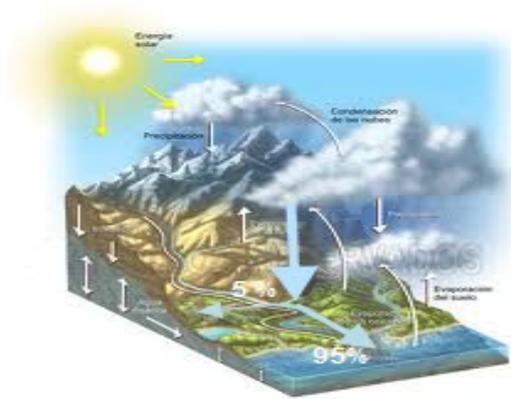


## HIDROBOX: SUSTAINABLE URBAN DRAINAGE SYSTEM



## INTRODUCTION: THE CURRENT DRAINAGE SYSTEMS

In urban areas there are constantly serious problems of flooding and impoverishment of the natural rivers courses as a consequence of extensive impermeable areas. If we add the deterioration of the systems to collect the rainwater we create a grave fault in the management of the surface water drainage, both in volume and quality.



*Surface water drainage in rural area*



*Surface water drainage in urban area*

Along the years, the most common practise has been to transfer the water through pipes outside the city. The city courses have been channelled and the sewage networks deigned to collect and transport all the superficial water. Due to this practise, rivers have lost its natural diversity and natural ways to response against flood events, whereas the sewage networks can not absorb the amount of additional water from the new housing developments.



*Flood events produced by the inability of absorbing a storm high peaks by traditional means*



## **THE SOLUTION: SUSTAINABLE URBAN DRAINAGE SYSTEMS (S.U.D.S.)**

Against all the problems mentioned before, it is proposed the sustainable urban drainage systems (SUDS) in order to protect and improve the quality of water, avoid flooding events and help aquiferous to recharge. These systems will also let a better urban development where the sewage network is about to be saturated.

The SUDS philosophy is to reduce, in the most similar way, the natural hydrological cycle before human action. The aim is to minimize the impact of urban developments with regards to quantity and quality of the surface water drainage (in origin, during transport and in final destiny), as well as maximize the landscape integration, social value and environmental performance.

The benefits gained in the application of the SUDS can be summarised in the following aspects:

- They reduce the volume of surface water drainage and caudal from urban areas through retention elements and lamination.
- They improve the quality of the recipient water of the surface water drainage, helping the natural purification process. It also avoids that polluted water get to sensitive areas.
- They retain the excess of nutrients (nitrates, phosphates,...) that produces the uncontrolled growing of vegetation, which makes decrease the oxygen in water and, therefore, the death of living beings.
- They incorporate the water management within the landscape. Thus, we obtain a better service to the citizens and improve the landscape with the integration of water courses.
- They let use the retained water for other uses (irrigation, street cleaning, etc.) while reduces the consumption from the clean water network.



The quality of the landscape offered by these systems is high level. With these systems, population can walk along a stream instead of a concrete channel; can see a lagoon full of life instead of a flooded plot. The SUDS can change the whole city into a park, offering shelter to animals and plants and avoiding their disappearance from urban areas. Summarising, they offer a great service to the community, economy, landscape and environment.



*Retention pond*



*Permeable park site*

From the totality of techniques that SUDS include, there is one that rises up above all: the geostuctures of geocells modular systems.

These systems offer great flexibility to the designer as, thank to its modularity, they allow the installation of every configuration depending on the available area.

What's more, they can be designed to allow traffic loads, which means they can be installed below roads and parkings as well as in other less sensitive areas like green or pedestrian areas.



## TECHNICAL CHARACTERISTICS OF HIDROBOX SYSTEM

Hydrobox systems consists of a plastic geostructure of high resistance that allows to install means of collecting rainwater, accumulation and underground transport in a easy and modular way. With an easy assembly, this product accepts a variety of configurations depending on the required resistance.



*Detail of Hidrobox 1.1 (\*)*

TECHNICAL CHARACTERISTICS	
* <b>Material:</b>	Black polypropylene reinforced with mineral charges
* <b>Dimensions (long x wide x high):</b>	728 x 445 x 495 mm
* <b>Porosity (aprox.):</b>	94%
* <b>Acumulation Capacity:</b>	151 liters
* <b>Weight (aprox.):</b>	11.86 Kg
* <b>Load resistance:</b>	from 300 KN/m <sup>2</sup> to 500 KN/m <sup>2</sup> (according to inner configuration)
* <b>RRP:</b>	Request for quotation

(\*)Nomenclature "HIDROBOX X.Y", where X: number of pieces high and Y: number of inner partition walls.

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