

Understanding the sewage options for off mains drainage plots

by Mike Norton, technical director for leading sewage solutions provider, Titan Pollution Control

As good, well drained development land runs out in the UK, finding the right solution for new rural properties that are off the mains drainage system is becoming a challenge and builders must be fully aware of the issues and regulations that govern their options.

Septic tanks, which allow the settlement, storage and partial decomposition of solids, were once the universal solution for properties that were off-mains drainage and could not be connected to the main sewer via a pump.

However, because septic tanks do not treat effluent and need a drainage field through which that effluent can be discharged, they are not suitable for land that is likely to become waterlogged.

Other local factors can also render septic tanks unsuitable and these are clearly stated in the H2 building regulations. For example, a septic tank cannot be installed within 10m of a watercourse, within 1.0m of the local water table or within 50m of a borehole, or within 7m of any domestic habited building.

Septic tanks must also be situated down slope from a ground water source and they must not be within a zone 1 ground water source protection zone. The drainage field must also be at least 15m from any habited building

In terms of size, a septic tank designed for four users should have a capacity of at least 2,700 litres below the level of the inlet. This figure should be increased by 180 litres for each additional user. Therefore a standard 2800 litre septic tank would be suitable for a two-bedroom property. The new British Water sizing criteria is based on a population calculation of one person per bedroom, plus two extra people per house. For example, a three-bedroom house = five people.

Depending on loading, septic tanks need to be regularly maintained and emptied several times a year. The tank must be sited no further than 30m from the nearest access point.

If a property in a poorly drained area cannot be connected to the main sewer by a pump, then a sewage treatment plant, such as the Titan Pollution Control Biotec, is often the best answer.

Sewage treatment plants provide an environment in which bacteria are cultivated to break down sewage. The bacteria survive by using biological matter in the sewage as a food source and only an annual de-sludge is required when using the Biotec models. Others on the market may require emptying twice per year, or even every 90 days.

Treatment plants can remove up to 95% of the biological pollutants present in sewage. Since the effluent is of a very high quality, it may be discharged directly into a river, stream, or ditch, with Environment Agency permission. This means that poorly drained soils and areas with a high water table are not a problem, provided there is a suitable watercourse nearby.

Most package treatment plants work by providing a fixed medium on which the bacteria are settled and mixed with oxygen and biological material. The design of such treatment plants can be extremely simple, making them easy and cost-effective to maintain. The Biotec, for example, has no electrical or mechanical parts within the tank. It has a small air blower, which can be discreetly situated above ground up to 15m away from the unit causing minimal disruption when maintained



There are many different sewage treatment plants on the market. However, when choosing one, make sure it has been type tested to the BS7781 standard and has been awarded the British Board of Agrément certificate. Also ensure that it can accommodate a power failure for several hours to minimise the risk of leakage or contamination.

If a property is in a particularly sensitive area and the local authority demands a higher quality of effluent, a reed bed may be used to complement a sewage treatment plant. Reed beds from Titan Pollution Control are packaged products, which are installed in the ground and filled with reeds and gravel. These units are "Patent Applied for". No other manufacturer outside the Kingspan group makes packaged reed bed systems. Therefore, if you are not buying from Titan Pollution Control, the reed bed system will need to be a bespoke construction on site. In addition to significantly improving the quality of effluent, reed beds are aesthetically pleasing and very easy to install when supplied in kit form.

Size is particularly important when specifying a sewage treatment plant, since no plant will function effectively if it is too small. This issue has been simplified by the recent re-launch of British Water's Code of Practice, which aims to promote the collection of accurate and complete information by providing a clear data collection method. One of its key features is a detailed table of loadings for sewage treatment plants. This table is divided into six categories - private homes; industrial buildings; schools; hotels/pubs & clubs; amenity sites, such as sports centres, and hospitals and residential care homes.

In each category, the table estimates how many litres of waste are produced per person per day (Flow), the strength of the pollutant (BOD) and the amount of ammonia. For example, a small hospital has a Flow of 450; a BOD of 140 and ammonia levels should be individually assessed. A three or four-star hotel has a flow of 250, a BOD of 94 and ammonia levels of 10.

Package treatment plants will only perform as well as they are maintained and buyers would be well advised only to buy plants supported by manufacturers' service contracts. Again British Water is in the process of establishing a maintenance protocol for the industry. This can only enhance the continuing protection of our environment.

If ground conditions are unsuitable for a septic tank and there is no watercourse into which effluent from a sewage treatment plant can be discharged, then a cesspool may be the only answer. Cesspools are watertight tanks, which are installed underground. They simply store sewage and do not treat it in any way. This means they have to be emptied regularly, which can be costly and inconvenient.

As a guide, a cesspool should have a storage capacity of 18,000 litres for two people and this should be increased by 6,800 litres for each additional user. There should be no openings on the tank other than for emptying and ventilation. As with septic tanks, the cesspool should be within 30m of the access point for cleaning and emptying.

To conclude, every building site needs to be considered on its merits when choosing a sewage solution. The type of soil, height of land and availability of a suitable watercourse are just some of the issues that affect the type of product that can be installed. It is vital that builders take all these factors into account to ensure customer satisfaction and environmental safety. Responsible manufacturers are always willing to help with the specifying process and Titan Pollution Control has a network of highly trained area sales managers who are available to advise builders on-site.

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