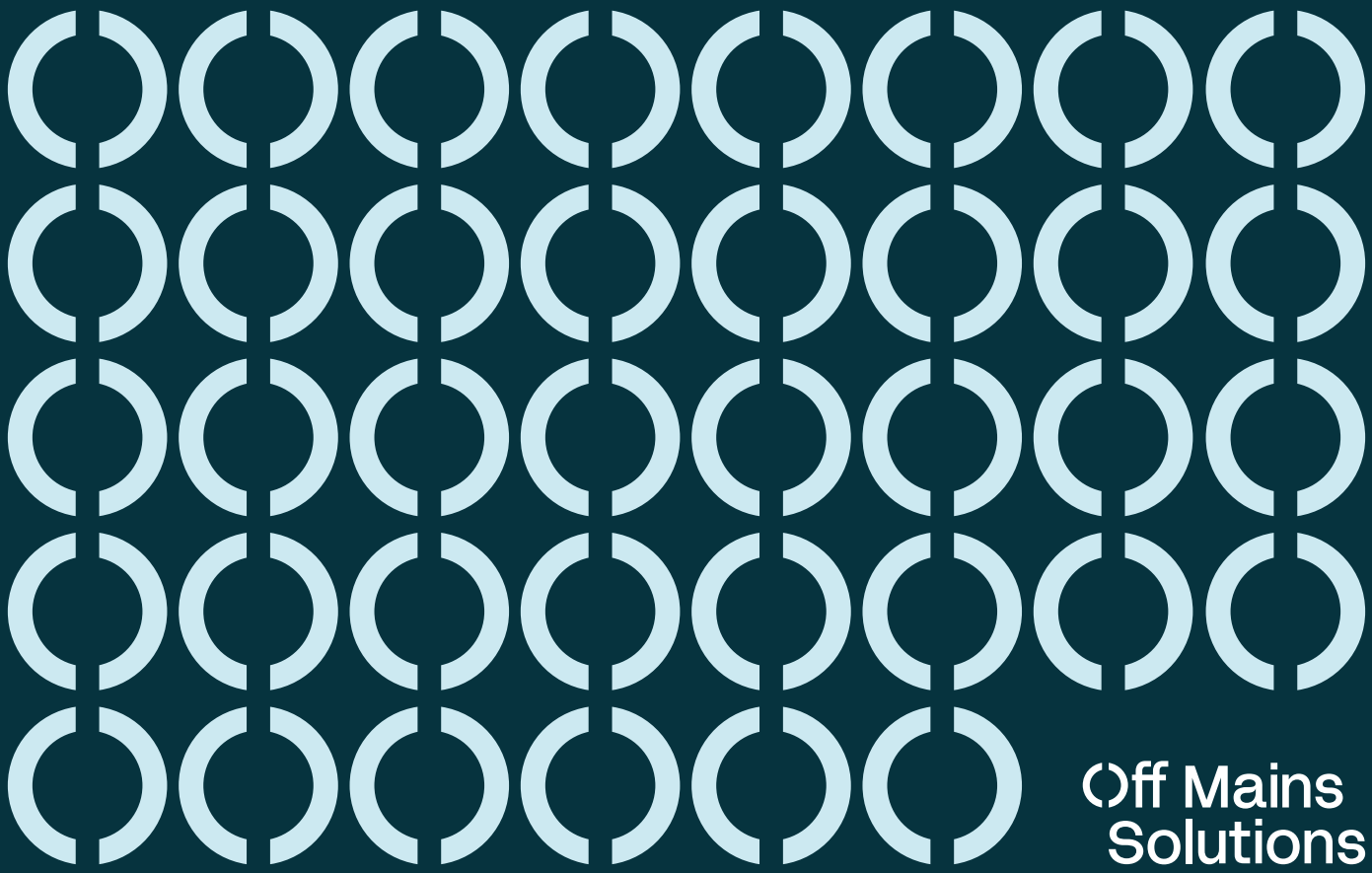
A guide to private off mains drainage systems



Off Mains Solutions

Understanding off mains drainage systems

Cesspit

A large watertight holding tank installed underground to receive a properties grey and waste water. Historically constructed of brick or blockwork with modern cesspits made from glass reinforced plastic (GRP) or similar materials. There is no outlet pipe, a cesspit simply fills up and requires regular emptying. The process continually repeats, and if sized appropriately, a cesspit will need emptying every 6-8 weeks.

Sewage treatment plant (STP)

A self-contained wastewater treatment system creating treated effluent which is allowed to discharge to ground or a surface water (ditch, stream etc). The vast majority of STPs require a permanent electricity supply which, depending on the specific make and model, help and encourage the growth of the microorganisms that treat the waste water. This is achieved via the introduction of oxygen which the good bugs need to grow and thrive. With the environmental regulators permission, a STP may also be permitted to discharge to a deep single point soakaway, a bore hole soakaway or a seasonal surface water i.e. one that does not have all year flow. A typical domestic STP requires an annual service, but larger STPs, and specifically commercial STPs, will require more frequent servicing. The respective STP manufacturer will specify the service intervals and they must be adhered with to ensure the warranty remains valid.

Septic tank

An underground tank which allows separated waste water to discharge to ground. A septic tank provides an environment for natural separation to take place. This occurs in quiet periods of the day, typically at night and when we're at work. The dense material falls to the bottom of the tank to create the sludge layer, the fat, oil, grease and rags (tissue) rise to the top to form the crust (or scum) layer, with what's left in the middle being clarified liquor, which is the only allowable liquid to exit the tank and enter a dispersal system, which should be a drainage field, but historically will be a soakaway arrangement of various designs.

Secondary treatment systems

A drainage field is a sub-surface infiltration system which provides treatment for the separated waste water from a septic tank or dispersal for treated effluent from a sewage treatment plant. A drainage field is a series of perforated or slotted pipework which is installed nearly flat (a gradient of 1:200), which ensures the liquid flowing through it does so slowly and calmly, preventing any overloading or ponding. A drainage field should only be installed after a percolation test has been carried out as this demonstrates if the ground is suitable and, if it is, how big the drainage field needs to be.

Off Mains Solutions offer a range of services to help the off mains drainage user address, with confidence, the rules and regulations that apply to private ‘off mains’ drainage systems. Whether it’s a pre-purchase survey, a compliance survey, the installation on a new system, a percolation test, we can deal with everything and anywhere in the UK.

Septic tanks – what you need to know

Although it's getting rarer and harder to install new septic tanks, they still represent the majority of off mains drainage systems. Septic tanks and their respective drainage field/dispersal system rely on each other for the system to work effectively. The septic tank needs to have adequate capacity and be in good structural condition to allow the required separation to occur, resulting in only the middle section (clarified liquor) exiting the tank and entering the drainage field/dispersal system.

The drainage field needs to be installed correctly (depth, design and location) to allow treatment to occur (underneath the pipework).

Septic tanks should be annually emptied, although dependant on usage and tank capacity, this may be relaxed or increased. An adequately sized septic tank serving a single occupant may only need an empty every two to three years, whereas a small tank serving a full family may require six monthly empties to prevent the build up of the sludge layer.

Why a septic tank system can fail

When they're working effectively, septic tank systems are a very cost effective and environmentally friendly private 'off mains' drainage solution, but unfortunately they can't last forever. Here's some reasons why they can fail;

- Internal baffle out of its original design position
- No 'T' pieces
- Structural damage caused by external forces (hydrostatic pressure, tree roots, localised ground movement)
- Incorrect installation
- Poor workmanship and/or materials
- End of life of drainage field/dispersal system

Signs of a septic tank system failure

Although the only way to ascertain that a septic tank system has failed is to have it emptied and inspected, some of the signs indicating failure are;

- Increased frequency of tank empties
- Boggy patches in or around the drainage field/dispersal area
- Oily residue in ponding water on ground level
- Toilets taking longer to drain away
- Increase in odours around the tank

Challenges in off mains drainage systems

4%

of properties (just over 1 million) in the UK are served by off mains drainage systems

7m

is the minimum distance a system must be from any habitable part of a dwelling

35%

of off mains systems have rainwater cross connections

£15k

is the average price to install a sewage treatment plant

It's not always straight forward identifying what system is which, meaning we must ascertain; if it's adequately sized, what and where it discharges to, if any part of the system is off boundary, how many properties are connected, if there are rainwater cross connections, if everything is working effectively and therefore if the system is compliant.

The only way to establish all of these essential details is to have an inspection carried out by an off mains drainage specialist. If it can be demonstrated that the system was installed before 1983, that it discharges to ground and is functioning, then it does not need to be replaced with a modern system. This is because the first standard for treatment systems and their discharges, the BS6297:1983, was introduced in 1983. It cannot be retrospectively applied to a pre-1983 system.

Important to know

All off mains drainage systems should only receive grey and wastewater (toilets, sinks, showers, washing machines, dishwashers etc.) there should never be any rain/surface water connected. These are referred to as cross connections. Rainwater cross connections cause cesspits to fill up artificially quickly resulting in the unnecessary expense of additional empties.

In septic tanks they cause a hydraulic overload whereby the contents are pushed through to the drainage field/dispersal system before adequate separation has taken place. This will cause failure to the drainage field/ dispersal system.

Similarly, in a sewage treatment plant, the micro-organisms have no time to form as the contents are pushed through artificially quickly. Many STPs discharge to surface waters therefore untreated effluent will be entering and polluting these waterways.


SITE
ACCESS

Rules and regulations

General Binding Rules

In January 2015, DEFRA, via the Environment Agency, released a regulatory reform in England called the Small Sewage Discharge General Binding Rules.* It focuses on septic tanks that non-compliantly discharge to surface waters, but also introduces and reinforces all aspects of wastewater treatment/discharge regulations and standards (Building Regulations 2010 Part H (2), BS6297:2007, British Water Flows & Loads). Some of the key points are;

- You cannot discharge a septic tank to a watercourse or ditch.
- You can only discharge a septic tank to a secondary treatment system such as a drainage field.
- Only sewage treatment plants can discharge straight to a watercourse or ditch.
- A non-compliant system should be addressed within 12 months of its discovery.
- A non-compliant system should be addressed as a condition of sale during a property transaction.

The 'small' in the Small Sewage Discharge General Binding Rules means you're allowed up to 2,000 litres per day discharging to ground or up to 5,000 litres per day discharging to a surface water (ditch, stream etc.) to be complicit and not require a permit. If these daily discharge volumes are exceeded, then a permit to discharge will be needed from the Environment Agency.

Rules across the UK

In Wales, Scotland and Northern Ireland, it is a legal requirement to approach the respective environmental regulator to either register or obtain a consent for your off mains drainage system. In England, you only need to approach the Environment Agency and request permission (a permit to discharge) if you can't tick the boxes to satisfy, and adhere to, the Small Sewage Discharge General Binding Rules.

Natural Resources Wales (NRW),

https://naturalresources.wales/permits-and-permissions/water-discharges-and-septic-tanks/septic-tanks-and-private-sewage-systems/register-your-septic-tank-or-small-sewage-treatment-plant/?lang=en

Scottish Environmental Protection Agency (SEPA),

https://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/small-sewage-discharges/

Northern Ireland Environment Agency (NIEA)

https://www.daera-ni.gov.uk/articles/regulating-water-discharges

UK

wide coverage for off-mains requirements

25+

years industry experience

50+

Solicitors, Conveyancers and Estate Agents have already recommended us

*This information is accurate as of May 2024 and may be subject to change with legislation changes.

How we can help

Sizing calculations

Every off mains drainage system needs to be sized against the maximum potential occupancy of a property and that is calculated very simply as, 'number of bedrooms + two'. A two-bedroom property would have a maximum potential occupancy of four, a three-bedroom property will be five and a four-bedroom property will be six.

Let's take the example of a four-bedroom property (six people/users) to size the different off mains drainage systems;

A cesspit has to have a capacity of 18,000 litres for the first two users, then 6,800 for each additional user.

18,000 (for two users)
27,200 (for four additional users)
45,200 total capacity (in litres)

A septic tank has to have a capacity of 2,700 for the first four users, then 180 litres for each additional user.

2,700 (for four users)
360 (for two additional users)
3,060 total capacity (in litres)

A sewage treatment plant (STP) is made population equivalent (PE) specific so you would need a 6PE STP.

2000+

systems surveyed to date

Industry leading solutions for all your off mains drainage requirements

With over a quarter of a century of specific industry experience coupled with a can do and customer centric attitude, we are here to help with anything off mains drainage related;

- Full system installation
- Sellers/pre-purchase survey inspection
- Compliance inspection
- Percolation testing (foul and surface water)
- Drainage field installation
- Insurance claims management
- Expert witness

James Warren - Managing Director

Get in touch to discuss your off mains drainage requirements

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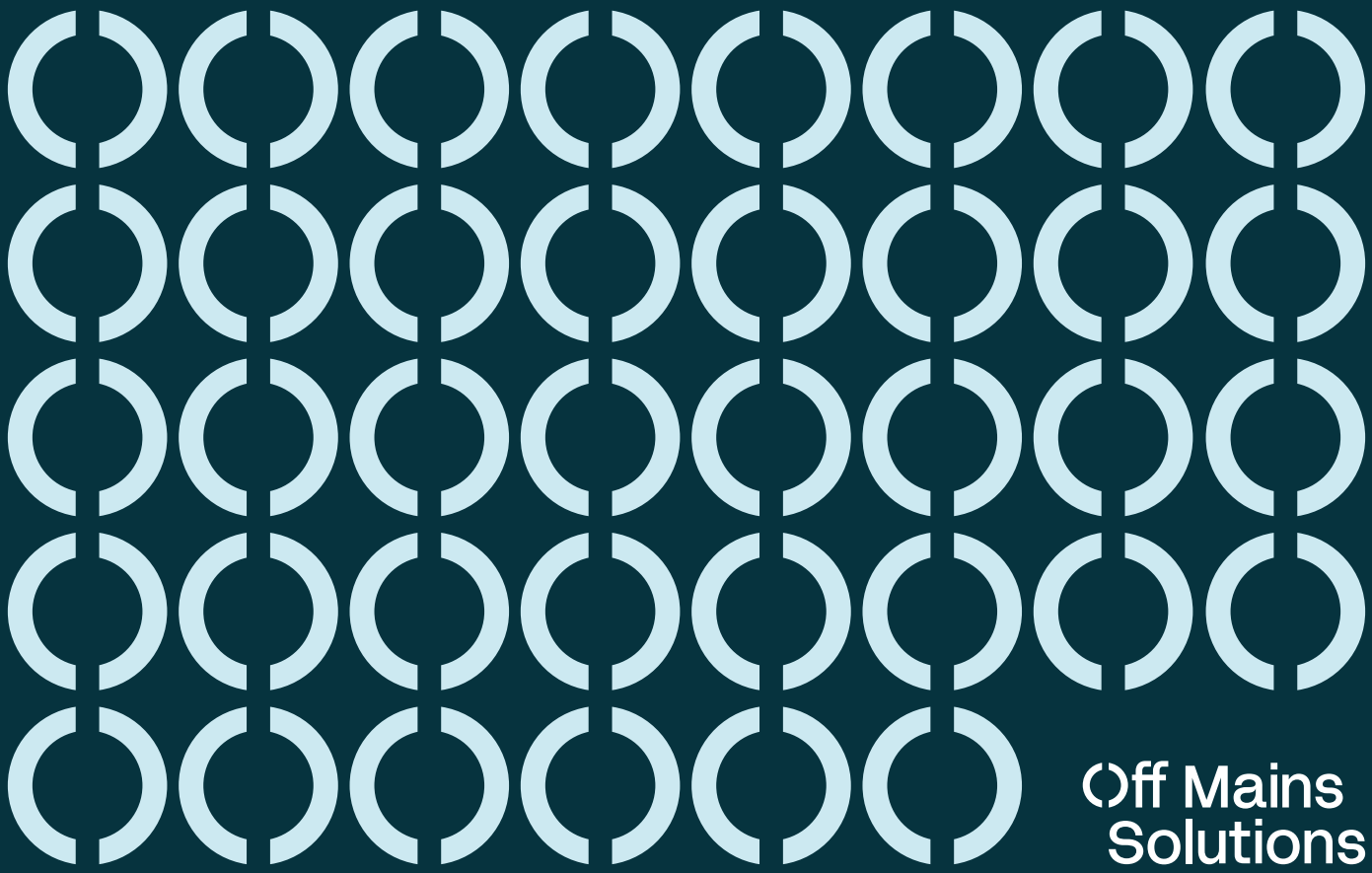

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