



rainwater harvesting

BS 8515:2009 made easy

save water,
save money,
save the
environment

Presented by 
Stormsaver

The need to **save water, save money and save the environment** has seen the rainwater harvesting industry develop rapidly in recent years, with a number of companies developing systems of varying quality. To ensure consistency BSI published BS 8515:2009 Rainwater harvesting systems – Code of practice (BS 8515:2009).

This succinct guide, produced with Michael Farnsworth, Managing Director of Stormsaver – the UK's leading designer and manufacturer of rainwater harvesting systems, provides architects, their clients, construction companies and mechanical and electrical contractors with an overview of BS 8515:2009 to help them comply with the new standard, in the same way the Stormsaver system does.



Michael Farnsworth Managing Director

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What is rainwater harvesting?

Rainwater harvesting is the capture and re-use of rainfall. It is an alternative to public mains water in non-potable applications, such as WCs, irrigation systems, laundries, vehicle washing, sprinkler systems and other uses where the water isn't used for drinking or ingested.

Why install rainwater harvesting?

There are many reasons: rising utility bills, meeting sustainability targets and reducing running costs are just three incentives for investing in rainwater harvesting.

What types of system are there?

Rainwater harvesting systems fall into three main categories:

- **Non-pressurised:** where rainwater is gravity fed, via a header tank, to its point of use.
- **Pressurised:** where the water is pumped directly from the storage tank to the point of use.
- **Combination:** which combines elements of both direct pressure and gravity fed systems by using an internal control unit to supply boosted water on demand to points of use. The unit integrates a WRAS compliant means of safely topping up with mains water. Stormsaver's COMBI system operates in this way.

What does the British Standard cover?

BS 8515:2009 covers the design, installation, water quality, maintenance, and risk management of rainwater harvesting systems.

The use of water butts and the design of system components are not covered but it does apply equally to new build and retrofit projects.

What design aspects need to be considered in order to comply?

Designing a rainwater harvesting system is complicated and technical, requiring specialist training. Experts, such as those at Stormsaver, take into account an array of factors when designing the most efficient systems.

The amount and intensity of rainfall; the size and type of roof or collection surface; and the number and type of intended applications, both present and future, will all be considered as part of adhering to BS 8515:2009.



The size of the storage tank, which can be located underground or above ground, will also be calculated based on the formula in BS 8515:2009. The system designer should also take into consideration the client's requirements and site restrictions, such as shallow drainage, giving a more 'detailed approach'.

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What is a detailed approach to system design?

A detailed approach is absolutely necessary in the design of large or complex rainwater harvesting systems as it looks at all variables. The design should take into account flow rates, peak demand periods, yield and demand, and suitable filtration levels to maintain a clean and clear rainwater supply. Not all of these factors are necessarily covered in BS 8515:2009, which defines the minimum standards required for rainwater harvesting systems.

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Can the roof affect the system's efficiency?

The collection surface has a significant impact. For example, a green roof absorbs water, resulting in less run off and more discolouration than other roof types. The use of syphonic drainage can be an effective method of collecting the maximum amount of available rainwater, but will affect the system design due to the high flow rates.

Care needs to be taken to ensure that the water cannot stagnate, so the system, including the roof, guttering and pipework should be free draining and prevent contaminated water entering the system.

How do you stop debris entering the system?

To comply with the British Standard the system has to feature filtration before the rainwater enters the "main body of stored water". The filter system needs to meet strict criteria: covering its weather resistance, accessibility and efficiency. Water should also enter via a calmed inlet. Stormsaver's most recent system development means that all its filters surpass the British Standard requirements.

Does this mean you can't use sediment chambers?

Sediment chambers are neither mentioned nor excluded by the British Standard. However the standard does require rainwater to be filtered prior to the main body of stored water, such as in the Stormsaver tank design.

What about UV treatment?

Most non-potable water use, such as flushing WCs and laundry, will not require the use of ultraviolet disinfection. The standard advises that when there is the potential for greater human exposure or in 'high-care' environments, UV treatment may be beneficial. Systems with a third stage of fine filtration are key to ensuring that the UV disinfection system remains clean and therefore most effective.

Is the storage tank covered by BS 8515:2009?

Storage tanks, whether below or above ground, are covered by the standard. They need to be watertight, discourage microbial growth, avoid stagnation and be sited so not to allow conditions suitable for Legionella to develop. Underground tanks should be designed to suit traffic loadings and resist flotation. Above ground tanks should be sufficiently insulated to prevent the water from either freezing or warming.

How do I stop the recovered rainfall entering the public mains water supply?

BS 8515:2009 stipulates, that backflow prevention, providing category 5 protection, should be fitted upstream of or at the point where the two systems meet. This should be in the form of a Type AA or AB Airgap conforming to BS EN 13076 and BS EN 13077 respectively.

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What sort of pump do I need to use?

Single or dual pump systems can be used and can be installed either inside or outside of the tank. Noise and energy use should be minimised and pumps should be equipped with run-dry protection. The pump should be protected from hunting by the incorporation of a pressure vessel or pressure controls, where a pressurised system is installed. Non-pressurised systems automatically protect the pump and extend its life.

For pumps inside tanks the minimum water level needs to be observed at all times to prevent damage from air, sediment or debris that might be sucked in. The pump also needs to be accessible and removable and a non-return valve should be provided.

Do rainwater harvesting tanks need an overflow?

Yes, so that in time of really heavy rain, the excess water can drain away. The overflow should be designed to prevent backflow and stop vermin entering the system.

The flow capacity of the outlet pipe on the overflow should be equal or larger than the inlet pipe's capacity.

A good design will allow the main storage tank to overflow at least twice a year to remove build up of floating sediment on the top of the stored water and maintain good water quality.

Why do I need a control unit?

Control units essentially tell people if the system is working correctly or not. The unit needs to control the pump, activate the back-up supply and provide a volt-free outlet to be linked to a building management system, where required.

The best systems also have a warning system so that any potential problems can be identified and volumes of water use monitored.

How can I tell which pipes are part of the rainwater harvesting system?

Connecting pipework used in the systems should not be blue; they should be green, or black and green. The pipes also need to be strong enough to withstand the pressure of the system and large enough to cope with the required flow rate.

Can anyone install a rainwater harvesting system?

Installation should only be undertaken by qualified personnel and should follow the manufacturer's instructions, ensuring that all parts can be accessed for maintenance.

Can anyone commission a system?

Only qualified people, authorised by the manufacturer, should commission a system. The system needs to be flushed and tested prior to handover. There should be no cross-connections in accordance with BS 6700 and all pipework and fittings need to meet BS 6700:2006, 6.1.12.3. Electrical wiring needs to comply with BS 7671.

How do I look after the system?

Routine and ongoing maintenance, in line with manufacturer's recommendations is the best way to ensure a system is reliable and effective. Stormsaver, for example, offers a comprehensive maintenance package.

How do I know if a system is safe?

A risk assessment should be undertaken when the system is being designed and follow a recognised process, as detailed in BS 31100 for example. The design, installation, testing, commissioning, operation and maintenance of the system all need to be considered within the risk assessment along with water quality, electrics and access.

The reputation of the supplier, the knowledge of its staff, track record and compliance with BS 8515:2009 plus testimonials and references from previous customers should also serve as reassurances.

In summary, what does BS 8515:2009 mean for the industry and for me?

The introduction of BS 8515:2009 means that there are for the first time, clear guidance on what are the minimum acceptable standards that rainwater harvesting companies and the people specifying their systems have to meet. By ensuring conformity across the industry, the standard will further strengthen the industry's reputation for producing high quality, reliable and efficient systems.

Finally, by complying with the new British Standard, companies, such as Stormsaver, are providing their clients with complete peace of mind with regards their system's safety, effectiveness and reliability.

Rainwater harvesting systems are increasingly specified as architects, engineers and end users seek to **save money, save water and save the environment**. Knowing that a company is trustworthy, reputable and meets certain standards is important. Now, the British Standards Institute has devised BS 8515:2009 – Rainwater harvesting systems – Code of practice to introduce consistency across the broad range of suppliers and systems available.

This guide, produced by Stormsaver, the UK's leading designer and manufacturer of rainwater harvesting systems, provides a brief overview of the key points contained within the new standard and additional technical information which may help when specifying a system, but which may not be covered in the standard. It is not a substitute for reading the new code of practice in full and should not be relied upon.

It has been produced to introduce the concept of rainwater harvesting and make, what can be a complicated and confusing process, easier to understand.

As market leader, Stormsaver regularly works with over half of the UK's top 150 construction companies, and its team are more than happy to receive enquiries and queries on rainwater harvesting and the new British Standard.



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