

Nepal Sanitation Studio 2013 background & briefing

The Studio will be made up of 6 students of architecture and 4 plumbers, contributing time and skills to work with a skilled team of local Nepali people to improve sanitation in rural Nepalese villages.

With generous support from EgresStudio Newcastle - Australia, the International Association of Plumbing and Mechanical Officials (IAPMO), RMIT (Royal Melbourne Institute of Technology - Australia), the World Plumbing Council and the Worldskills Foundation.

The 2013 Studio will be organised and hosted by Community Health and Development Society Nepal, the participating villages and Healthabitat.

Nepal Sanitation Studio : aims and introduction

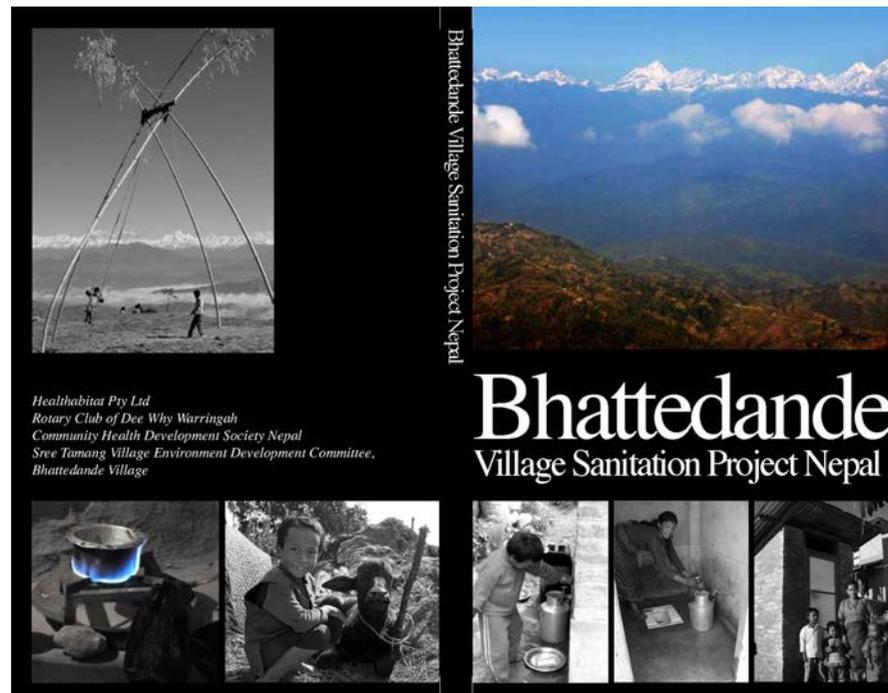
The aim of the studio is to work with a skilled existing Nepalese team to improve the existing design process and construction detail of toilets to improve the safe removal and treatment of human waste.

You are all highly skilled and about to enter, and contribute to, an ongoing project. Our aim is to use your skills to improve the program not to displace, disrupt or discourage the local Nepalese teams.

We hope the studio will leave significant improvements in the design and construction of the toilets in Nepal. It is a key part of the studio that these improvement can then be used and replicated by the Nepalese teams. It is also essential that cost is a key consideration in any design or construction changes.

All studio participants will receive a pdf file of the booklet describing the start of the Nepal sanitation project (cover shown below). Please read the booklet before the project commences as it will give invaluable background as to why the project started, who we will be working with and factors that have influenced the design work and construction process to date.

HH & CHDS 2012



For the Plumbing Team

Improving the rainwater system –

to be reviewed, redesigned and rebuilt within the studio week. There are drawings and pictures of the existing design included in this brief.

Including:

- Tank and lid
- Gutter type and fixing
- Spout type and fixing
- Diverter for dry season roof dirt (preliminary ideas later in this brief)
- Tank filler option where water is available (preliminary ideas later)
- All taps and pipework
- Hand wash splash pad and drainage

Important considerations

Use local expertise and the local plumbing team (Surya Lama),

Use only locally available materials (we will help to find them and buy them),

Leave behind at least one completed toilet (ie the new work has been installed and is working) with the new spec. and design documented so that is well understood by local plumbing team and can be reproduced.

Ask the archi students to help document the design and spec. using pictures and drawings, not words.

For the architectural student Team

Improving the toilet design, siting and detail (drawings and pics are attached)

- **Siting kit:** Currently a local engineer check the siting of each toilet and waste system for structural safety. This will continue to be done. Your kit of parts, with minimal if any written instructions, will be designed for our Nepali team to use when siting toilets with each family. The kit should be designed, manufactured, packaged and tested within the studio week. The kit should consider:
 - Toilet building location and size
 - The engineers criteria
 - Proximity to other buildings and terrace edges
 - Entry and door swing
 - Hand wash location relative to toilet and drainage
 - Septic or biogas location, size and connections to toilet, house and drainage areas
 - Paths, access, privacy
 - Winds and rain
 - Land (ownership, topography, drainage)
- A **better door** and / or personalising the door (kids project?)
- Designing a better **hand washing point** and splash pad
- Find higher quality / robust **toilet brush (and rethink a better attachment), clothes hooks and toothbrush storage**
- **Better documentation of the toilet building** for the construction teams.

By all means, get involved with the plumbing team, as this will help your work. You may be able to help them with communication of their design ideas and their design work, but remember, your focus is on the above projects.

What you will need to do prior to the studio or bring with you.

For all:

Arrange a travel visa to Nepal. (they can be obtained on arrival (for Australian passport holders) but it can be very slow

Travel insurance and health insurance that covers Nepal and any other countries visited. This will be essential for all.

Warm clothes (it will be winter) and some waterproof protection for rain if it happens

Torch is useful as blackouts occur

Good shoes hilly country

Camera

Maybe laptop computers (there is usually some internet at the hotel)

Credit/debit cards work in some places, auto teller machines and banks

US or AUD are accepted and changes by banks

Mobile / cell phones will work in Nepal and the area we will be working in (depending on your network and plan)

Local SIM cards are available

Any personal medical prescriptions (there is a very good hospital very close to where we stay and work)

CONFIRM WITH HEALTHHABITAT BY EMAIL where you will be on the 27th of January for pick up at 2.30 - 3pm

OPTION 1: The Airport Hotel (3 minutes by taxi or 10 minutes walk from the Kathmandu international airport

OPTION 2 : The car park area directly opposite the international arrivals gate Kathmandu international airport

There will be a 15-seater bus ready to pick you up and leave at 3pm.

For the architectural student Team

Working kit for design and simple construction of the designs projects

Pens, tape measure, string, coloured tapes

Any visual aids or examples of work that may help the project and inform the local team

Healthhabitat will provide a minimal local materials budget

For the Plumbing Team

Working hand tool kit for simple construction of the project

Any visual aids or examples of work that may help the project and inform the local team

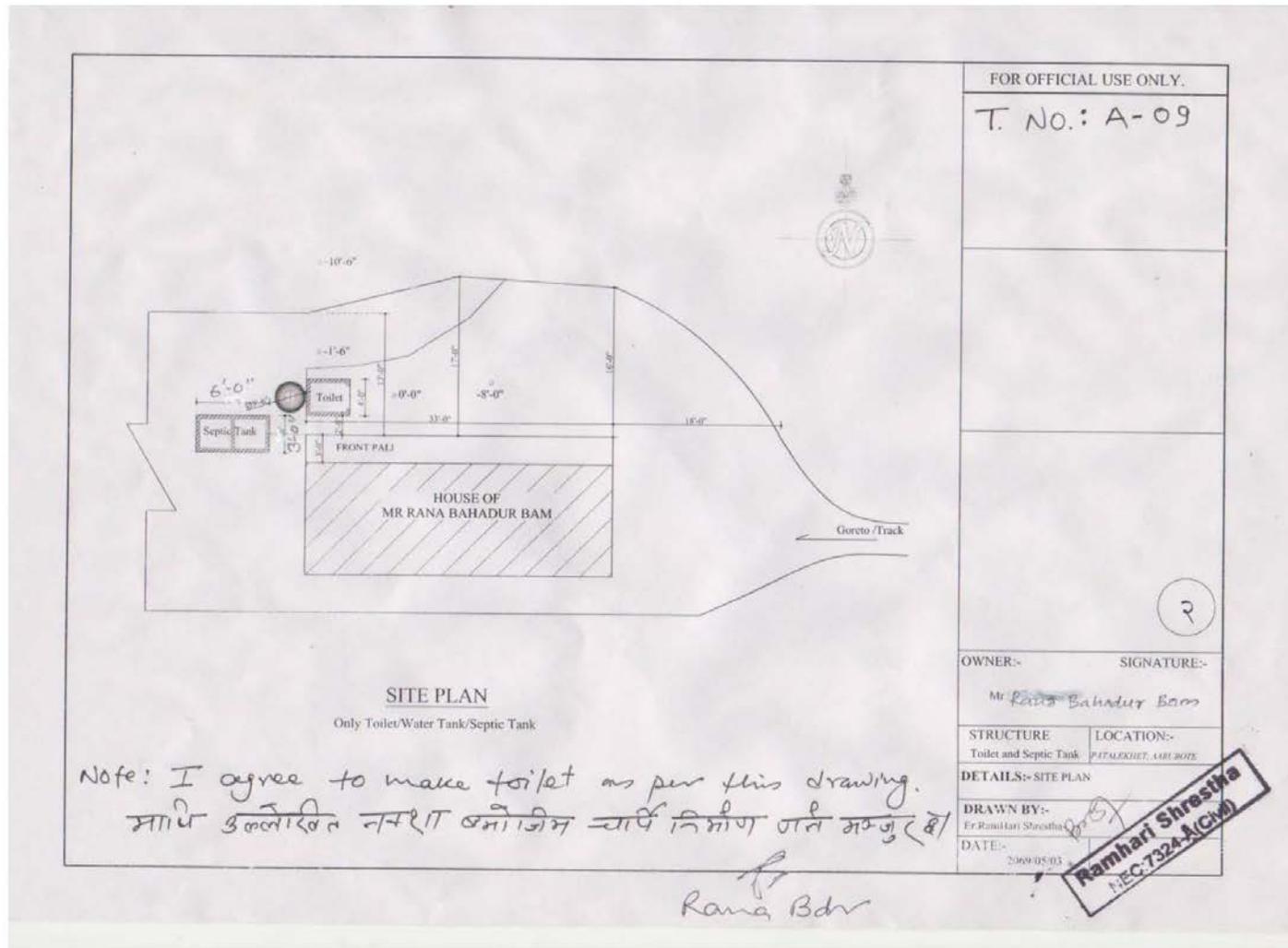
Maybe laptop computers (there is usually some internet at the hotel)

Healthhabitat will provide a minimal local materials budget

Engineer's typical site assessment

Location Drawing: Arubot

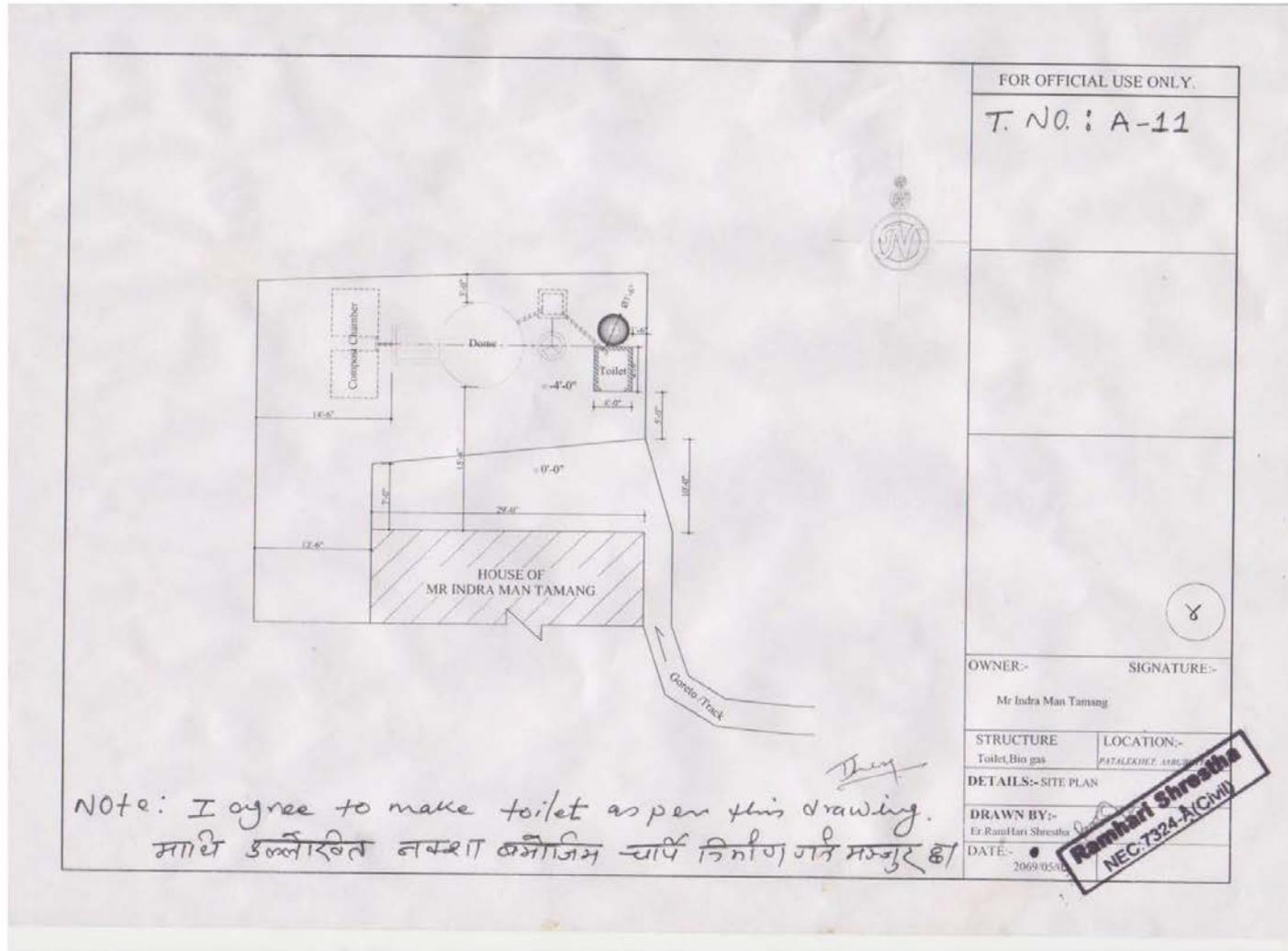
Family Name: Rana Bahadur Tamang , No.: A - 09



Engineer's typical site assessment

Location Drawing: Arubot

Family Name: Indra Man Tamang , No.: A - 11

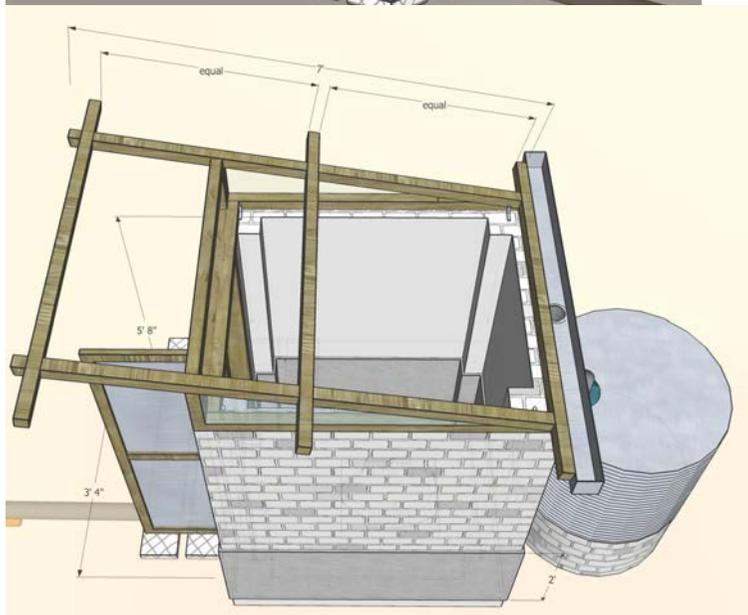


The toilet building in context

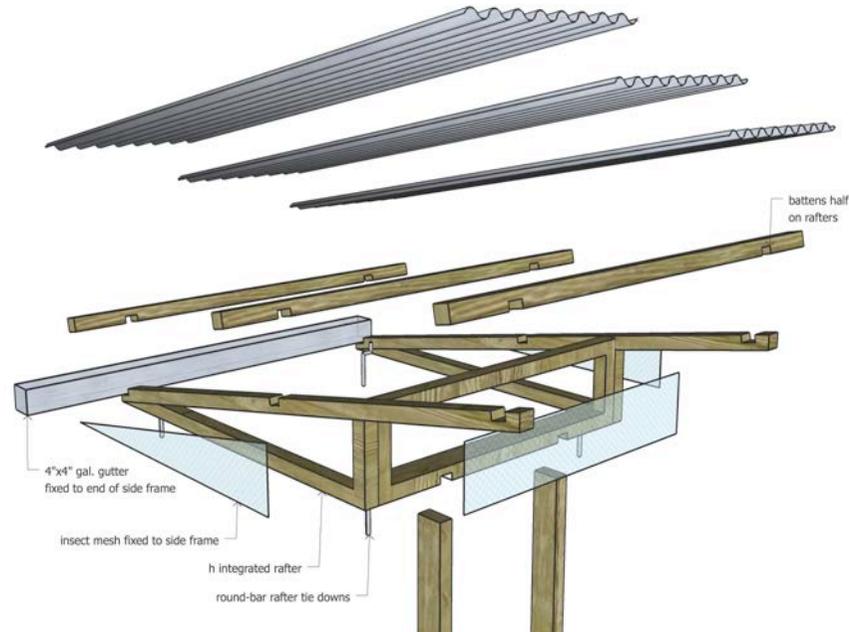
Note: the house, paths, biogas churn, biogas outlet point, tap point



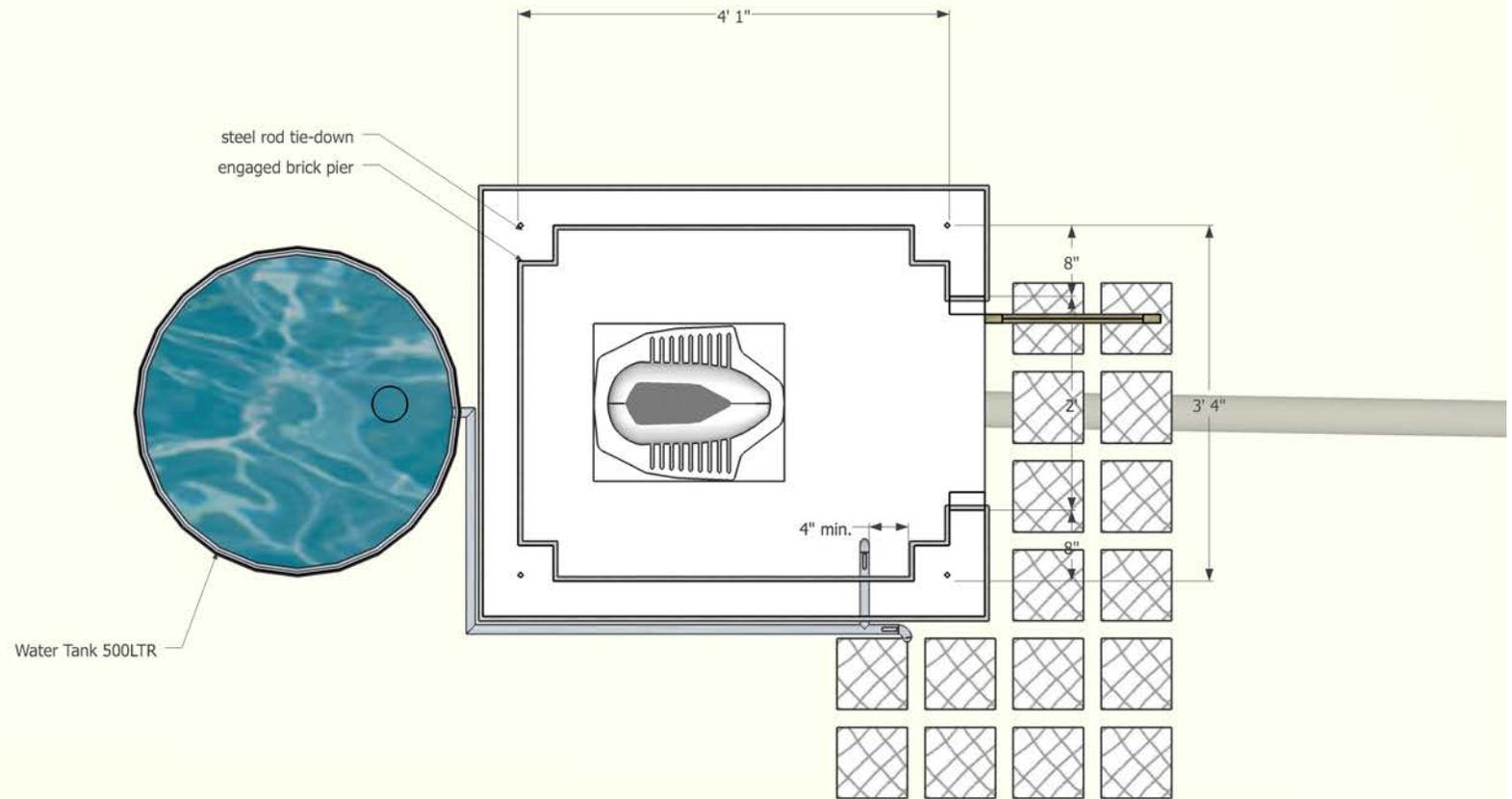
The toilet building



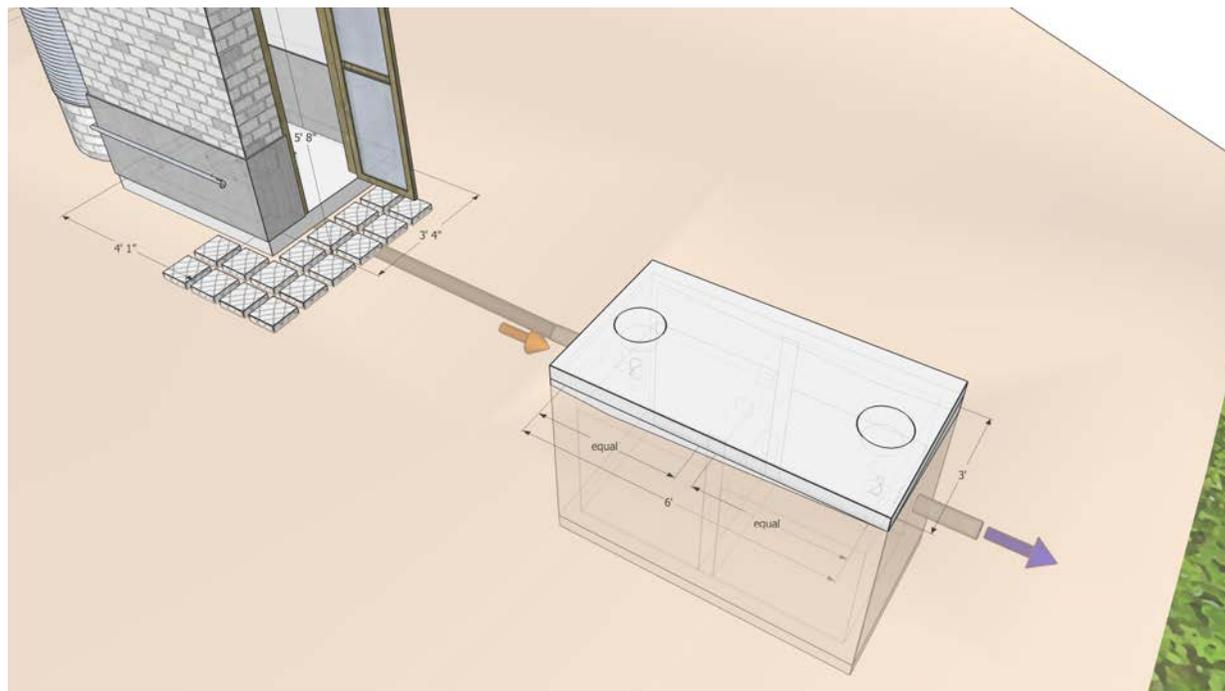
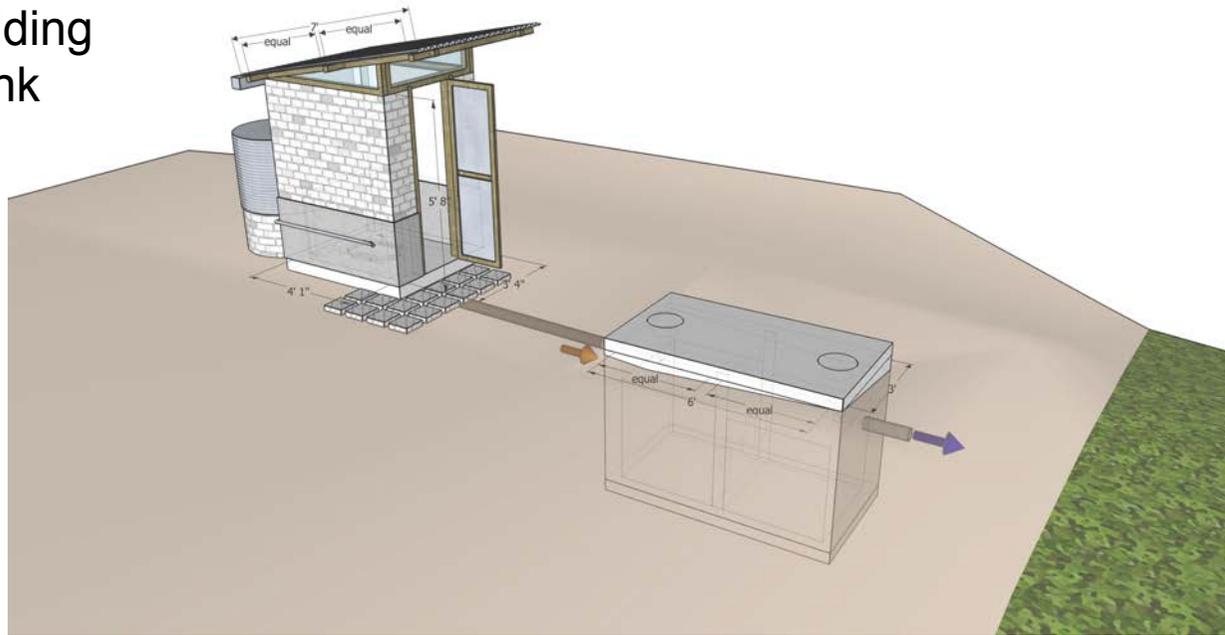
1. 500 litre poly water tank
2. Base to tank (approx +300mm above floor level)
3. 2.5 x sheets of roofing iron
4. metal gutter, ends, spout and downpipe to tank
5. hardwood roof structure
6. hold down rods for roof in pier corners of the walls
7. brick walls
8. hard render external to approx 700mm from ground
9. hard render internal (+600 from floor level)
10. asian type pan
11. Ball valve for dip flush (inside)
12. Ball valve tap for hand washing (outside)
13. Insect meshed vents (front and side)
14. timber framed door with metal infill and slide bolt and handle (inside) and pad bolt and handle (outside)
15. coat / clothes hooks and cleaning brush and securing rope and fixings (not indicated on this drawing - see details)
16. Entry pathway of optional brick or stone
17. Splash pad and drain for hand wash tap
18. *connecting septic tank OR biogas tanks not indicated in this drawing*



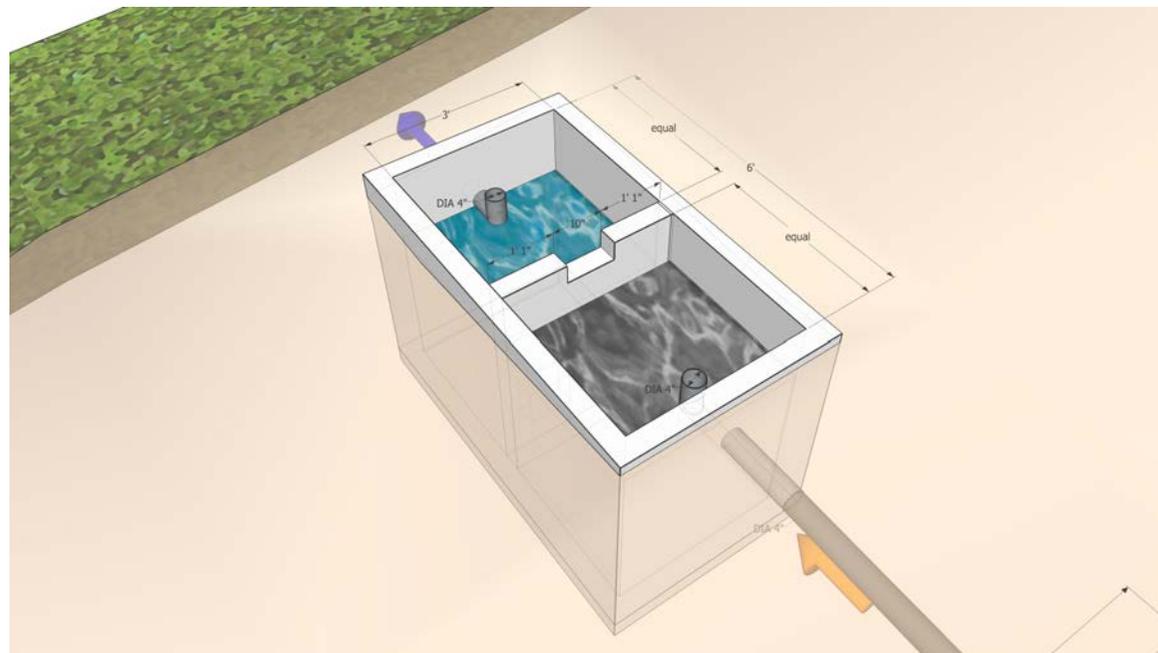
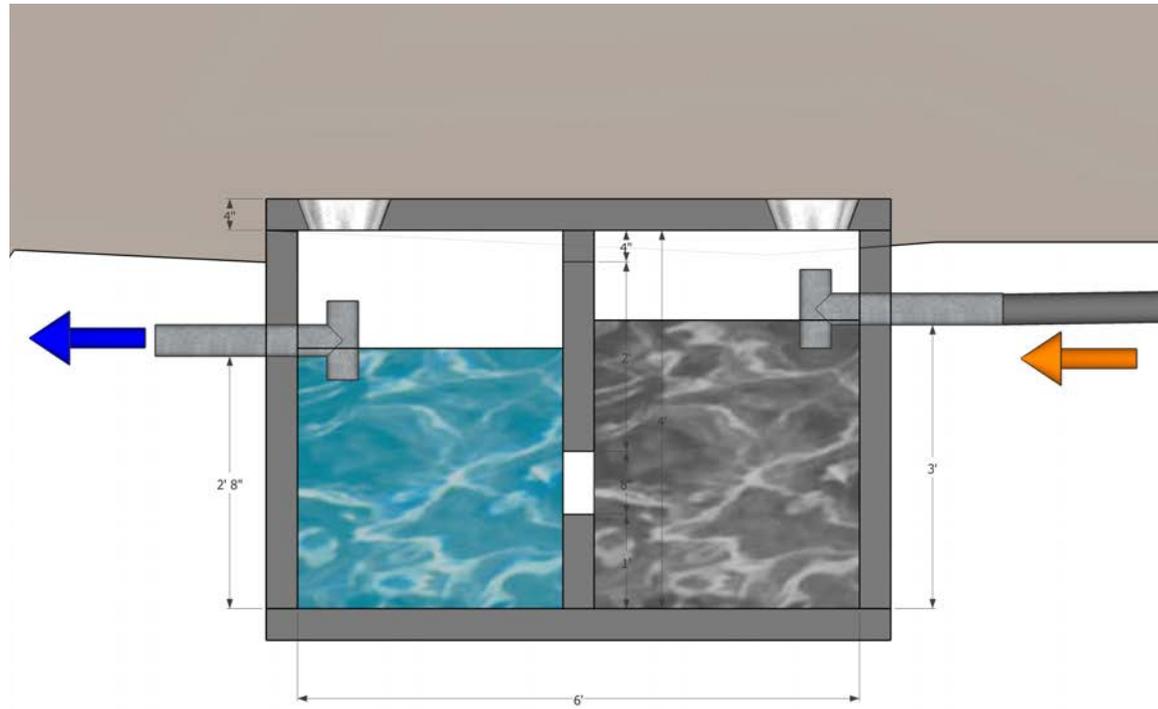
The toilet building (plan ideal layout)



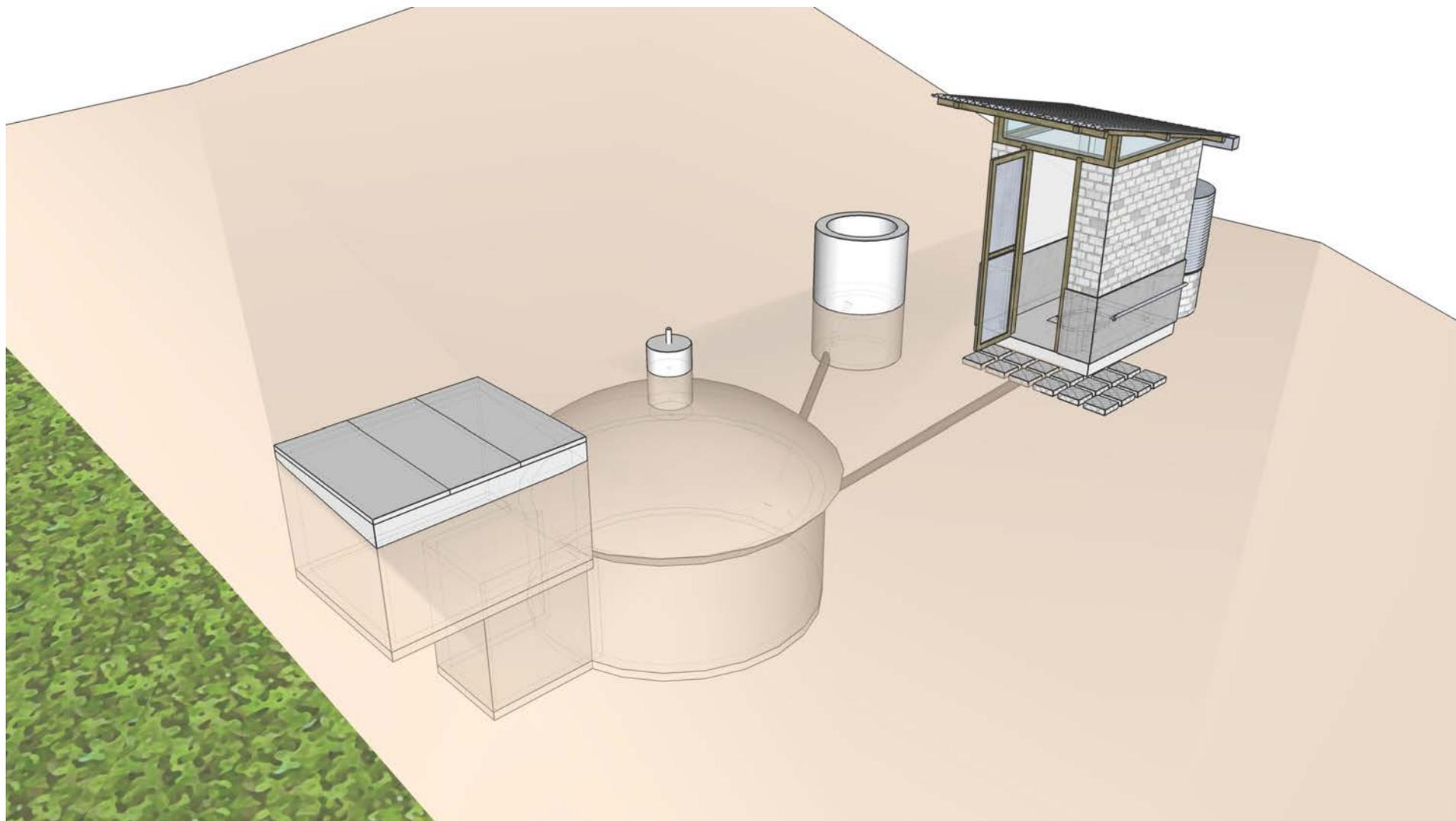
The toilet building and septic tank



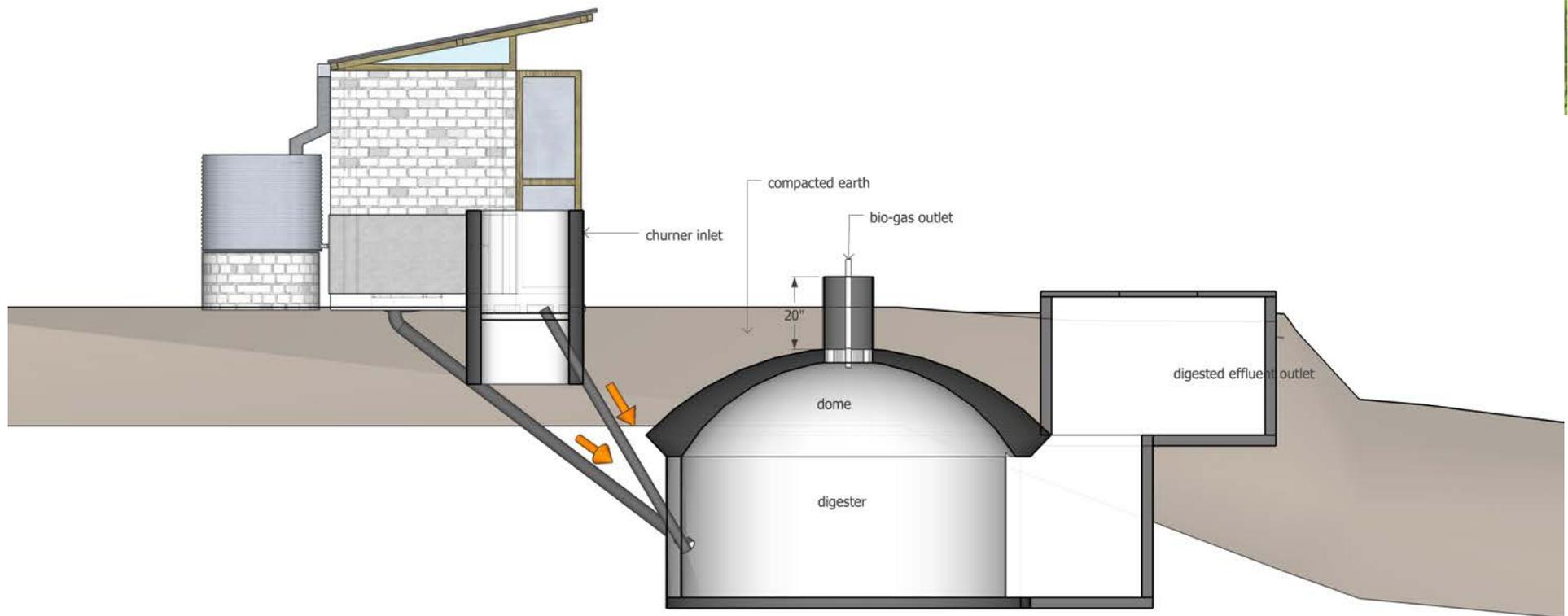
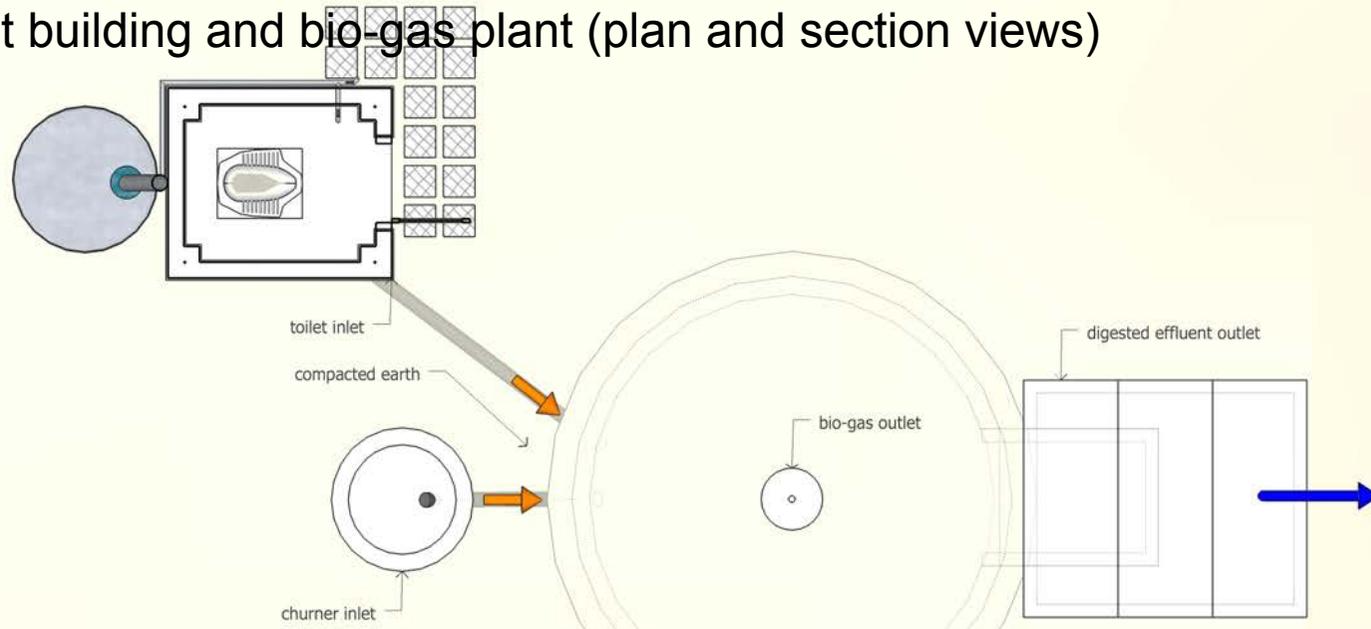
The septic tank



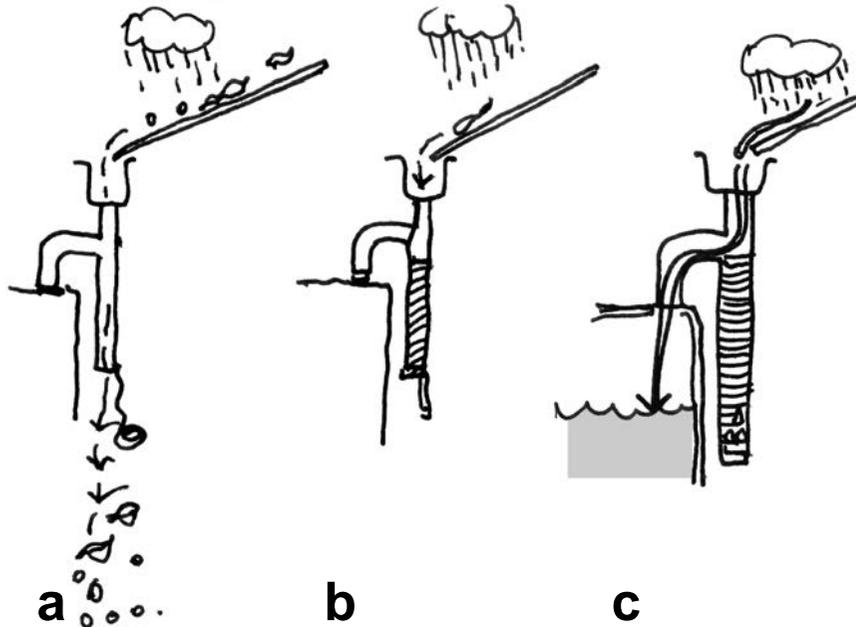
The toilet building and bio-gas plant (view)



The toilet building and bio-gas plant (plan and section views)



The proposed diverter valve



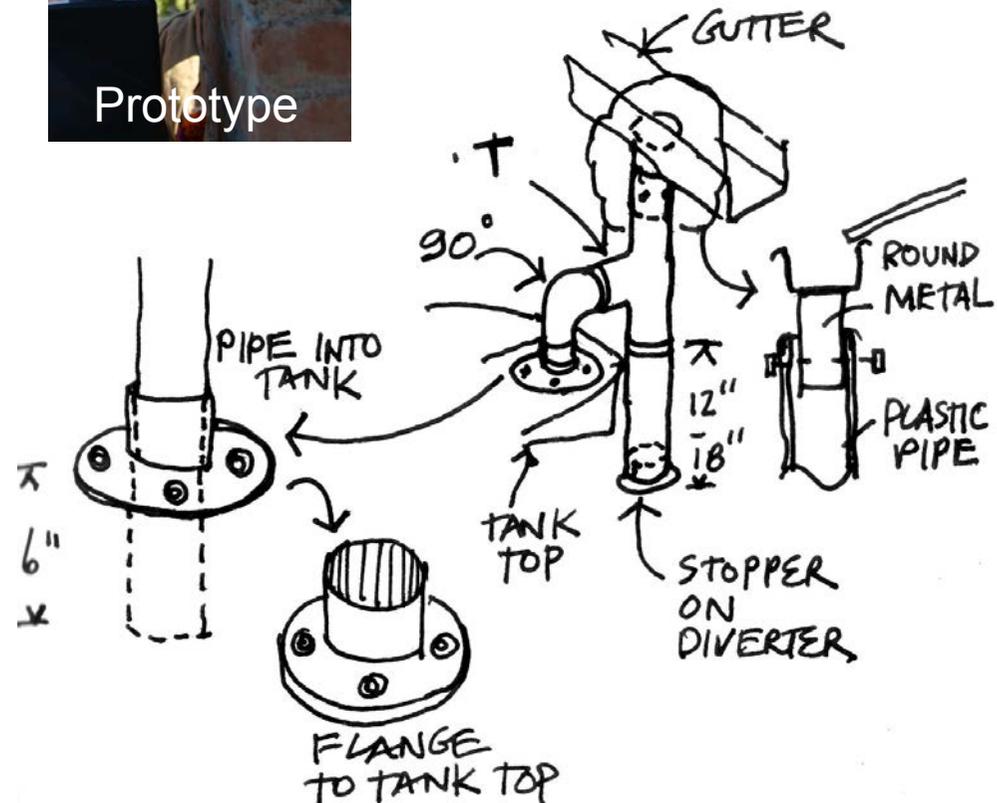
Function:

- During dry season stopper left open to allow rubbish to drop through open pipe
- After the first few storms that clean the roof, the stopper is fitted ... the next water will be diverted into the pipe (and can be drained later) How to not lose the stopper ???
- During the wet season when the roof is clean the stopper is secured to ensure all water is collected (it may be removed to drain any dirty water or rubbish at any time)



Notes:

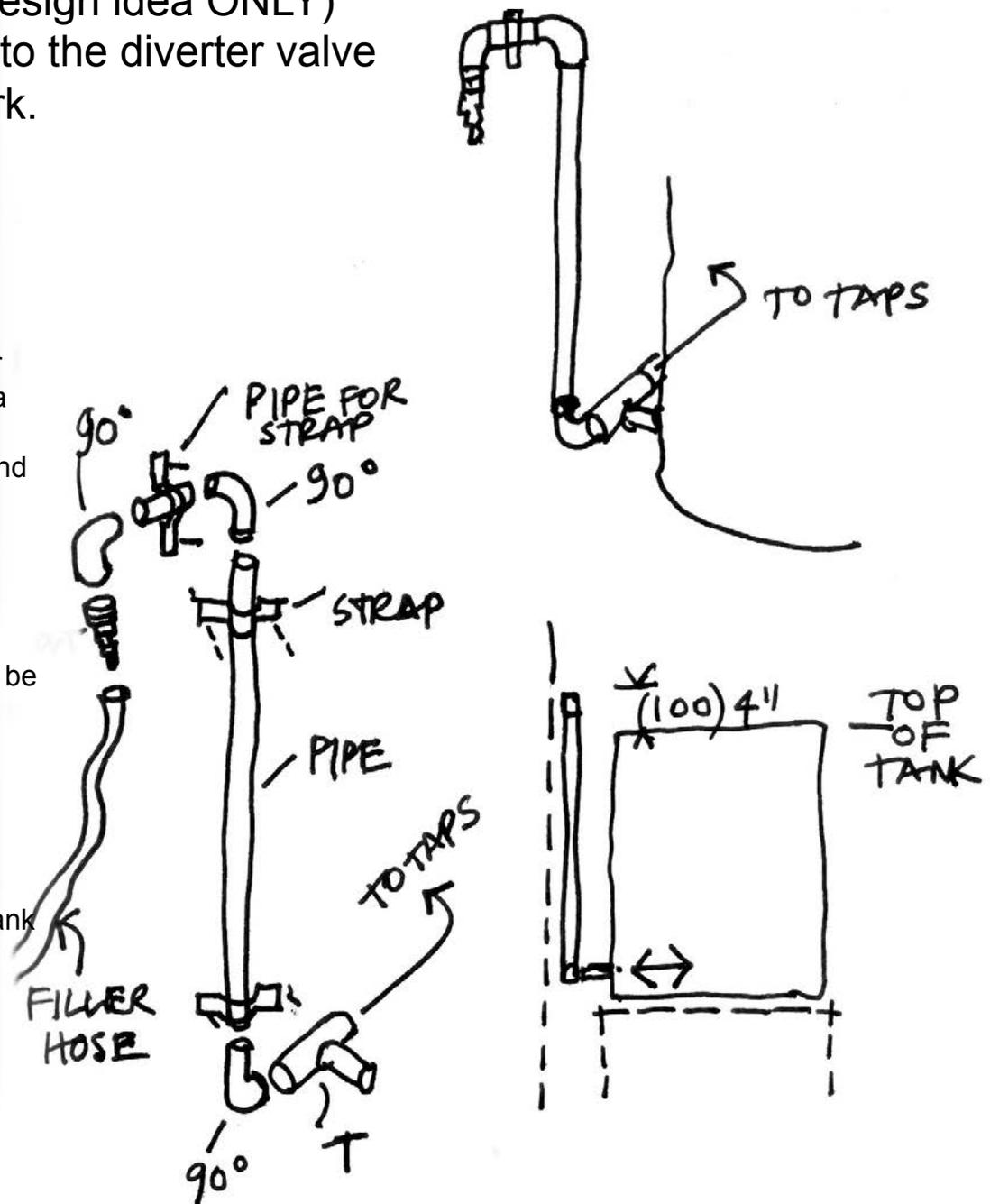
- New metal spout from gutter will need to be round not tapered and fit into the plastic pipe
- The plastic pipe (?) will need to be screwed to the metal spout.
- The plastic flange(?) to the tank top will need to be screwed to the pipe



The water tank filler construction (design idea ONLY) perhaps this can be incorporated into the diverter valve design to reduce additional pipework.

Notes:

- The new water supply in the village has meant many people want to fill the toilet water tanks for general family use during the dry season using a hose
- Currently the tank lids are removed frequently and this causes damage
- The new addition consists of:
 - a T piece near the tank outlet
 - 90 bend
 - length of gal. pipe strapped in 2 places to the brick wall of the toilet. Pipe diameter to be the same as pipe to taps
 - 90 bend
 - short piece of pipe to allow strapping
 - 90 bend turned out from wall
 - nozzle for hose attachment as per hand washing tap nozzle
- The main pipe should be at least 4" above the tank lid height to avoid syphoning of the tank water when filling



The house main room inside

Note:

Biogas cooking burner

Wood fired stove and ceiling



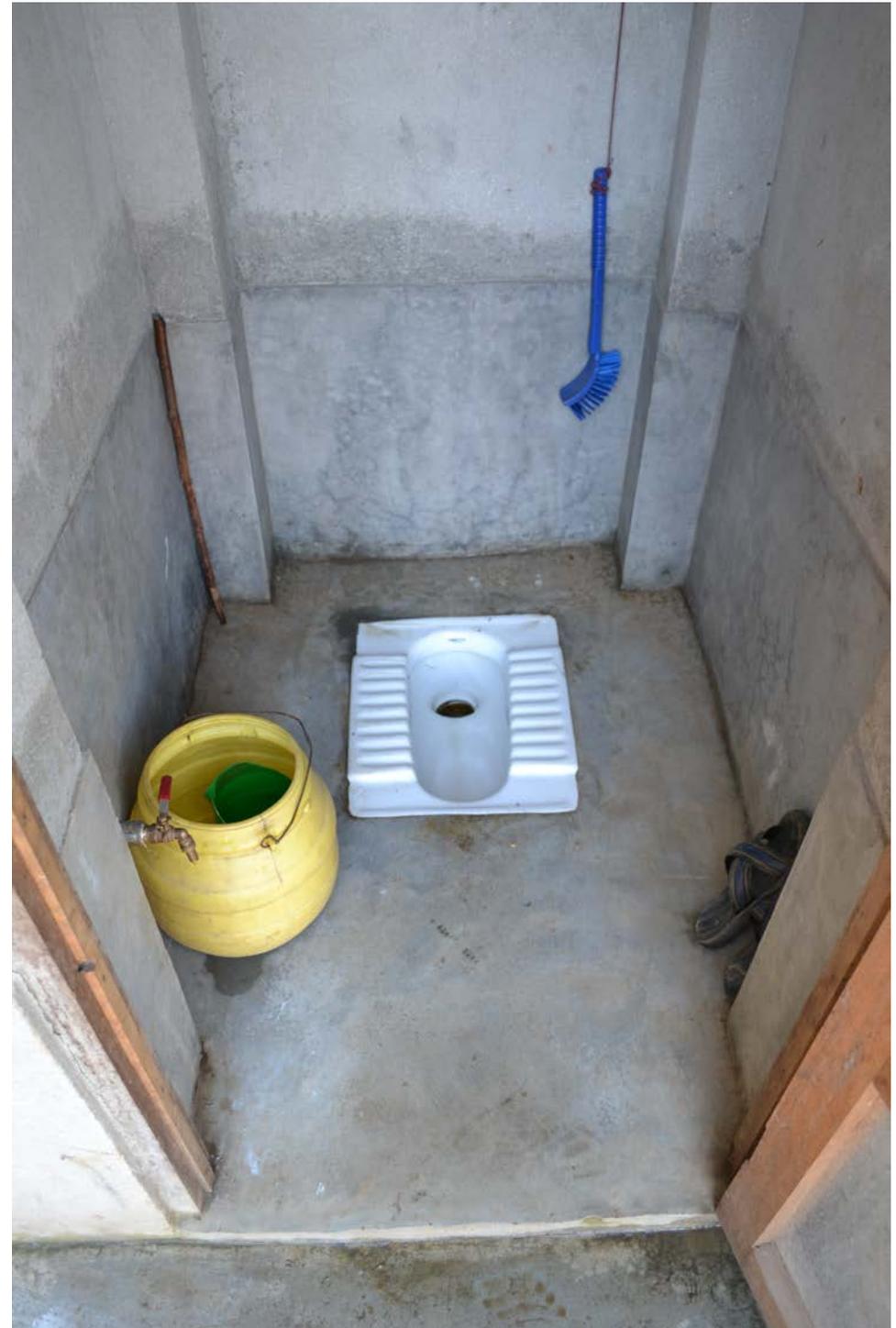
The toilet building inside

Note:

Toilet brush and hanger

Dip flush container

Shoes inside so soiled shoes left outside



The toilet hand washing tap, splash pad and drain

Note: this is often informally designed and built, the drain is small, toilet hand wash vs cooking utensil cleaning is an issue.



The toilet door - metal panel

Note: this is easily damaged and could be a source of local community involvement with designs/paintings etc

Consider:

- Alternate material for cladding generally
- Panels for painting added to existing metal or fibrous cement / ply?
- Toilet number for maintenance on the door

