Installation continued

Tanks and inlet pipework should be installed according to the manufacturer’s instructions and the requirements of the Building Regulations. As a guide:

- Support the excavation where necessary
- Check tank invert and pipework orientation before backfilling.
- Backfill carefully following manufacturer’s recommendations.
- Ensure that the inlet and outlet pipework to the tank are properly supported.
- Distribution pipes should be smooth with perforations of at least 8mm diameter or slots at least 5mm x 15mm.
- Corrugated agricultural land drainage pipe is not suitable for effluent distribution. Granular material should be 30-50mm grade to maximize aeration and minimize the risk of blockage.

- Shingle, dinker or crushed stone may be used.
- Place a geotextile membrane between the shingle and the topsoil backfill.
- Do not drive construction machinery over the drainage field after completion.

Drainage fields must be carefully constructed to avoid impairing the absorptive properties of the subsoil.

Septic tank installations subject to soil and vehicular loading must be installed to withstand the loads imposed.

LEGAL CONSIDERATIONS

A septic tank system requires planning permission. In Scotland and Northern Ireland the Planning Authority must be consulted in all cases. In England and Wales it will not be necessary to submit a planning application if the installation meets the following criteria:

- To serve a single dwelling, and
- Is within 800m of a house and a highway (or if so, it is more than 20m from the highway).

In all other cases a planning application must be made. If you are in any doubt, consult your Local Authority. In addition, prior to construction, you must seek Building Control approval from your Local Authority or an Approved Inspector.

When the authority is satisfied that the system does not cause a nuisance or pollution the environment. Control over discharges from septic tanks to ground and surface waters is the responsibility of the Environmental Regulator. Legal consent to discharge may be required depending on location, local conditions and the volume to be released. (For advice in England and Wales 0845 333111; Scotland 01286 457500; Northern Ireland 01232 254754).

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It is part of a series which also includes:

- Septic tank systems: a user guide
- Onsite sewage disposal systems
- Domestic greywater systems
- Infectious waste systems

Sniffer Engineering

The National Trust

Klargester


design & installation

SEPTIC TANK SYSTEMS

HEALTH AND SAFETY

Septic tank systems should be installed in accordance with manufacturer’s instructions and relevant health and safety requirements.

Inspection or access covers above septic tanks should be securely fastened to prevent unauthorised removal.

Final effluent should not be discharged directly to ditches and streams except under certain conditions in Northern Ireland and Scotland or allowed to collect on the surface. Sludges removed from septic tanks should be safely disposed of by a desludging contractor on a regular basis.

RESPONSIBILITIES OF DESIGNERS & INSTALLERS

The designer and installer must take great care to eliminate problems which may cause trouble for the owner, or property occupant, at a later date. These include:

- River and/or groundwater pollution, which may threaten local water supplies
- Environmental health problems, ranging from minor issues to statutory nuisance.

In either case, the owner could be prosecuted by their Environmental Regulator or their local authority Environmental Health Department. Both have the power to serve notice to secure improvements to unsatisfactory systems. It is therefore, possible that a civil action may be pursued by the owner concerned against the designer and installer.
Do you design and install septic tank systems or are you planning to? YES - then this guide is aimed at you. It summarises essential information, provides best practice guidance and directs you to relevant sources of expertise.

A septic tank system is an effective, economic way of treating domestic effluent on-site. It consists of two main components: a wastewater underground tank, into which raw sewage is fed, and normally a drainage field, to which wastewater is released. Direct discharge from the tank to a ditch or watercourse should not occur (however, in Northern Ireland and Scotland, the use of a perforated pipe which drains to a waterway is allowed under certain conditions). The tank provides suitable conditions for the settlement, storage and partial decomposition of solids, which need to be removed from time to time. The tank effluent can, however, still cause harm and needs further treatment in the drainage field.

The drainage field is critical for protecting the environment from pollution. It typically consists of a system of sub-surface perforated pipes, laid in shallow trenches, partially filled with shingle, which allow the liquid to drain into the surrounding soil. To function properly, it relies on adequate soil drainage and good contact between the load, air and organisms in the sub-soil, which break down and purify the effluent. Simple point soakways should not be used.

Septic tank systems depend on proper siting, design, installation, operation and maintenance to work satisfactorily. And you should be aware that not all sites are suitable for septic tank drainage. It is, therefore, necessary to carry out a site assessment before deciding which sewage disposal method is appropriate for your site. If site conditions are unsuitable you must adopt an alternative disposal method, such as a biological treatment plant, reedbed or constructed wetland (reed bed).

Remember, septic tanks are living systems. If they are incorrectly designed, installed and maintained, they will lead to future problems such as small, surface ponding, blocked drains and pollution for which designers and installers may be liable.

**REQUIRED SITE CHARACTERISTICS**

Site location, topography and subsoil, and groundwater characteristics are important factors in determining the suitability of a site for a septic tank system. Use the following checklist as a guide:

**Location and topography:**
- Avoid steep slopes.
- Choose a site remote from ditch/stream and sensitive habitats.
- Avoid cultivated land and areas such as uplands, which will suffer from compaction.
- Choose land with enough space.
- Seek to avoid land where the water table rises to within 1m of the drainage field base at any time of the year.

**Percolation value:**
- Check percolation values on site using the method given in BS6927, to decide suitable conditions for further effluent treatment and disposal.

**Soils and plants as indicators:**
- Orange or grey soil moisture and a number of moistureloving species (e.g. rushes or sedges) could mean the site is prone to waterlogging and not suitable.

**Water sources:**
- Avoid ground water sources, wells, etc.

**Alternative drainage field:**
- It may be possible to pump effluent to a remote alternative drainage field with suitable percolation characteristics.

**Density of installations:**
- Locations containing multiple installations may be unable to sustain additional systems.

**Discharge consent:**
- Check with your local Environmental Regulation.

If the site under consideration does not meet one or more of the above criteria you must adopt another method - seek professional advice.

A guide to site assessment may be found in British Standard BS5627. However, percolation tests on their own do not provide an adequate assessment of the suitability of a site.

**TANK DESIGN**

The tank should:
- separate, retain and digest solids - to protect the drainage field.
- prevent short-circuiting and solids carry over to the drainage field.
- provide access for maintenance of the inlet and outlet pipework and sludge tanking.

**Stylistic septic tank - designs vary.**

**DRAINAGE FIELD DESIGN**

A septic tank should be constructed to suit the site and to maximise soil contact. A loop is usually appropriate but other designs may be considered. The network should be laid taking into account site geometry and location. Simple point soakways should be avoided.

**INSTALLATION**

The septic tank should be located to:
- allow access for desludgying and maintenance.

If the drainage field is to:
- at least 10m from any ditch or stream.
- at least 50m from a well, borehole or spring.
- as far from the property and site boundaries as possible.
- as far as possible from surface water soakaways.