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Water saving, SUDS urban drainage and greywater 74

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Humans contain over two thirds water and it is recommended that we drink 8 glasses of it a day, although a lot of this water is found in food.

Water is also used in many places around buildings in day to day living. In the UK we use over 150 litres a year per person, a rise of **50%** compared to 1970.

Around **70%** of water is used for **food and textile** production. Water is not a limitless commodity and requires a lot of **energy** to purify.

In the **UK** there are only 1334 cubic meters per person, compared to 3065 cubic meters in France and 2785 cubic meters in Italy. Due to **climate change**, summers in the UK are predicted to be far hotter than in the past.

Combined with dryer winters this has the potential to reduce the amount of water available, with water droughts already happening in some areas. It is therefore essential that any **green build** take as many steps possible to **reduce** the amount of water a building requires for normal usage.

Sustainable Urban Drainage Systems

SUDS, or sustainable urban drainage systems, is an alternative to the traditional method of collecting rain water in pipes down sewers and discharging it into treatment works or watercourses.

SUDS best practice **reduces the flow of rainwater** from a site or is piped away, which protects local watercourses from the contamination carried in surface run-off. It encourages natural groundwater recharge, and reduces the likelihood of flooding.

Various approaches to reducing rainwater run-off are used:

- **rainwater harvesting**

This could be anything from small tubs for gardening to a full buried rain and greywater system

- **rainwater soakaway**

These are rubble filled volumes near houses where rain can soak away in a measured way rather than causing a local flash flood. Various types can be used.

- **rainwater attenuation (reduction)**

These would include such things as green roof, storm drains, and temporary storage systems for storm water.

Building Regulations UK

Building Regulations Approved Document H3, Rainwater Drainage, April 2002, prioritises drainage requirements.

It requires that rainwater from the roof of a building or from a paved area may either be gathered for reuse or be discharged into one of the following:

- a soakaway or some other infiltration system, or if not practical
- a watercourse, or if not practical
- a sewer

The traditional method of rainwater disposal of discharging into a sewer is only be considered **after** other forms of reuse or drainage have been considered.

Building Regulations also provide guidance on the construction of rainwater harvesting systems.

See www.ciria.org/suds

Greywater - used water

Greywater is non-industrial waste water generated by day to day activities such as dish washing and bathing. This type of water can make up to 80% of all the water drained from a residential building (**blackwater** contains a higher chemical and biological pollutant content).

In the interests of public health and environmental protection, grey- and blackwater should **not be mixed** together. Greywater has many potential uses in green building allowing it to be put to a much more environmentally friendly use rather than being flushed away into the sewage system where it will end up in rivers and seas.

Greywater catchment systems can be fitted to a building allowing this waste water to be stored, processed and filtered on site. While filtered greywater is safe for a majority of uses it is not safe enough to use as drinking water.

Uses

Greywater can be used, after filtration, to replace the water used to **flush** toilets. This would save approximately 4 - 8 litres of drinking quality water every flush and dramatically reduce the amount of water used over a year.

Greywater can also be used for **irrigation** purposes, with hose pipe bans becoming more common using water that would otherwise gone down the drain will allow many green fingered home owners to continue watering there lawns guilt free.

Costs

Costs vary from site to site but an all purpose greywater storage and filtration system can cost around £3000 (UK pounds) and consist of filtration units and a separate drainage system (normally taking everything except toilet waste) once installed they require no special regime or differences in daily water use.

A greywater system installed in a typical home can be expected to replace around 30% of the fresh water used depending on the type of installation.

Whilst greywater is **not suitable for drinking**, when properly filtered it poses no threat to human health. Untreated greywater is still suitable for many garden applications with plant life able to benefit from small particles of food contained within the greywater. Many buildings use greywater for **plant beds** as a way of filtering it prior to any release. This applies particularly in zero discharge buildings, for instance in nature reserves.

Unfiltered greywater is not suitable for use in toilets as it can dye the toilet if left standing for a few days. Greywater filtration systems also require electricity, as they tend to use of Ultra-Violet (UV) light to purify the water. Savings gained on water bills may be lost to higher electric costs, however the water saving alone is still a major benefit to green builders.

When being used purely for garden irrigation a **reed bed filtration system** can be used to purify greywater instead of chemical and UV treatments, these consist of a tank with layers of sand and stone as well as the root networks of the reeds. The water passes through the various layers filtering out pollutants. Once filtered the water is safe to use around the garden the same as normal drinking water.

See other [Building DIY com](#) articles on water saving and green topics.



Water butt stores rainwater for use in garden



Green roof holds a large amount of water - attenuates flow off site

Low water use toilet



Smaller toilet uses less water; has dual action flush; note recycled plastic worksurface material (old mobile phones!)

Buildings and DIY information & advice site

- [Building and DIY advice, tips and techniques](#)
Advice and Information on all building techniques - solve problems save money and save energy. Huge site with all aspects of building in detail. A green buildh means save energy and save money, help fight climate change and reduce global warming too.
- [CIRIA organisation, Sustainable Urban Drainage advice](#)
CIRIA is an information source, and run training etc. on SUDS and other building subjects