



Terms of Reference

Project overview

The Lebanese Red Cross (LRC), through its Disaster Management Sector – WASH Program, implements emergency and resilience-focused Water, Sanitation and Hygiene (WASH) interventions across vulnerable communities in Lebanon. The project aims to improve safe access to sanitation facilities, water supply systems, drainage mitigation measures, and site infrastructure for Syrian refugees and vulnerable Lebanese populations residing in Informal Tented Settlements (ITSs), collective shelters, and underserved communities.

The intervention includes the manufacturing, transportation, supply, installation, construction, rehabilitation, testing, commissioning, and handover of various WASH facilities and associated civil works under challenging field conditions, including muddy agricultural lands, restricted-access settlements, and emergency-response environments.

Project Scale & Deployment Requirements

The project includes the manufacturing, transportation, supply, installation, construction, testing, and commissioning of approximately fifty (50) complete WASH intervention units distributed across multiple ITS family plots/tents.

The project is implemented consists of the following major activities:

- Installation of Latrines superstructures
- Digging of Pits
- Installation of water Tanks
- Connection of water networks
- Plumbing works
- Steel works (manufacturing, welding...)
- Site Improvements (Excavation Works, Channel digging, land elevation...)

All components shall be prefabricated, transported, assembled, and installed on-site under difficult field conditions while maintaining implementation timelines, structural durability, beneficiary safety, and quality standards required by LRC.



Areas of Implementation

The LRC WASH project will be implemented in **Hermel/ Baalbek**

A detailed list of the specific sites will be shared with the contractors with specific coordinates and list of works to be done in each site.

Scoop Of Work

The contractor shall provide all labor, supervision, transportation, tools, machinery, consumables, materials, testing equipment, installation, commissioning, and temporary works necessary for complete execution of the project.

Contractor shall submit material datasheets, catalogues, and samples for approval prior to procurement and installation.

Contractor shall restore all disturbed areas after completion of works and remove debris, excess soil, packaging materials, and temporary works.

The contractor shall maintain sufficient:

- Fabrication capacity;
- Transportation means;
- Skilled manpower;
- Site supervision teams;
- Machinery and excavation equipment;
- Simultaneous deployment capability across multiple ITS locations.

The contractor shall also:

- Coordinate with LRC field teams;
- Submit implementation schedules;
- Maintain quality assurance procedures;
- Ensure site safety and environmental protection;
- Remove and transport all disposed materials to a location approved by the municipality;
- Protect existing shelters and beneficiary circulation areas;
- Maintain operational continuity throughout implementation phases.

The Contractor shall be from Bealbek-Hermel /Bekaa area.



INSURANCE

The cost of all required insurance policies shall be deemed to be included within the contract price. This includes, but is not limited to, the insurance of the Contractor's personnel and staff, equipment, and any liabilities related to the Employer and their representatives, in accordance with the conditions of contract and applicable laws and regulations.

The insurance shall also explicitly cover risks related to war, armed conflict, civil unrest, and acts of terrorism. No separate payment shall be made under this item. The Lebanese Red Cross (LRC) shall not be held liable for any loss, damage, injury, or claim arising from inadequate, insufficient, or missing insurance coverage on the part of the Contractor. It is the sole responsibility of the Contractor to obtain and maintain all necessary insurance for the entire duration of the contract.

All relevant insurance documents and certificates shall be submitted to the LRC & ICRC for review and approval prior to the commencement of works.



Map of areas of implementation





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Delivery condition

The supplier undertakes to supply items and materials in the quantities specified on the purchase order form issued by LRC. The quantity and the quality of the delivered items and materials shall be verified by a representative of LRC Center or the WASH field officer, in the presence of the supplier, by visual inspection and counting.

LRC reserves the right to refuse supplies which are found not to comply with the quantitative and qualitative specifications of the order, or which are incomplete deliveries or in excess quantities.

Acceptance of the equipment shall only be effective once the quantitative and qualitative verification of the supplies confirms that the supply conforms to the order and to the technical specifications.

Acceptance shall be notified by LRC on the delivery slip. This document shall be signed by the representatives of both parties.

Two possibilities for the reception of material:

- Delivery note (done by the transporter / supplier) will be given to the LRC representative and signed by both party
- Good Receive Notes (LRC procedure)

In case of problem on the material (defective/items missing/...) the GRN/ delivery note will be the only authoritative document.

The contractor should have the capacity to work at least in 5 different sites at the same time. Winter season should not be an excuse for the delay of implementation, more or less all the sites are agricultural lands with muddy soil.

Safety

The contractor is responsible for the safety of his workers and the people living around the site.

The material & goods delivery will be store to avoid hazards, in particular the risk of falling.

The surroundings of the pit have to be marked and protected to avoid hazards, in particular the risk of falling into the hole. In case of unstable soils, a formwork has to be used for the safety of the workers.

End of work

The cleanness and the safety of the site is the responsibility of the contractor.

The contractor shall remove and transport all disposed materials resulting from the works to a location approved by the municipality;

The contractor works will be monitored by LRC Center and LRC WASH Field officer and an approval of specifications and detailed agreed on in advance should be confirmed.

Water facilities

Water tower stand

The water tower structure is made of rectangular iron bars 60mm x 30mm, 3mm thickness for the poles and an iron sheet of 1000mm x 1000mm, with 3mm thickness for the base. The structure is reinforced with square iron bars 30mm x 30mm, 3mm thickness.

A barrier made of square iron bars 30mm x 30mm, 3mm thickness and height 200mm fence-in the water tank.

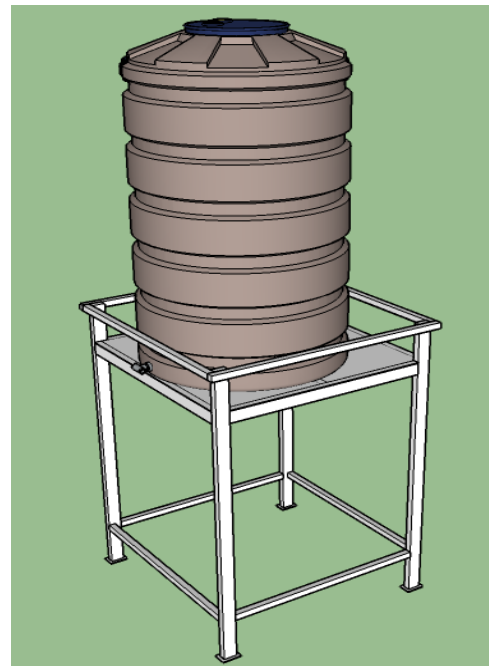
The metallic structure is painted with anti-rust paint from all sides and can support a full 1000L water tank (equivalent to approximately 1 ton). The water tank has a valve and Tee junction to provide water to the cabin latrine & to the shelter.

The contractor shall ensure proper structural stability, alignment, and safe fixation of all steel members during fabrication and installation. All welded connections shall be properly executed to maintain rigidity of the structure during transportation and operational use.

The structure shall be installed on stable and leveled ground conditions to prevent settlement or instability during operation. All steel elements shall receive anti-rust protection prior from all sides to final painting to improve durability under outdoor environmental exposure conditions.

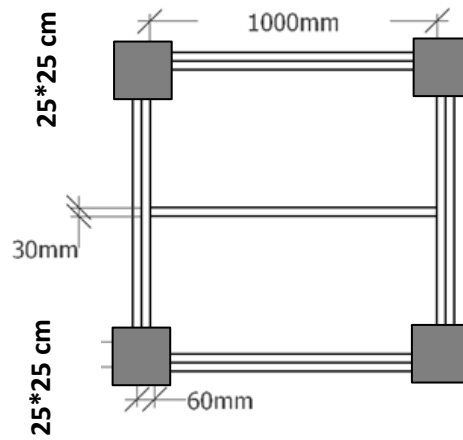
The contractor shall ensure safe accessibility around the water tower and avoid sharp edges, unstable supports, or unsafe protruding steel elements that may affect beneficiary safety.

Design

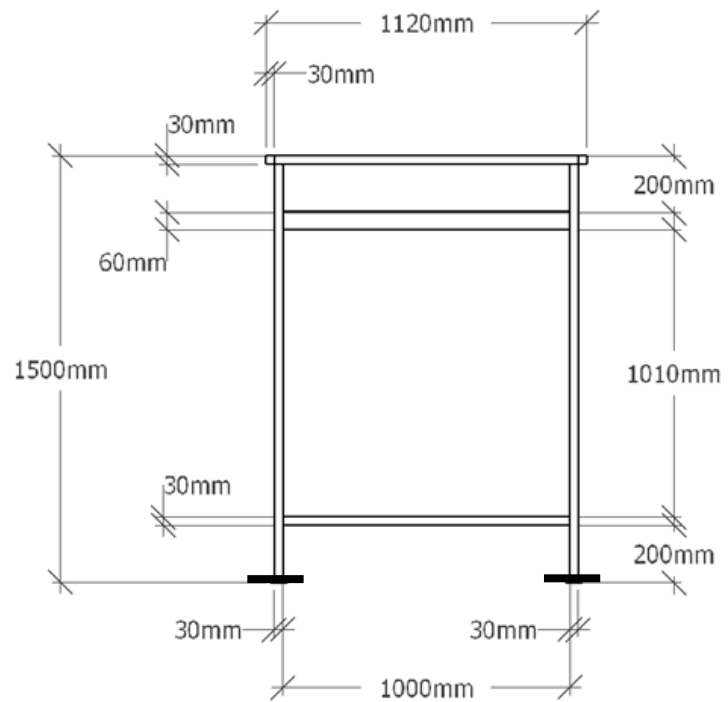
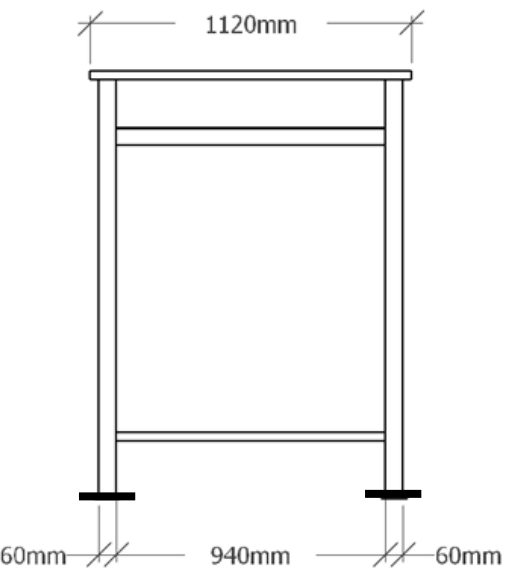


Design

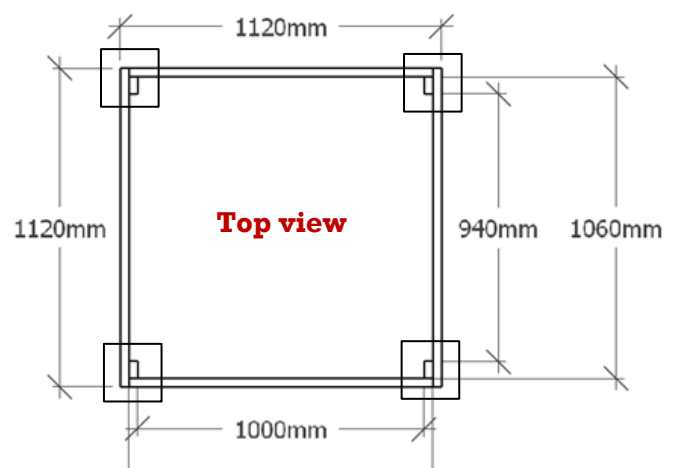
Bottom view



Side view



Top view



Water tank & connection

The water tank is 1000L and has an exit $\frac{3}{4}$ " female threaded.

- Volume: 1000L
- Material: HDPE, 3 layers plastic
- Shape: Cylindrical form
- Water tank with cover - grey color
- One outlet connection



The contractor shall ensure that the tank is properly fixed and installed on a stable supporting structure capable of safely supporting the full operational load when the tank is completely filled.

A plumber kit has to be installed to deliver water from the tank to the cabin and the shelter. The plumber kit is composed of a reducer, a ball valve, two ball taps and different fittings for adaptation. The threaded part will be screwed with Teflon to ensure proper water tightness, while heat-sealing shall be used for all PPR pipe connections.

The assembly of the plumber kit is as follows:

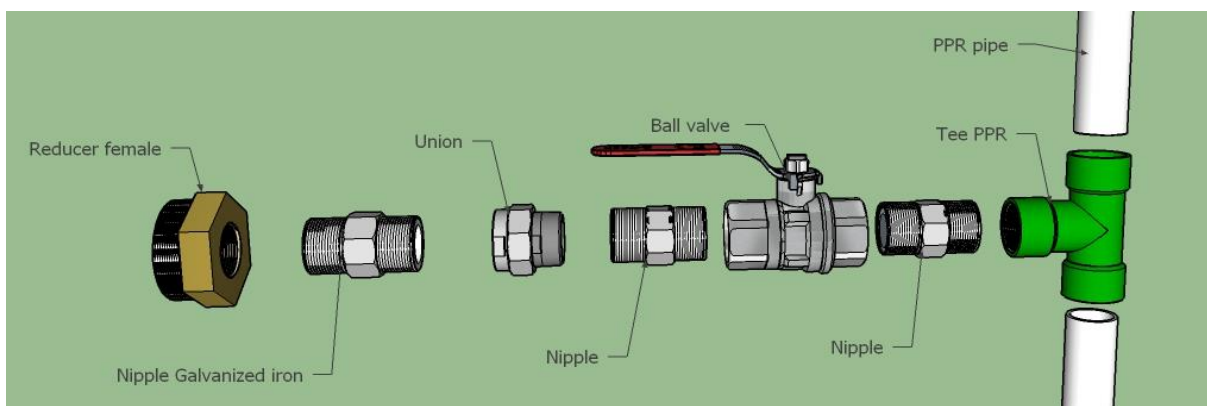
From the tank, a reducer $\frac{3}{4}$ " male to $\frac{1}{2}$ " threaded female join a nipple male $\frac{1}{2}$ ", then go to a union female $1/2$ " then a nipple male $\frac{1}{2}$ " to the ball valve $\frac{1}{2}$ " threaded female.

The valve allows isolating the rest of the pipes and the union allows easy disconnection in case of maintenance activities.

All plumbing connections shall be properly aligned, leak-free, safely fixed, and protected against accidental damage during site activities. Pipe routing shall minimize exposure to beneficiary movement areas and maintain safe operational conditions.

The contractor shall verify all valves, reducers, fittings, and flexible pipe connections before commissioning the system to ensure continuous and leak-free operation.

Both taps shall remain properly fixed to the wall and stable during repeated beneficiary use.

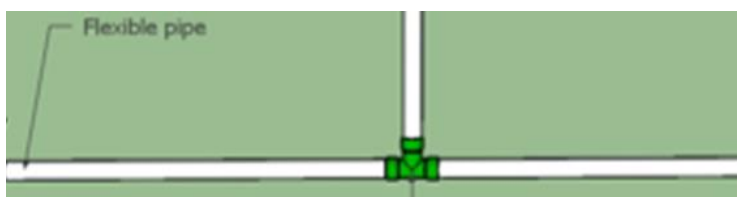
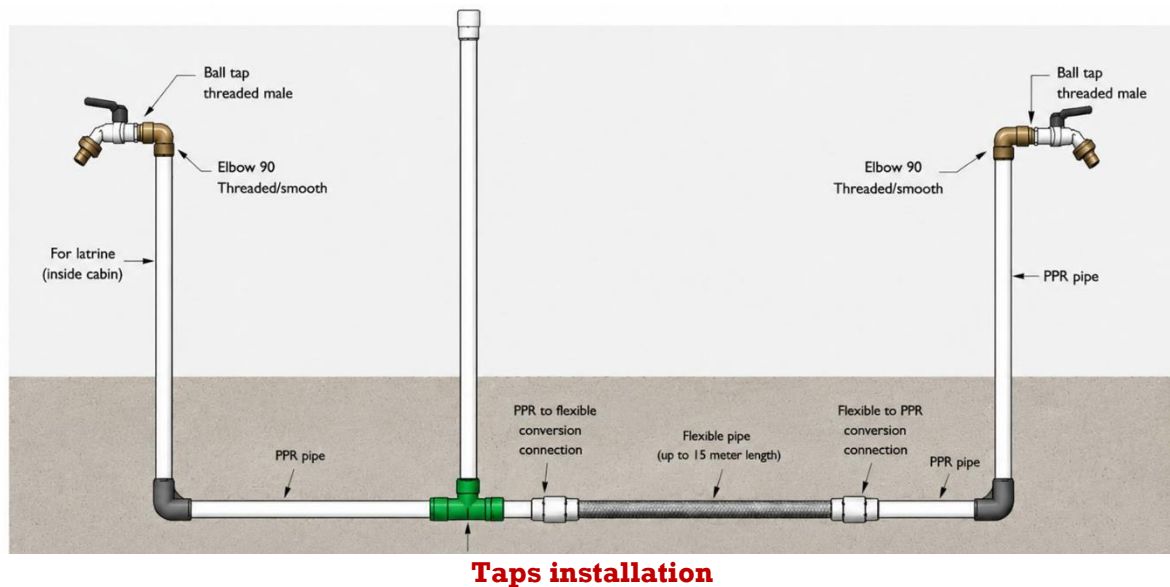


Fittings & connection

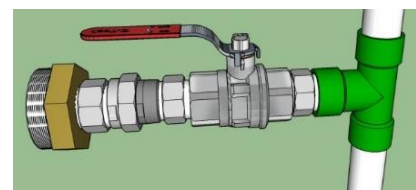
2 flexible pipes $\frac{1}{2}$ '' go from the Tee PPR down. The first goes to the cabin, the second to the shelter. A flexible PE pipe white, and with good quality, is used to in the connection. A 90° elbow female $\frac{1}{2}$ '' threaded in one side is used to connect the pipe to the ball tap threaded male $\frac{1}{2}$ '' . See figure 2 beside.

The first ball tap is installed inside the cabin, the second inside the shelter. Both of them are metallic, at 50cm above the floor, fixed on the wall and should not be loose. See figure 3 below.

Note that :All water tanks shall be securely fixed against movement and overturning; Exposed piping shall be UV-resistant or properly protected; Pipe routing shall minimize interference with pedestrian circulation; Leak testing shall be conducted before commissioning.



Fixing PPR pipe



Plumbing kit

Concrete Foundation for Water Tanks

Concrete base for water tank stands to ensure their stability where soil is clayey or unstable. In this case, it is required to use the same specs of concrete used in construction activities. These specs are: Sulphate Resisting Cement should be used in all concrete work adjacent to the soil. The use of vibrations during casting concrete. All shuttering should be made from plywood to ensure acceptable fairfaced concrete faces. Supply, cast, install and vibrate concrete for slabs with compressive strength 25 MPA. use Twisted Steel reinforcement bars of diameter 14mm where needed.



Site Improvement

Site improvement: Ground Leveling

In case the site remains muddy even after drainage works (soak away pit) an excavator will level the ground before spreading a first layer of 10cm of small gravels. After compaction of the first layer of gravel, a second layer of 5cm of bigger gravel is spread and levelled.

As a method of flood-prevention in ITSs, channels surrounding the ITSs must be cleaned to remove debris and waste.

The contractor shall ensure complete removal of accumulated waste, mud, vegetation, and obstructions affecting the normal drainage flow inside the channels.

All removed waste and debris shall be safely transported and disposed outside the intervention area in accordance with site safety and environmental requirements.

Cleaning activities shall improve drainage continuity and reduce risks of flooding and stagnant water accumulation around shelters and sanitation facilities.

The contractor shall ensure Proper compaction; Uniform thickness distribution; Adequate surface leveling; Proper drainage slopes; Reduction of stagnant water accumulation; Safe pedestrian circulation for beneficiaries.

All ground improvement works shall remain stable and functional during winter conditions and under repeated beneficiary use.

Soak away pit



The pit is 1m deep, not less than 2m above groundwater. A pit of 1m³ must be dug and a perforated 200L metallic barrel (with holes) with a base that is placed inside the hole.

Empty space around barrel is lined with porous material and filled with coarse rocks and gravel. Sand and fine gravel spread across bottom to disperse flow.

lid with **hinges** to seal the pit. The lid is metallic cover with handle with 3 mm thickness.

When the soil is rocky or the water table is high, it is necessary that the barrel and the lid be installed.

Quality shall be verified on site through percolation testing before final approval of the soak away system.

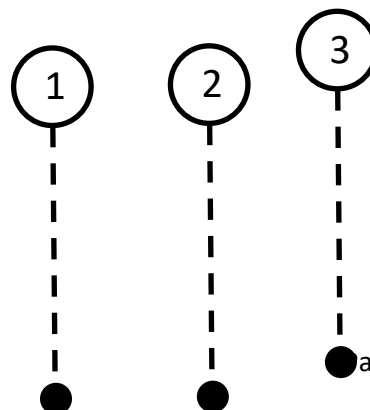
The contractor shall ensure proper infiltration performance and avoid direct overflow toward shelters or pedestrian circulation areas.

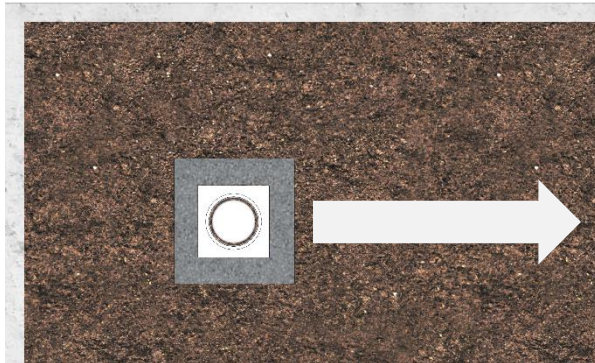
Clean out For Tents/Shelters

A wire mesh should be provided on top of the p-trap connected to the soak away pit with a 2-inch PVC pipe to reduce clogging risks and prevent debris infiltration into the system

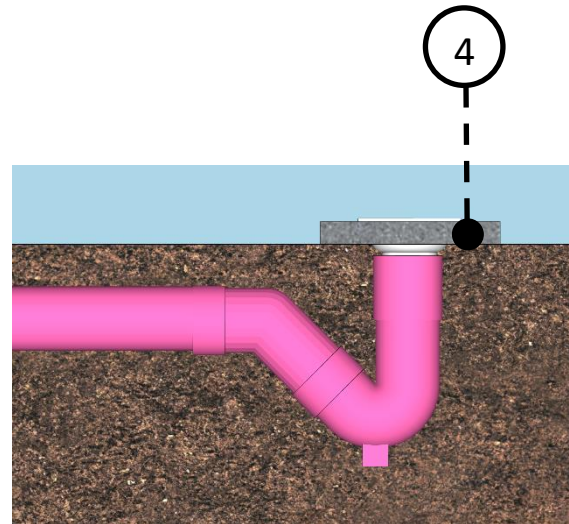
Clean out For Tents/Shelters

1. 2-inch PVC Pipe
2. 2-inch PVC P-trap
3. Clean out 20 x 20cm
4. mortar for stabilizing the drain





Toward Soak away pit



Sanitation facilities

Latrine cabin

Construction of the metallic cabin

The structure is made of square iron bar 30x30mm with 3mm thickness. The bars are welded together to form a skeleton or body of the superstructure. **Note: in the case of western Seat Toilet /Option 2 the handheld side bidet must be properly fixed by a separate support steel sheet welded to the 30x30mm welded iron bar as per the below drawing.**

The contractor shall ensure proper alignment and rigidity of all welded steel members to maintain structural stability during transportation, installation, and long-term operational use in harsh ITS environmental conditions.

An iron bar is added to support the hinges. Two small iron bar pieces are installed at the same level as the hinges to block the door opening till 90°.

To cover the structure, a white galvanized metallic sheet 0.6mm thickness/1050mm width is used (sides, door and roof). The roofing sheet is folded to ensure better waterproofing quality and reduce rainwater infiltration inside the cabin.

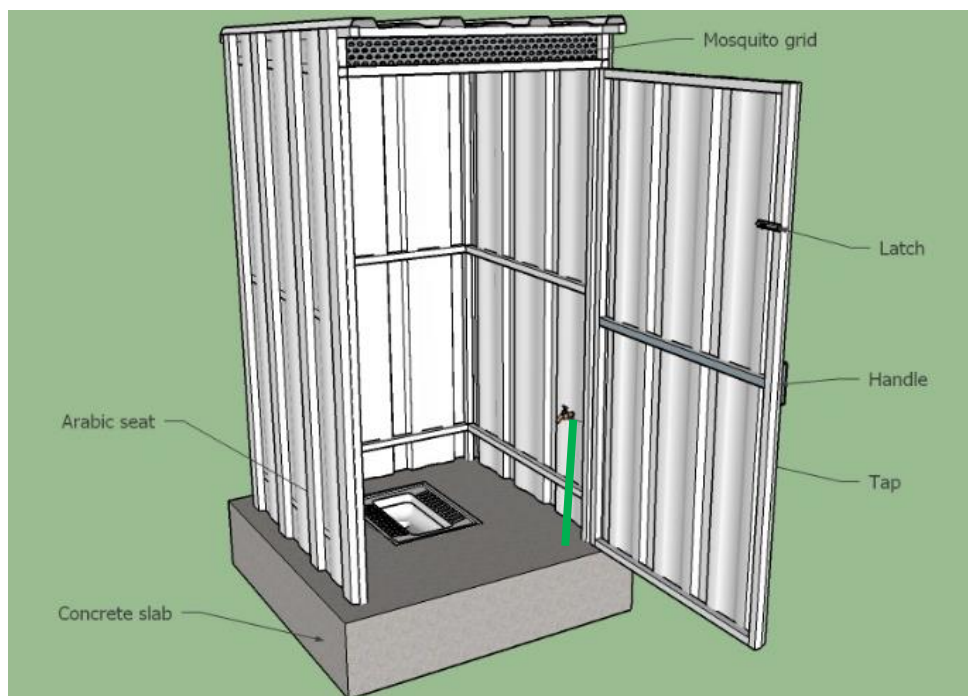
All screws are screwed into the metallic bar to ensure beneficiary safety. Sharp edges, unstable fixation points, or exposed metallic elements shall not be accepted.

The door is equipped with an external handle. A locking system (interior/exterior) is installed at 0,80m height. This locking system allows adults to open from outside in case a child is locked inside.

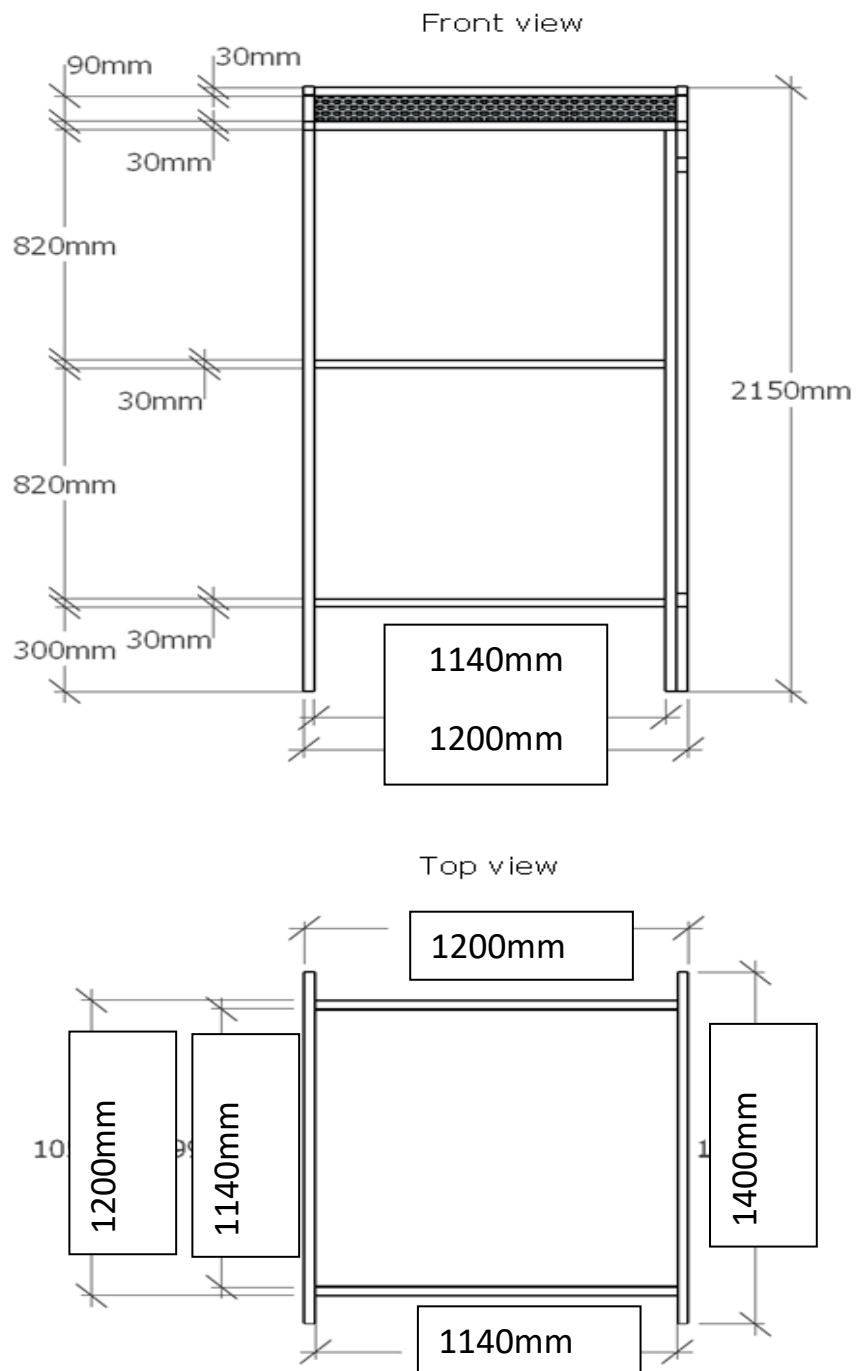
The complete superstructure (square bars, iron mesh sheet, feet) is first protected with anti-rust paint from all sides , and secondly painted with white acrylic paint to improve corrosion resistance and prolong operational lifespan under outdoor conditions (from all sides).

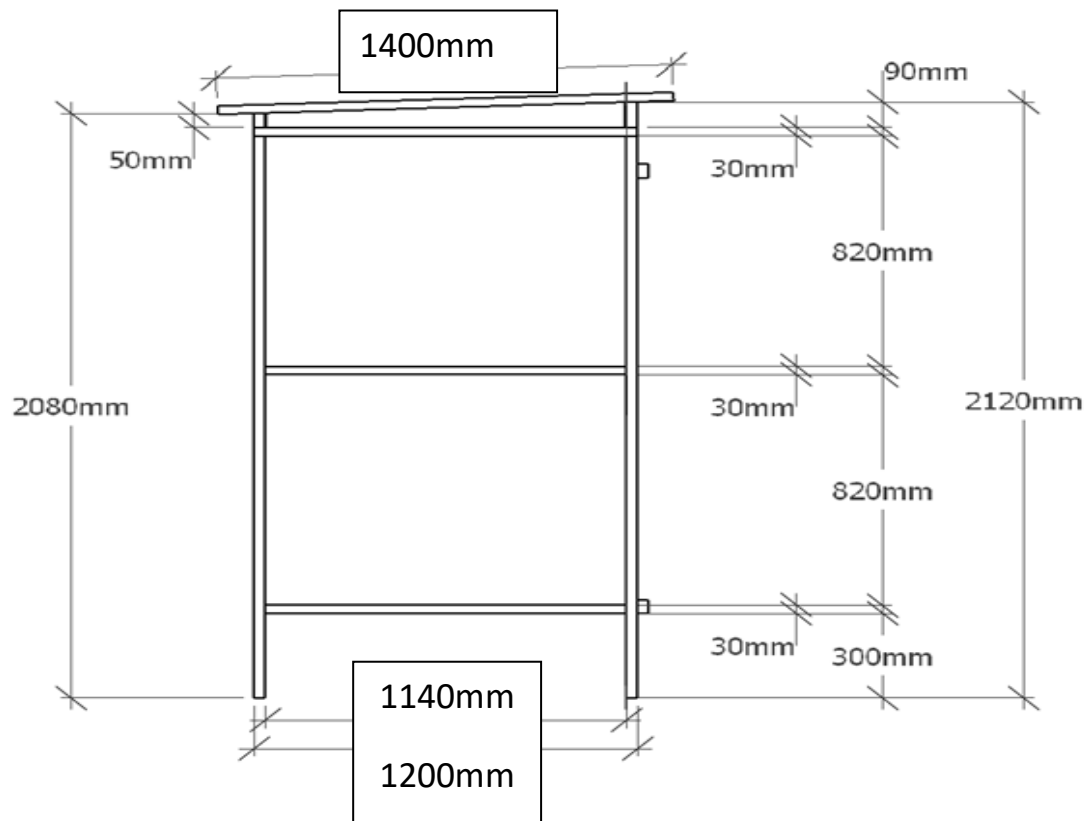
Ventilation openings shall ensure continuous airflow circulation while limiting insect penetration through the welded internal mesh protection.

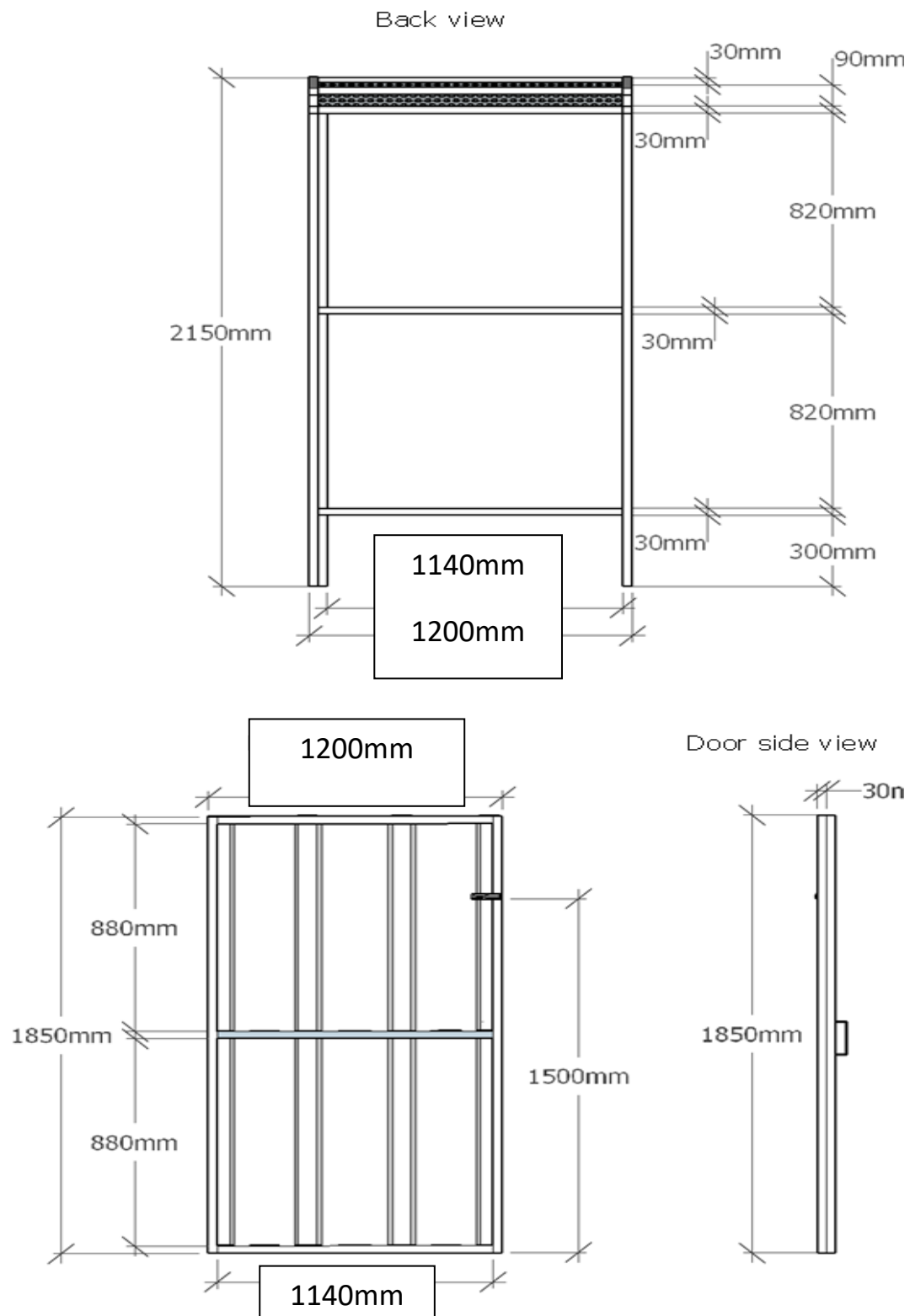
The cabin shall ensure: Beneficiary privacy; Safe daily use; Weather resistance; Adequate ventilation; Easy maintenance and cleaning access.



Design







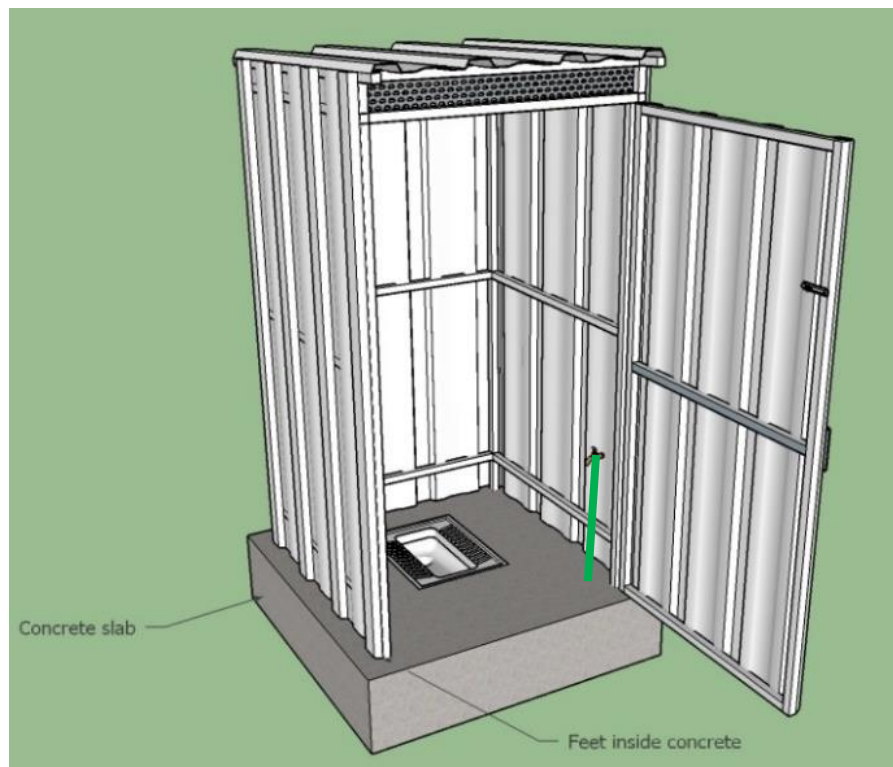
Latrine Concrete Base

Construction of the concrete base

A formwork is prepared for the base with the following interior dimensions: 1,30m L/1,30m W/0,30m H (Length/ Width / Height). See figures below. A 4" PVC pipe, a P-trap 4" PVC and a ceramic Arabic seat are connected with PVC glue to the sewage system (e.g. septic tank, simple pit, sewage network). The pipe needs a gentle slope to ensure good evacuation of the liquids and feces, minimum 1% or 1cm/m. The concrete mix is at 350kg of cement/ concrete cubic meter or 1:2:4 (Cement/Sand/Gravel). Special focus on concrete is required depending on the weather conditions. For a good curing and a normal shrinkage, it must be sheltered from sun and wind to avoid drying too fast. After pouring the concrete, the completion works includes a smooth floor with a slight slope toward the Arabic toilet, to facilitate water run-off during cleaning. The Arabic WC is set into the concrete and has to be at the same level of the concrete or a bit lower to maintain cleanliness of the cabin. It must not be higher. Attention on the completion works to ensure a smooth slab with slight slope towards the Arabic toilet is of high importance for easy maintenance of hygienic conditions. The location of the cabin shall be in a place with lights or where it is easy to install a light to be used at night.

Installation of the latrines cabin

The metallic cabin is installed at the center of the concrete base. The cabin's feet are buried in the concrete slab to avoid to be removed. See figure below.



Cabin installed on base

Case of Ceramic Arabic Toilet /Option 1

1. Ceramic Arabic toilet

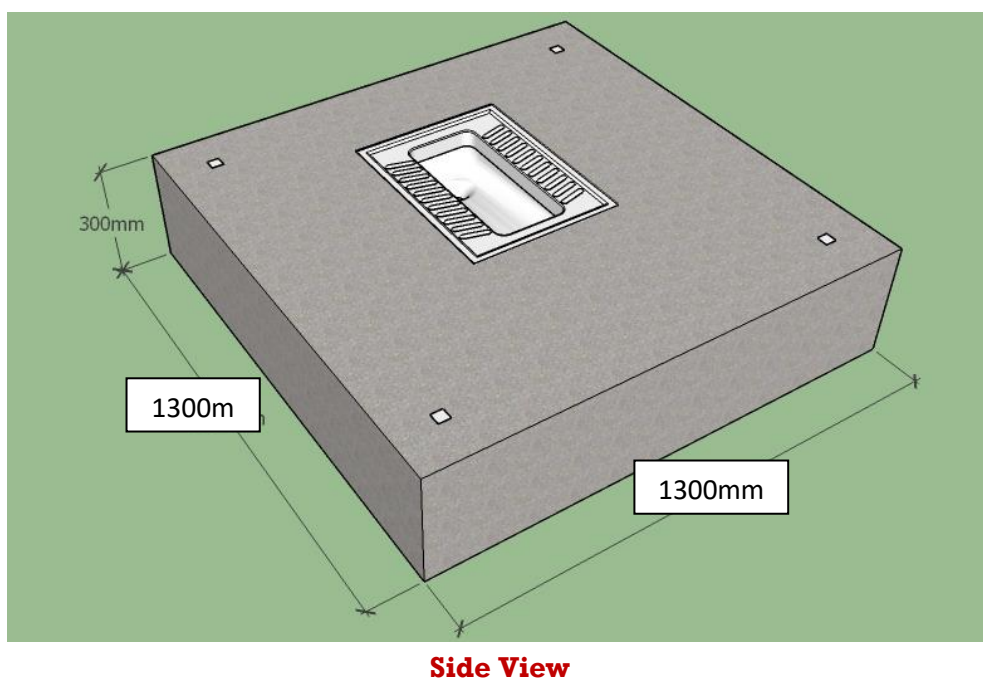
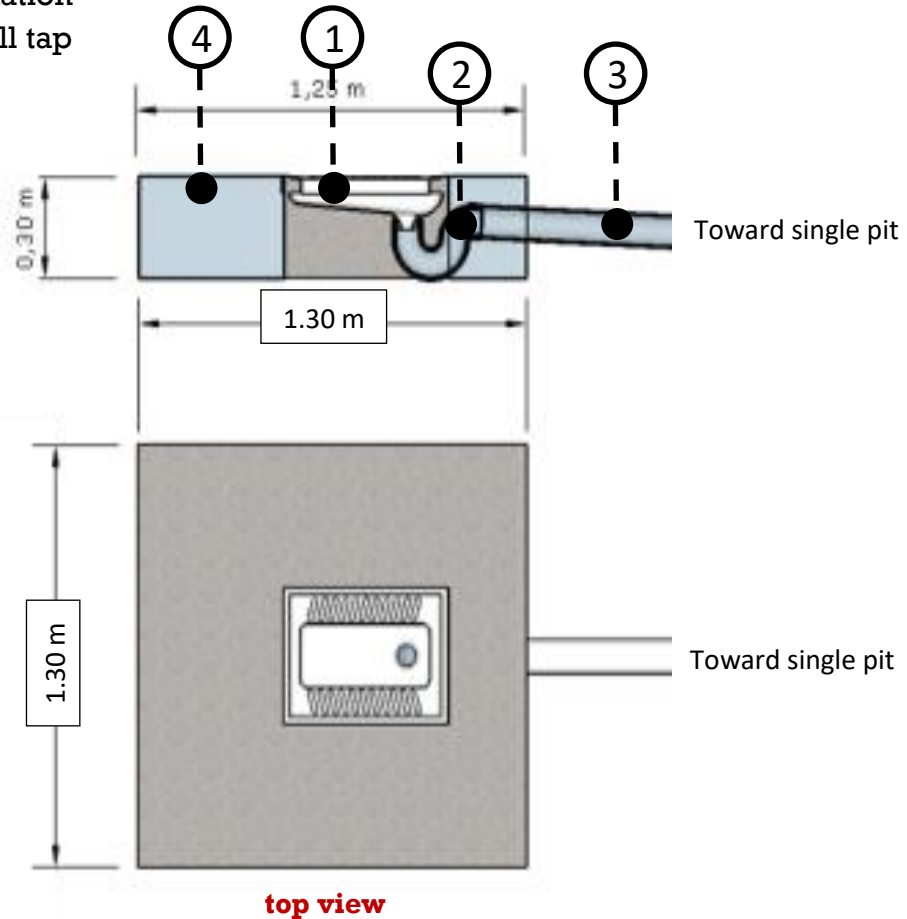
2. 4-inch PVC P-trap

3. 4-inch PVC Pipe

4. Concrete foundation

In addition to a Ball tap

$\frac{1}{2}$ inch



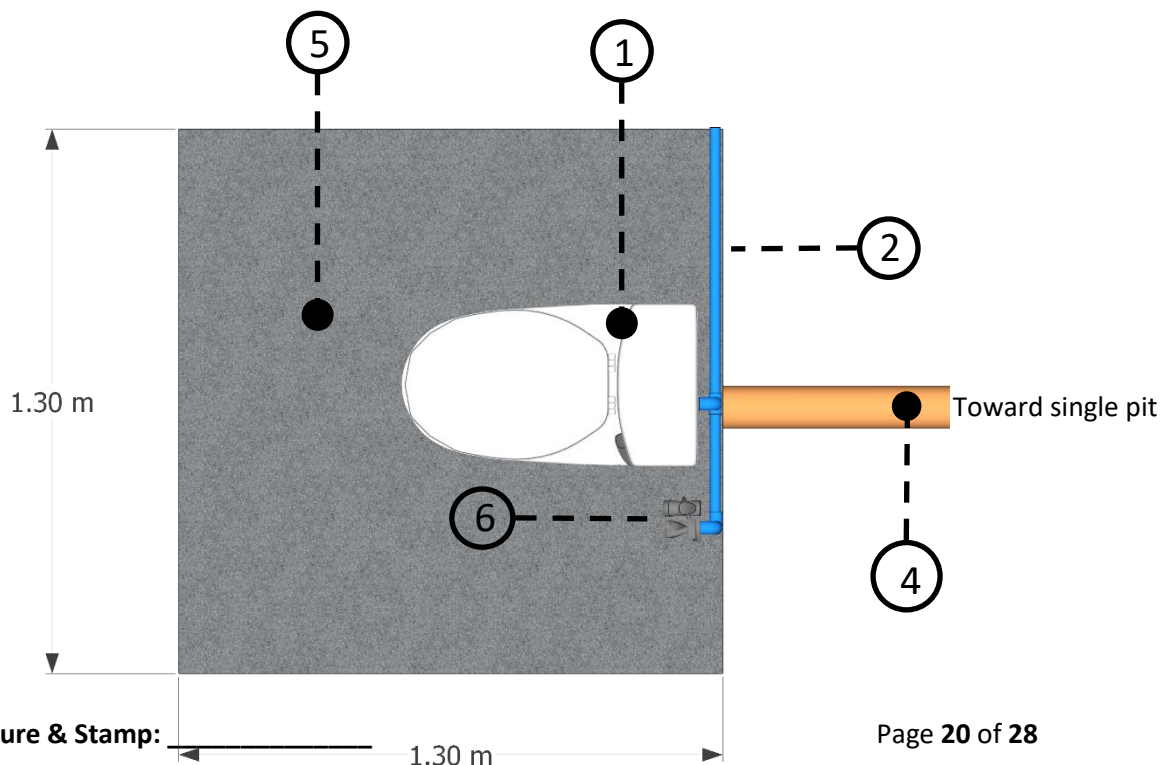
WATER SUPPLY PIPE THROUGH CONCRETE SLAB – INSIDE TOILET TANK STRUCTURE

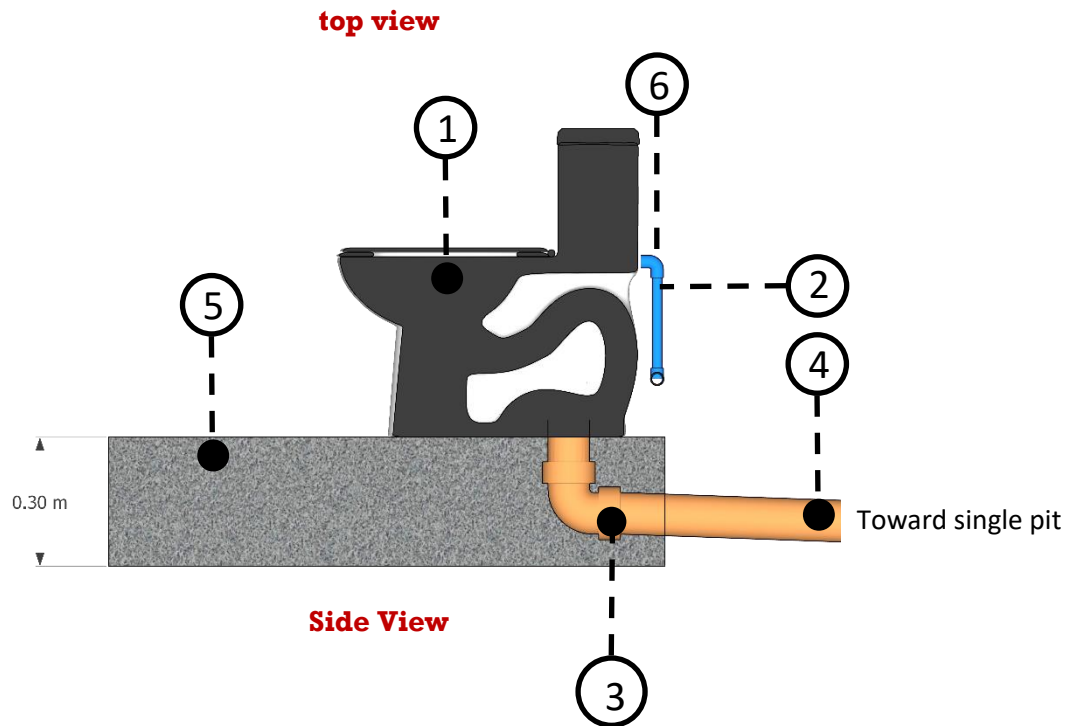


Same for option 2

Case of western Seat Toilet /Option 2

1. western Seat Toilet
2. 1/2-inch PPR
3. 90/120-degree Elbow PVC Pipe
4. 4-inch PVC Pipe
5. Concrete foundation
6. handheld Side Bidet





Single pit latrine

Safety

The contractor is responsible for the safety of his workers and the people living around the site. The surroundings of the pit have to be marked and protected to avoid hazards, in particular the risk of falling into the hole.

In case of unstable soils, formwork has to be used for the safety of the workers.

Pit excavation

The whole pit excavated has a size of 2.0m L/ 1.7m W/ 1.7m D (Length/ Width / Depth or Height) or a total excavation volume of 5.8m³. The nature of the ground may change the dimension of the hole, but the total volume should be kept equal as much as possible.

LRC intervenes in existing sites, where the path often is narrow and the working area is small. Therefore, the work demands the use of a small excavator as "Bobcat". The depth of 1.7m reflects the maximum depth of the excavator's operating range.

The pit walls must be vertical, to the extent possible. Draw a square with plaster powder or spray on the ground to mark the location to facilitate the excavation work.

The evacuation of the soil from the site is the responsibility of the contractor.



Tank construction

The tank has an inside volume of 2.6m³ or 1.4m L / 1.1m W/ 1.7m H. Allow 0.15m of free space between the concrete blocks and the ground walls (all around). This space is to be packed with gravel at the end of the construction process to ensure better infiltration into the soil.

The walls are made with standard concrete blocks (0.4m L / 0.15m W / 0.2m H).

The ground floor is left bare. Two options can be made to build the foundation:

1) a reinforced concrete belt of 0.2m width and 0.1m height and 8mm diameter (or Ø) twisted iron bars

2) with a first line of blocks put on its wider side (0.2m width and 0.15m height).

The blocks are stacked to build the entire pit wall from the top of the foundation of the pit to the ground level. Use mortar to seal the blocks, layer for layer to create the wall to its specified height. The masonry mortar is a mix 1:6 (1 volume of cement for 6 volumes of sand). Some spaces are left between the concrete block, each has to be between 0.5 and 1 cm.

Slab Pit cover construction

The slab covering the pit has an open hole made with PVC pipe 4" (cover with a PVC cap) to allow for desludging. The pipe is 0.10m above ground, see illustration below.

The slab is made with an iron formwork where concrete is poured. The frame is reinforced with Ø 12 mm twisted iron bars. The spacing between each iron bar is 15 cm, tied between them with bending wire. The concrete slab dimensions are 1.7 m x 1.4 m and 12cm thickness.

The concrete is a mix at 350 kg cement/concrete m³ with a proportion in volume of 1/2/4 i.e. 1 volume of cement/ 2volumes of sand/ 4volumes of gravel.

Special attention to the drying of concrete is required depending on the weather. For good curing and normal shrinkage, the concrete must be sheltered from sun and wind to avoid drying too fast.

Completion work

The inlet pipe has to be sealed in the wall to avoid water infiltration.

The free space of 0.15m around all walls is filled it up with gravels to ensure a better infiltration. Then a concrete layer 0.03m height and 0.20m width is poured on the top of the gravel to avoid a quick clogging.

Four (4) concrete block sealed with mortar (mix 1:6) protect the desludging pipe. The work can be totally covered with soil if the site allows for it, but the 4 blocks protecting the desludging pipe must remain uncovered; see the illustration in monitoring sheet below.



The pit walls constructed from concrete blocks shall include controlled openings/gaps between blocks, as indicated in the approved drawings and figures, to improve wastewater infiltration into surrounding soil layers.

The single pit latrine system shall include a dedicated desludging opening/pipe equipped with a removable PVC cap or approved equivalent valve/opening system to facilitate future desludging and maintenance activities without requiring demolition works. □

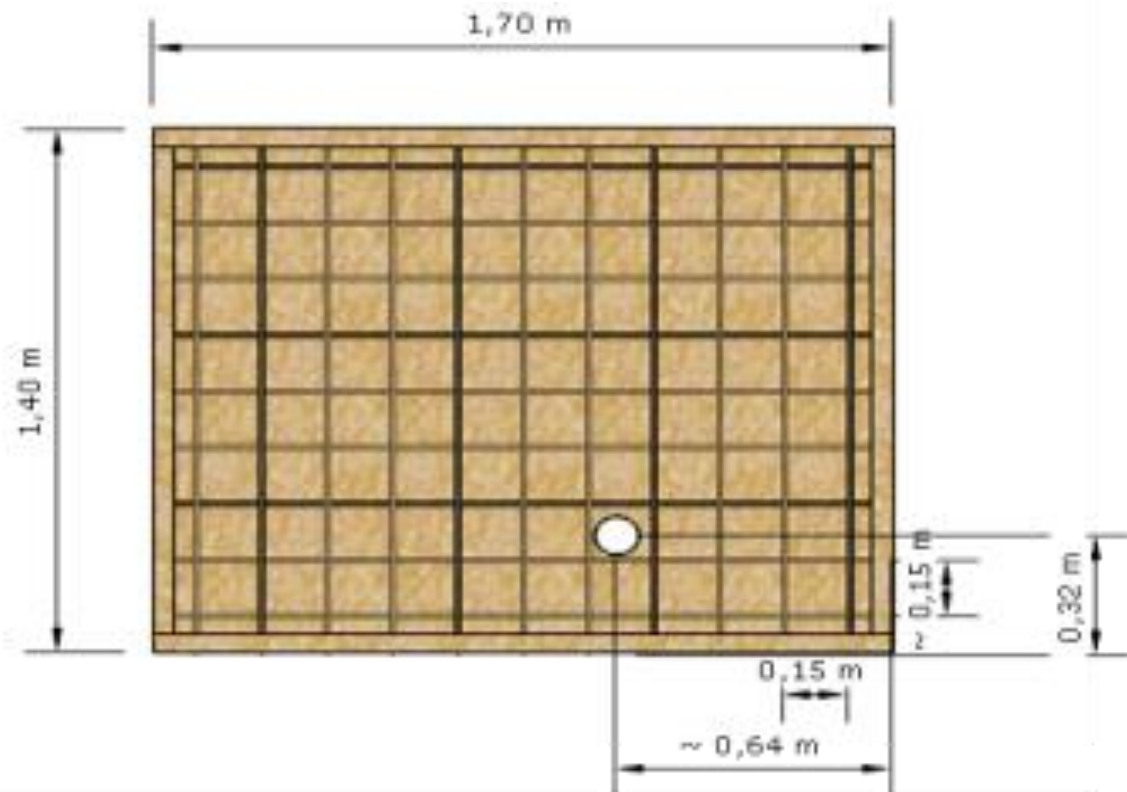
The desludging access point shall remain accessible after installation and be protected against accidental blockage; Extend above finished ground level where applicable; Be securely sealed to prevent odor leakage, insect penetration, and rainwater infiltration.

The contractor shall ensure that the pit structure, excavation profile, block arrangement, and foundation system are suitable to withstand varying ground conditions commonly found in ITS locations, including: Clayey soils; Rocky soils; Loose soils; Wet/muddy terrains; Mixed soil conditions...

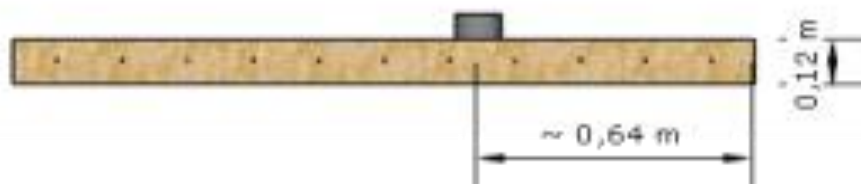
Where difficult soil conditions are encountered, the contractor shall provide all necessary: Reinforcement measures; Structural strengthening works; Stabilization procedures....

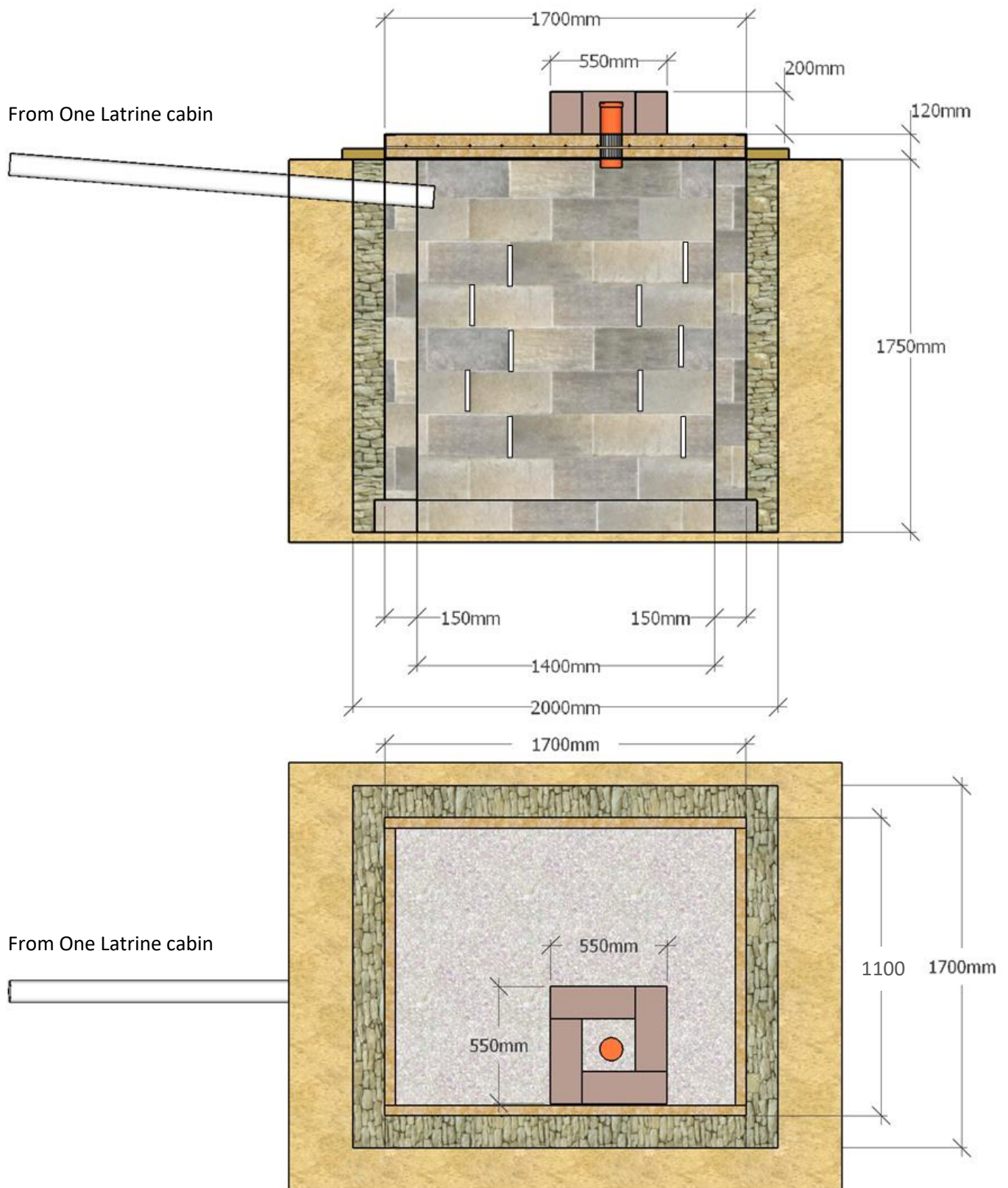
Design

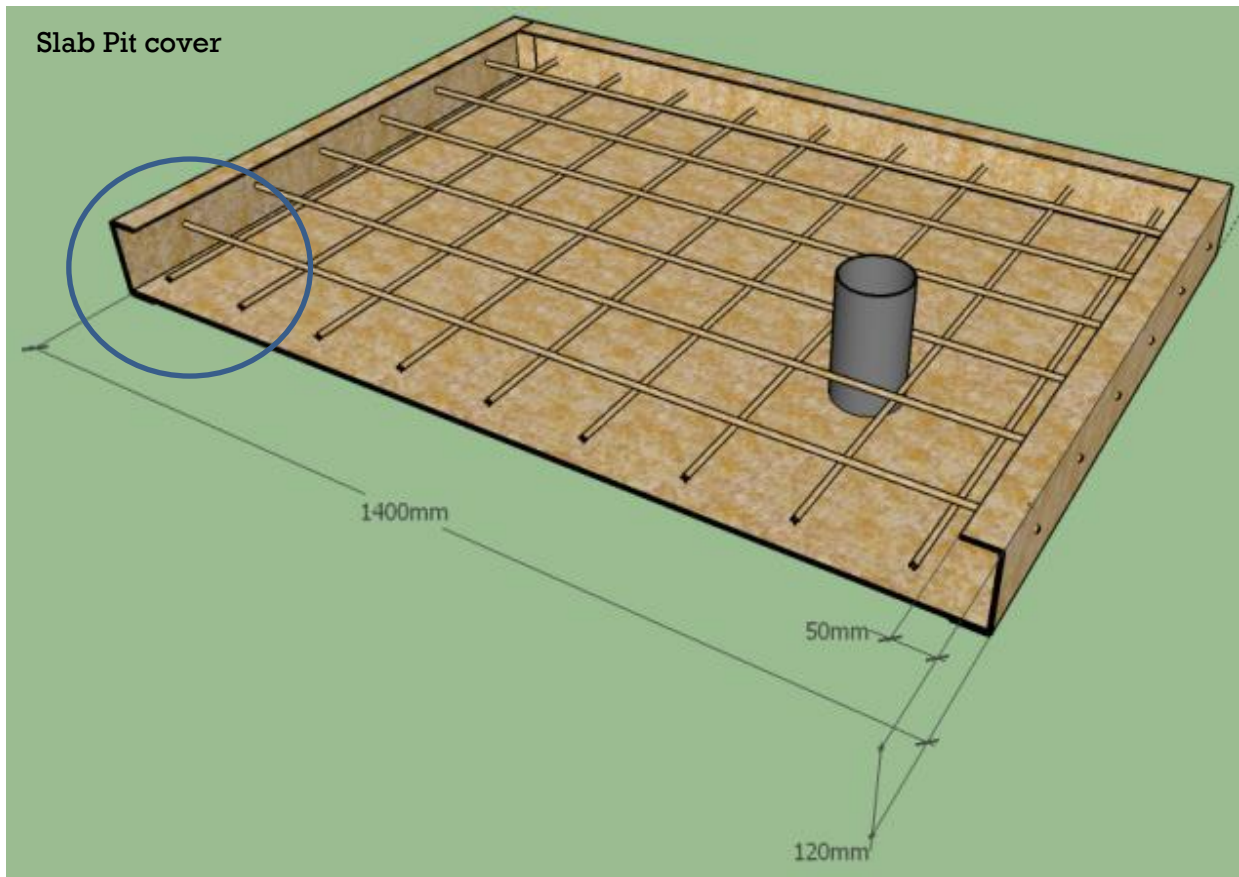
Top view



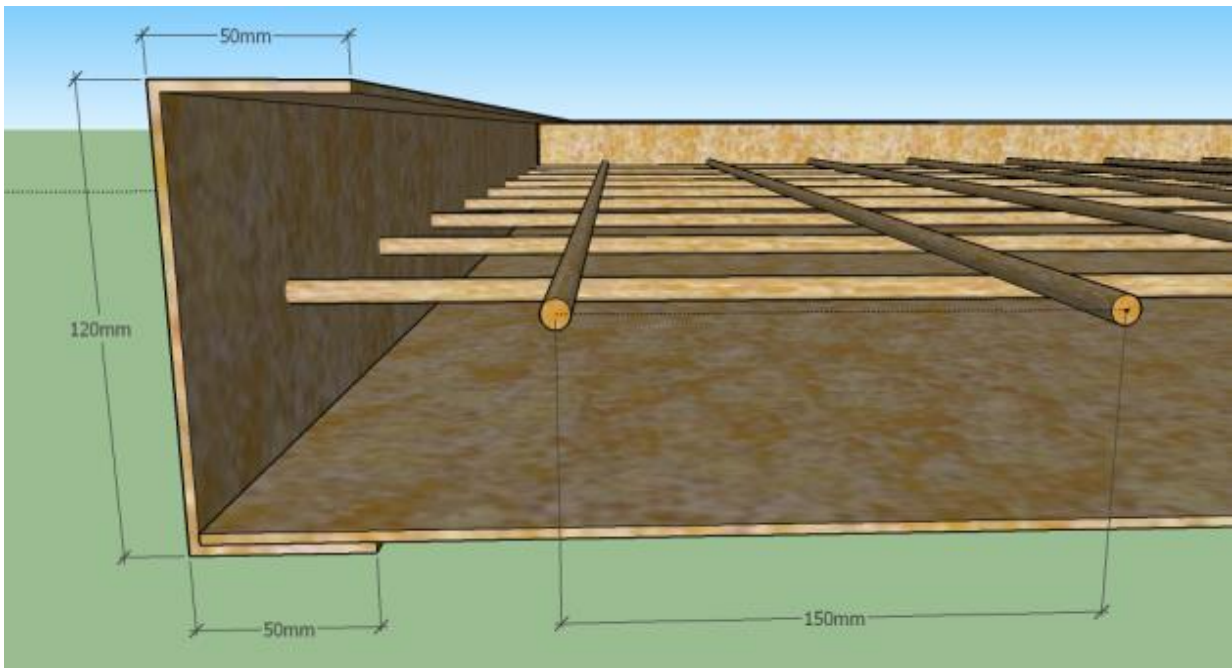
Side view







Section view on formwork



Zoom on section view



Technical Specifications

All materials shall be new, defect-free, suitable for outdoor humanitarian use, and subject to LRC approval before installation.

Steel Works

- Galvanized or anti-rust protected steel;
- Properly executed welding;
- Structural rigidity and alignment;
- Smooth safe edges;
- Corrosion-resistant coating systems.

Concrete Works

- Sulphate-resistant cement where required;
- Minimum compressive strength requirements;
- Proper vibration during casting;
- Controlled curing procedures;
- Reinforcement installation according to approved details.

Plumbing Works

- HDPE/PPR approved systems;
- Leak-free installations;
- Pressure-resistant fittings;
- Proper support spacing;
- Secure valve installations.

Excavation Works

- Safe excavation profiles;
- Controlled spoil disposal;
- Soil stabilization measures where required;
- Excavation protection systems in unstable soils.

Painting Systems

- Anti-rust primer systems;
- Weather-resistant finishing paint;
- Proper surface preparation before application.



HDPE Tanks

- UV-resistant HDPE tanks;
- Proper fixing systems;
- Stable operational support structures.

PPR Systems

- Heat-welded approved fittings;
- Pressure-rated piping systems;
- Proper reducers, valves, elbows, and unions.

Handover Requirements

Before final acceptance, the contractor shall submit:

- As-built drawings;
- Site photos before/during/after implementation;
- Testing and inspection reports;
- Material warranties where applicable;
- Operation and maintenance notes where required;
- Defect correction confirmations;
- Final cleaning confirmation;
- Final inspection approval by LRC.