



# OPTIGREEN RETENTION ROOF SYSTEM SOLUTION – FLOW CONTROL

## WATER STORAGE AND ADJUSTABLE DISCHARGE DELAY



**SOLUTION 1 + 2**

**WEBCODE:** web244 + web245  
Direct access via [www.optigreen.co.uk](http://www.optigreen.co.uk)

**SOLUTION 3**

**WEBCODE:** web246  
Direct access via [www.optigreen.co.uk](http://www.optigreen.co.uk)

### CHARACTERISTICS

- For extensive and intensive green roofs and areas subject to vehicular traffic
- Optigreen Water Retention Box WRB, including Flow Control system
- Additional storage volume of approximately 75 l/m<sup>2</sup> in Water Retention Box WRB 85i. Maximum storage volume of 140 l/m<sup>2</sup> in Water Retention Box WRB 150
- Very low discharge through individual Flow Control system setting
- Discharge yield, also less than 1 l/s adjustable
- Low weight due to cavity type construction of the Water Retention Box WRB
- Increased evaporation performance due to integrated capillary system
- Rainfall runoff model with the RWS 4.0 rainwater simulation program

### TECHNICAL DATA

	Solution 1: Extensive	Solution 2: Intensive	Solution 3: Trafficked areas
Weight:	100 – 300 kg/m <sup>2</sup> or 1.0 – 3.0 kN/m <sup>2</sup>	310 – 520 kg/m <sup>2</sup> or 3.1 – 5.2 kN/m <sup>2</sup>	from 450 kg/m <sup>2</sup> or from 4.5 kN/m <sup>2</sup>
Build-up depth:	140 – 250 mm	330 – 460 mm	from 260 mm
Roof pitch:	0°	0°	0°
Vegetation form:	Sedum-herbs- grasses	Perennials-shrubs- lawn areas	–
Water retention / discharge coefficient / discharge yield: project specific setting			
Water storage in green roof build-up:			
	from 21 l/m <sup>2</sup>	from 91 l/m <sup>2</sup>	–
Additional maximum water storage in Water Retention Box WRB:			
	approx. 75 – 140 l/m <sup>2</sup>	approx. 80 – 140 l/m <sup>2</sup>	approx. 80 – 140 l/m <sup>2</sup> l/m <sup>2</sup>
Ecological value:	■ ■ ■ □ □	■ ■ ■ ■ ■	■ □ □ □ □
Maintenance cost:	■ ■ □ □ □	■ ■ ■ ■ ■	□ □ □ □ □
Cost factor:	■ ■ □ □ □	■ ■ ■ □ □	■ ■ ■ ■ ■

### NOTE

- Basic requirement: 0°-roof
- Suitable for inverted roofs



1  
2

Solution 1 + 2



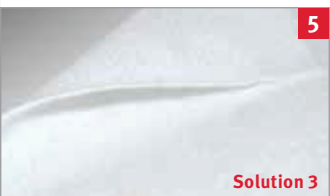
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Solution 3



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Solution 1 + 2



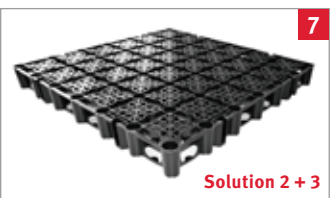
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Solution 3



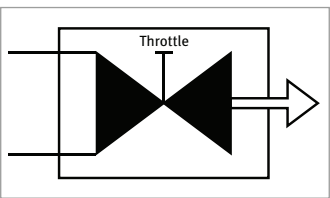
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Solution 1



7

Solution 2 + 3



8

Solution 1 + 2



9

Solution 3

**Extensive green roofs**

**Intensive green roofs**

**Trafficked areas – Pedestrian or vehicles**

**Optigreen Suction and Capillary Fleece RMS 500K**

- Optimal water distribution below the substrate layer

**Optigreen Filter Fleece FIL 300**

- Prevents fine particles from forming sludge in the drainage layer; high water permeability

**Optigreen Water Retention Box WRB 80F**

- High cavity volume for water retention
- Water retention adjustable to the green roof build-up above
- Low weight
- High water storage capacity
- Stackable for easy transport
- With capillary columns

**Optigreen Water Retention Box WRB 85i resp. WRB 150**

- Cavity volume suitable for water retention
- High pressure stability
- Adjusted to specific project requirements
- Low weight
- With capillary columns

**Optigreen Flow Control System**

- Throttle with defined perforations that allows a delayed water discharge
- Permanent accumulation of stormwater possible up to a defined height

**Optigreen Protection and Storage Fleece RMS 900**

- Protects Root Barrier membrane or roof membrane from damage and stores water

**Optigreen Protection, Separation and Slip Layer SGL 500 and Optigreen Separation and Slip Sheet TGF 0.2 mm**

- Slip layer
- Easy installation

**SOLUTION 1 + 2:**

**EXTENSIVE GREEN ROOFS**



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**INTENSIVE GREEN ROOFS**



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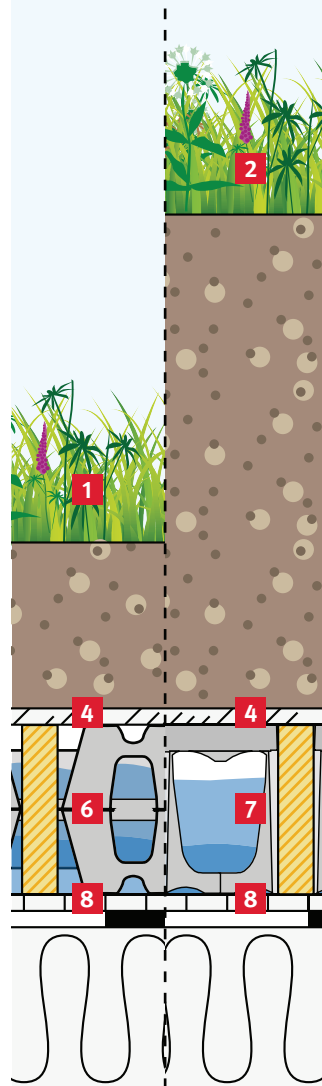
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**SOLUTION 3:**

**TRAFFICKED AREAS**



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For suitable roof construction see page 90



## FURTHER INFORMATION

### 1. Rainwater Management

The Optigreen Retention Roof System Solution combines the benefits of the green roof with managed drainage out-flow and ecological rainwater usage.

- Delayed drainage
- Minimisation of peak drainage outflow
- High water retention within the green roof build-up
- Evaporation processes and return to the natural water cycle
- Improvement in the microclimate, air pollution control, cooling effects
- Independent of the local soil and groundwater conditions
- Possibility of combining rainwater use and controlled drainage

### 2. Extreme water run off delay using the Optigreen Meander Retention Roof System Solution

Our research and development team have been able to optimise the positive effects of a green roof in terms of stormwater management. The result of this work is the patented Optigreen Meander System.

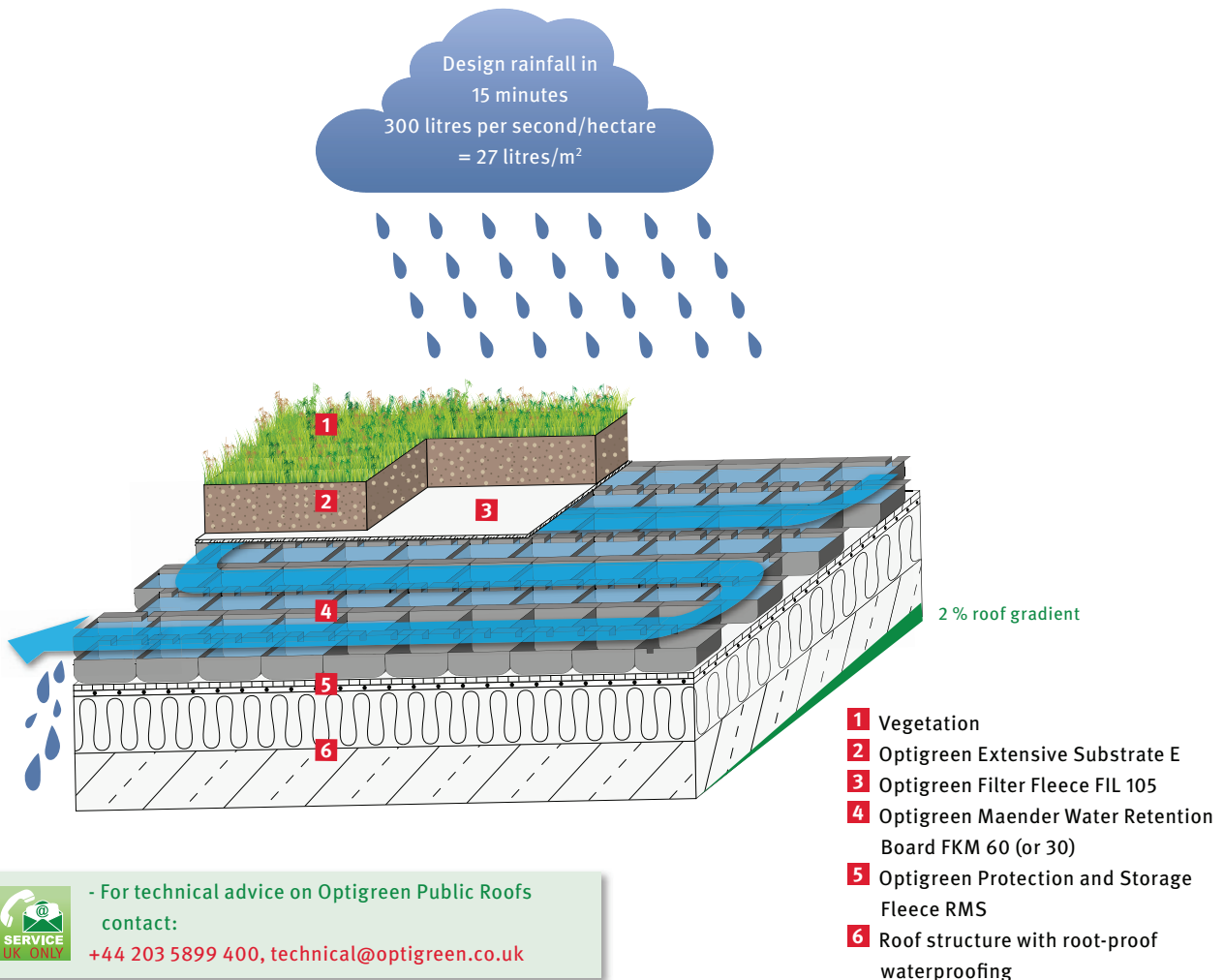
### 3. How the Optigreen Meander System works

The principle behind the patented Meander system is as simple as it is effective - water flows along a winding route from one chamber to another, just like a naturally meandering river or stream. During heavy rainfall the chambers of the board are filled with water and it passes from one chamber to the next causing a long delay in the discharge of excess water.

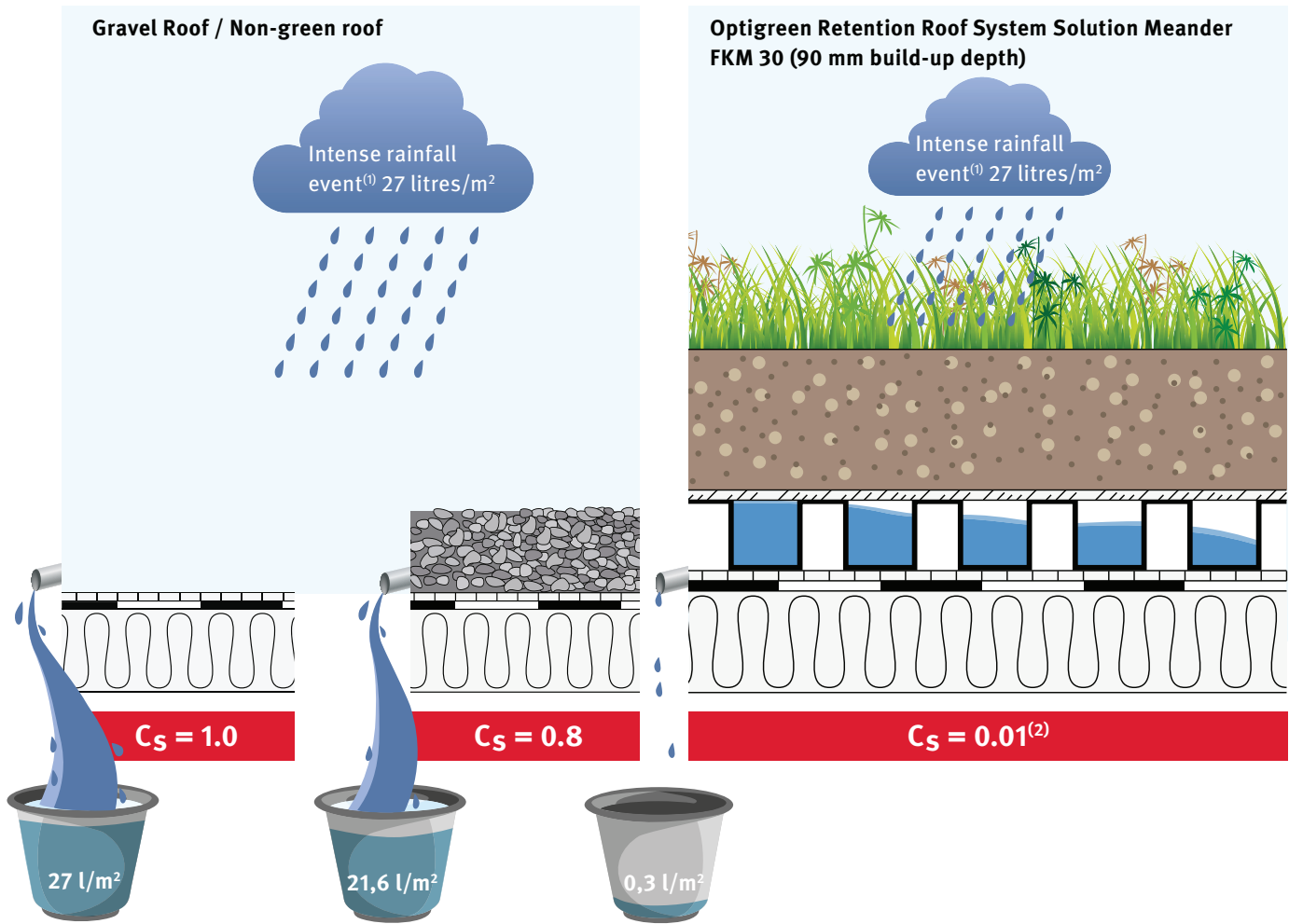
The Meander 60 board, for instance, extends the water flow length by a factor of 13. Each Meander 30 board covers two square metres yet the water flow route inside it measures up to 46 metres in length.

#### Determining the discharge coefficient $C_s$ in accordance with the guidelines.

The FLL guidelines specify a special test method to provide system-related proof of the discharge coefficient  $C_s$ . This method measures the worst case scenario of a green roof experiencing complete water saturation and the resulting run off from a roof gradient of 2% during a 15-minute rainfall event with a precipitation rate of 300 litres per second/hectare. The discharge coefficient  $C_s$  gives the ratio between stormwater run-off and a heavy rainfall.



- For technical advice on Optigreen Public Roofs contact:  
+44 203 5899 400, [technical@optigreen.co.uk](mailto:technical@optigreen.co.uk)



Of the 27 litres/m<sup>2</sup> of rainfall, 21.6 litres/m<sup>2</sup> flow off a gravel roof and put the drainage system under enormous pressure. Things are even worse on a non-green roof: nearly 100 % of the stormwater flows straight into the drainage system.

Only 0.3 litres/m<sup>2</sup> of stormwater reaches the drainage system during the above rainfall intensity. 26.7 litres/m<sup>2</sup> are retained on the roof!



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<sup>(1)</sup> Hydrological design in accordance with FLL:  
300 l/(s x ha) in 15 min. = 27 l/m<sup>2</sup> at 2 % roof gradient

<sup>(2)</sup> To calculate pipe dimensions we recommend using the discharge coefficient  $C_s=0.1$