

# BALMORAL TANKS

# RAINWATER HARVESTING SYSTEMS

[www.balmoralrainwatersystems.co.uk](http://www.balmoralrainwatersystems.co.uk)



 **BALMORAL**

# The Balmoral HydroStore™

With the recognition of water as a valued commodity, Balmoral Tanks has invested in the design and manufacture of a new range of simple and unobtrusive rainwater harvesting systems.

Balmoral's 'HydroStore' tanks benefit from the company's experience in providing tanks for underground installation as well as recognising the engineering progress being made in the global rainwater harvesting sector.

The HydroStore allows full capacity storage and, when installed above the natural water table, does not require a concrete surround. The lower part of the body has vertical flats which allow interconnecting pipework and the linking together of multiple tanks to provide greater storage capacities. The HydroStore has been designed to minimise materials and installation costs.

The base of the tank is flat which helps with installation and allows complete drainage of the tank when cleaning. The cover is retained using a single bolt and can be removed completely to leave clear access. Surface water is directed down past the lid and turret to soak away into the surrounding soil.

Ultimately, these tanks become air pockets under the ground, allowing their volume to be flooded with recovered and usable water. Above ground they do not impede on available space which can be used for more diverse, practical and imaginative purposes.

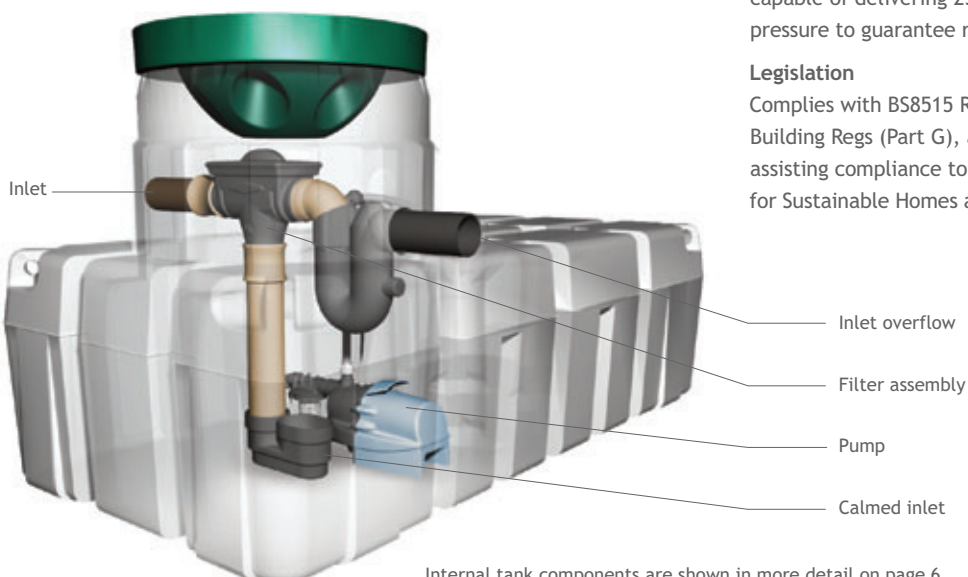
## UK designed and manufactured

The Balmoral HydroStore is designed and manufactured in the United Kingdom. All the components are sourced from UK companies as part of our effort to minimise Balmoral Tanks' carbon footprint.

This means that when you specify a Balmoral HydroStore for UK installation you are helping eliminate unnecessary transport miles and carbon output.

## Carbon footprint

'Carbon footprint' is a measure of the impact our activities have on the environment, and in particular climate change. It relates to the amount of greenhouse gases produced in our manufacturing activities and transportation.



Internal tank components are shown in more detail on page 6



## Balmoral HydroStore benefits

### Capacities

1500-2900 litre single tank capacities

### Modular design

Allows increased capacity by linking together multiple tanks

### Lid

Flat, load-bearing lid unobtrusive to pedestrians, lawnmowers, etc. Large diameter for easy access.

### Turret

Diverts potentially contaminated surface water away to preserve integrity of captured water. 500mm invert depth as standard, with collars available to enable adaptation to site conditions.

### Inlet

Calmed inlet reduces turbulence to tank sediment, improving water quality to property.

### Filter

Self-cleaning, low maintenance filters, with no consumable parts, at inlet and pump ensure clear water supply.

### Tank body

Seamless, one-piece moulding eliminates on-site 'assembly' and guarantees internal cleanliness.

Flat base for stability and integrated lifting points for ease during handling and installation.

Entire capacity utilised, ie, no potential air pockets or base ribs to reduce 'working' volume.

### Pump

Pressure-sensitive (turns off if no demand), dry-run protected (turns off if no water detected) pump for extended service life. Pump outlet capable of delivering 2500ltr/hour, nominal 35m head, and 3.5 bar pressure to guarantee reliable, constant and efficient supply.

### Legislation

Complies with BS8515 Rainwater Harvesting Code of Practice and Building Regs (Part G), and often vital to planning approval by assisting compliance to environmental guidelines such as The Code for Sustainable Homes and BREEAM.

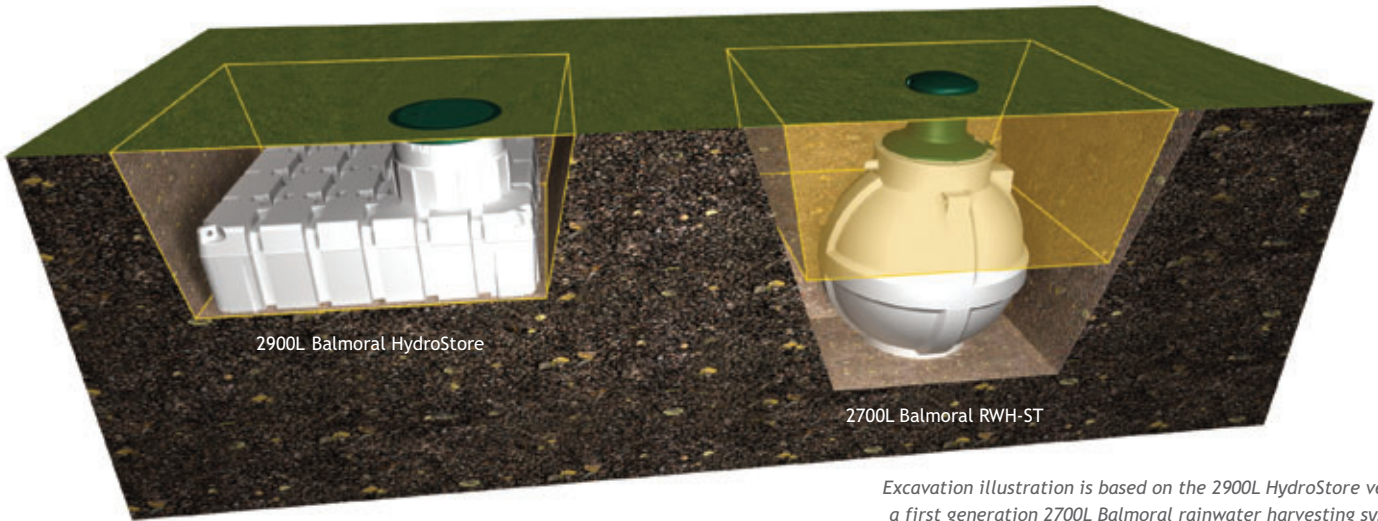


## Shallow excavation + no concrete backfill = reduced installation costs

The installation of the HydroStore couldn't be easier or more cost effective. The overall design of the tank is aimed at reducing costs from delivery to installation and from day-to-day use to annual maintenance.

The HydroStore is designed to allow two people - using the most basic digging equipment, ie, a couple of shovels - to move and install a system.\* Another key benefit of the tanks' low height is that no concrete backfill is required as long as the water table does not rise above the base of the tank.

\*Based on the 1500 litre model



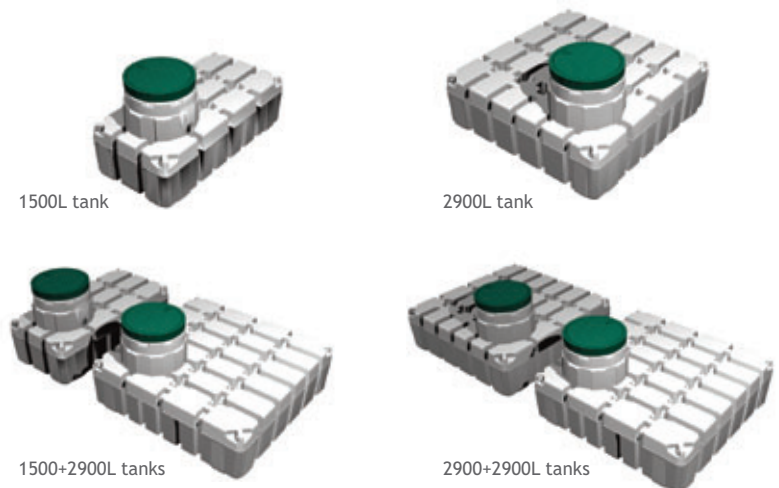
Excavation illustration is based on the 2900L HydroStore versus a first generation 2700L Balmoral rainwater harvesting system

## Tank capacity options

Two tank sizes are currently available in the HydroStore range: 1500 and 2900 litres. If greater storage capacity is required the tanks are easily linked together. For instance the 1500 and 2900 tanks can be linked to provide a working capacity of 4400 litres.

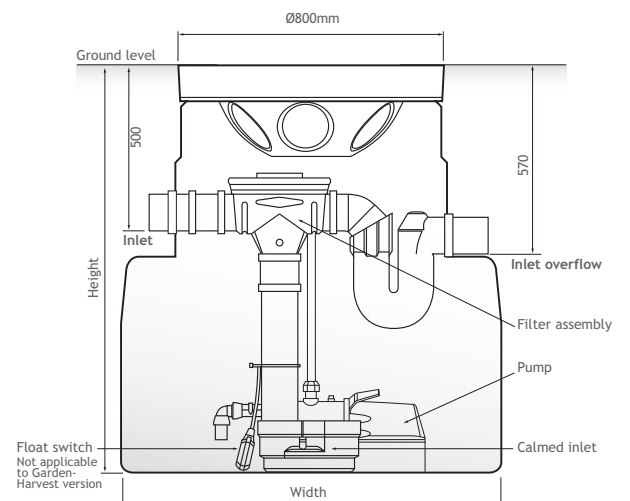
Using the linking option, only one tank needs to be fitted with inner components while the other(s) perform merely as holding vessels.

All tanks are produced as standard with 2" moulded-in outlets meaning that only a length of pipe and two threaded fittings are required to complete the link.



## Balmoral HydroStore rainwater tank specifications

| Specifications           | RWH-1500                      | RWH-2900                      |
|--------------------------|-------------------------------|-------------------------------|
| Capacity (litres)        | 1500                          | 2900                          |
| Length (mm)              | 2400                          | 2400                          |
| Width (mm)               | 1200                          | 2400                          |
| Height (mm)              | 1250                          | 1250                          |
| Empty tank weight (kg)   | 110                           | 200                           |
| Inlet invert (mm)        | 500 (Can be extended to 1000) | 500 (Can be extended to 1000) |
| Inlet overflow (mm)      | 570                           | 570                           |
| Pipework fitting (mm)    | Ø110                          | Ø110                          |
| Turret aperture (mm)     | Ø600                          | Ø600                          |
| Filter checking interval | 12 months                     | 12 months                     |



# Balmoral HydroStore™

## Rainwater harvesting system

### You know it makes eco-sense

Balmoral rainwater harvesting systems reduce the demand for mains water provision. Many springs and rivers are naturally fed by groundwater and are important for wetlands and their ecosystems. More than 25% of groundwater sources are at risk because of abstraction pressures.

By gathering and recycling rainwater, Balmoral's harvesting systems reduce the volume of discharged rainwater and contribute to reduced flood risks. The loading on combined sewer overflows is also lowered resulting in improved river water quality.



### Rainwater distribution

There are three options available for water distribution:



#### 1 Garden Harvest

A very simple system that allows the connection of a hose to the pump within the tank to provide water for irrigating lawns, gardens and car washing.



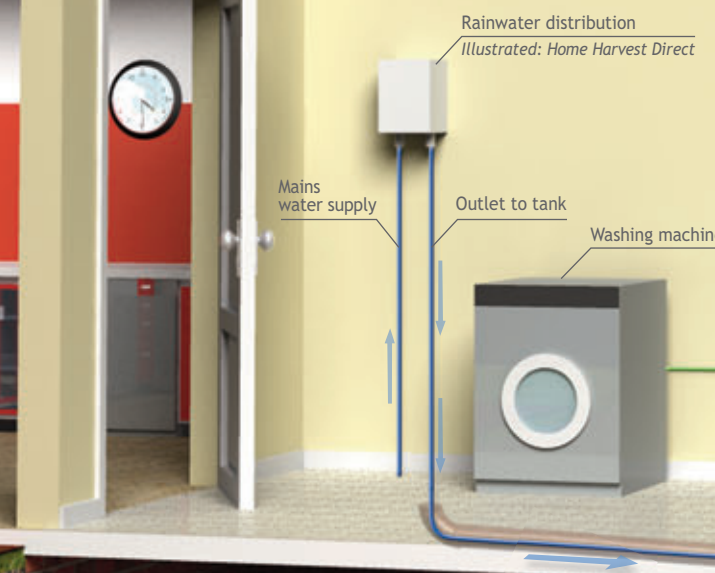
#### 2 Home Harvest Direct

When supply of rainwater is exhausted, the 'Backup in a Box' unit uses mains water to replenish the tank. The pump in the tank is then ensured of a constant supply of water to feed washing machines, toilets, garden taps, etc.



#### 3 Home Harvest Gravity

Using the Rain Director system, rainwater is pumped to a header tank where gravity distributes it to the required water appliances. This minimises pump on/off cycling, reducing electrical cost and wear on the pump. The system also ensures that the rainwater tank is replenished with mains water once the stored rainwater is exhausted.



- Rainwater supply to household
- Backup mains water supply to tank
- Power supply to pump

*installation shown is for illustration purposes*

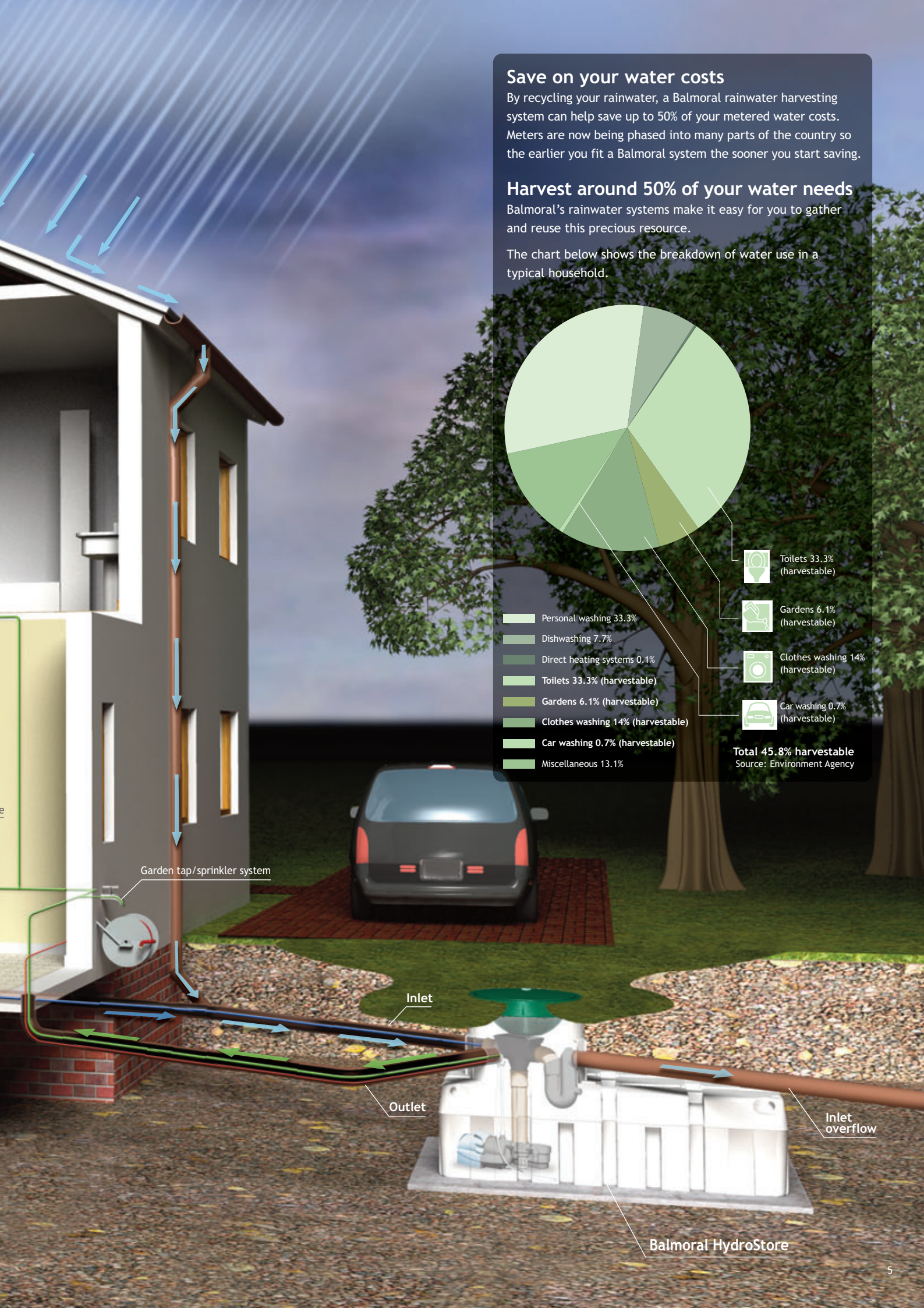
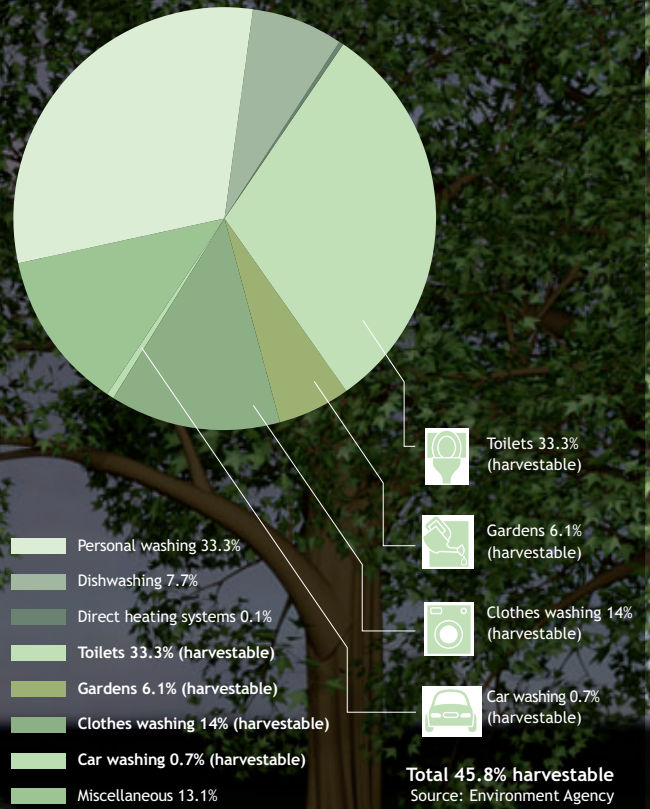
## Save on your water costs

By recycling your rainwater, a Balmoral rainwater harvesting system can help save up to 50% of your metered water costs. Meters are now being phased into many parts of the country so the earlier you fit a Balmoral system the sooner you start saving.

## Harvest around 50% of your water needs

Balmoral's rainwater systems make it easy for you to gather and reuse this precious resource.

The chart below shows the breakdown of water use in a typical household.



Garden tap/sprinkler system

Inlet

Outlet

Inlet overflow

Balmoral HydroStore

# Balmoral RWH-ST

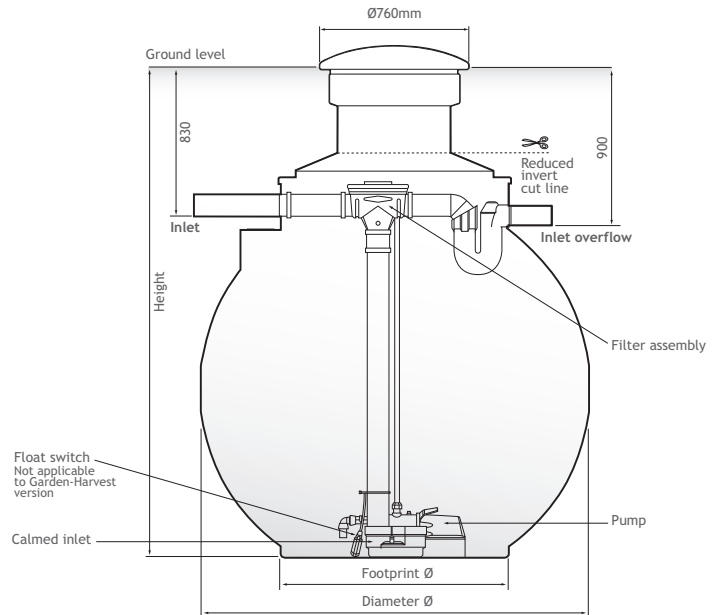
Other rainwater storage products are available from Balmoral Tanks if installation space does not permit the use of linked tanks. Available in two capacities, 4500L and 6000L, the ST range uses the same internal components as the HydroStore and provides similar services, ie, Garden Harvest, Home Harvest Direct or Home Harvest Gravity

- ▶ 4500-6000 litre single tank capacities
- ▶ High impact strength at low temperatures
- ▶ Stress free mouldings provides extra strength
- ▶ Lightweight, easy to handle
- ▶ Integrated handling points
- ▶ Corrosion resistant
- ▶ Low maintenance
- ▶ UV protected



## Balmoral RWH-ST rainwater tank specifications

| Specifications           | RWH-ST-45            | RWH-ST-60            |
|--------------------------|----------------------|----------------------|
| Capacity (litres)        | 4546                 | 6000                 |
| Diameter (mm)            | Ø2165                | Ø2365                |
| Height (mm)              | 2770                 | 3005                 |
| Footprint (mm)           | Ø1275                | Ø1275                |
| Empty tank weight (kg)   | 260                  | 310                  |
| Inlet invert (mm)        | 830 (Can be reduced) | 830 (Can be reduced) |
| Inlet overflow (mm)      | 900                  | 900                  |
| Pipework fitting (mm)    | Ø110                 | Ø110                 |
| Lid size (mm)            | Ø760                 | Ø760                 |
| Filter checking interval | 12 months            | 12 months            |



## Internal tank components

### Filter assembly



### Calmed inlet



### Pump



# What size of tank do you need?

The size of a rainwater holding tank must match the demand for water with its availability as closely as possible. BS 8515:2009 provides an authoritative and industry-approved means of calculating the optimum size of tank for household water use.

Unlike other industries it is better to reduce the size of the tank rather than over size it if in doubt as to the requirement. This is due to the benefit of allowing the tank to overflow at least twice a year to flush out floating debris. The tank size chosen must therefore be a balance between rainwater supply and water demand.

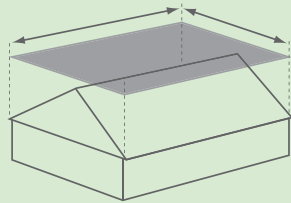
In order to correctly size the tank, the capacity should be the lesser of either the rainwater supply or the water demand. A worked example demonstrating this principle is shown below;

## What is your annual rainwater supply?

$$\begin{aligned} \text{Tank size (litres)} &= \text{Roof area m}^2 \times \text{Drainage coefficient} \times \text{Filter efficiency} \times \text{Annual rainfall mm} \times 5\% \\ \text{Example} &= 130\text{m}^2 \times 0.8 \times 0.9 \times 1125\text{mm} \times 5\% \\ &= 5,265 \text{ litres} \end{aligned}$$

### Roof area

Is the width and length of your roof in m<sup>2</sup>. Remember you do not have to collect water from the entire roof. This can help to reduce installation costs.



### Drainage coefficient

It is impossible to collect every drop of rain that falls on your roof. Light rainfall will only wet your roof and then evaporate and heavy rainfall can overflow gutters. A drainage coefficient is used to adjust the tank size calculation to allow for this.

| Roof type                   | Drainage coefficient |
|-----------------------------|----------------------|
| Pitched roof tiles          | 0.75-0.9             |
| Flat roof smooth tiles      | 0.5                  |
| Flat roof with gravel layer | 0.4-0,5              |

### Filter efficiency

If debris reaches the filter, it momentarily reduces the capture of water and is used to remove the debris to the overflow. During heavy rain, high flows of rainfall will also bypass the filter to overflow. As a result, 90% of rainfall is caught meaning the filter coefficient is 0.9.

### Annual rainfall

This can vary dramatically over a relatively small area so a reading (in mm) within 10 miles of the property is preferable. The local Environment Agency or Met Office can supply rainfall data or you can use the regional guide figures provided in the table below. In the 'annual rainwater supply example' above we have used the average figures for the UK.

| Region    | Average rainfall (mm)           |
|-----------|---------------------------------|
| UK        | 1125                            |
| S England | 781                             |
| N England | 944                             |
| Wales     | 1433                            |
| Scotland  | 1520                            |
| NI        | 1111                            |
| EIRE E    | 875 (Source: Irish Met service) |
| EIRE W    | 1125                            |

### 5%

Based on BS8515 the rainwater tank must be big enough to hold 5% of the annual rainwater yield, or 5% of the annual non-potable water demand, whichever is the lesser.

## What is your annual rainwater demand?

$$\begin{aligned} \text{Tank size (litres)} &= \text{Average usage} \times \text{people in household} \times \text{days/year} \times \% \text{ harvestable} \times 5\% \\ \text{Example} &= 150 \text{ litres} \times 4 \times 365 \times 45.8\% \times 5\% \\ \text{tank size} &= 5,015 \text{ litres} \end{aligned}$$

### Average usage

On average, each person in the UK uses around 150 litres of water every day and 45.8% of this total could be rainwater instead of mains water.

### What is the right tank for you?

The capacity selected above should be the lesser of the two values, ie, 5,015L (as this is less than 5,265L).

Again following the same rule, the specific tank should be selected based on your annual rainwater supply and your annual rainwater demand.

# Balmoral Tanks

Balmoral Tanks is a division of Balmoral Group Holdings Ltd, a leading European engineering design and manufacturing company that was established in 1980.

Over the years the company has made substantial investment both in its plant and its people and now offers what is believed to be the most comprehensive range of liquid storage and treatment solutions from a single source in the EU.

The civil engineering, wastewater, drainage, fuel oil containment, bulk liquid and potable water storage sectors are all served by the company.

## **Balmoral Tanks' product range**

- ▶ Rainwater harvesting systems
- ▶ Wastewater treatment plant
- ▶ Bulk liquid storage
- ▶ Chemical storage
- ▶ Fuel oil storage and dispensing
- ▶ Potable & non-potable water storage
- ▶ GRP sectional water storage
- ▶ Steel sectional water storage
- ▶ Cylindrical water storage
- ▶ Trade moulding

## **BALMORAL TANKS**

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