

AQUABOX



**MODULAR
RAINWATER MANAGEMENT
GEOCELLULAR SYSTEM**

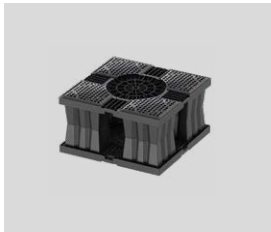


CONCEPT

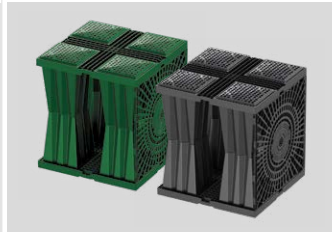
Sustainable drainage systems made by Geoplast are an alternative to the traditional approach of collecting stormwater in pipes or gravel trenches and discharging it into treatment plants or watercourses.

Drainage systems contribute to sustainable development and improve the places and spaces where we live and work by balancing the different opportunities and challenges that influence urban design and the development of communities. The rainwater flow management approach aims to protect local watercourses from contamination carried by surface runoff, encourage natural groundwater recharge and reduce the likelihood of downstream flooding.

AQUABOX CUBE



AQUABOX



THE SOLUTION

Aquabox is a modular underground retention unit made of polypropylene, designed for the sustainable management of rainwater.

Built areas can suffer flooding due to lack of proper rainwater management. Aquabox is used for controlling a rainwater by creating infiltration, storage and retention basins or collection tanks to reuse water and turn it into a resource.

The elements are assembled on site and joined by high-strength connectors that ensure the stability of the basin.

Thanks to its high mechanical resistance, Aquabox can be installed both in urban areas and in industrial/commercial areas subject to heavy vehicle traffic.

RAINWATER INFILTRATION

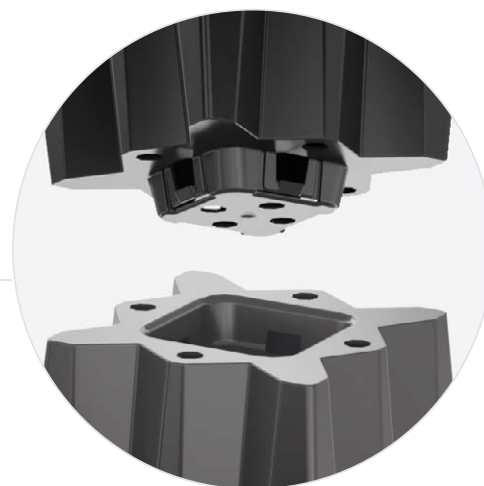
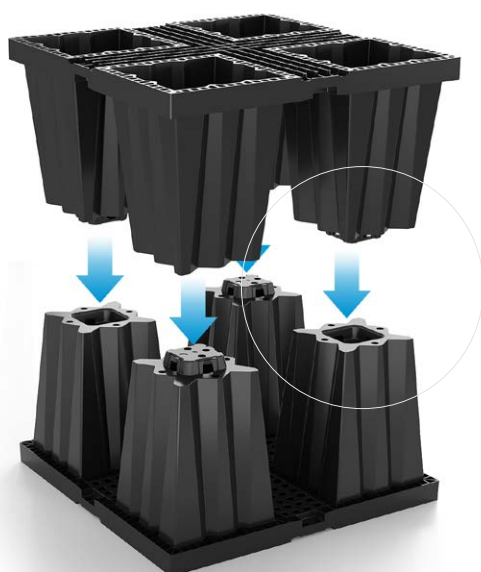
STORMWATER ATTENUATION

RAINWATER HARVESTING

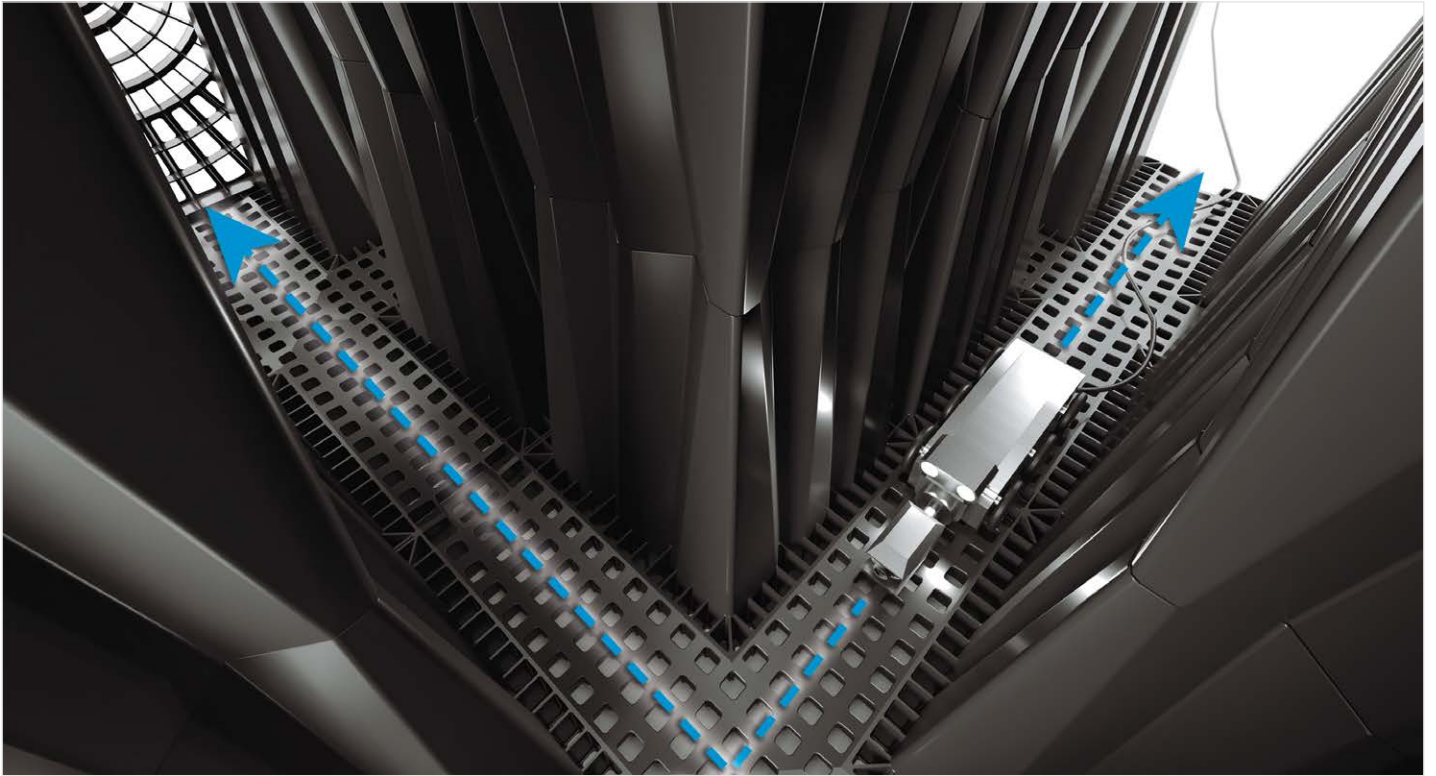


THE AQUALOCK CONNECTOR

The functional design has led to the development of the Aqualock snap-lock connector, that allows a quick, intuitive and safe assembly.



ADVANTAGES



Each Aquabox module is formed by coupling two semi-modules. The system is composed of a series of modules joined by snap-lock clips and confined by lateral grids and upper closing covers: all these elements together create structural voids suitable for underground rainwater management.

360° INSPECTABLE

The internal configuration of the modules makes the system easily accessible for inspection, routine maintenance and cleaning.

The cavities are designed to allow the entrance of a wheeled camera to make a video inspection of the basin in any direction and on all levels.

UNIVERSAL SOLUTION

Aquabox meets the most stringent urban planning restrictions, offering a universal solution for the construction of infiltration, attenuation/retention and stormwater harvesting basins.

The low weight of the elements (just 20 lb) facilitates the installation of the basin and allows safe working conditions.

HIGH CAPACITY

The Aquabox system allows storage volumes of rainwater equal to 96% of the nominal volume of the basin, guaranteeing a void ratio that is 3 to 4 times higher than gravel, with consequent savings in the surfaces used and a reduction in excavation depth.

Aquabox will reduce the risk of flooding in impervious urban areas.

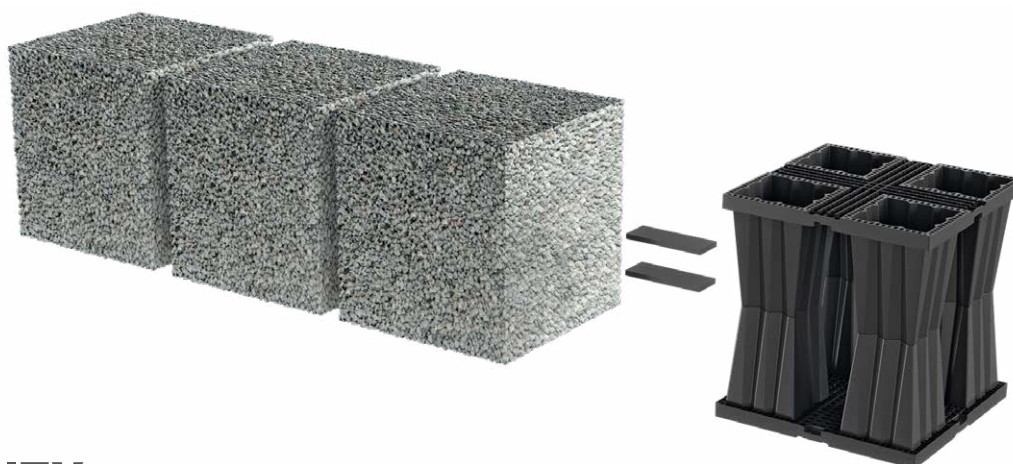
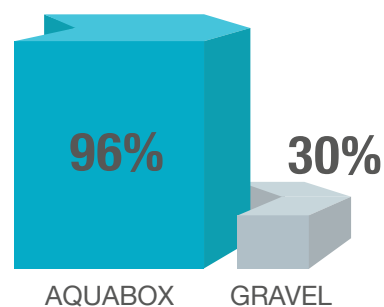
THE CONCEPT

HIGH VOID RATIO

Aquabox is an alternative to gravel pits.

The assembled module guarantees a void ratio that is 3 times greater than gravel.

Due to its geometry, Aquabox stores a high volume of rainwater while significantly reducing the volume of excavation.



CAPACITY

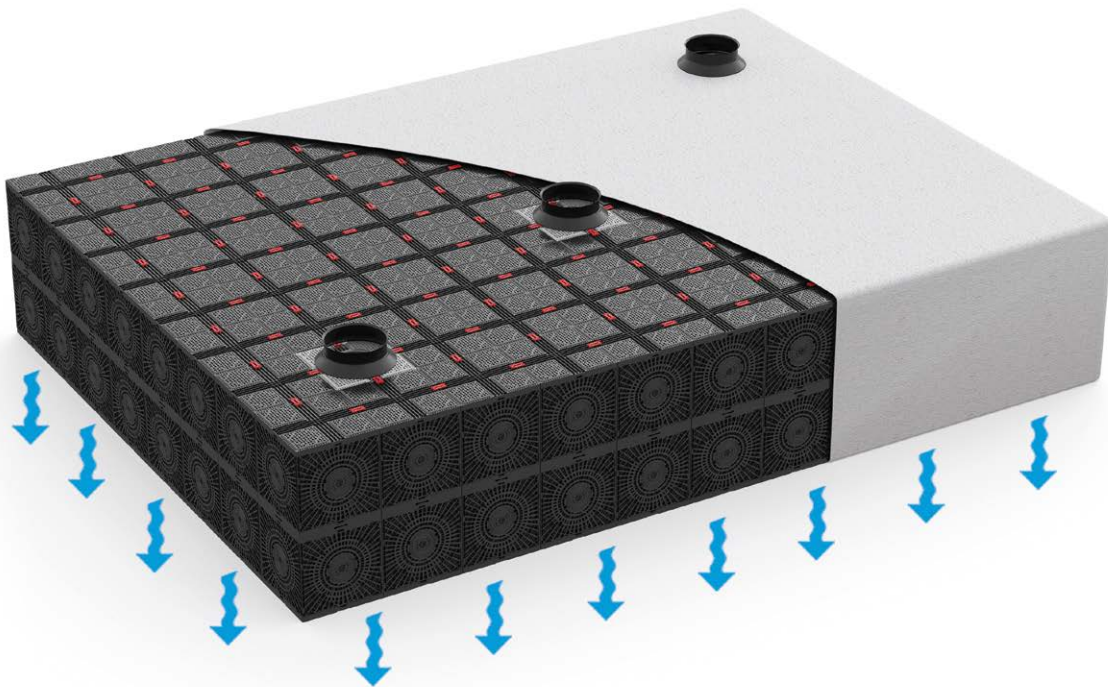
Each assembled Aquabox element offers a water storage capacity of 432 litres (nominal 450 litres).

Designers and clients prefer the Aquabox system over traditional systems (gravel and pipes) thanks to its very high void ratio (96%).

The columns are completely permeable: water will pass through them, and therefore they are part of the useful storage volume of the system.

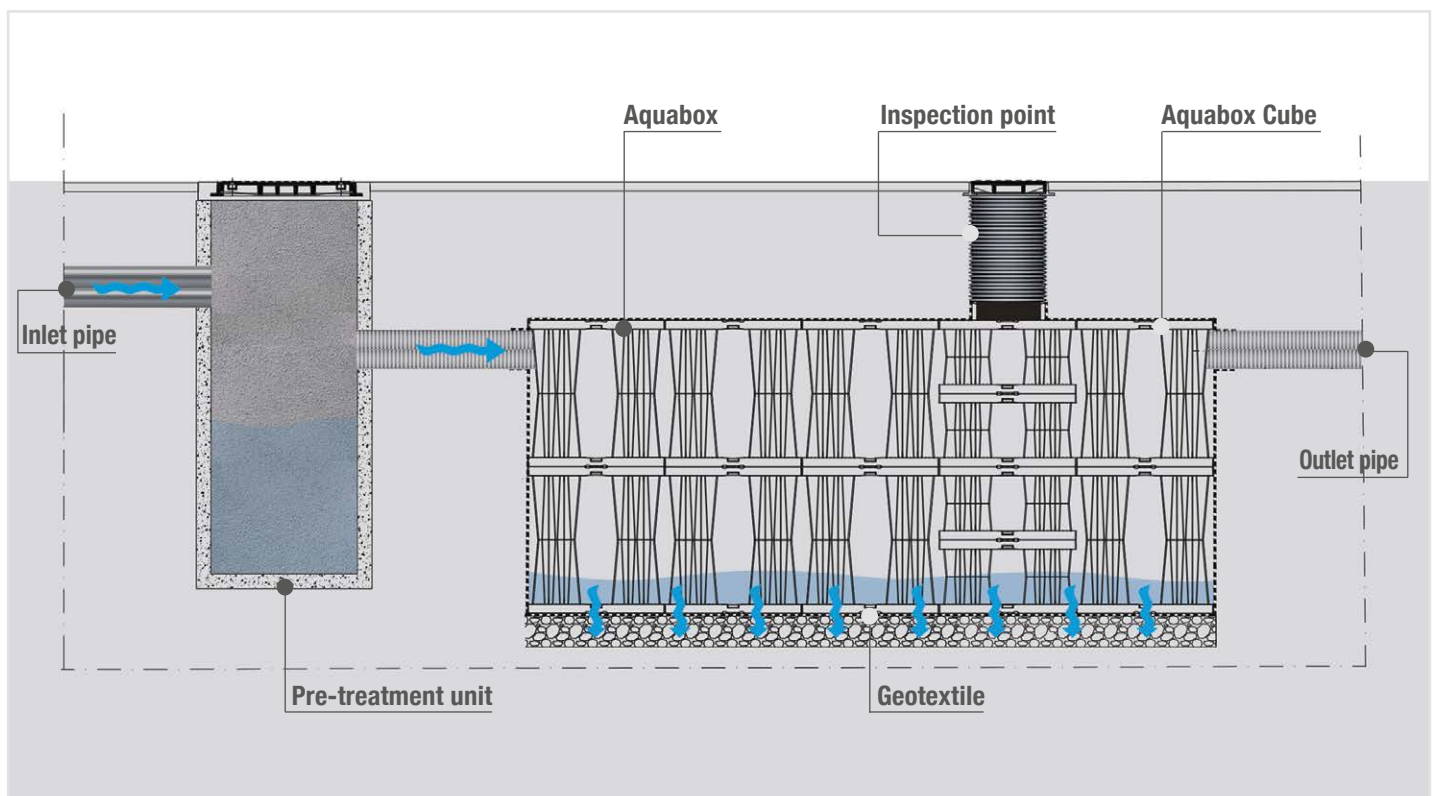


INFILTRATION



The replenishment of groundwater aquifers during heavy rainfalls is a crucial design point in stormwater management regulations. An Aquabox basin is a good solution for rainwater infiltration, promoting its management in situ and contributing to the restoration of the natural water cycle. The system stores incoming water and releases it gradually into the ground. The soil must have geotechnical characteristics of permeability such that it is able to receive the water stored in the Aquabox basin.

Advantage: compared to traditional methods (gravel or pipes) the useful storage volume for equal volume is 3 times higher. This results in a lower cost for digging, excavation work and disposing of the dig material (sand, gravel, stones).



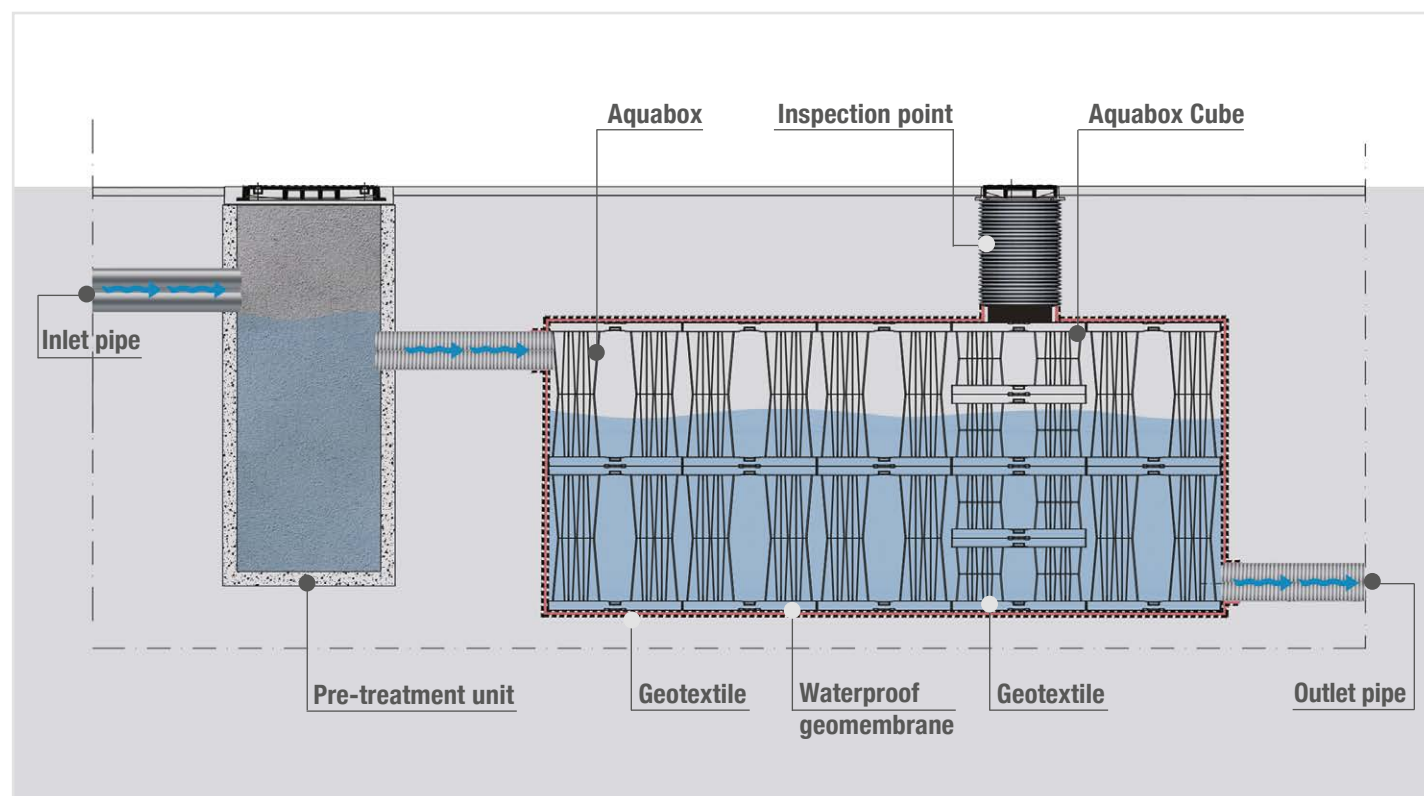
ATTENUATION



Where the permeability of the soil is poor and such that water cannot penetrate into the soil, storage tanks must be built. The attenuation tank allows to attenuate the peak flow rates avoiding the overloading of the sewer and the receiving water bodies.

After filling, the release takes place through a special drain pipe placed in the lowest layer of the basin and designed for gradual outflow rate, not exceeding the maximum discharge rate allowed by the planning authorities.

Advantage: less stress on the water infrastructure. It reduces the flood flow rates that depend on the capacity of the downstream drainage system to convey water.

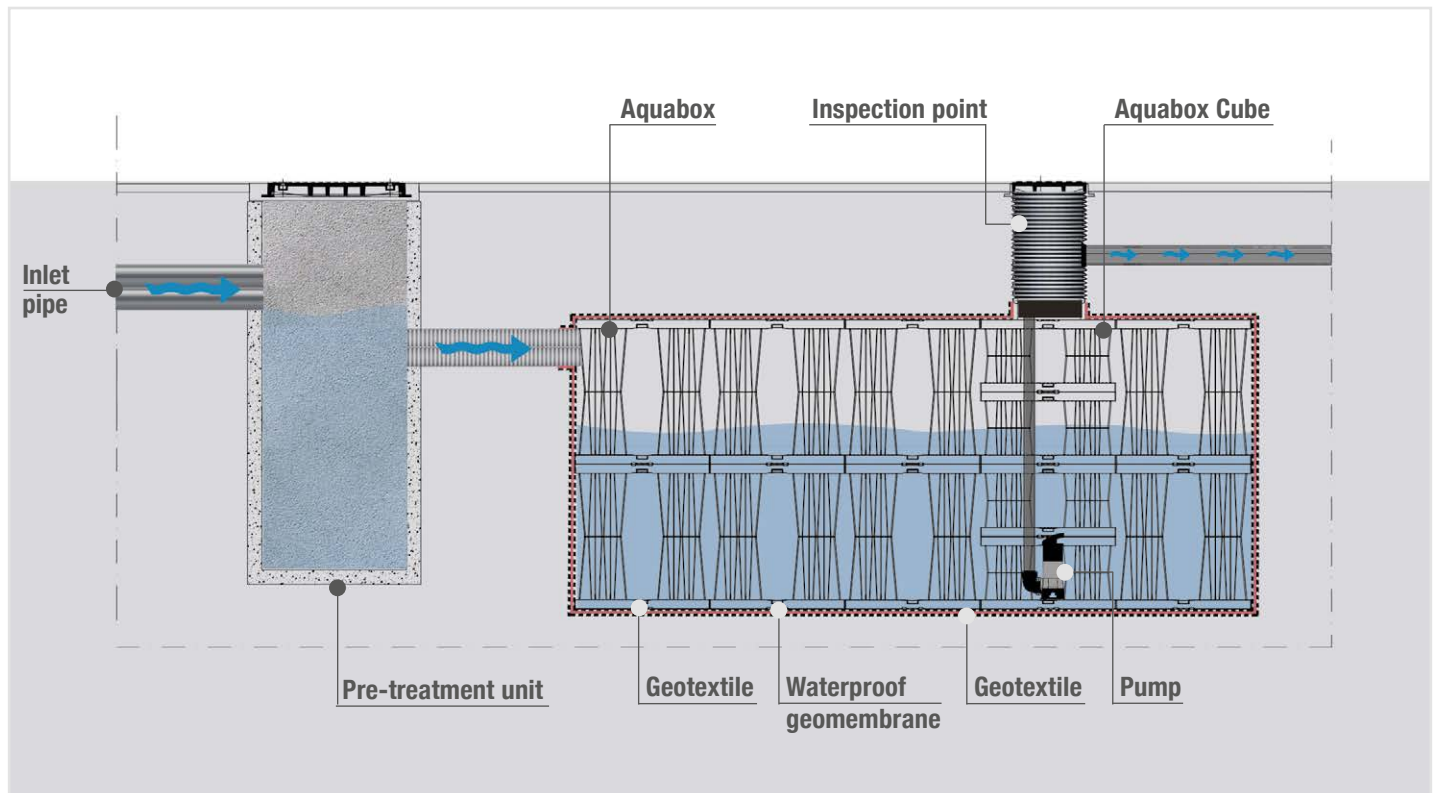


HARVESTING FOR REUSE






The rainwater running off from roofs or other surfaces and harvested for reuse is always channeled through a suitable pre-treatment stage before it can enter the storage tank. The water is conveyed into the Aquabox basin through one or more inlet pipes and is extracted when necessary with a pump housed in a suitably placed Aquabox Cube shaft.

Advantage: lower water supply costs and lower municipal wastewater charges.





CUBE POSITION

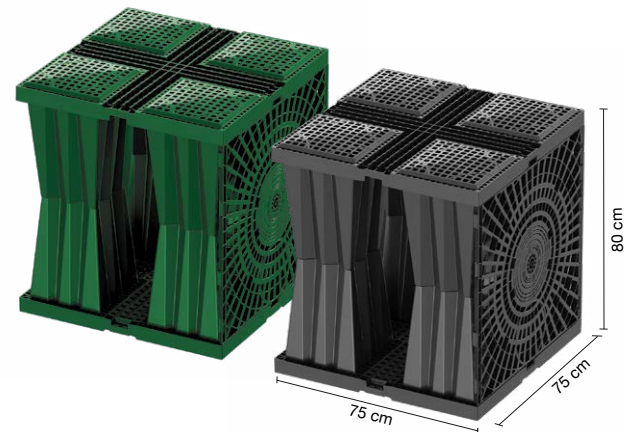
AQUABOX

Aquabox is a modular element in plastic material used for the realization of underground basins for rainwater infiltration, detention and harvesting.

The Aqualock mounting system makes it possible for each module to be pre-assembled by one person without the use of cranes or mechanical means.

Finally, the modules are installed in-situ very quickly; in the case of multi-level basins the single and double connectors guarantee stability and solidity of the basin.

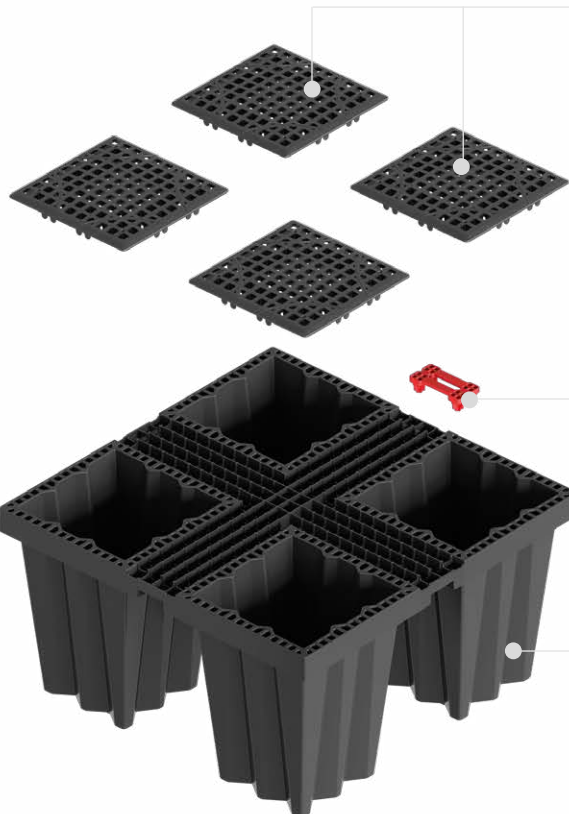
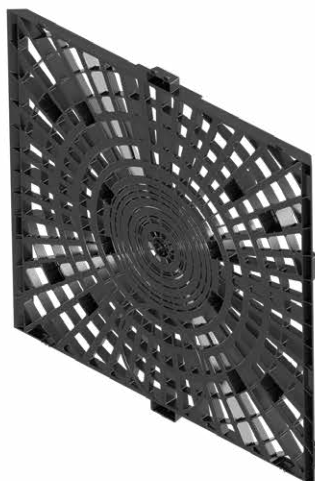
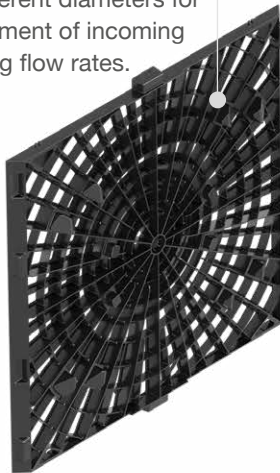
Each Aquabox module is composed by two assembled semi-modules and is 80 cm high.



SIDEWALL GRIDS

Grids are used on the sides of the pit. This allows an even distribution of the lateral loads and the simple laying of geotextiles or waterproof membranes.

Moreover, being pre-shaped, they allow the connection of pipes of different diameters for the management of incoming and outgoing flow rates.



TOP CAPS

The upper surface of each element is equipped with four perforated closing lids that allow the passage of water. At the same time, these closures create a homogeneous walkable surface which is useful both during installation and to distribute the loads acting on the system.

SINGLE JOINT

It allows the simple and quick horizontal connection of the Aquabox modules placed in the last level.

AQUABOX SINGLE

Hollow semi-module formed by 4 truncated-pyramidal pillars.

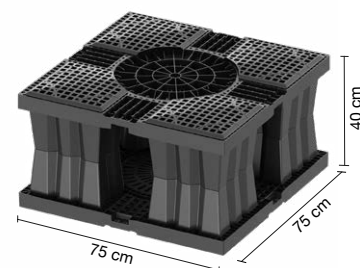
DOUBLE JOINT

Allows quick and easy horizontal connection of the Aquabox modules located in the intermediate levels.

AQUABOX CUBE - INSPECTION

Aquabox Cube is a modular hollow element in virgin or regenerated polypropylene, designed to make inspection shafts for the management of Aquabox underground basins.

The modularity of the elements always allows the installation in all basins, even multi-layered ones. Four assembled Aquabox Cube elements measure 80 cm high, the equivalent of two assembled Aquabox elements.



CUBE SIDEWALL GRIDS

Grids are used on the sides of the trench. This allows a even distribution of side loads and the simple installation of geotextiles or waterproofing membranes. Moreover, being pre-shaped, they allow the connection of pipes of different diameters for the management of incoming and outgoing flow rates.

CUBE TOP CAP

The upper surface of each element is equipped with four perforated closing caps that allow water to pass through. At the same time, these caps create a homogeneous surface that can be walked on, which is useful both during installation and for the distribution of the loads acting on the system.

SINGLE JOINT

Allows quick and easy horizontal connection of the Aquabox Cube modules with the Aquabox modules located in the last level of the basin.

AQUABOX CUBE SINGLE

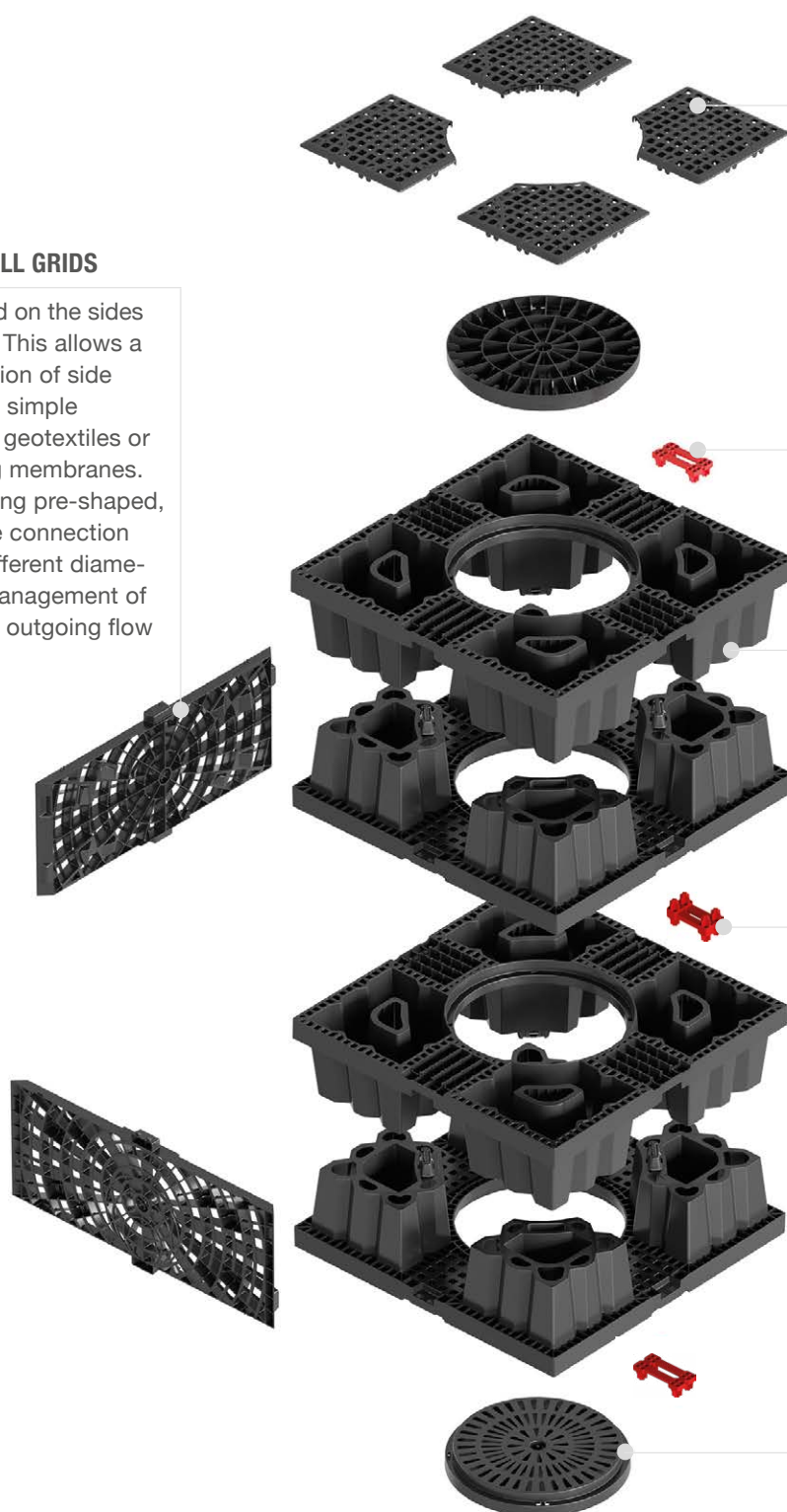
Hollow half module.

DOUBLE JOINT

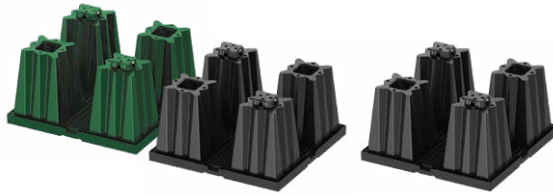
Allows quick and easy horizontal connection of the Aquabox Cube modules with the Aquabox modules located in the intermediate layers.

D4 CAP

Circular cover for closing the shaft.



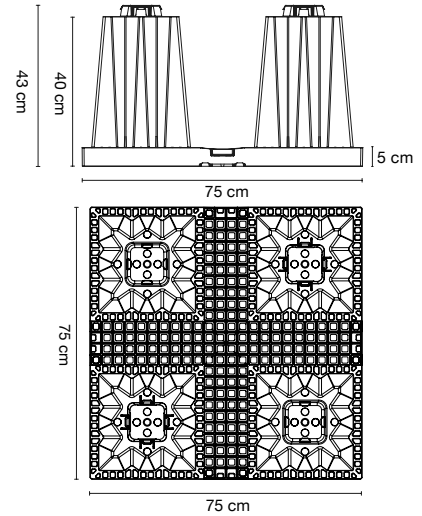
TECHNICAL DATA



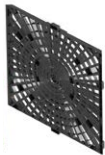
AQUABOX HP

AQUABOX

Dimensions (cm)	75 x 75 x H43	75 x 75 x H43
Material	PP Compound HP	PP Compound
Net storage volume (l/pcs)	216	216
Void ratio	96%	96%
Package size (cm)	75 x 150 x H250	75 x 150 x H250
Product code	EDAQUABV400	EDAQUAB0400

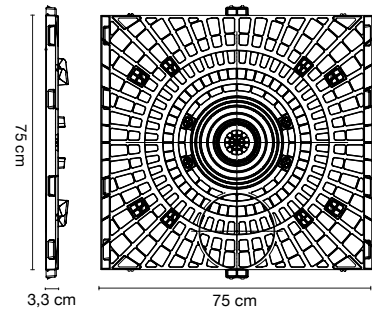


SYSTEM COMPONENTS



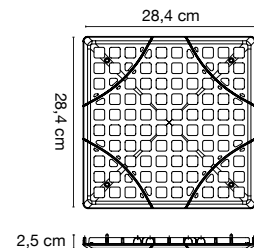
**HP SIDEWALL GRID
SIDEWALL GRID**

Dimensions (cm)	75 x 75 x H3,3
Material	PP
Colour	Green - Black
Connection (DN/OD)	100, 110, 125, 160, 200 225, 250, 315, 400, 500
No. pieces per pallet	216
Product code	EDAQSWG033 (HP) EDAQSWG0033



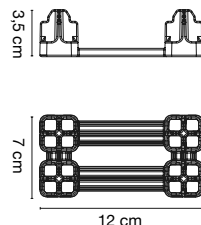
**HP TOP CAP
TOP CAP**

Dimensions (cm)	28,4 x 28,4 x H2,5
Material	PP
Colour	Green - Black
No. pieces per pallet	540
Product code	EDAQTOCV024 (HP) EDAQTOC0024



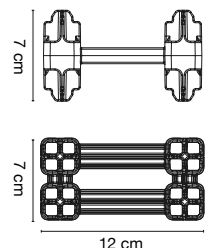
HP SINGLE JOINT

Dimensions (cm)	12 x 7 x H3,5
Material	PP
Colour	Red
No. pieces for bag	400
Product code	EDAQJOI0035

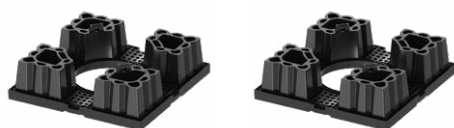


HP DOUBLE JOINT

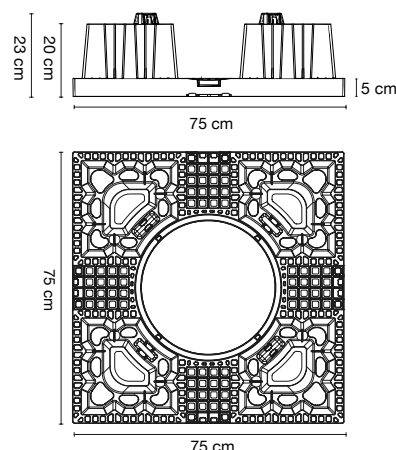
Dimensions (cm)	12 x 7 x H7
Material	PP
Colour	Red
No. pieces for bag	300
Product code	EDAQJOI0070



TECHNICAL DATA AQUABOX CUBE

**AQUABOX CUBE HP****AQUABOX CUBE**

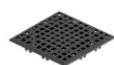
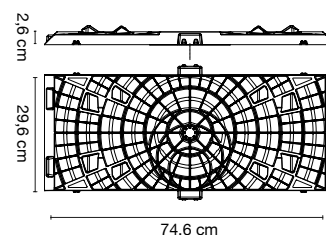
Dimensions (cm)	75 x 75 x H23	75 x 75 x H23
Material	PP Compound HP	PP Compound
Net storage volume (l/pcs)	106	106
Void ratio	94%	94%
Package size (cm)	75 x 150 x H250	75 x 150 x H250
Product code	EDAQUBCV200	EDAQUBC0200



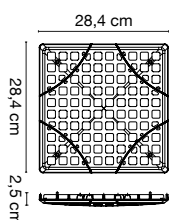
SYSTEM COMPONENTS

**CUBE HP SIDEWALL GRID
CUBE SIDEWALL GRID**

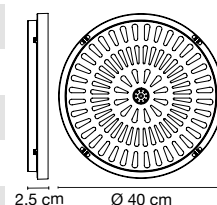
Dimensions (cm)	74,6 x 29,6 x H2,6
Material	PP
Colour	Green - Black
Connection (DN/OD)	100, 160, 200
No. pieces per pallet	420
Product code	EDAQSWG026 (HP) EDAQSWG0016

**HP TOP CAP
TOP CAP**

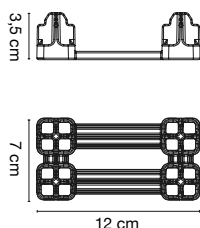
Dimensions (cm)	28,4 x 28,4 x H2,5
Material	PP
Colour	Green - Black
No. pieces per pallet	540
Product code	EDAQTOCV024 (HP) EDAQTOC0024

**D4 HP CAP
D4 CAP**

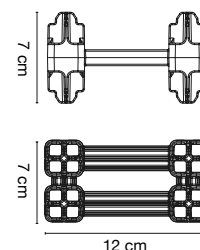
Dimensions (cm)	Ø40
Material	PP
Colour	Green - Black
No. pieces per pallet	220
Product code	EDAQCCDV400 (HP) EDAQCCD0400

**HP SINGLE JOINT**

Dimensions (cm)	12 x 7 x H3,5
Material	PP
Colour	Red
No. pieces for bag	400
Product code	EDAQJOI0035

**HP DOUBLE JOINT**

Dimensions (cm)	12 x 7 x H7
Material	PP
Colour	Red
No. pieces for bag	300
Product code	EDAQJOI0070



AQUABOX HP (HIGH PERFORMANCE) FOR HEAVY GOODS VEHICLES

The choice of Aquabox HP is based on the depth of the excavation, the storage volume required and the type of vehicle passage (applied loads).

With Aquabox HP it is possible to create basins with multiple levels with a minimum basin cover of 80 cm (DIN 1054).

Underground drainage basins with Aquabox HP allow the overlying surfaces to be used for the following purposes:

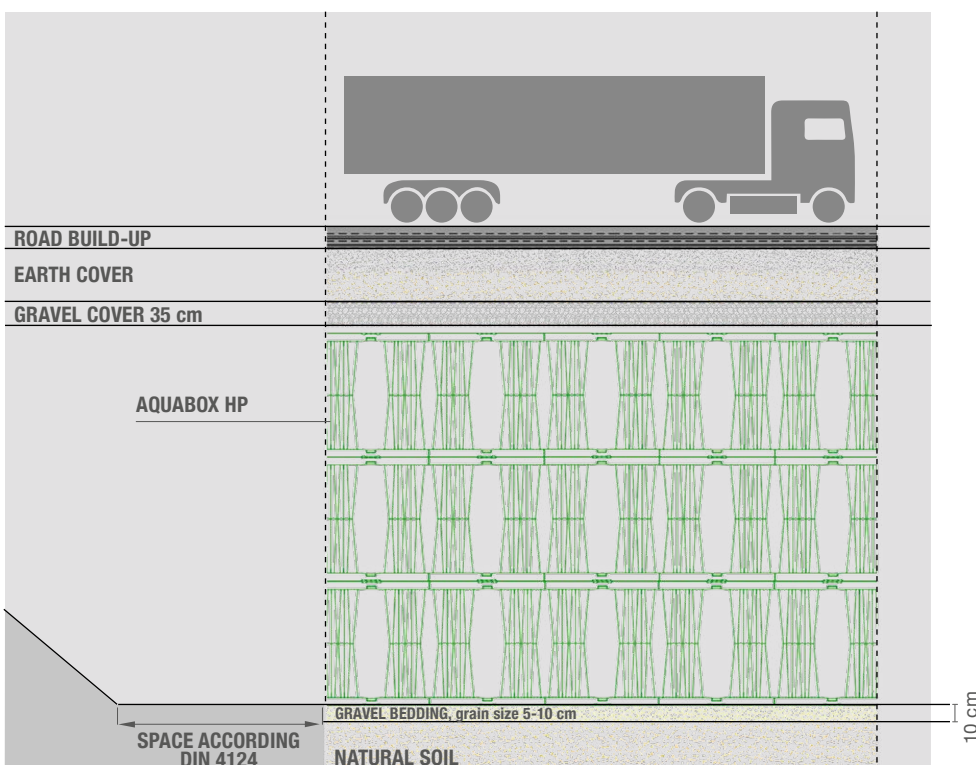
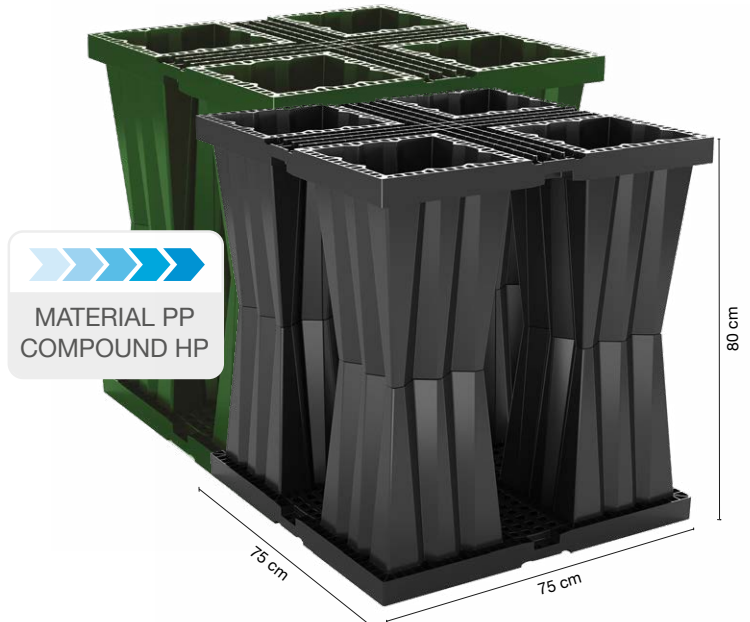
DRIVEWAY AREAS SLW 60 / HGV 60

ACCESS RAMPS FOR HEAVY GOODS VEHICLES

ACCESS ROADS TO RESIDENTIAL AREAS

ACCESS ROADS TO INDUSTRIAL AREAS

**PARKING AREAS FOR SPECIAL VEHICLES
(TRUCK MIXERS, FIRE ENGINES)**

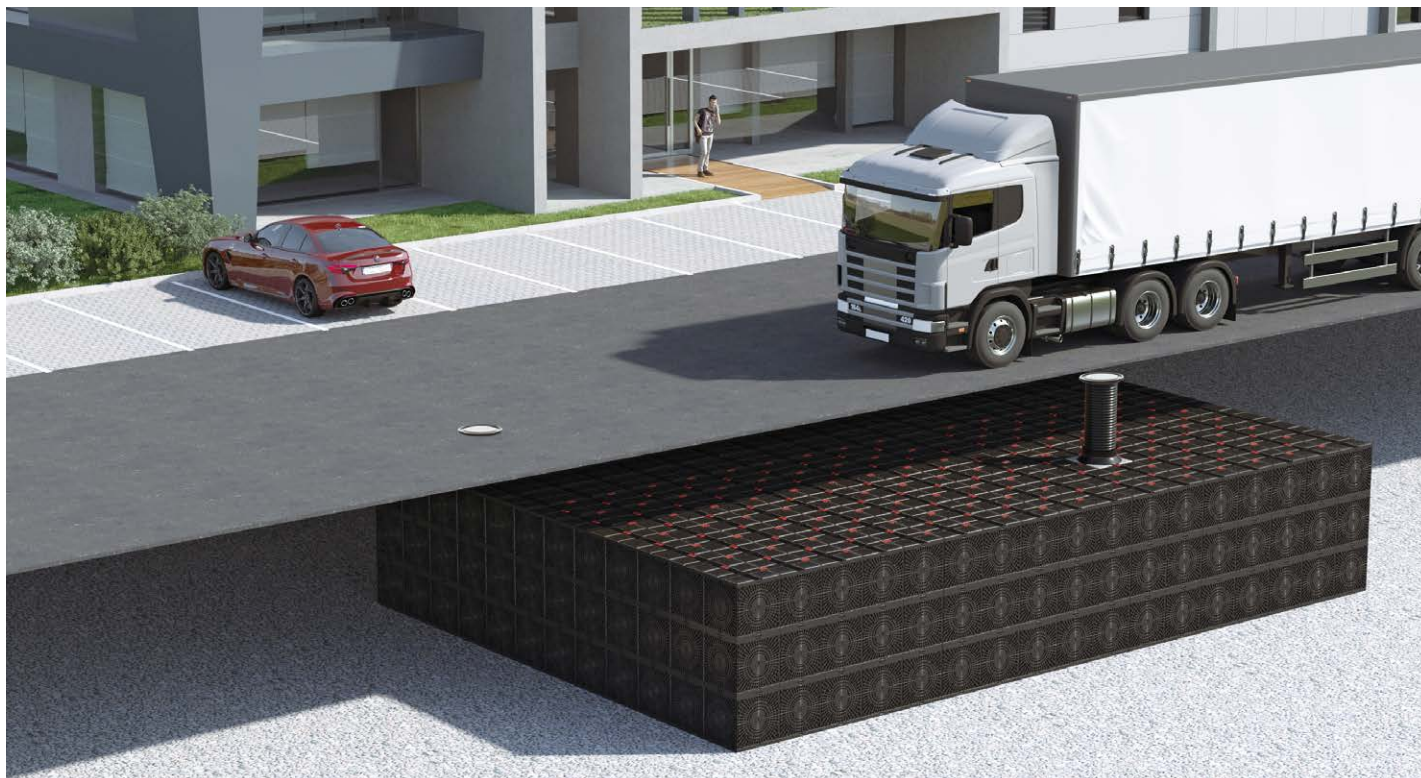


When building a road surface, it is necessary to provide an upper levelling layer, preferably consisting of a gravel sub-base with a thickness of at least 350 mm.

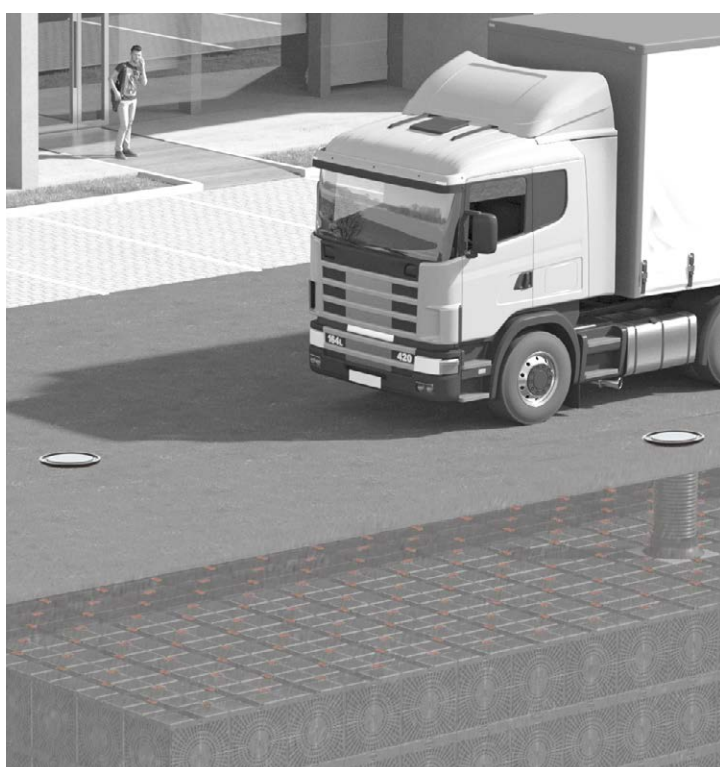
Aquabox HP is suitable for traffic loads up to SLW 60 / HGV 60.

An analysis specific to your project can be prepared by Geoplast's technical department which, depending on the project, can assess the maximum depth of cover.

AQUABOX HP (HIGH PERFORMANCE) FOR HEAVY GOODS VEHICLES



Aquabox HP is suitable for the passage of heavy vehicles, load class SLW 60 / HGV 60. The basin is equipped with access points for inspection and cleaning of the basin. Aquabox is designed to last at least 50 years.



SLW 60
HGV 60



AQUABOX

FOR CARS AND COMMERCIAL VEHICLES

The choice of Aquabox is based on the depth of the excavation, the storage volume required and the type of vehicle passage (applied loads).

With Aquabox it is possible to create basins with multiple levels with a minimum basin cover of 80 cm (DIN 1054).

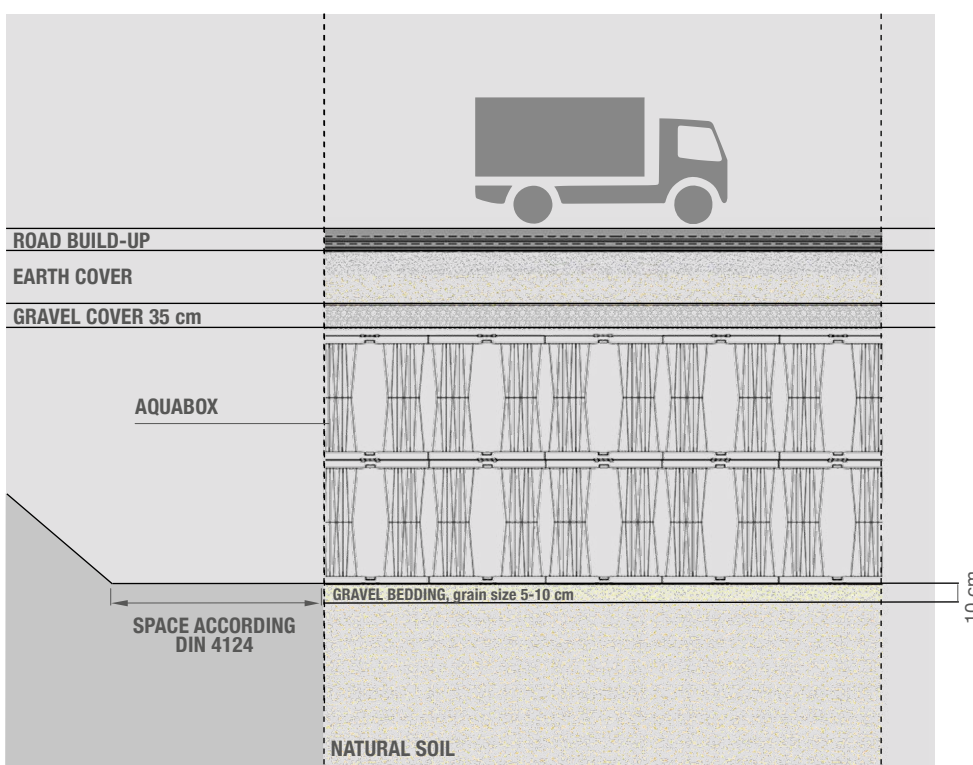
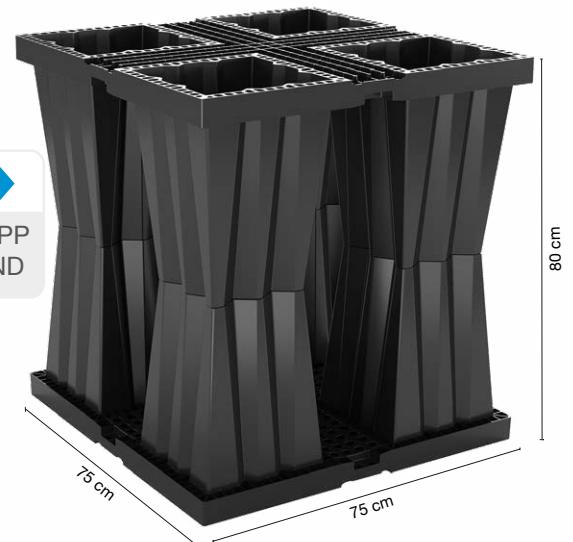
Underground drainage basins with Aquabox allow the overlying surfaces to be used for the following purposes:

GREEN AREAS WITH PASSAGE OF VEHICLES

PEDESTRIAL AREAS

DRIVEWAY AREA SLW 30 / HGV 30

ACCESS ROADS TO RESIDENTIAL AREAS



When building a road surface, it is necessary to provide an upper levelling layer, preferably consisting of a gravel sub-base with a thickness of at least 350 mm.

Aquabox HP is suitable for traffic loads up to SLW 30 / HGV 30.

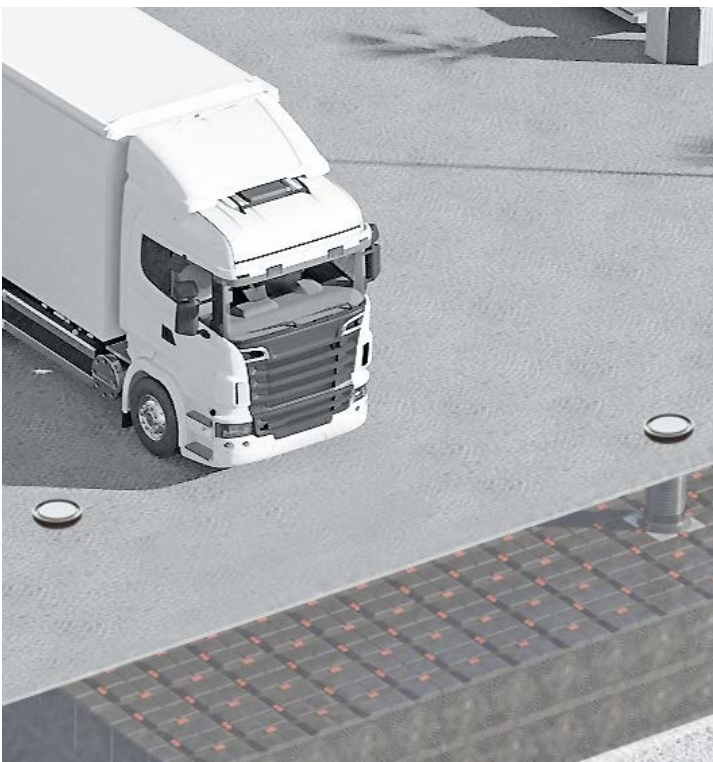
A project of specific stability analysis can be prepared by Geoplast's technical department which, depending on the project, can assess the maximum depth of cover.

AQUABOX

FOR CARS AND COMMERCIAL VEHICLES



Aquabox HP is suitable for the passage of vehicles with load class SLW 30 / HGV 30. The basin is equipped with access points for inspection and cleaning of the basin. Aquabox is designed to last at least 50 years.



360° INSPECTION AND CLEANING



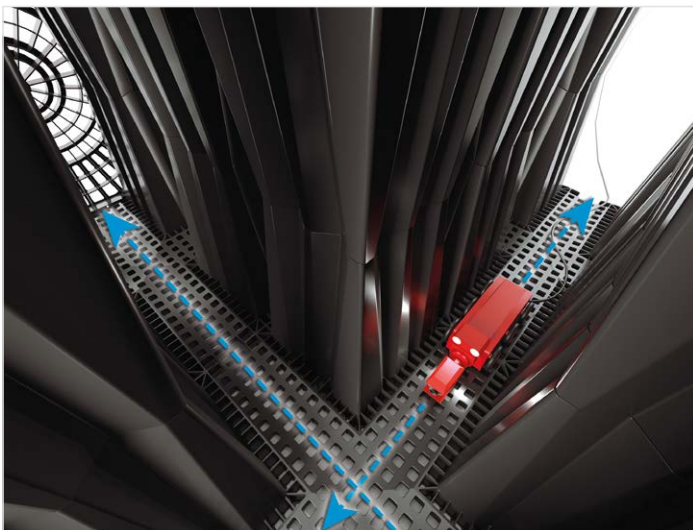
INSPECTION WITH SWIVEL CAMERA



Both during testing and once in operation, the basin must be inspected by a specially designed camera.

Accessibility is always guaranteed by the Aquabox Cube maintenance shafts that allow access to the basin in depth.

The structure of Aquabox offers great visibility and accessibility in every axis of the basin. The operator on the surface receives a live video stream on the whole inspection operation of the basin and the tubes, which can be recorded for offline viewing.

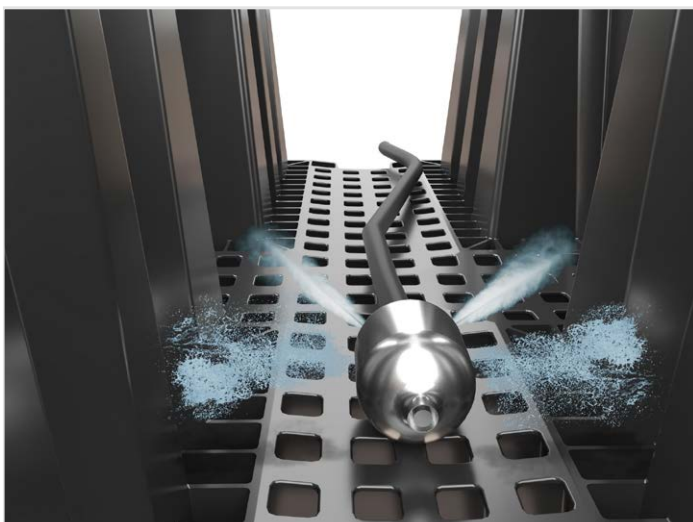


360° INSPECTION ON ALL LEVELS AND IN ALL DIRECTIONS



Inspection with a special wheeled camera gives the opportunity to verify the true internal situation of the basin, evaluating its state of repair and the presence of silt deposits.

The concave surfaces of the Aquabox tunnels guarantee the easy passage of an inspection robot.



HIGH PRESSURE WASHER OF INTERNAL CHANNELS



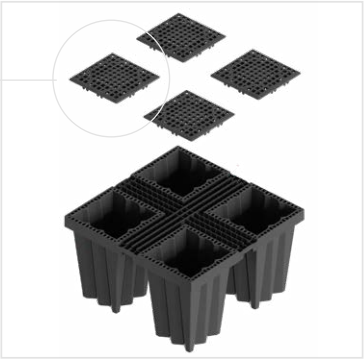
The internal structure should be cleaned by means of a high-pressure jet cleaner, accessing the basin through the Aquabox Cube shafts located downstream.

Depending on need and situation, the jets be directed forwards or backwards.

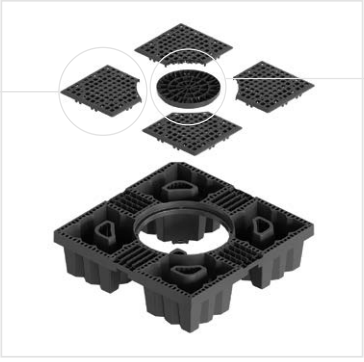
With more than 300 meters of hose length the nozzle of the pressure washer will reach every point of the basin and perform a complete cleaning.

SYSTEM COMPONENTS

TOP CAPS AND D4 CAP



The top cap is a universal closing element for Aquabox and Aquabox Cube. It should only be installed in the highest level of the Aquabox Cube cockpit. The Aquabox Cube module is closed with 4 pre-cut caps. Circular cover D4 is available for the lower (on the ground level) and, if necessary, the upper level of the Aquabox Cube module, when not used as access point to the basin.



INSPECTION SHAFT ACCESSORIES

	LID Ø400 mm	
	TUBE ADAPTER Telescopic adapter - Ø400 mm	
	CORRUGATED TUBE Ø400 mm	
	SEAL RING Ø400 mm	
	SHAFT ADAPTER DN 600/315 mm	

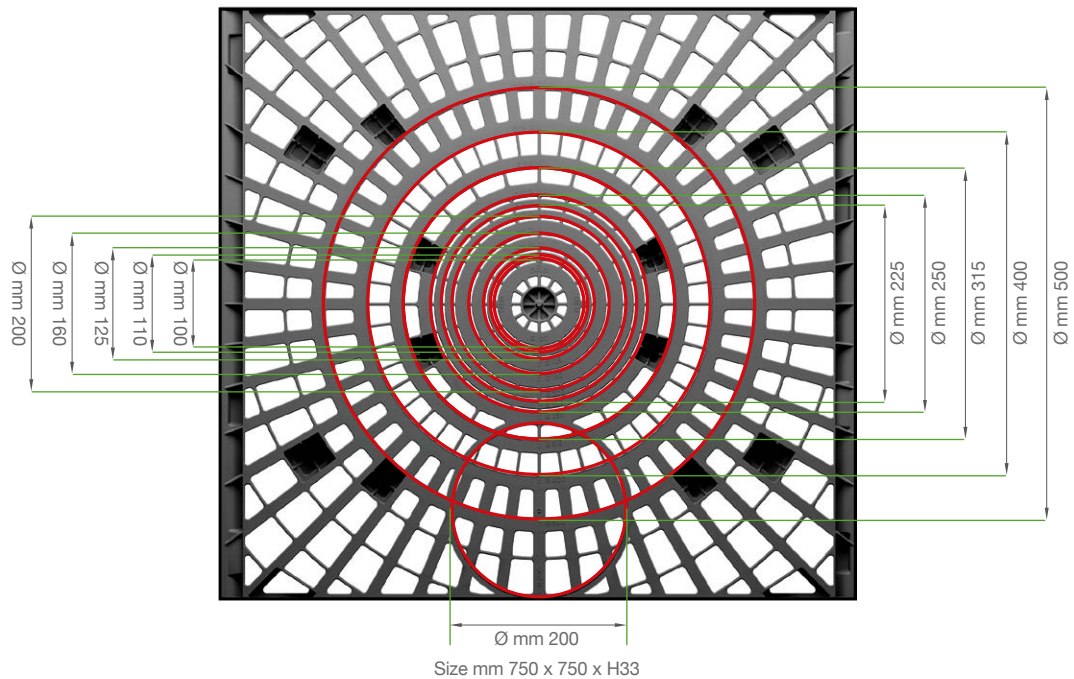
AQUABOX SIDEWALL GRID

The Aquabox sidewall grid is used to close the lateral surface of the basin and is fixed to Aquabox with a simple integrated clip.

Each grid is equipped with templates corresponding to the market-standard diameters for inlet/outlet pipes.

The sidewall grids are designed to close the side of the basin and perfectly support the membranes chosen to wrap it.

DIAMETERS FOR INLET/OUTLET PIPE CONNECTION



DN/OD 100

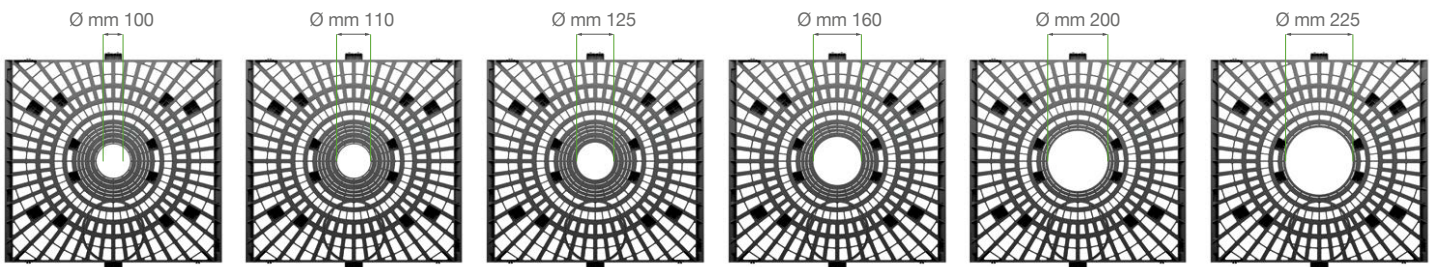
DN/OD 110

DN/OD 125

DN/OD 160

DN/OD 200

DN/OD 225



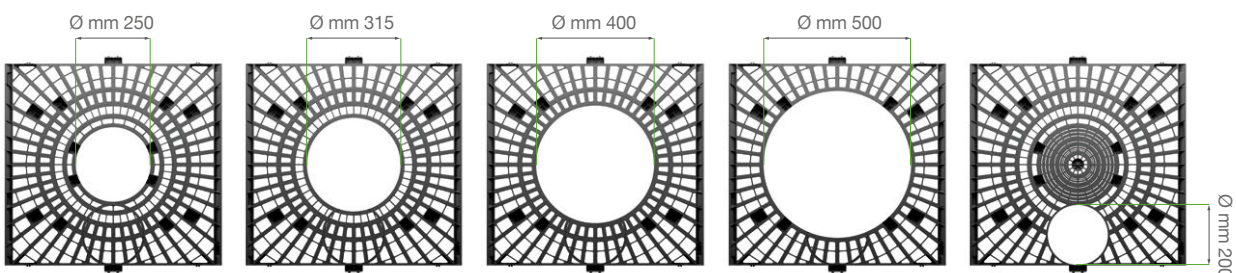
DN/OD 250

DN/OD 315

DN/OD 400

DN/OD 500

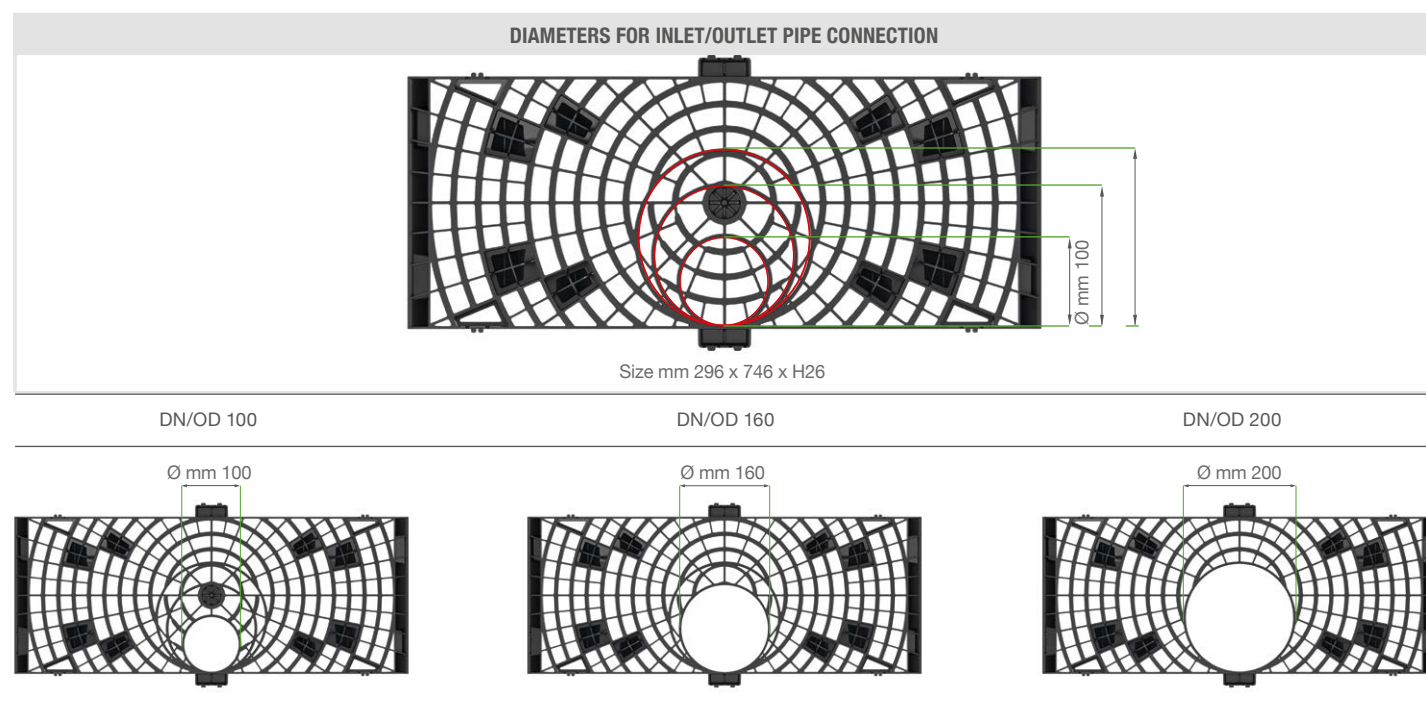
DN/OD 200



AQUABOX CUBE SIDEWALL GRID

The Aquabox Cube sidewall grid is used for the side closing of each module when the access point is installed at the perimeter or at the edge of the basin.

If the Aquabox Cube is used inside the basin, no side grid is required.



STORMWATER MANAGEMENT



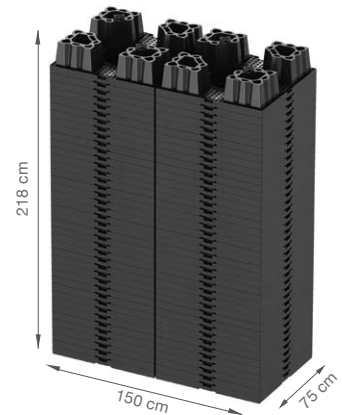
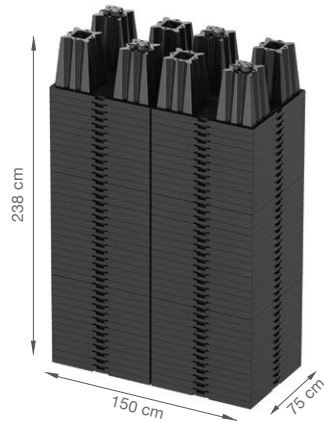
STORAGE AND ASSEMBLY

The innovative design of Aquabox makes stacking the elements very easy, reducing the space used for storage and transport of materials on site.

Stacking

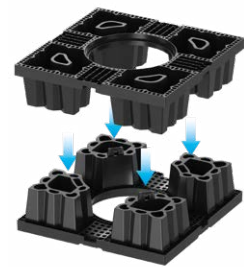
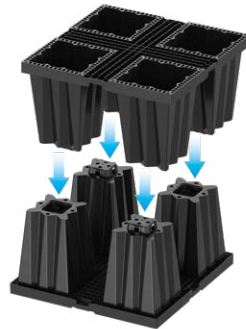
The modules are stackable and are supplied on pallets of 80 pieces, which are equivalent to 18 m³ each.

The dimensions of the pallet are 75 x 150 x h250 cm.



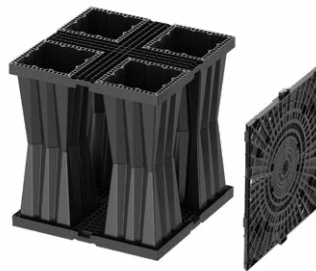
Easy to install

The “Aqualock” locking system joins two semi-modules, which are assembled before the installation in the basin.



Ready for use

Once assembled, the Aquabox modules are ready to be laid in the excavation to create the basin. The side walls also serve as connections for the inlet or outlet pipe.



88%

REDUCTION OF STORAGE SURFACE

compared to non-stackable infiltration/attenuation crates

SIMPLIFIED LOGISTICS

A classic articulated lorry measuring 13.6x2.45x2.5 m allows to transport 27 pallets measuring 150x75 cm.

Thanks to its shape and stackability, the total volume of product transported per articulated truck is 480 m³.

This reduces CO₂ emissions considerably when compared to the number of vehicles needed to transport the equivalent storage volume in gravel.



480 m³ = 2160 units

package size
75 x 150 H250



COMPARISON BETWEEN GRAVEL AND AQUABOX

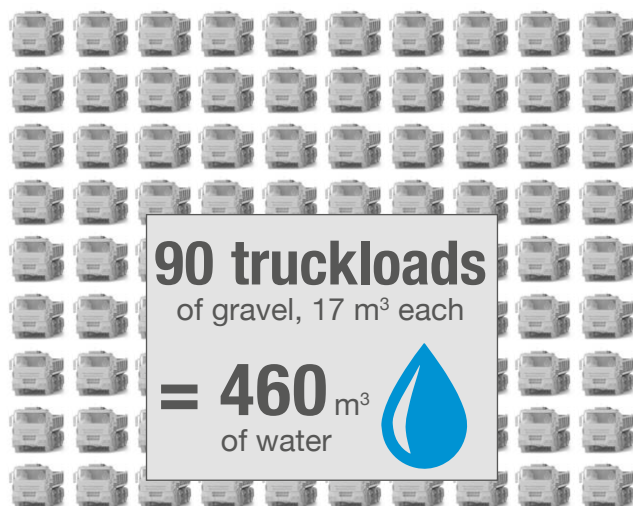
To build a basin of about 500 m³ it is possible to use the Aquabox system moving only 1 articulated truck compared to the traditional gravel solution, which requires 90 truckloads.

The advantages are obvious and countless:

LOGISTICS: 1 vs. 90 trucks.

ECONOMIC: fuel saving, less wear and tear on vehicles, reduction in man-hours and use of earthmoving machinery.

ENVIRONMENTAL: lower CO₂ emissions, less disfigurement of the landscape.



90 truckloads
of gravel, 17 m³ each

= 460 m³
of water



VS

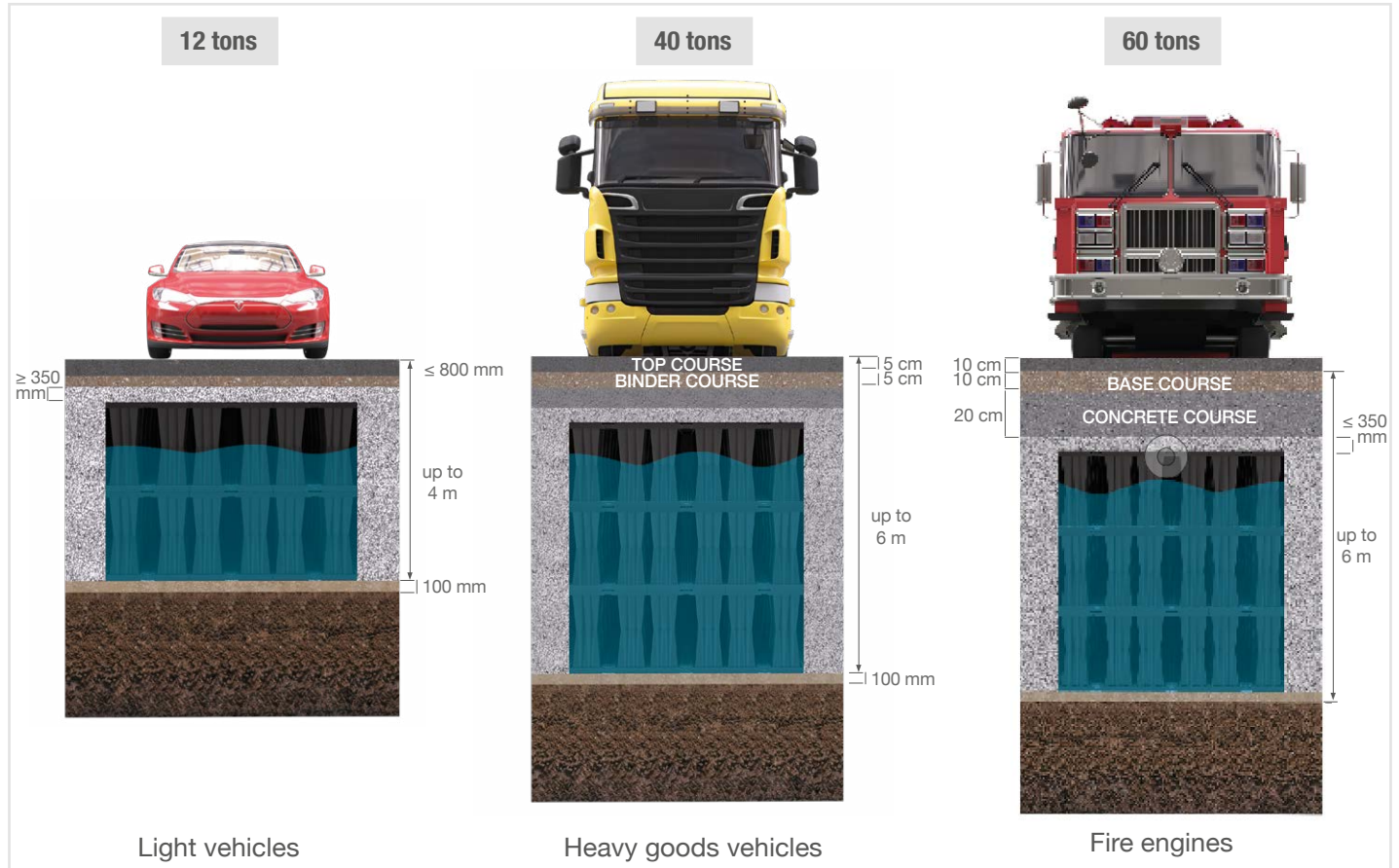
1 truckload
of Aquabox (480 m³)

= 460 m³
of water



BUILD-UP AND LOAD CLASSES

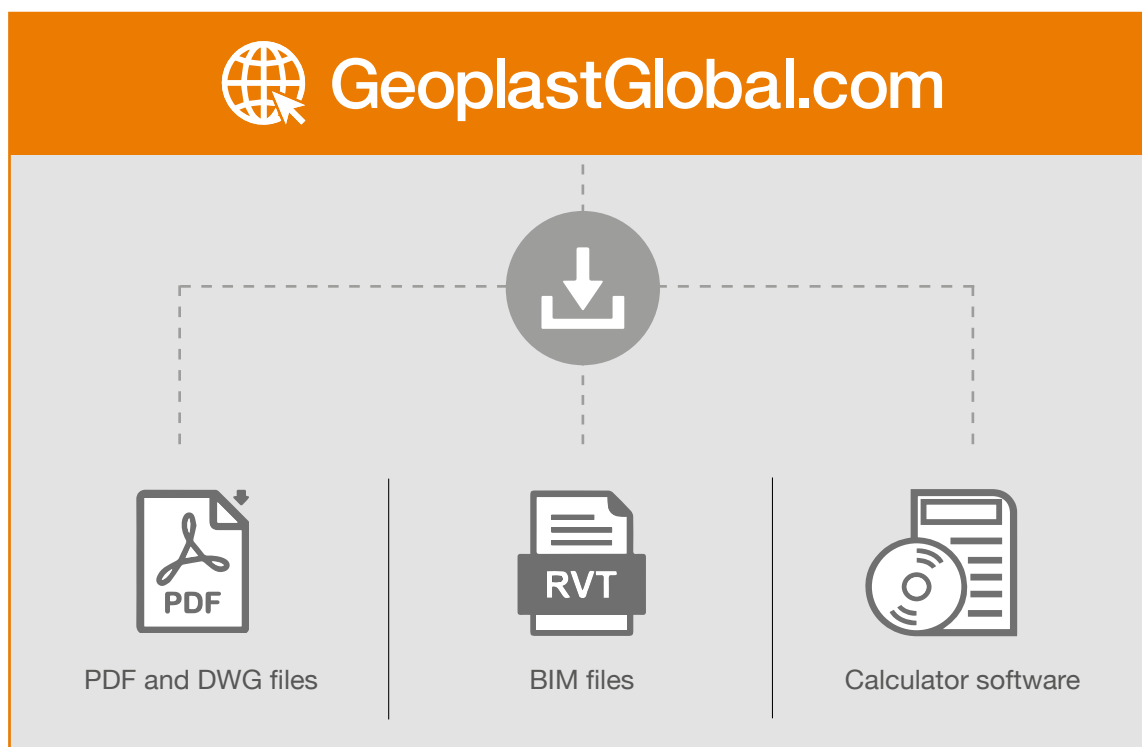
Depending on the loads applied, the area where the basin will be created and the height of the water table, we can create basins of different depths (stacking levels).



OUR CONSULTING SERVICES

The Geoplast website provides every kind of literature to give a concrete technical support to designers and installing companies. It's possible to download drawings in format PDF as well as CAD files in DWG format, or alternatively the BIM files.

Moreover, designers and/or engineers can compare and share project information with Geoplast's engineers, who will be happy to carry out feasibility analysis and dimensioning of rainwater collection/infiltration systems.





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Building beyond together

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