

FOR UNCOMPROMISING FUNCTION  
AND VERSATILE DESIGN

## OPTIGRÜN RETENTION ROOF FLOW CONTROL



# EFFECTIVE STORMWATER MANAGEMENT

## RETENTION ROOF FLOW CONTROL

### GROWING CHALLENGES DUE TO URBANISATION AND CLIMATE CHANGE

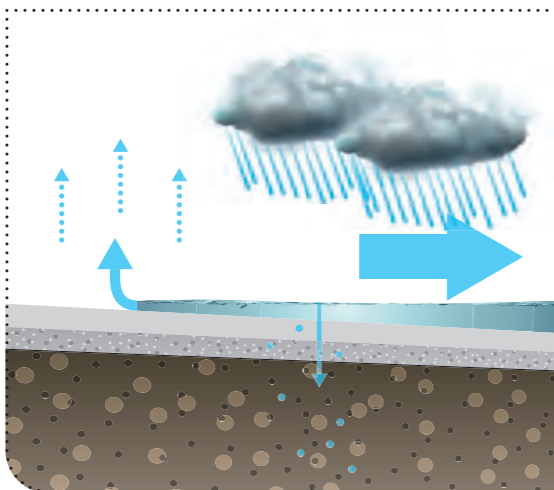
Cities are particularly exposed and vulnerable to climate change. The development of high density urban areas has led to cities becoming significantly warmer, while also leaving no space for the infiltration and evaporation of stormwater.

This combination can result in extreme weather events.

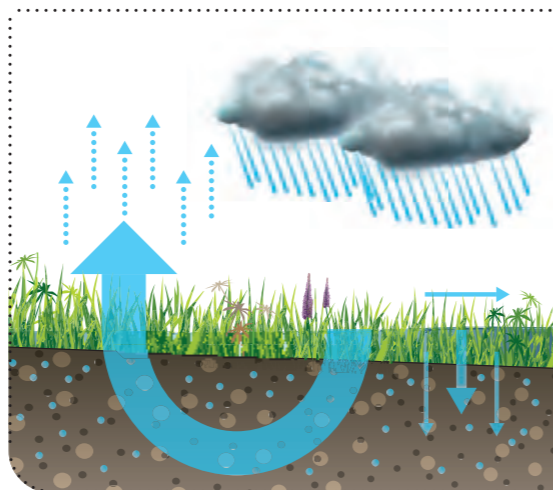
The effects of urban heat islands and flash flooding can lead to property damage and contribute to health problems.

A critical approach to improving the urban climate lies in restoring the natural water balance. Efficient and future-proof systems for stormwater management on roof surfaces, which have often been unused so far, help to ensure that cities remain worth living in.

#### WATER BALANCE FOR SEALED SURFACES



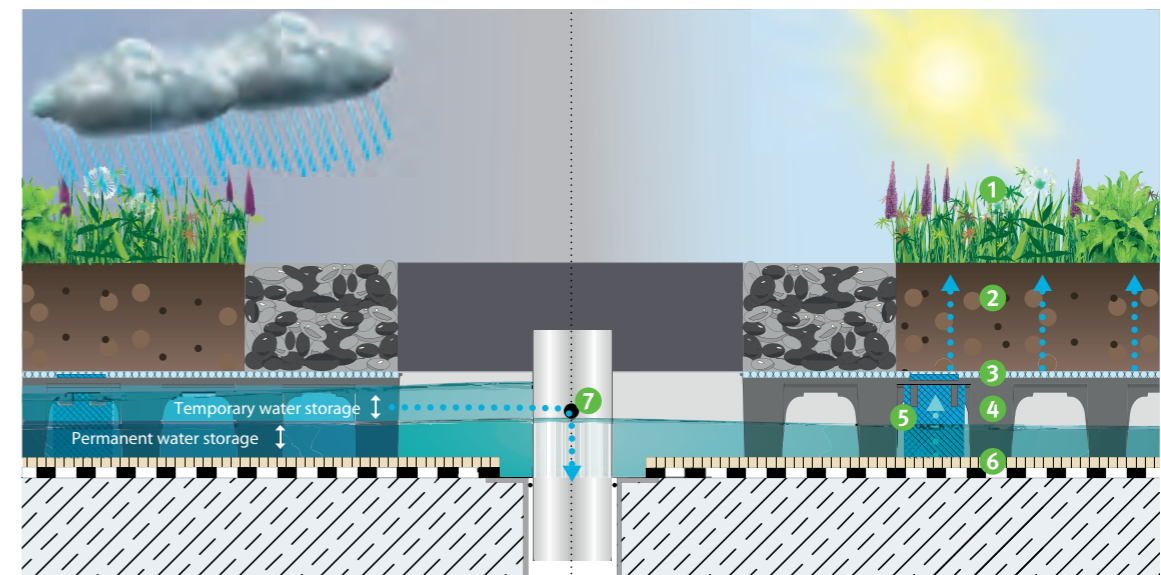
#### NATURAL WATER BALANCE



A natural water balance helps to sustainably reduce the negative effects of climate change in cities. Due to a high level of evaporation of accumulated rainfall the environment is cooled and infiltration of surface water promotes replenishment of groundwater. The overall low surface runoff is an important component of flood protection.

- i**
- Flood protection through space for damage-free retention of rainfall events
  - Contribution to the restoration of the natural water balance through high evaporation rates
  - Promotion of biodiversity

### A RELIABLE SYSTEM WITH MULTIPLE RETENTION BENEFITS



- 1 Vegetation
- 2 Substrate
- 3 Suction and Capillary Fleece
- 4 Water Retention Box
- 5 Capillary Bridge
- 6 Protection and Storage Fleece
- 7 Flow Control System

Optigrün has developed a special green roof solution for decentralised stormwater management. In the system structure of the RETENTION ROOF FLOW CONTROL, on zero falls roofs (0°) large quantities of rainwater are retained in the 4 Water Retention Boxes. The discharge from the roof surface is strongly regulated by a 7 Flow Control System. As a result, low discharge restrictions can be complied with and protection against flooding is ensured even in the case of rainfall events with high annual frequencies.

Additionally, the stored rainwater is transported into the substrate through 5 Capillary Bridges. The evaporation of the water via the vegetation contributes to maintaining the natural water balance. The greening on a Retention Roof Flow Control with a permanently available water storage creates a habitat for diverse plant and animal species, even during longer periods without rainfall. As a result, city inhabitants also benefit from the biodiversity on green roofs. By binding CO<sub>2</sub> and fine dust from the air, the green roofs actively contribute to health protection and create appealing recreational and social spaces for people.

## SPECIFIC COMPONENTS WITH IMPORTANT FUNCTIONS

### WATER RETENTION BOXES

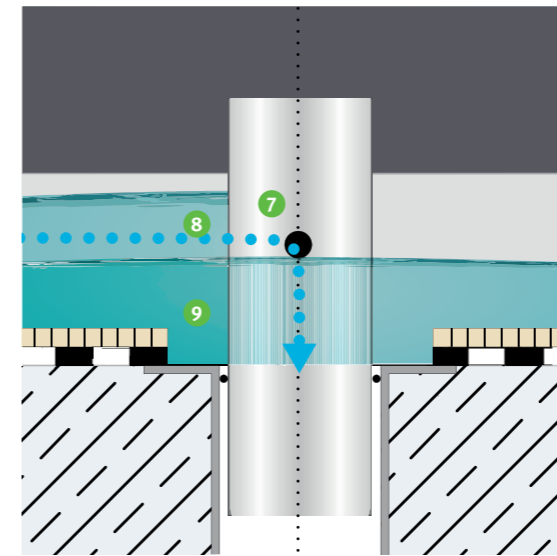
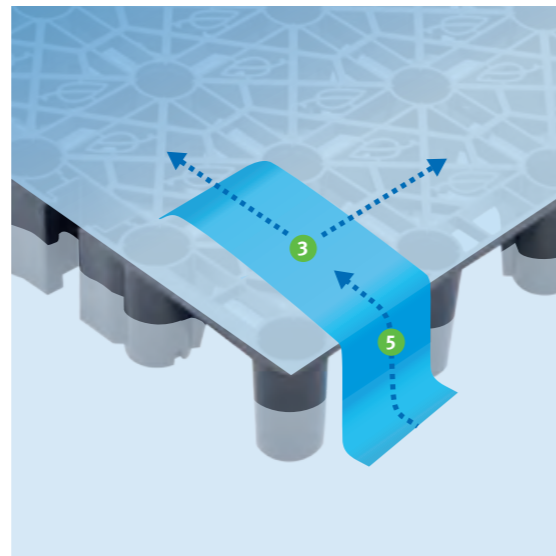
WRB 80F | WRB 85 | WRB 95 | WRB 170

Water Retention Boxes (WRB) are an essential component of the system solutions “Retention Roof Flow Control” and “Public Roof Retention”. The 80 - 170 mm high void plastic elements create a connected retention space and have a particularly high usable volume. Therefore, the water storage capacity of retention roofs with Water Retention Boxes considerably exceeds that of all other green roof structures.

The Water Retention Boxes have special properties that ensure the functionality of the retention roofs:

Under vegetated areas, the integrated 5 Capillary Bridges or Capillary Columns transport stored water back into the 3 Suction and Capillary Fleece, which lies on the top of the boxes. Water is distributed over the entire surface and keeps the overlying substrate layer moist. The optimal water supply of the vegetation leads to a high evaporation rate - as much rainwater as possible is returned to the natural water cycle and the microclimate is improved by evaporative cooling.

Water Retention Boxes are freely flowable due to their structure. The rainwater is distributed quickly and evenly, even in the case of punctual water inflow. This allows reliable calculation of water levels and accurate simulation of overflow frequencies and discharge rates. The available retention volume can be utilised optimally.



### FLOW CONTROL A POWERFUL SYSTEM

The roof outlet is fitted with a 7 static Flow Control System to create a regulated discharge and, if necessary, an accumulation of water in the Water Retention Boxes.

This divides the retention room into a 8 temporary and a 9 permanent water storage. While the temporary storage in the retention room is emptied via the discharge, the permanently stored water is reduced only by evaporation.

The maximum height that the water level on the roof surface should reach is defined in the planning phase. A specifically dimensioned hole in the Flow Control System ensures that rainwater that accumulates above this opening can discharge at a restricted rate.

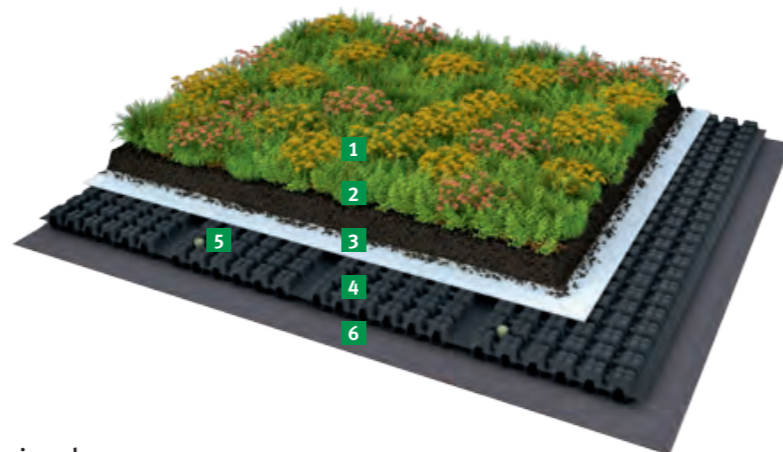


#### SMART FLOW CONTROL AND WATER BALANCE CONTROL

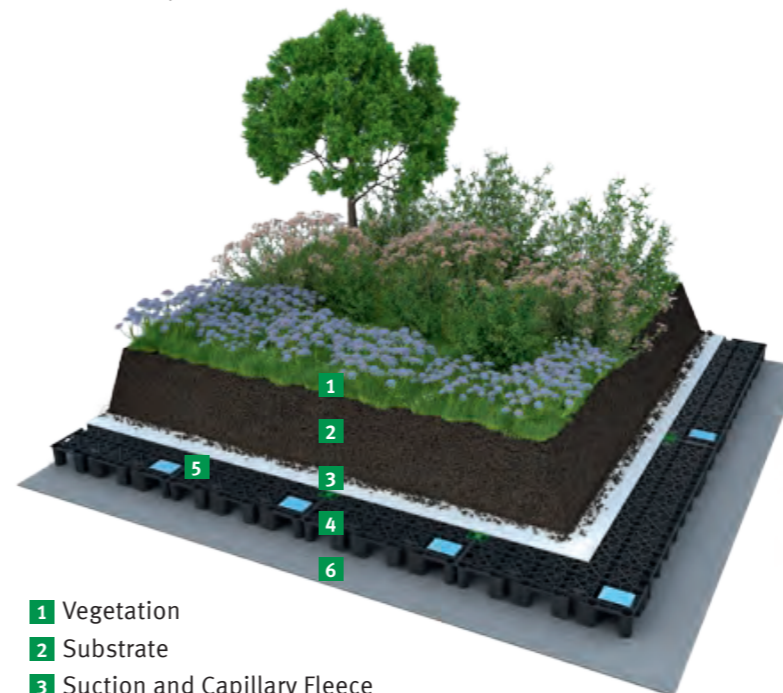
Modern stormwater management through the intelligent regulation of retention roofs and the linking of green roofs and civil engineering.

# THE RIGHT SOLUTION FOR EVERY REQUIREMENT

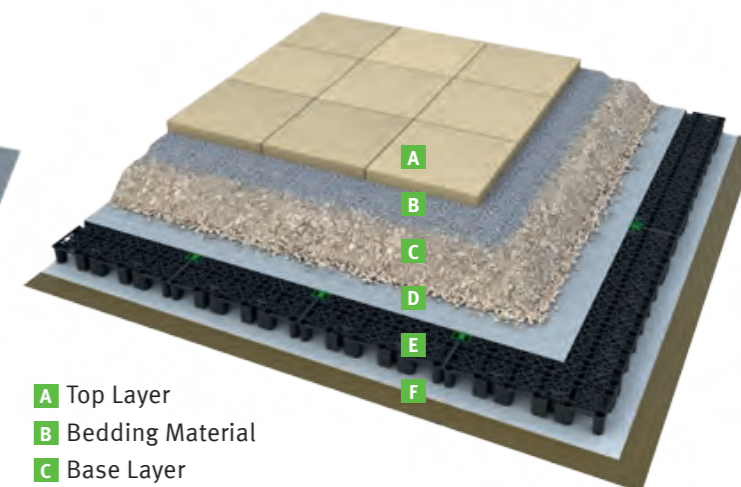
Optigrün Retention Roof Flow Control Extensive and semi-intensive



Optigrün Retention Roof Flow Control Intensive



Optigrün Public Roof Retention



- 1 Vegetation
- 2 Substrate
- 3 Suction and Capillary Fleece
- 4 Water Retention Box
- 5 Capillary Bridge/Capillary Column
- 6 Protection and Storage Fleece

- A Top Layer
- B Bedding Material
- C Base Layer
- D Filter Fleece
- E Water Retention Box
- F Protection, Separation and Slip Layers

Whether extensive greening, roof gardens as a green oasis in urban spaces or traffic areas on underground garages, Water Retention Boxes enable the multi-functional use of roof surfaces.



**WRB 80F**

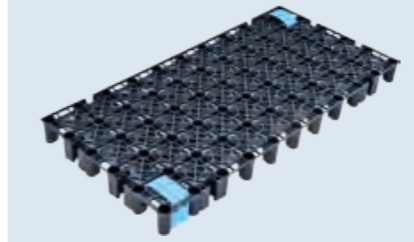


Nominal thickness 80 mm  
Retention volume approx. 72 l/m<sup>2</sup>

The Water Retention Box WRB 80F is specially designed for use under extensive and semi-intensive greening. They are particularly light and have a Flow Control-independent water storage.

WRB 80F	
Material	Recycled HDPE
Cavity volume	approx. 90 Vol.%
Compressive strength according to DIN ISO 25619-2	approx. 100 kN/m <sup>2</sup>

**WRB 85**

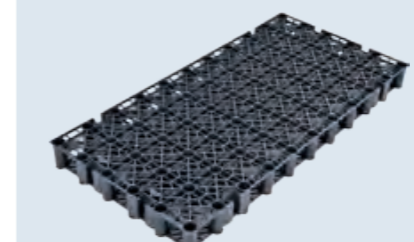


Nominal thickness 85 mm  
Retention volume approx. 80 l/m<sup>2</sup>

Ideal for use under extensive and intensive greening as well as traffic areas.

WRB 85, 95, 170	
Material	PP-Recycling-Regenerat
Cavity volume	approx. 95 Vol.%
Compressive strength according to DIN ISO 25619-2	approx. 800 kN/m <sup>2</sup>

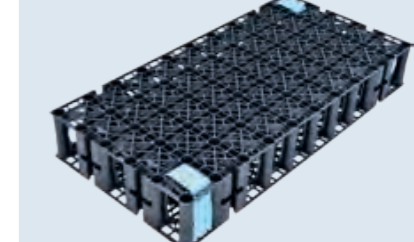
**WRB 95**



Nominal thickness 95 mm  
Retention volume approx. 90 l/m<sup>2</sup>

The load-distributing structure of the base plate allows the WRB 95 to be used under intensive greening and traffic areas with particularly high loads on the on the insulation level.

**WRB 170**

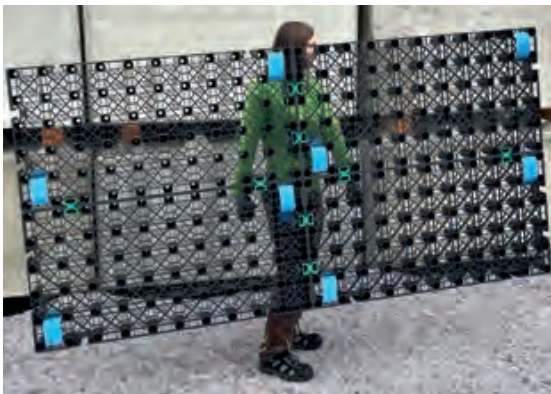


Nominal thickness 170 mm  
Retention volume approx. 161 l/m<sup>2</sup>

With an especially high retention volume and a closed, load-distributing structure, the WRB 170 is suitable for extensive and intensive greening as well as under traffic areas.

# NOT JUST ECOLOGICAL BUT ALSO ECONOMICAL

The versatile design options for green roofs with Water Retention Boxes from OPTIGRÜN open up additional potential - synergies that reduce the ecological footprint and achieve economic goals at the same time.



WRB 85 as pre-assembled, large format element – for installation in no time at all.

## SERVICES

OPTIGRÜN prepares the necessary calculations for your construction project and takes over the dimensioning of retention areas on roof surfaces and in civil engineering. Proof of overflow, determination of the water balance and proof of discharge quantities: OPTIGRÜN offers professional planning support with the rainwater simulation programme RWS – even for complex, interconnected areas and stormwater management systems.

**OPTIGRÜN PREMIUM SERVICE –  
free of charge for you!**

SERVICE REQUESTS:

<https://www.optigruen.com/planning-aids/checklists/>



## EASY APPLICATION FOR A PRACTICAL SOLUTION

Water Retention Boxes as pre-assembled, large format elements allow considerable time savings during installation.

The format of the elements and their low weight allow for quick installation and convenient handling. In the Water Retention Boxes WRB 85, 95 and 170, connectors create a stable bond between the individual elements and prevent them from slipping. Some of the WRBs are available with Capillary Bridges, factory fitted, so that it is not necessary to insert them on the construction site.

## ECONOMIC PRODUCT WITH MAJOR BENEFITS

A retention roof with Water Retention Boxes is an economical solution for stormwater management in many ways. By using the elements in the system solution, the number of roof outlets and the associated pipes and break-throughs can be reduced. No slope insulation is required and infiltration systems, such as underground attenuation tanks, can be dimensioned smaller or even be omitted.

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