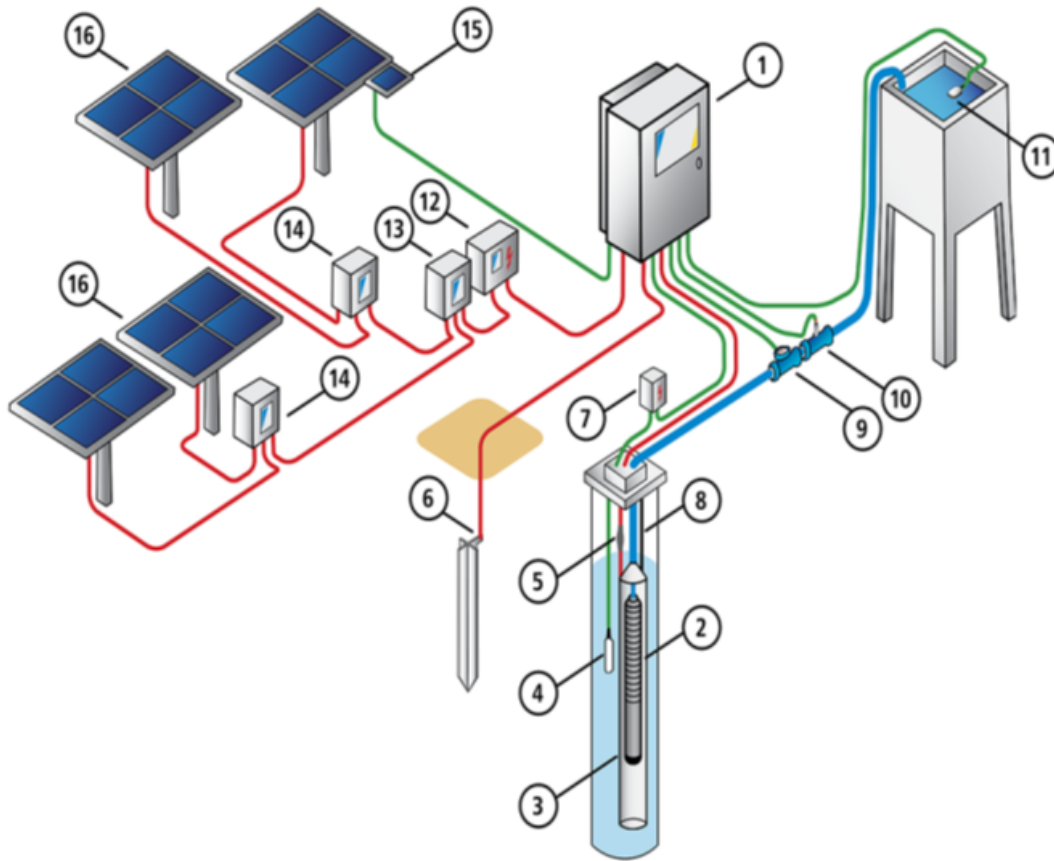
50 m² ELEVATED WATER TANK

NOTE: ALL DIMENSION IN METER

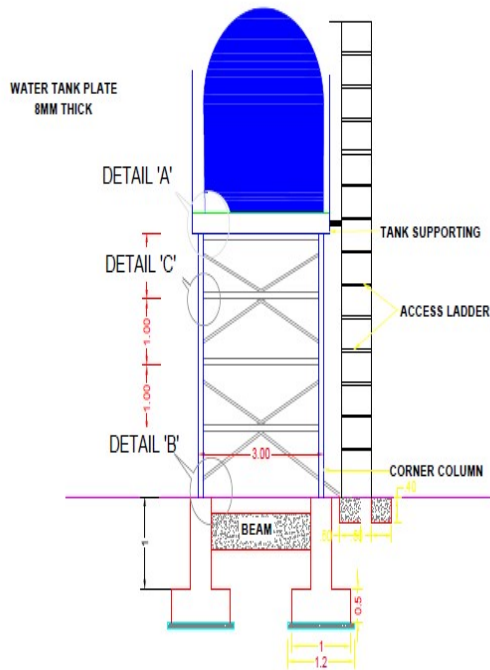
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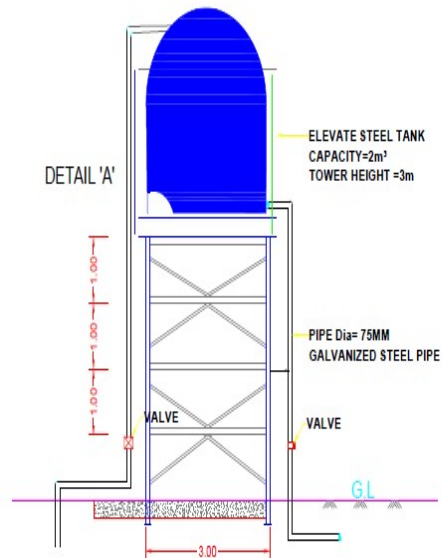




1. PSK3 Controller
2. Submersible Pump
3. Stilling Tube
4. Well Probe
5. Cable Splice kit
6. Ground Rod
7. Surge Protector
8. Safety Rope
9. Water meter
10. Pressure Sensor
11. Float Switch
12. PV Protect
13. PV Combiner
14. PV Disconnect
15. PV Module for Sun Switch
16. PV Generator



ELEVATION OF TOWER FOUNDATION



ELEVATION OF TOWER

