

Waterless toilets are suitable for all kinds of remote and environmentally sensitive locations – this toilet is on the Handa Island nature reserve in Scotland

SITE FACILITIES

Call of Nature

For sites with no mains water or sewer connection, ‘dry’ toilets offer a pleasant, reliable alternative to conventional toilets, writes Andrew Warren

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FOR ANY OUTDOOR venue premises, one of the first considerations is sanitation. Without toilets, that lakeshore, woodland glade or scenic meadow - potential locations for magical nights under the stars, romantic wedding ceremonies or outdoor pursuits - have much less potential. Provide toilets and immediately visitors can stay longer: events can be run, refreshments provided, overnight stays become possible. Even if you have conventional toilets in one or two locations, adding remote toilets means you and your visitors will be able to make the most of the whole site and reduce pressure on the ‘hot spots.’

Yet bringing mains services to a remote location can be expensive, difficult or even impossible. With water but no sewer, septic systems and leachfields can be deployed but these can be large and very expensive - and they are not always permitted. Gardens and historic buildings are also sensitive sites that should not be subject to extensive digging and trenchlaying. The bottom line is, however, that customers - especially young families and relatively elderly or infirm visitors - are much happier

“DRY TOILETS HAVE BEEN SUCCESSFULLY INSTALLED IN ALL KINDS OF LOCATIONS FROM GLAMPING SITES TO REMOTE SCOTTISH ISLAND NATURE RESERVES”

visiting attractions with easy toilet access.

Fortunately, it is possible to install toilets even when a water supply or a sewer connection are impossible to provide. We are familiar with toilets that use water, however the flush is mainly a vehicle to carry away the waste for biological treatment at a sewage works. Yet, instead, this treatment can take place right on site, also using biological processes, removing the need for any mains connections.

Even where flush toilets are possible (connected to a sewer, cesspit or septic system) it can be cheaper and easier to install toilets that require no water - either coming in or going out. These toilets can also be more reliable and more pleasant for customers to use than the conventional kind. And, as they don’t add five to 10 litres of water from the flush for each user visit, there is far less waste to deal with.

‘Wet’ toilets in outdoors settings may have to contend with frost which can render them unusable or, worse, lead to burst pipes and flooding when it thaws. Flush toilets sometimes block; it is depressing how often the floor in outdoor toilet



facilities seems to end up wet and with an unhappy smell of urine.

‘Dry’ sometimes known as composting, toilets don’t block and tend to smell less than wet toilets. They are more likely to stay pleasant and functional between staff checks. Most dry toilets also incorporate a ventilation system (often passive and therefore silent, and requiring no power supply).

How dry toilets work

The decomposition process that breaks down the waste is kick-started by bacteria that are naturally present. Instead of a flush, users or staff add aerating



ABOVE Compact, waterless toilets need emptying more often but easily fit into a small cabin or, as here, a shepherd's hut used for glamping holidays at Penn Farm, Devon



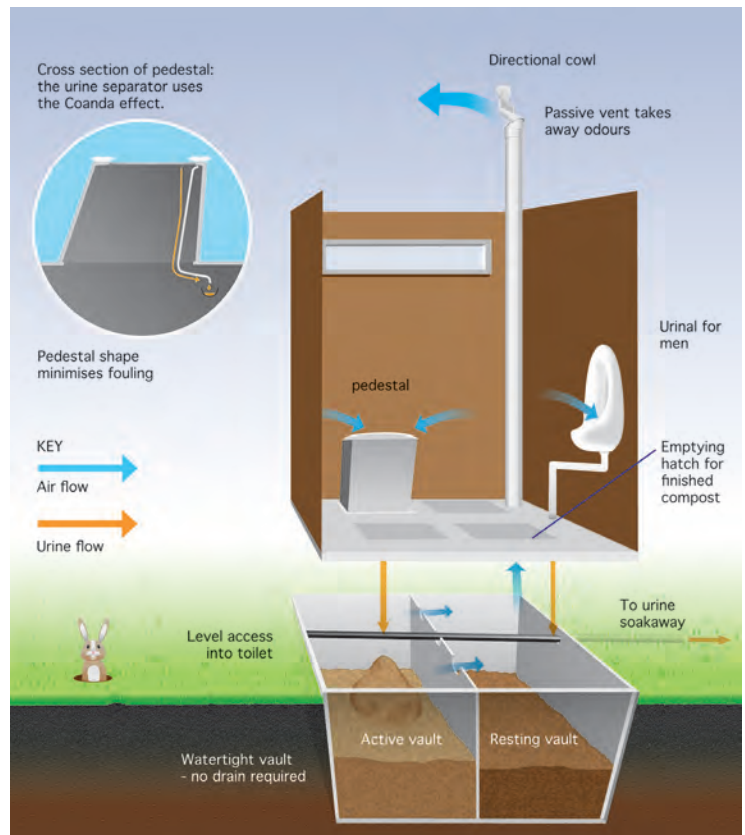
LEFT NatSol full access, twin vault toilets serve shepherd's huts at Hollow Ash, Broad Oak, Herefordshire. The customer designed and built the structure to suit the venue

BELOW LEFT Churches and churchyards are very sensitive sites. This architect-designed accessible compost toilet has been installed in Gloucestershire with minimal disruption



'soak' such as wood shavings; the air in the mixture helps the process along, and means it smells a lot less than at the sewage works. The waste breaks down over a period of months and years to form an inoffensive loamy compost that can safely be returned to the soil. This natural process makes it possible to build a dry toilet almost anywhere and it is not as difficult to manage as you might think. All these toilets require some maintenance and time to remove the waste but, depending on the system, this may only take a few hours a year.

A variety of different dry toilet options are available, from a range of suppliers. They have been successfully installed in all kinds of locations from glampsites, golf courses, parks and gardens to remote Scottish island nature reserves. Some dry toilets can be put in new buildings, some can be retrofitted into existing ones. Some suppliers will install the entire



facility, including a building, some give options for you to design and construct your own shelter, some supply a kit.

What all have in common is that, rather than large volumes of flushed waste, much smaller quantities of more solid waste are produced which can be managed on site. This is usually straightforward for site staff and not necessarily unpleasant or difficult. One or two suppliers also offer service contracts for ongoing or seasonal maintenance.

Although it is more or less sterile, urine (especially lingering urine) is what usually leads to the worst toilet smells because its high nitrogen content produces ammonia. Many dry toilets, therefore, separate the urine and drain it directly to the ground where it soaks away harmlessly into the soil, removing the problem at source. The remaining compost is lighter and easier to manage as a result. To improve separation, many systems recommend adding a waterless urinal; some provide one in the toilet cubicle as standard.

The choice: big or small

The most important difference between the options available is probably the size. Put simply, a large installation stores the waste for longer, meaning it will be broken down further before it needs to be removed. The longer it composts in-

situ, the less material remains to be removed, as the bacteria gradually break the waste down into carbon dioxide and water. The longer it composts, the more inoffensive it becomes.

Where there is room for a large chamber or 'vault', composting can continue for one to two years, or even longer, before any emptying is required. For toilets that only need emptying yearly, pretty big chambers (or sometimes twin chambers) are required - usually at least 1 x 1 x 2m in volume. Large systems are suitable for free-standing toilets or toilet blocks. They can also be included in the design of a full-sized building, though excavation - or a storey below the bathroom - is needed to accommodate them.

For smaller huts or cabins, or existing buildings or shelters, it may be easier to opt for a compact unit. These store less waste so require more frequent emptying; the waste is removed for composting elsewhere. However, the weight and volume is still a lot less than with a chemical toilet and waste management can be completed on site. Some neat systems have been developed that make this process straightforward and help keep the waste contained, and good design can make these systems as simple and pleasant for customers to use as the larger units.

Between the two extremes there are units that need fairly regular emptying but allow the waste to be removed and stored for composting to continue in the same container (eg, a wheelie bin) so waste is not handled for several months or longer. Depending on the length of time the compost has been in-situ, most systems recommend further composting of the waste but, usually, this can be achieved in regular slatted compost bins. The quantities diminish even further during this process and the small volumes remaining can safely be spread in non-food garden or landscape areas.

If a power supply is available, waste treatment in a dry toilet may be taken a step further. Composting can be accelerated by tumbling or aeration, or the waste dehydrated, or even incinerated leaving only a very small quantity of ash for disposal. These approaches are more complex so potentially more prone to malfunction but may be appropriate if outdoor space is restricted and the waste needs to be taken off site. Incinerating toilets are also available to work off grid, powered by propane.

Toilets can work very well without water but users still need to clean their hands. Dry toilets, therefore, usually make provision for antiseptic gel. This has the advantage of working even in sub-zero temperatures and it makes less mess than a washbasin.

They're not complicated

Compost toilets are generally very acceptable to users who are, after all, likely to be grateful the facility is there! Most compost toilets look superficially like 'normal' toilets but with a hole or holes instead of a pan with water. A simple explanation is generally all that is needed (for example requesting that men and boys sit, or use the urinal, to ensure urine separation) but, as with all toilets, it is important to provide and maintain appropriate bins for disposing of sanitary towels, nappies, etc.

As well as for sites in regular use, dry toilets can also make sense in outdoor venues that are used only a few times a year. Here, if there are no mains services, the alternative is likely to be a hired toilet trailer or chemical toilets. For one-off or sporadic use at low numbers these may be the economical option but it is worth performing a cost/benefit analysis over say 10 or 15 years, looking at the recurring costs of hire versus the investment in permanent facilities. If the capital investment in a dry toilet is made, there are a couple of additional advantages to consider:

- dry toilets are generally reliable, pleasant and odourless and can be decorated to suit the venue and occasion (for example with fresh flowers or pictures and posters)
- the (toilet-related) marginal cost of running extra events at the same venue is reduced to virtually nothing. This may mean it is possible to generate extra income or extra value from the site.

Add to the flexibility and convenience of these toilets the fact that they are resource efficient and environmentally friendly and 'going naturally' has a lot going for it!

LEFT Most venues need fully accessible toilet provision. This compost toilet, at Leabrook Allotments, Derbyshire, comes with wheelchair space and handrails as standard



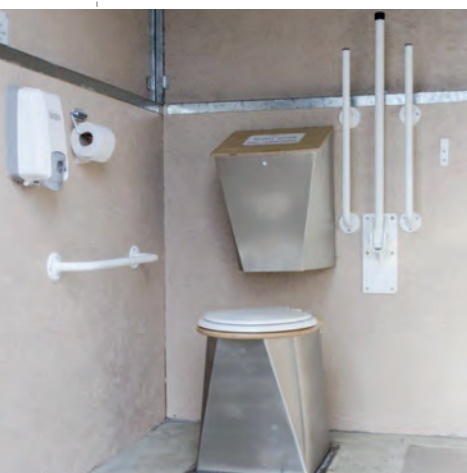
LEFT Compost toilets can adapt to all kinds of locations. Here an accessible toilet in a vandalism resistant shed has been installed at an urban allotment site in Cardiff

RIGHT A farm shop in Bernard Castle constructed this magnificent structure of timber, stone and thatch



OUTDOOR TOILET CHECKLIST

SUPPLIER SHOULD ASK YOU:	YOU SHOULD ASK SUPPLIER:
<p>USAGE</p> <ul style="list-style-type: none"> ➤ Total uses over the year, expected pattern and highest in any one day / week / month ➤ Daytime or overnight? Food and drink on site? ➤ Users and their access needs (eg, wheelchair access, young children, etc) 	<p>COSTS</p> <ul style="list-style-type: none"> ➤ Groundworks, toilet, building, (capital + person hours) ➤ Consumables (eg, soak, liners) ➤ Design life of installation
<p>SITE</p> <ul style="list-style-type: none"> ➤ Services available (water, sewer, power) ➤ Access for vehicles / tankers / construction equipment ➤ Space and height / depth available for toilets and waste management ➤ Vandalism risk low / high ➤ Type of ground ➤ Environmental considerations (eg, watercourses, ecologically sensitive sites, risk of waterlogging or flooding) 	<p>SITE REQUIREMENTS</p> <ul style="list-style-type: none"> ➤ Dimensions, footprint, depth of excavation if needed ➤ Drainage – height of drain outlet, what area and conditions needed downhill of drain ➤ Further composting – space, equipment, location ➤ Vehicle access requirements (for delivery, construction and management) <p>MAINTENANCE (BEYOND NORMAL CLEANING)</p> <ul style="list-style-type: none"> ➤ Frequency of visits / person hours / equipment required ➤ Quantity, management and disposal of composted waste ➤ Some suppliers may be able to point you to existing installations that you can visit



ABOUT THE AUTHOR

Andrew Warren is the managing director of NatSol, a company that designs, manufactures and supplies wheelchair accessible waterless toilets for a wide variety of remote sites. These toilets require no mains connections and are odour free under normal use. With designs for very low and very high use situations, NatSol toilets are ideal for glampsites, wedding venues, allotments, nature reserves, churches, golf courses, gardens and all sites without mains services. www.natsol.co.uk