

Klargester Guide to Selfbuild



No one likes to talk about sewage. We know that. But if you're not very careful, your sewage and wastewater discharges could become an awful-smelling health and pollution hazard. And that really would be embarrassing. All homeowners who rely on private drainage are legally responsible for the choice, installation and maintenance of their wastewater system.

Septic tanks are the most commonly installed private drainage system - you may have one in your garden - but even if it's one you inherited, it may not be right for your property. And if it's not working, you'll soon know! As, indeed, will all those living downwind of you...

Wrongly installed septic tanks create a nasty smelling effluent which can be both a serious health issue as well as highly polluting to groundwater, which is the water we drink. If your septic tank is the cause, you could be prosecuted.

Sewage treatment plants are highly effective at treating waste and have very low impact. They use bacteria to remove up to 97.8% of the pollutants, before discharging the effluent into a (much smaller) drainage field.

They are therefore suited to even the most sensitive sites such as close to freshwater lakes, rivers and streams - or where the water table is very high. Maintenance and running costs are relatively low for sewage treatment plants.

Neither septic tanks nor sewage treatment plants should be considered a "fit-and-forget" solution - they need regular servicing. Regulations require that they are maintained and emptied regularly, so employ a professional service team to look after your wastewater system.

"At least 75 per cent of discharges from private drainage systems are probably illegal."
- Consulting Engineer.

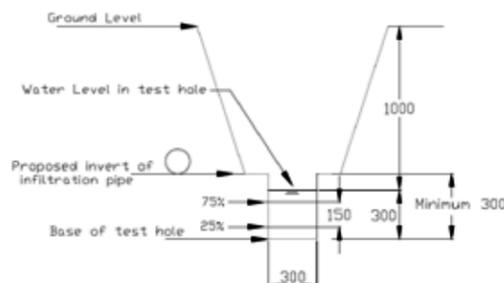
Selfbuild Guidance: a step by step checklist

At which stage are you?

- 1 Have you found your ideal site?
- 2 Spoken with the planning department re permission?
- 3 Which drainage system should I choose - Septic tank or treatment plant?
- 4 How to do a soil porosity check? -please see reverse
- 5 Request a free site survey from KINGSPAN KLARGESTER
- 6 WE will check discharge options
- 7 Check paperwork for NIEA to ensure all ok
- 8 Offer best solution "Septic or Treatment"
- 9 Offer support on purchase and install

Percolation Test

1. Excavate at least two holes, 300mm square to a depth of at least 300mm below the proposed invert level (bottom of the infiltration pipe) and space them evenly along the proposed line of the subsurface irrigation system.
2. Fill each hole with water to a depth of at least 300mm and allow this to seep away overnight.
3. If the water drains rapidly, within 10 minutes, the hole should be refilled up to a maximum of 10 times. If the water continues to drain away rapidly, the ground is unsuitable.
4. If the water has not soaked away within 6 hours, the area is not suitable.
5. Next day, refill each hole with water to a depth of at least 300mm and observe the time in seconds for the water to seep away from 75% full to 25% full (i.e. depth of 150mm).
6. Divide this time in seconds by 150. This gives the average time in seconds (Vp) required for the water to drop 1mm.
7. Repeat the test at least three times in each hole.
8. Take the average figure from the tests to produce the percolation value Vp (in seconds).
9. Obtain the average figure for the percolation value (Vp) by summing all the values and dividing by the number of values used.
10. Record these results in the table opposite. These may be required by the regulator and the property owner.
11. Where the Vp results vary widely (50% above or below the average figure), make further tests on a minimum of three different locations in the area of the proposed drainage field.
12. Drainage field disposal can only be used when percolation tests indicate average values of Vp between 15 and 100 and the preliminary assessment of the trial hole tests has been favourable.
13. The minimum value of 15 ensures that untreated effluent cannot percolate too rapidly into groundwater.
14. Where Vp is above the limit of 100, effective treatment is unlikely to take place in the drainage field as there will be inefficient soakage leading to wastewater ponding on the surface.



Results of the Percolation Test

Total number of people that could live in the property (p)

Test 1

Length of Time in seconds for the water to seep away from 75% full to 25% full

seconds (Vp 1) divide by 150
=

Test 2

Length of Time in seconds for the water to seep away from 75% full to 25% full

seconds (Vp 1) divide by 150
=

Test 3

Length of Time in seconds for the water to seep away from 75% full to 25% full

seconds (Vp 1) divide by 150
=

Take the average figure from the tests to produce the percolation value Vp (in seconds).

Obtain the average figure for the percolation value (Vp) by summing all the values and dividing by the number of values used.

Average Figure



Floor area to linear trench length			
Drainage field floor area (A) m ²	Linear trench length (in meters)		
	0.3m width trench	0.6m width trench	0.9m width trench
20	66	33	22
30	100	50	33
40	133	67	44
50	167	83	56
60	200	100	66
70	233	117	78
80	266	134	88
90	300	150	100

The Vp is used to determine the total floor area of the drainage trenches and therefore the total length of irrigation drain.
For domestic premises, the floor area of the drainage field required may be calculated as follows:

A = p x Vp x 0.25 for septic tanks
A = p x Vp x 0.20 for package sewage treatment plants (i.e. 20% less, because the effluent has received additional treatment)

A = required drainage field floor area in square metres (m²).
P = number of people served by the tank (for domestic applications this should be the maximum number of people that could live in the dwelling).
Vp = percolation value.

Insert your calculation result here:

The calculated area A should be converted to an amount of linear trench based on the width of the trench which is usually between 0.3m to 0.9m. The layout of the trench network will depend upon the soil porosity and the availability of land but the legs of the trenches should be connected so as to form complete loops.



Frequently Asked Questions

Q. How do you size a septic tank or sewage treatment plant correctly?

A. The British Water's established Flows and Loads code of practice (<http://www.britishwater.co.uk/media/download.aspx?MediaId=72>) is invaluable reading for system designers, providing help in calculating daily sewage loading, plus advice on the nature of the sewage to be treated, and anything which may affect treatability and system performance. This includes the quantity of surface water which could run off from nearby hard-standing areas - in other words the rain which has fallen onto both the roof and paving around your house.

Bear in mind that, if you extend your property, you may well need to resize and replace your system.

Q. Is my ground suitable for off-mains drainage?

A. One of the most important factors in determining the choice of sewage treatment product is the site's drainage properties. Both septic tanks and sewage treatment plants typically require a drainage field into which they discharge effluent.

Testing the ground for its permeability is usually done by professional installer using a percolation test; the correct procedure is described in BS 6297:2007. Note: your property will need to be located on highly permeable ground if you want to install a septic tank otherwise the drainage field will fail. Should your plot sit on a clay substrate, then a sewage treatment plant is the only viable option.

The propensity of the site to flood and the height of the water table are also important considerations. Both H2 building regulations and BS 6297 state that the water table must be at least one metre below a septic tank outlet. In this instance, and if your property is in a flood risk area, you will need to install a sewage treatment plant.

For more information, contact:

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Q. Is my garden big enough?

A. The size of the drainage field will vary depending on the number of bedrooms in the property and the permeability of the soil. Any house up to and including three bedrooms, must have a sewage system designed for coping with a minimum of five person occupancy.

There are also restrictions on its location. Drainage fields must be a minimum of 10 metres from a watercourse, 50 metres from a water abstraction point and 15 metres from a building.

Again, we recommend getting expert advice from a professional installer first.

Q. Why can't I just install a septic tank?

A. Your property must be located on highly permeable ground (not clay) for a septic tank. At best, septic tanks remove about 30% of the pollutants - which is why a septic installed in the wrong place is likely to smell obnoxious and why unfiltered solids may find their way to the surface. This will, in a short space of time, create a serious health risk and pollute groundwater (the water we drink).

Both H2 building regulations and BS6297 state that the water table must be one metre below the septic tank outlet. In areas where the water table is higher than this, septic tanks should not be installed in these locations or in areas prone to flooding.

