

Rainwater Harvesting – A Simple Step to Greater Sustainability

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Involvement in what is probably the UK's largest prompted Mike McKee, managing director of gutter (http://www.guttermaster.co.uk/gutter_sys.htm) and roof trim specialist, Guttermaster (<http://www.guttermaster.co.uk>), to consider how this technology can be used in other building applications. Rainwater harvesting is a simple and relatively low cost technique that can deliver immediate benefits, have a short pay back and produce an enduring legacy.

Waste Not

Climate change and sustainability are issues that are becoming more prominent. The 2006 drought brought problems of water scarcity into sharp focus, but in 2007 the problem was severe flood, followed in 2008 by a further year of exceptional rainfall. What is increasingly clear is that extreme weather events are going to become more common. If we take this into account in the design of rainwater systems we can minimise both draught and flood impact.

It is prudent to take into account extreme weather events in sizing gutters and rainwater downpipes. In the past it was considered permissible to allow gutters to overflow in extreme cases – such as in a one in fifty year storm. If such extremes become more common buildings will be more exposed to dampness and damage. Oversizing of gutters to deal with this contingency is an investment that is well worth considering.

Over the years, we have supplied gutters and rainwater down pipes for a diverse range of projects. In the hospitality sector these range from modern hotels like Express Holiday Inns to more traditional venues like the five-star Hilton Puckrup Hall near Tewksbury. Sports clubs like Esporta and Fitness First have Guttermaster fittings as does the press centre at Wimbledon and Scotland's National Stadium at Hampden Park in Glasgow. Supermarkets, schools commercial and industrial buildings all use our long life aluminium gutters.

The concept of rainwater harvesting couldn't be simpler. Instead of letting rainwater from the roof and paved areas around the building run to waste, it is collected, filtered and reused as a substitute for treated mains water in non-critical applications. Clearly, water captured in this way cannot be used for drinking, bathing, showering or where there is any possibility of accidental ingestion. However, captured rainwater is perfectly suited for general cleaning, toilets, laundry and watering plants. For plants the absence of chemical additives and retention of natural properties is a positive benefit.

How Much Can I Save?

This depends on two factors, your local level of rainfall and the charges levied by your water company. The UK Rainwater Harvesting Association (www.ukrha.org) estimates that commercial projects are likely to have a two to five year payback. After that it is all money in the bank.

There are two ways to save. First, you can save by direct substitution of harvested water for metered mains water. Second, it is often possible to negotiate a reduction in sewerage charges. True, the free

rainwater that you use in your laundry eventually goes into the sewer, but by collecting storm water you perform a vital service for your water company by reducing the peak load sewerage capacity required to deal with storm surges.

There are other broader economic and environmental benefits. By reducing water demand there would be less need for utility companies to build new reservoirs or expand abstraction. Reducing storm surges in sewers means fewer overload discharges to rivers that could contribute to flooding, health hazards and damaged eco-systems.

Key Variations

The level of rainfall in the UK varies greatly. The Met Office tells us that East Anglia has as little as 500mm (20 inches) per year, but this is ten times greater, 5000mm, for the Western Highlands of Scotland. There are differences in rainfall pattern also. Most highland rainfall is steady and persistent showers that last for hours. In the dryer areas, such as East Anglia and South East England there is a greater incidence of the short torrential storms that can overwhelm drainage in the short term.

Building size is another factor. The roof will be the main gathering area, possibly augmented by terraces and other paved areas nearby. Ignore car parks as these may have unwanted pollutants. In some cases, particularly with multi-storey buildings, the water yield may be too small in relation to demand to justify full scale harvesting. Even in these cases, installing butts on rainwater down pipes can provide water for plants, reduce demand for mains water and buffer the effects of storm surges.

Sports clubs offer one of the best opportunities for viable harvesting schemes. These are usually large, purpose built, single or two storey buildings where provision can easily be made during construction for tanks and basic filtration. The Environment Agency says tanks should be sized to provide about five percent of the annual demand. Tanks located at basement or ground level are often preferable to avoid load on the structure. The mains supply will provide a back-up in the event of prolonged periods of drought.

Non-commercial Considerations

For many property owners and the justification for rainwater harvesting may not be strictly commercial. Schemes like this provide great PR by demonstrating environmental concern and forward thinking. Most significantly, for many occupiers, having harvesting may contribute to maintaining a high quality of service for customers at times of water scarcity.

Many countries on the continent already include rainwater saving in new-build projects and it may only be a matter of time before EU directives or changes to UK Building Regulations make harvesting mandatory. Building this in at the outset during new projects is far less costly than retrofitting.

More Information

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High/low resolution images are on the web at www.ainsmag.co.uk/gu234/4631gu1a.htm