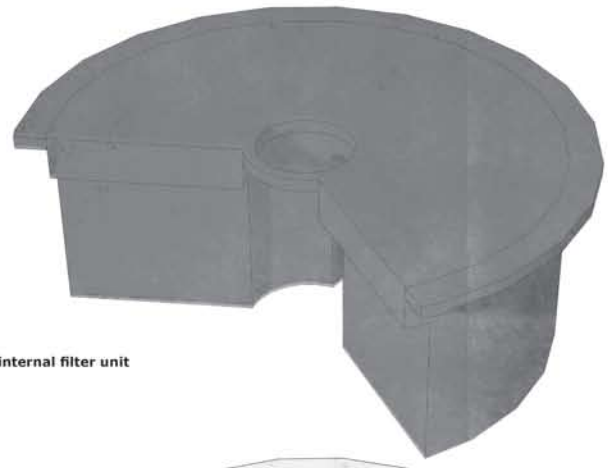
KN 209

The main method of waste disposal in humanitarian sites across Africa is the pit latrine, a 3m. long drop into the ground. A major problem that has recently arisen is that waste is leaking from the pit into the surrounding water table and thus contaminating all water produced by the wells on site.

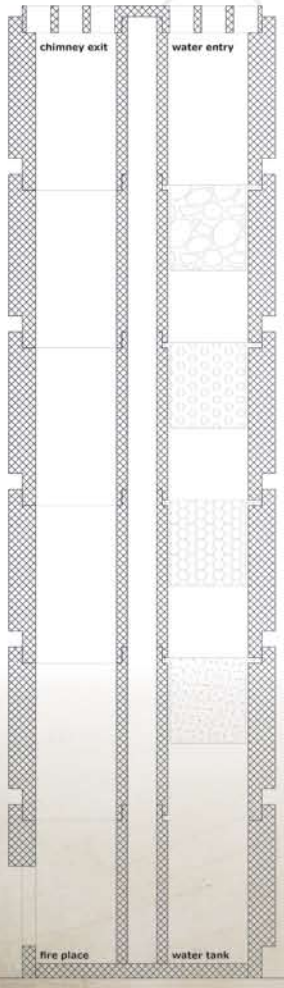
By adding different substances to the concrete mixture a porous/pervious concrete is formed. As explained below the quantity and type of substance added affects what type of filtration is achieved. The filtration units are precast. Each filters mix is coloured with red dye, as a warning sign to the drinker, that is activated if the filters fail and bacteria makes it through. This allows easier transport and in the case of failure, removal from the system.

All the filters are placed in larger concrete shells that slot together on top of one another to protect and separate the filters. These pieces are all cylindrical in shape for transport purposes. It is proposed that the shells are made from eco-concrete that uses carbonates in the mixture that are obtained through the mineralization via aqueous solution of CO2 produced in industrial processes. The exterior protective cylinders are have 3 internal cells 2 house the filter, the third is as void that can act as chimney. On the bottom unit there is a space to light a fire, this can be a communal cooking area. It can also be used to heat up the water sitting in the bottom chamber, should it be needed for washing or cooking.



internal filter unit

filter container



1:5 section

filtration system

mesh of openings precast, using oversaturation of the mix. 100 microns in diameter, filters bigger particles.

mix is embedded in polyester for a finer filtration. 15 microns in diameter, filters large clusters of bacteria.

chamber of beads impregnated with iodine, this kills parasites and 99.3% of bacteria.

the final filter is filled with a granulated active carbon in the mix, not only improves taste and smell but should filter remaining bacteria.

transportation system

units are small enough to be transported by small vehicles

when on awkward site placement steel tubes can be attached to enable it to be pushed like a wheelbarrow over rough terrain

the units are small and light enough to be lifted into place by hand.

"Water, water, every where,
Nor any drop to drink."

Samuel Taylor Coleridge