

10 Effluent disposal drains (leach and French drains)

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Effluent disposal drains such as leach drains and French drains are used to get rid of effluent that comes from the septic tanks. It is better to have these disposal systems put in two at one time (dual), so that one can be in use while the other one is rested. Resting one drain system lets oil and grease that has collected in the surrounding soil be broken down. These dual systems also last longer than a single system the same size.

10.1 Leach drains

A **leach drain** is a tube-like structure which is made of concrete or plastic and buried in the ground. There are holes in the sides. Its width can vary and its length depends upon the size of the leach drain being used, the amount of liquid waste to be disposed of, the type of soil (dirt) around it, and how it is built.

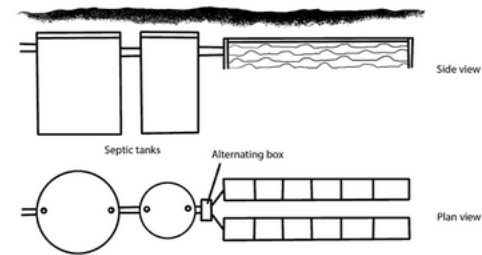


Fig. 2.38: Septic tanks and brick leach drain.

The liquid waste enters the leach drain at one end then slowly seeps down through the open base and out the sides through holes into the surrounding soil.

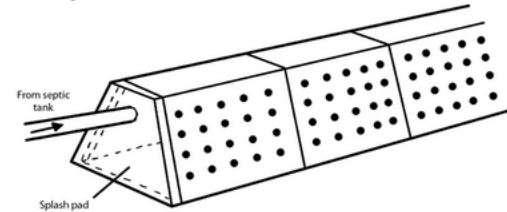


Fig. 2.39: Concrete segment leach drain.

8.1 On-site disposal systems

All the liquid waste from the toilet, bathroom, laundry and sink goes into pipes which carry it to a **septic tank**. The effluent from the tank is then disposed of through effluent disposal drains often referred to as **leach** or **French drains**. Both of these methods of disposing of liquid waste are **on-site disposal systems**. They must be installed and maintained properly.

In these systems, the effluent is soaked into the surrounding soil. Some soils don't allow good soakage such as clay or similar soils; if there are any problems with this disposal system a local government EHO should be consulted to talk about the problem.

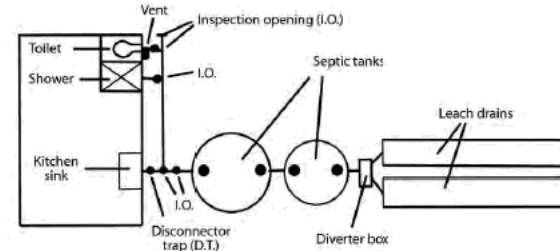


Fig. 2.30: Plan view (top) of an on-site sewage disposal system.

On-site disposal systems cannot be installed in all situations. For example, they cannot be installed:

- in areas that flood regularly
- in areas that have a high water table (that is, where the underground water is close to the surface)
- where the amount of wastewater to be disposed of is large
- near to drinking water supplies

9 The septic tank

Page last updated: November 2010

A septic tank can be used to treat the sewage from individual buildings at the building itself or for the whole community, at the lagoon. The sewage will pass through sewer pipes to the septic tank either at the house or at the lagoon.

The septic tank is a sealed round or rectangular container which is used to break down the sewage so that it becomes effluent through the action of bacteria living on the waste matter.

9.1 Septic tank design

A household septic tank usually consists of two round concrete tanks with lids placed close to each other. They are connected by a pipe. This type of septic tank is designed to be used by up to 10 people. Round tanks are constructed (built) at a factory and transported to the site (place) where they are to be used.

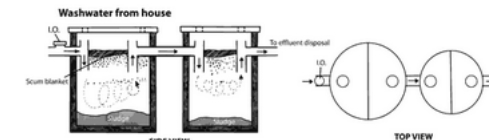


Fig. 2.34: A round septic tank system.

A septic tank can also be a single rectangular concrete tank with a dividing wall in it. A rectangular septic tank is designed to be used by more than 10 people and is often used for sewage treatment at a lagoon. The tank is constructed on the site where it is to be used.

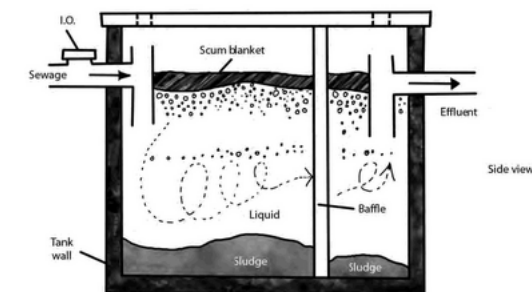


Fig. 2.35: A rectangular septic tank system.

Septic tanks are always divided into two sections, the first being twice the size of the second. In round septic tanks, the separation into two tanks provides this division. In rectangular tanks the dividing wall provides the division. This wall will have a hole in it below the level of the sewage to allow effluent to pass from the first to the second section.

Round septic tanks have concrete bottoms and lids. Rectangular tanks usually have concrete bottoms and lids, but some may have metal lids. The lids can be lifted off for maintenance and will have IOs in them.

There are many regulations (rules) which require septic tanks to be constructed, positioned and installed in a particular way. These rules are controlled by local authorities.

It is very important to find out if the regulations are being followed by contractors or anyone else installing (putting in place) new septic tanks in the community. It is a good idea to contact the local EHO to check that the necessary approval has been given to construct and/or install the septic tank disposal system.

If anyone wants to know anything about septic tanks, including the rules relating to their construction, or there are any problems with these tanks in the community, contact the EHO or Environmental Health Practitioner.

9.2 How a septic tank works

A septic tank must be filled with water before it is used. The water helps start the treatment of the sewage by the bacteria. The sewage treatment by the bacteria turns the waste matter into **effluent** (wastewater) and a solid substance called **sludge**. The effluent gets carried to the leach drain, French drain or lagoon.

The material in the septic tank gets covered by a hard crust known as a **scum blanket**. This blanket acts as an **air seal** keeping air away from the sewage. The lack of air helps in the breakdown of the sewage by the bacteria.

The sludge gathers at the bottom of the tanks. Eventually there will be too much sludge in the tank and it must be pumped out and the sludge disposed of correctly.

By having two tanks or a rectangular tank divided into two sections, most of the sludge stays in the first tank or section. In the second tank or section, the sewage undergoes further treatment to remove solid matter.

The effluent is then piped to the effluent disposal system, such as the lagoon.

This water still contains germs and parasites.

9.3 PROBLEM SIGNS IN SEPTIC TANKS

The septic tank will need to be checked if there are signs that it is not working properly.

Some signs that a septic tank is not working properly are:

- The sewage in the toilet or the liquid waste from other fixtures flows away very slowly
- Liquid waste overflows from the disconnecter trap
- Wet areas are seen at the top of the septic tank
- There is a strong unpleasant smell near the septic tank
- The grass around the tank is very green and growing well

In the case of on-site disposal systems, it is important to remember that some of these signs may indicate problems with the leach or French drain. Therefore, these drains will need to be checked at the same time as the septic tanks are checked.

If the septic tank and the leach or French drain need to be pumped out, both should be done at the same time.

9.4 Pumping out septic tanks

Septic tanks should be pumped out every five years to keep the disposal system working properly. However, this may need to be done more often, for example, if they overflow or become blocked.

If there are any signs of a problem with the septic tank (see Section 9.3), it will need to be checked.

The inside parts of the tank system which will need to be checked are:

- the scum blanket (as it may become too thick and block the inlet pipe)
- the inlet or outlet pipes (as they may be blocked by solid matter)
- the sludge (as it may have accumulated so that it fills most of the tank)
- the tank's bottom, sides or lids (as one or more of these may have been cracked or broken. For example, vehicle movements over septic tanks are likely to damage the lids and sides.)

For the first few times an EHP pumps out a septic tank, it is important to always check with the local EHO or Environmental Health supervisor before any pump-out work is commenced.

These people will provide information on disposal sites and the correct pump-out methods as well as technical help in assessing the inside parts of the septic tank.

10.2 French (rubble) drains

The French drain is also used to dispose of the liquid waste coming from the septic tank. It is a pipe with holes or slits cut in it, laid on a bed of round rocks. The holes or slits in the pipe face downwards. It is usually about 20 m long but the length depends upon the amount of effluent to be disposed of and the soil type around the drain.

The drain is covered with plastic or some similar material and is then covered with a protective layer of sand or gravel. This helps prevent the pipe holes or the gaps between the rocks from blocking up with the protective sand or gravel.

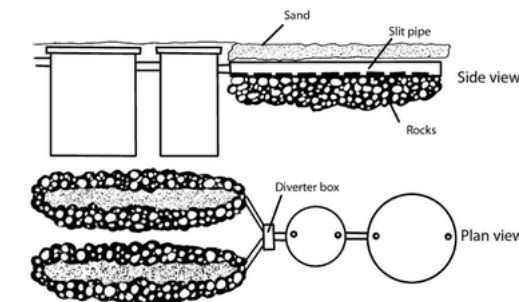


Fig. 2.40: French drain (rubble drain).