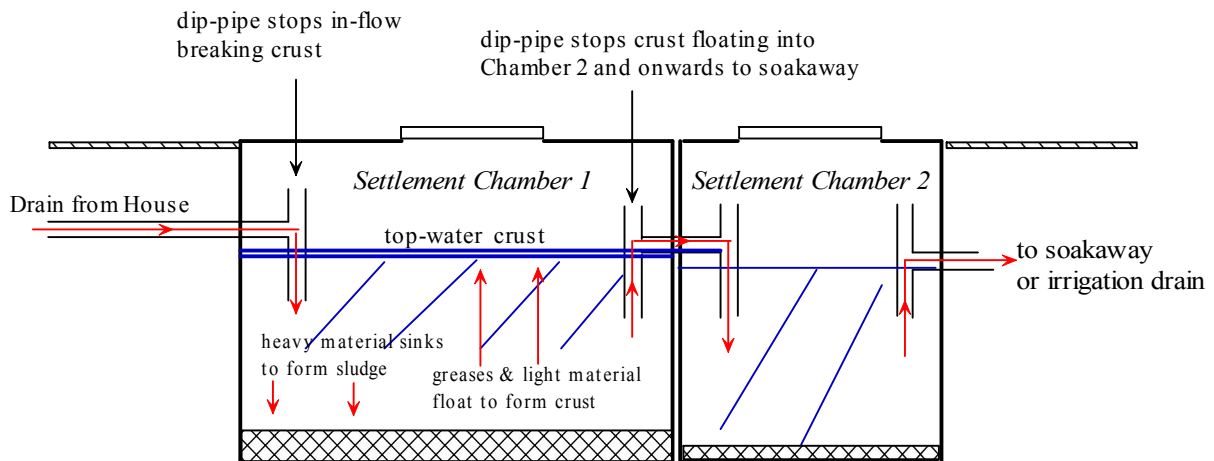


What are Septic Tanks and How do they work?

There are basically two types of septic tanks: traditional, masonry-built pits or more modern GRP (glass-fibre) units, often referred to as “onions”. Whatever the type, their function is the same – a settlement tank in which the sewage sludge is retained for sufficient time for the organic matter to undergo anaerobic decomposition. The final effluent from the septic tank should then be drained to an underground soakaway system.

The soakaway must be of adequate size to deal efficiently with the volume of final effluent, which could be in excess of 180 litres (40 gallons) for each member of the household. **Whichever type of septic tank, the most common problem is failure of the soakaway.**

Traditional Masonry Septic Tanks



Some tanks only have one settlement chamber. In others, Chamber 2 has porous, slotted walls and acts as the soakaway.

The dip-pipes are extremely important but often get knocked off when the tank is de-sludged.

It is most important to regularly de-sludge a septic tank – normally annually. If this is not done, sludge can wash into the soakaway, to almost inevitably clog it. Even when properly maintained, one must appreciate that the normal effluent from a septic tank is far from “clean” and can eventually clog the soakaway. The savings from not having to pay sewerage charges with the water rates should therefore perhaps be set aside for any future improvements or extensions to the soakaway system. The tank should be de-sludged whenever the sludge or crust build up to any significant depth. Usually this is every 12-18 months.

Surface water should not be drained to a septic tank, as it can overburden both the tank and its soakaway.

GRP “Onion” Septic Tanks



A similar principle to a traditional tank but flow is upwards rather than laterally.

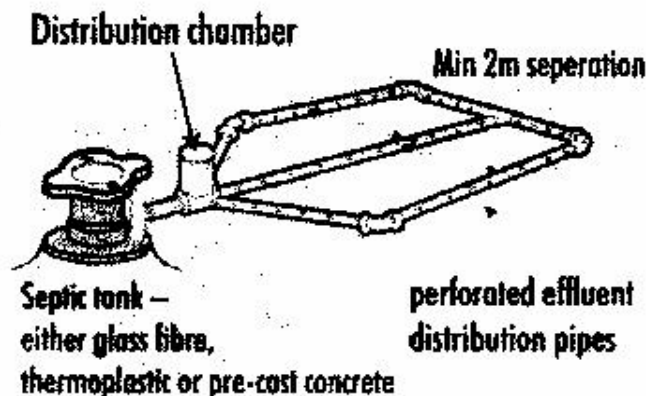
Manufacturers such as Titan, Klargester and Balmoral have more detailed information about their own tanks.

Septic Tank Soakaways

Perhaps the most important component of the septic tank system is its soakaway, and it is often the “weakest link”. The soakaway system has to be capable of dealing with all the waste water produced by the household, which can often be in the region of 40 gallons per day per person. Such a soakaway would normally be one of three types: a porous chamber, a stone-filled pit or a layout of irrigation drains. Years ago, the porous chamber or stone-filled pit were most commonly used, but nowadays a layout of sub-soil irrigation drainage is normally considered the most appropriate system. This is similar to a herringbone land drainage system but designed to allow water to leak out to the sub-soil instead of attracting ground water into the drain. The amount of drainage required depends on (1) the porosity of the sub-soil, which can be determined by percolation tests in trial pits and (2) the population being served by the tank.

There are three basic types of soakaway:

1. The preferred method: irrigation drainage, preferably in a looped or closed-circuit design. The drain consists of porous pipe or land-drainage pipe within a stone-filled trench, as shown in the sketch below.



2. A soakaway chamber – normally brick-built with slots in the sides to allow effluent to soak into the sub-soil.
3. A simple stone-filled pit. This has little chance of working properly unless in particularly porous ground

The efficiency of a soakaway depends on the porosity of the ground and this should be determined by a percolation test. The less porous the ground, the bigger the surface area of the soakaway has to be.

Septic tank soakaways are unlikely to be successful in areas of heavy clay ground. Often the most effective and cheapest solution / alternative is to use a small package sewage treatment plant instead of a septic tank, particularly if there is a suitable nearby watercourse for the treatment plant to discharge to.