

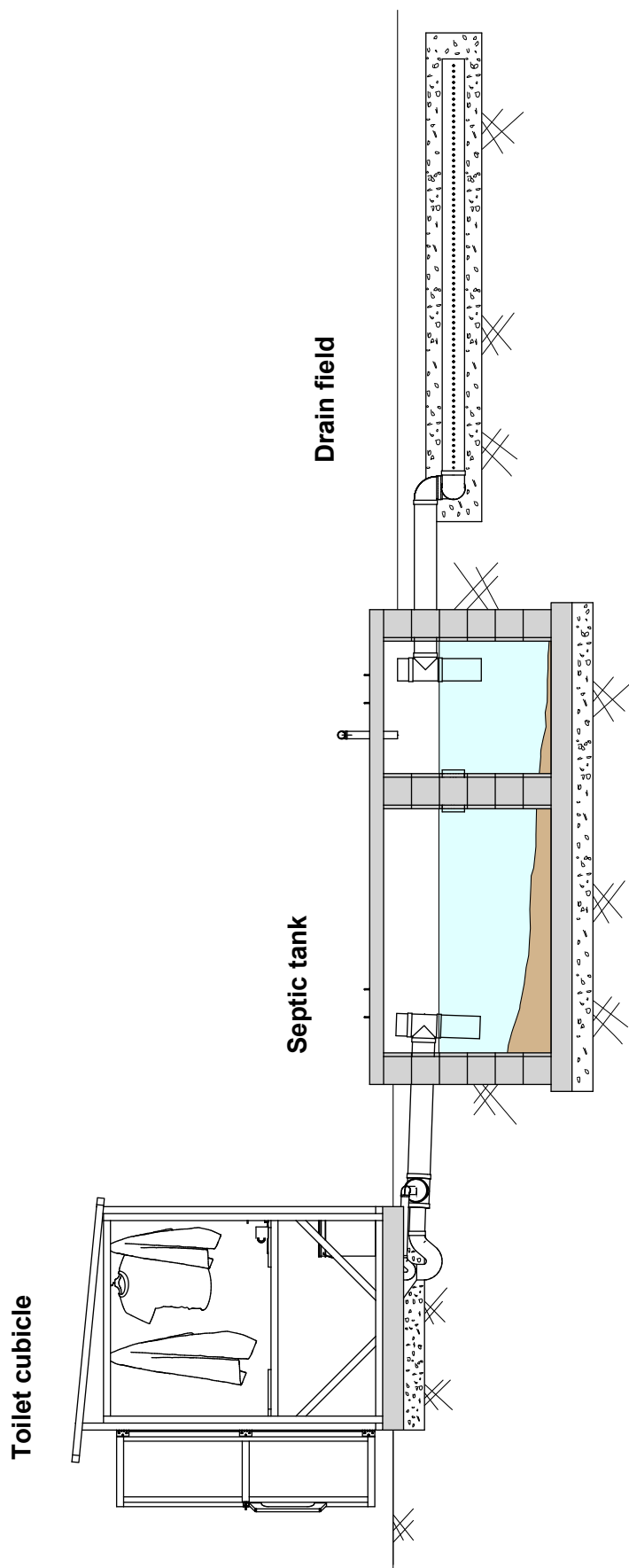
UNHCR Household Toilet / Bathing Unit (Septic Tank & Drain Field)

**Tools and Guidance for
Refugee Settings**

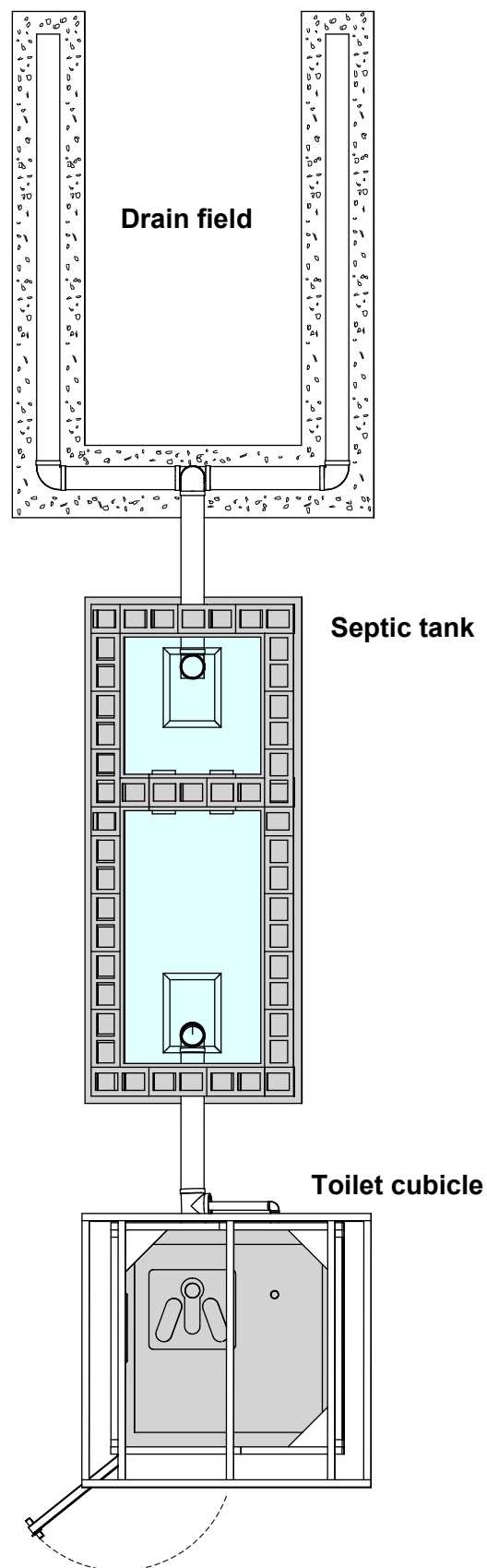


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Sectional View



Plan View



D-404

TITLE
Household Toilet (Septic Tank)
 General Layout
PROJECT
 Project Name, Country

DRAWN BY
 B. Harvey - 11/10/15
APPROVED BY
 M. Burt - 15/11/15
SCALE
 1:48

UNITS
 metres
SHEET
 1 of 9
PUBLISHED
 15/11/15



Household Toilet Septic Tank Plan View

Base slab 0.79 m³ reinforced concrete 15cm thick (1:1.5:3 cement dosage 380 kg/m³).

Walls to be fabricated from cement blocks 20cm x 20cm x 40cm and 4cm wall thickness.

Cement blocks to be laid with strong cement mortar (1 part cement to 3 parts coarse sand) - at least 510 kg cement per m³.

Fill all cement block voids with mortar.

Place two 6" PVC diffuser pipes into the 4th course of cement blocks. This set of diffusers will be approx 1/4 of the total liquid depth.

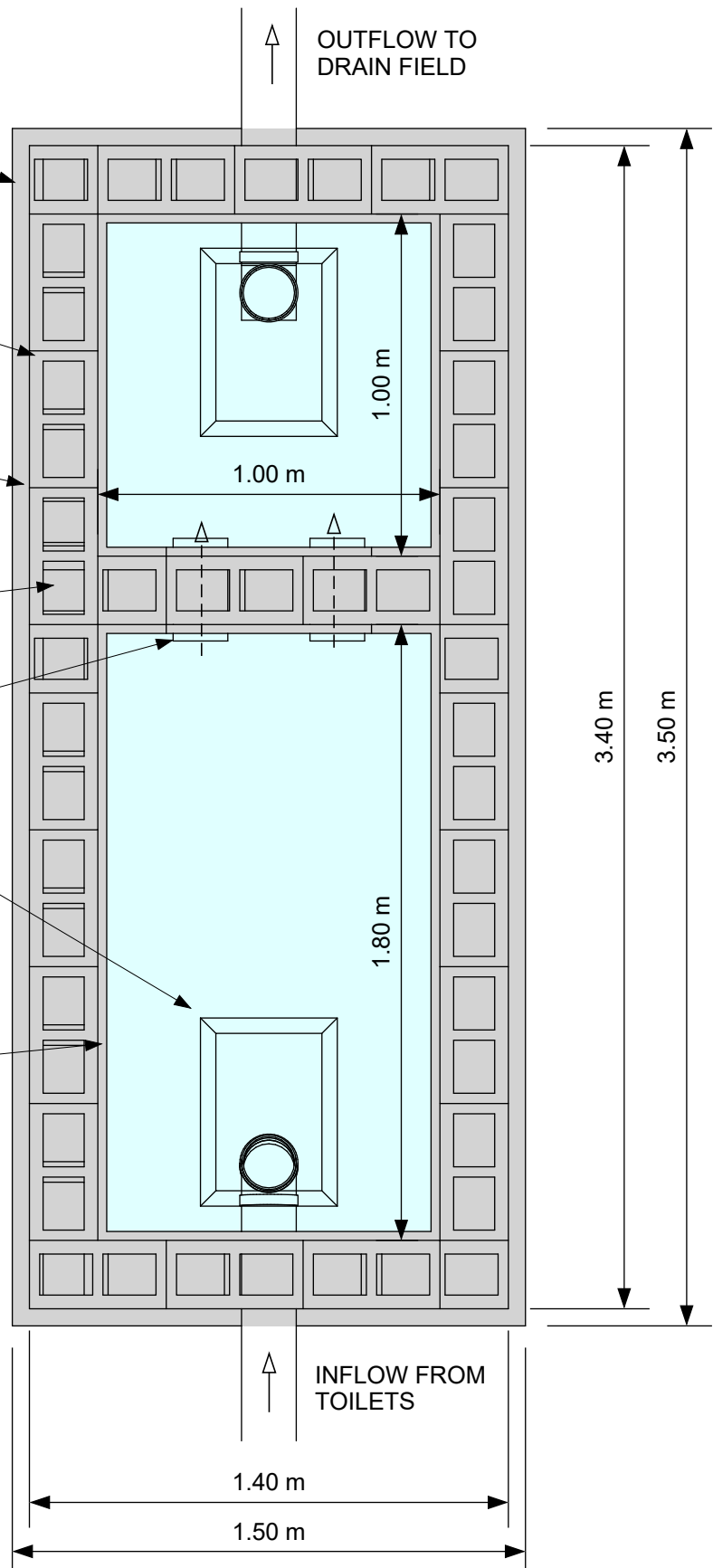
Access covers 40cm x 55cm upper opening size and 36cm x 51cm lower opening size.

Internal plastering consists of three layers using sikalite waterproofing compound (1kg for 50kg of cement)

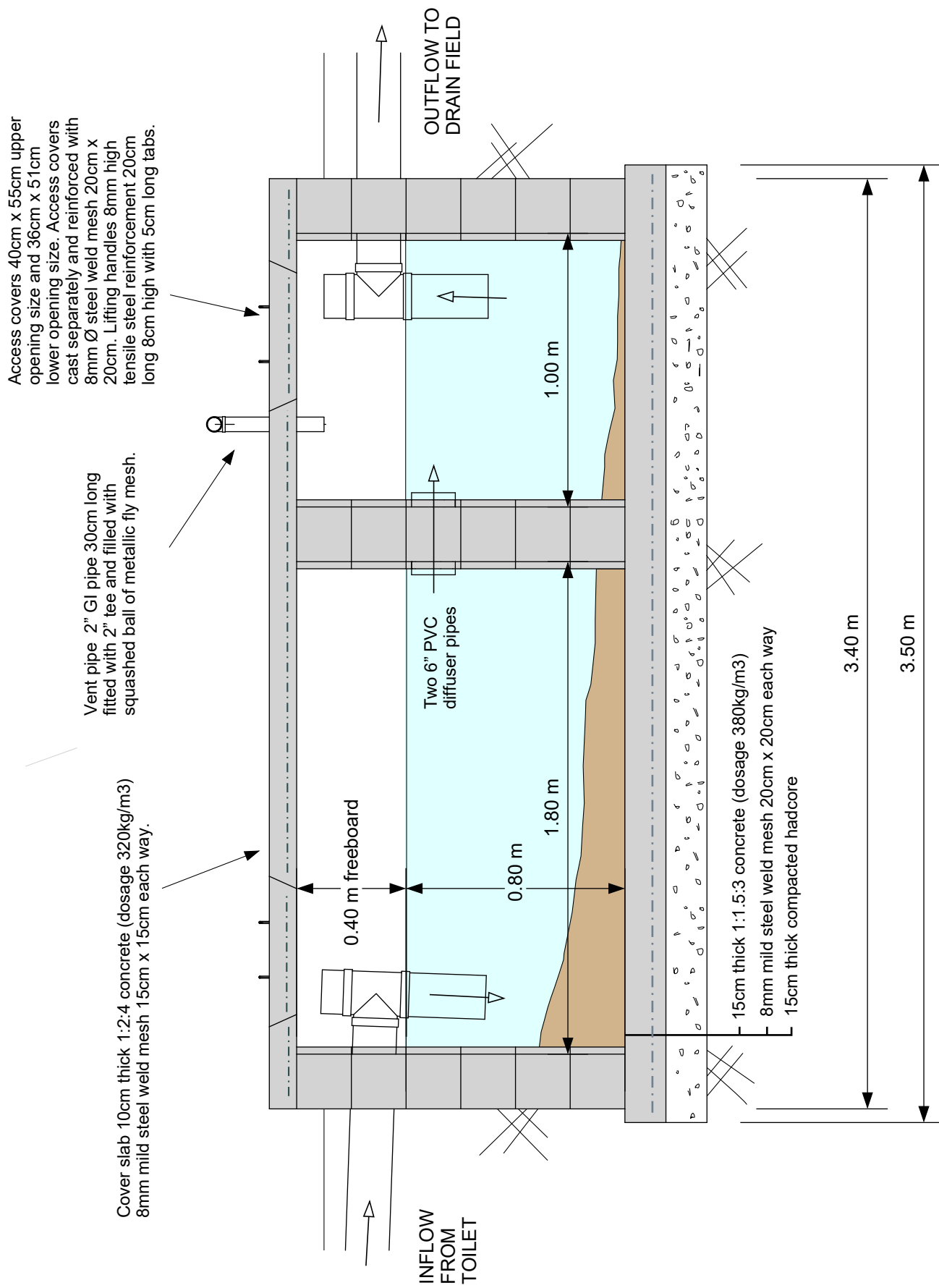
- Layer #1: 6mm 1:4 splatterdash
- Layer #2: 10mm 1:3 rough finish
- Layer #3: 10mm 1:2 smooth float

NOTE

The size of the septic tank is dependent on the number of users, the quantity of wastewater being generated, the retention time, desludging frequency and the ambient temperature and therefore the septic tank design should be adapted correctly to the context. For more information consult the UNHCR WASH Manual or use the UNHCR Septic Tank Sizing Tool from <http://wash.unhcr.org/>.



Household Toilet Septic Tank Sectional View



TITLE

Household Toilet (Septic Tank)

Septic Tank Sectional View

PROJECT

Project Name, Country

DRAWN BY

B. Harvey - 11/10/15

APPROVED BY

M. Burt - 15/11/15

SCALE

1:20

UNITS

metres

SHEET

3 of 9

PUBLISHED

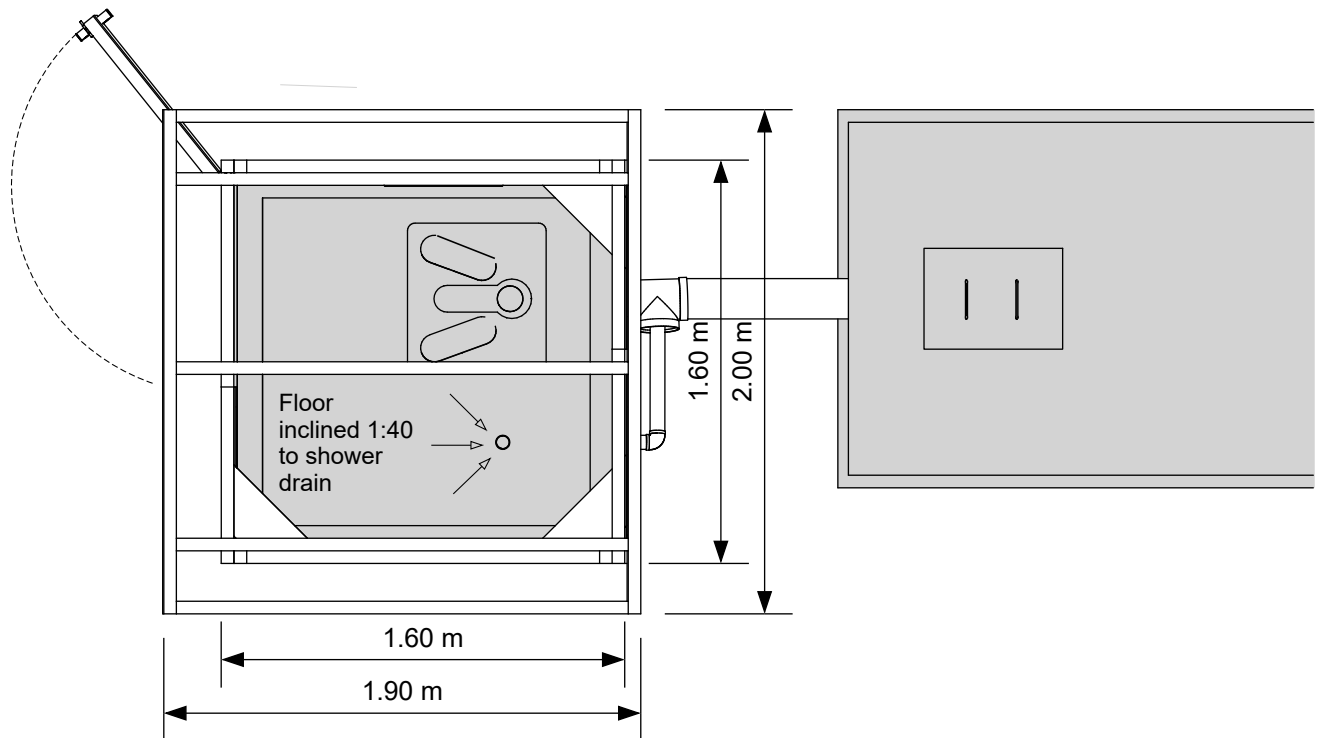
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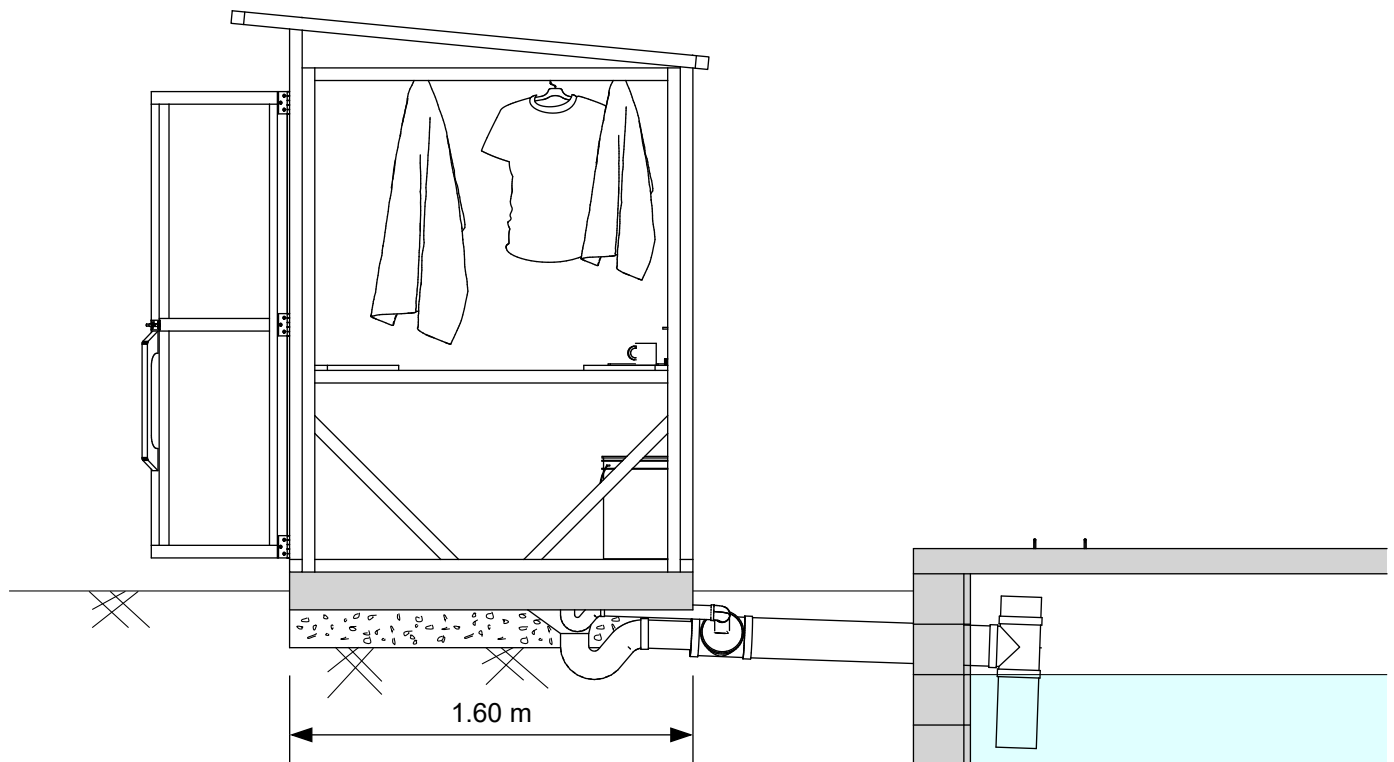
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Toilet Cubicle Top View



Toilet Cubicle Side View



NOTES

1. All WASH infrastructure to be located at least 30m from ground or surface water sources. Distances to be increased in fissured rock.
2. Ensure the toilet cubicle superstructure is perfectly square and level (perform a 3-4-5 triangle check in the corners).
3. Ensure the slab is kept damp and covered (out of direct sunlight) for at least 7 days.

D-404

TITLE

Household Toilet (Septic Tank)

Toilet Top and Side Views

PROJECT

Project Name, Country

DRAWN BY

B. Harvey - 11/10/15

APPROVED BY

M. Burt - 15/11/15

SCALE

1:42

UNITS

metres

SHEET

4 of 9

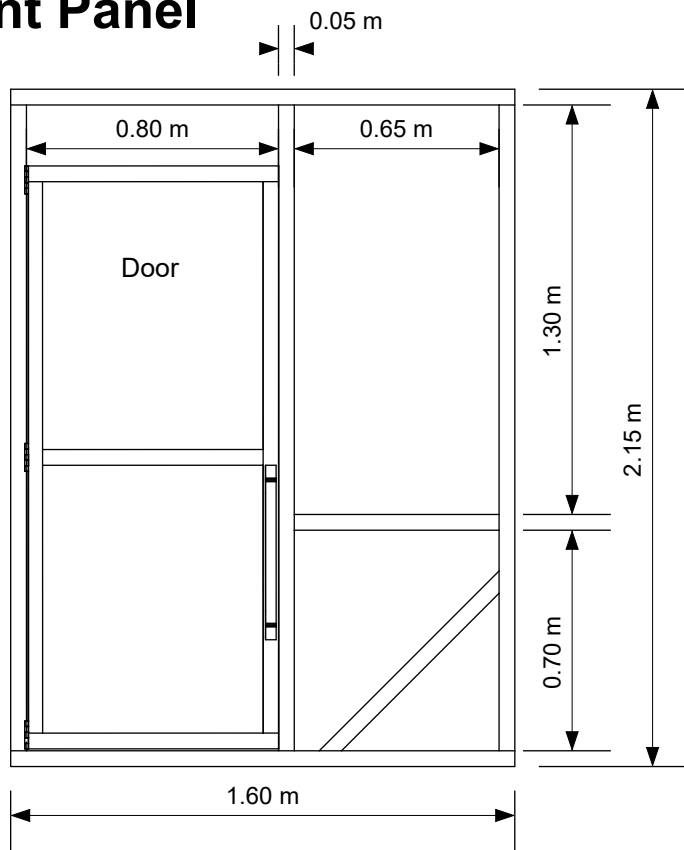
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15/11/15

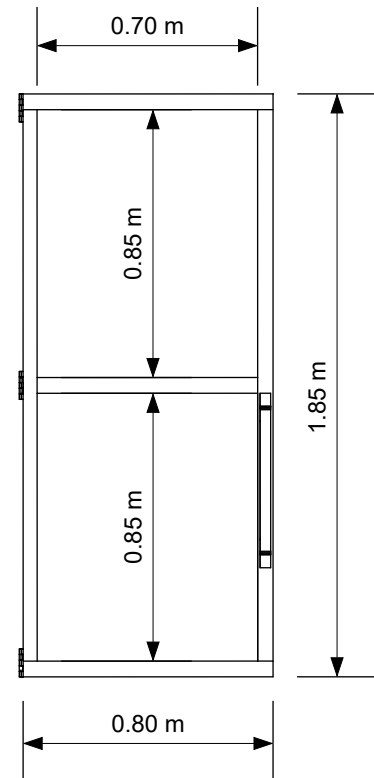


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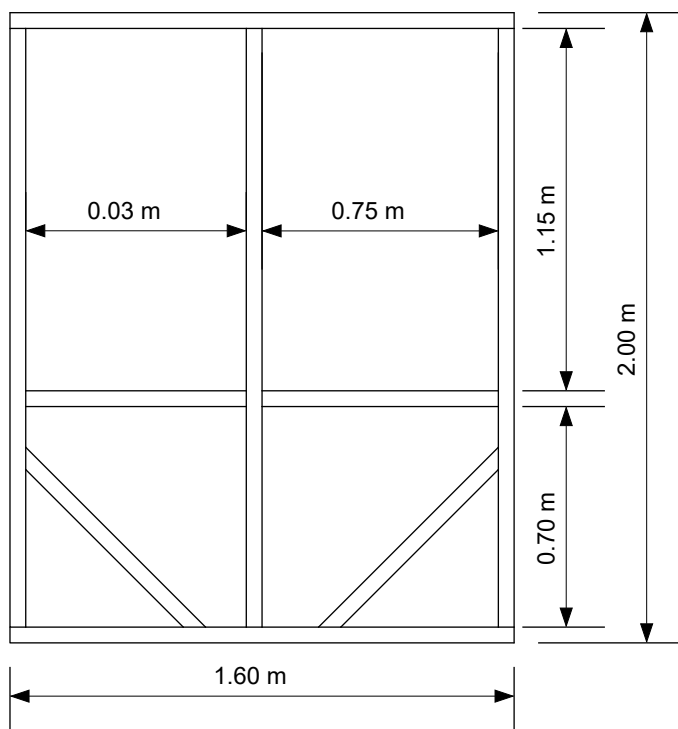
Front Panel



Door Detail



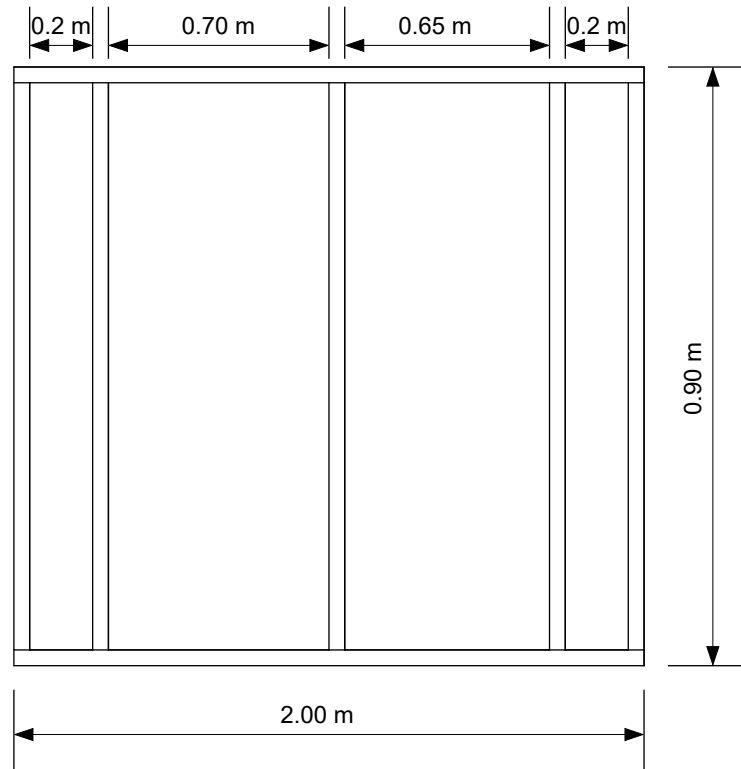
Rear Panel



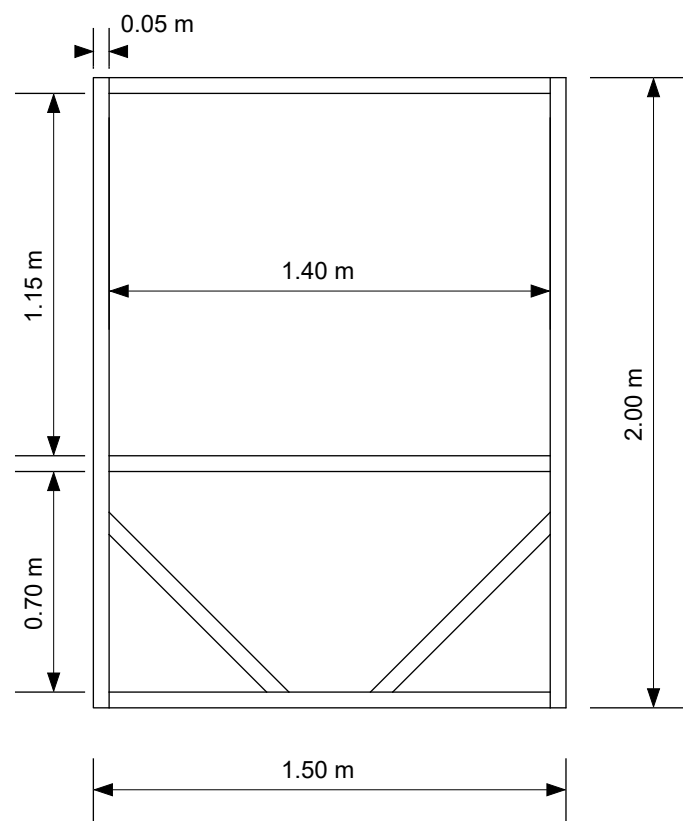
NOTES

1. All WASH infrastructure to be located at least 30m from water sources.
2. Distances to be increased when excavating infiltration pits in fissured rock.
3. The base of all latrine pits and infiltration pits must be at least 1.5m higher than maximum annual groundwater table.
4. Site to be adequately cleared and levelled before starting construction.
5. All doors hung straight and level.
6. All doors equipped with three (3) hinges at least 50cm long. All screw holes filled with screws. Nails not permitted.
7. Maximum gap between door and frame 3mm. Maximum gap between door and floor 10mm.
8. All doors to be equipped with a long child friendly handle of at least 50cm length on both the inside and outside door faces.
9. All doors to be equipped with a child friendly and secure locking mechanism.
10. Superstructure construction materials to be harmonized with household shelter materials taking into account local culture and context. Options for the superstructure material include plastic sheeting, elephant grass, wood planks, wood panels, adobe, or corrugated iron sheeting.
11. In some settings the provision of materials for the superstructure may be the responsibility of the household.

Roof Panel



Side Panels



x2

NOTES

1. Individual panels to be prepared in a dedicated mass production facility and transported to the assembly location.
2. Panels timbers to be joined either using galvanized screws or at least two (2) galvanized skewed nails at each connection location.
3. Panel-to-panel connections to be made using M10 bolts for ease of dissassembly or movement to new locations.
4. All plastic sheeting to meet UN humanitarian standards (i.e. 200g/m2 700N tensile strength, UV stabilized laminated woven or braided mesh of black high density polyethylene between two white layers of low density polyethylene).

D-404

TITLE

Household Toilet (Septic Tank)

Toilet Cubicle Framing

PROJECT

Project Name, Country

DRAWN BY

B. Harvey - 11/10/15

APPROVED BY

M. Burt - 15/11/15

SCALE

1:24

UNITS

metres

SHEET

6 of 9

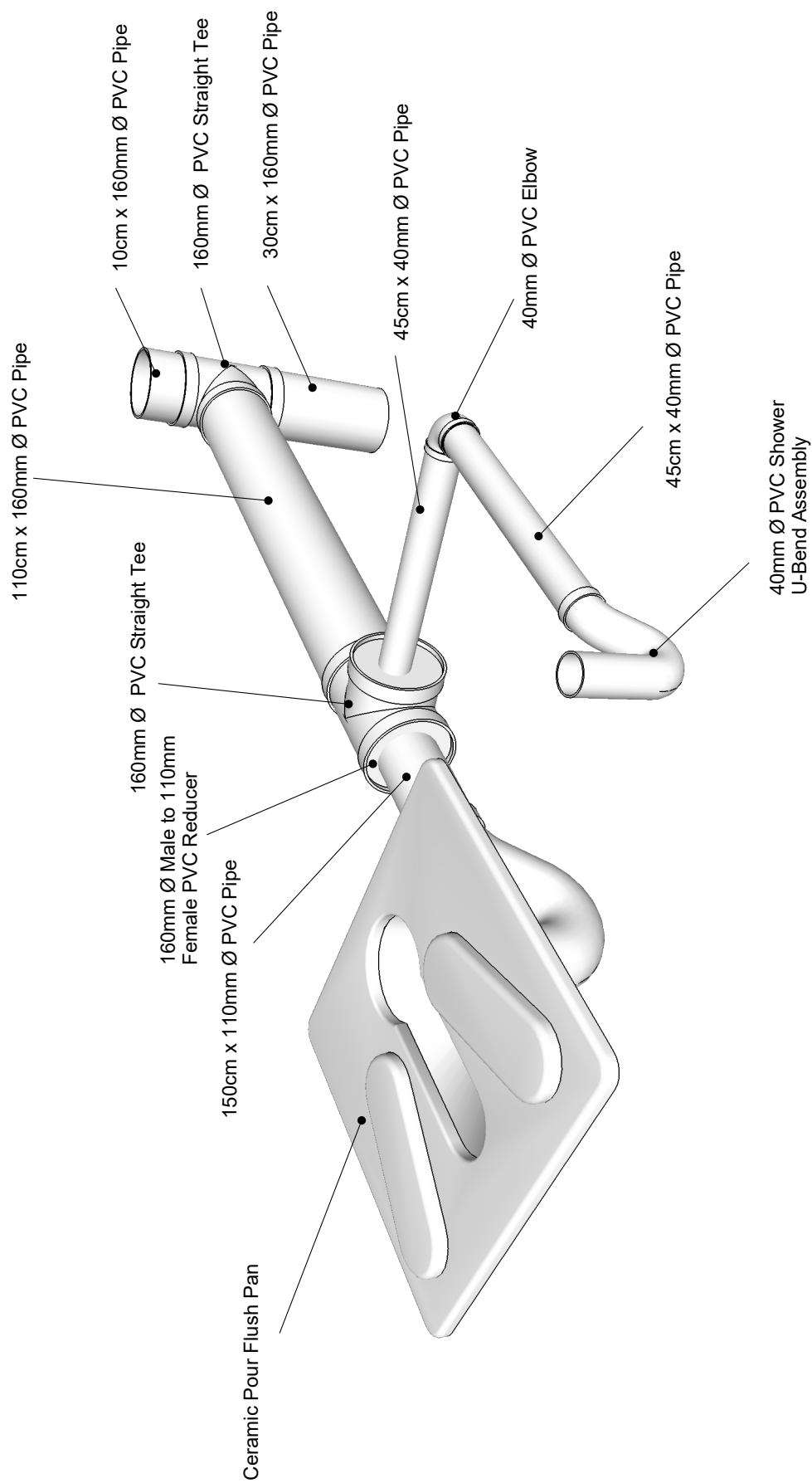
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Evacuation Pipe Assembly Detail



Notes

1. Ensure that the PVC pipe assembly is inclined towards the septic tank at an angle of 1:50
2. Ensure that the pour-flush pans are correctly aligned with the top surface of the concrete slab.
3. The evacuation pipe assembly should be bedded in a 30cm wide and 40cm deep gravel trench.

TITLE

Household Toilet (Septic Tank)
Evacuation Pipe Assembly Detail

PROJECT

Project Name, Country

DRAWN BY

B. Harvey - 11/10/15

APPROVED BY

M. Burt - 15/11/15

SCALE

1:25

UNITS

metres

SHEET

7 of 9

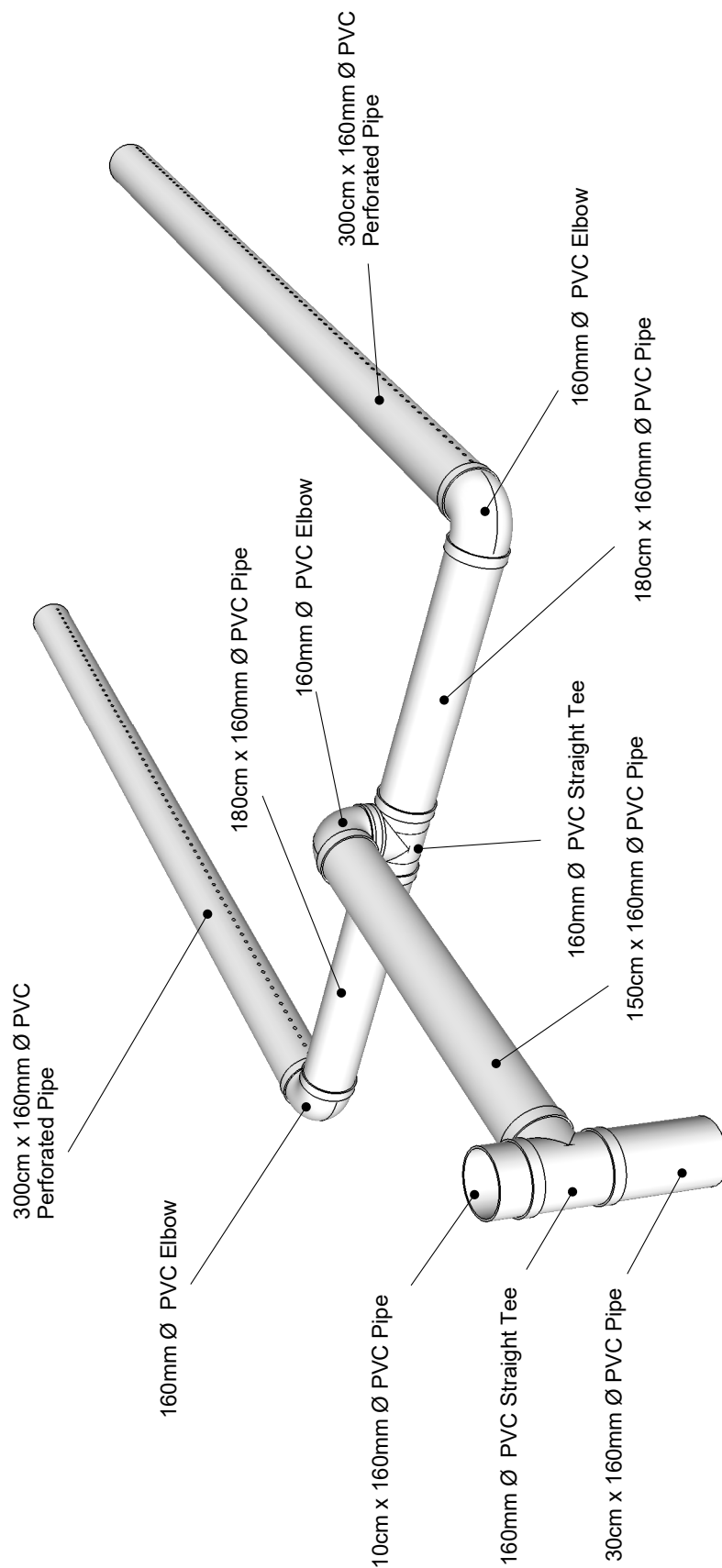
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Drain Field Pipe Assembly Detail



Notes

1. Fill the trenches with a 50cm wide and 30 cm deep bed of gravel. Gravel should be between 15mm - 40mm in diameter.
2. Drain field to be constructed from rigid 6" (160mm) PVC pipes with 12mm holes drilled in the 4 o'clock and 8 o'clock positions every 4 cm. Slotted pipes (or PVC pipes with slots cut with a saw) should not be used as the slots clog easily.
3. Position the drain field pipe assembly centrally in each channel with at least 15cm of gravel below each pipe and 10cm above each pipe.
4. Ensure that the PVC pipe in each trench is inclined with a gradient of 1:50 to allow the effluent to flow along the entire drain field network. The gradient of the short sections of pipe joining each trench contour can exceed 1:50 and should match the slope of the terrain.

TITLE

Household Toilet (Septic Tank)

Drain Field Pipe Assembly Detail

PROJECT

Project Name, Country

DRAWN BY

B. Harvey - 11/10/15

APPROVED BY

M. Burt - 15/11/15

SCALE

1:25

UNITS

metres

SHEET

8 of 9

PUBLISHED

15/11/15

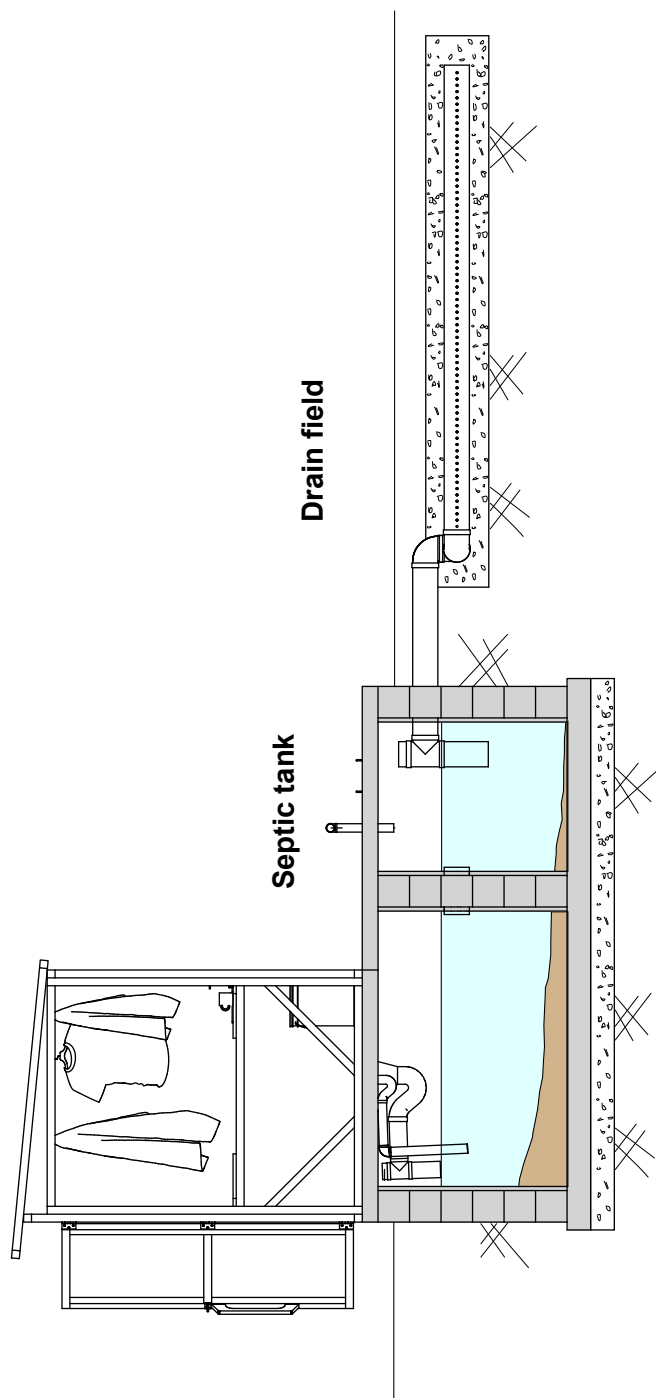


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Household Pour Flush Toilet - Reduced Cost Version

A cost saving in terms of cement, rebar, gravel, sand and time is achieved by constructing the superstructure directly above the septic tank (instead of offset as in the standard design). Please also note that the design is 20cm narrower than the standard design in order to fit on top of the septic tank. Alternatively the septic tank width may be increased by 20cm.

Sectional View



Plan View

