



TECHNOLOGY AND SOLUTIONS



DRAINAGE DIVISION

Knowledge, competence and development. Born from a long experienced professional team, Refill-Tech Solutions is leader in processing plastics for air and water treatment. Faultless partner for companies who project plants for Energy and Environment and want to improve their performance with an excellent design, entirely developed for the highest efficiency.

In addition to the wide range of catalogue products, Refill-Tech Solutions can develop models on demand, new technical solutions and exclusive prototypes, by thermoforming, injection molding and extrusion.

The know-how improved in all the different processing and assembling technologies, the reliable technical support, the solutions perfectly targeted for functionality and affordability are all crucial for the superior quality of the Solutions products in the most widespread applications, such as rainwater harvesting and reuse, stormwater infiltration, detention and attenuation storage, infiltration, flood defense and land scaping, aimed at balancing the indiscriminate waterproofing increase of urban areas and restoring the natural hydrological cycle.

As a matter of facts, the Refill-Tech Solutions' Drainage Division provides the highest international standards for functioning, safety and sustainability of its products, creating the best conditions for strengthening its customers business worldwide, where many nations are already sensitive to the water resources best management and to the philosophy of rainwater reuse as a renewable and sustainable asset.



RESEARCH AND DEVELOPMENT

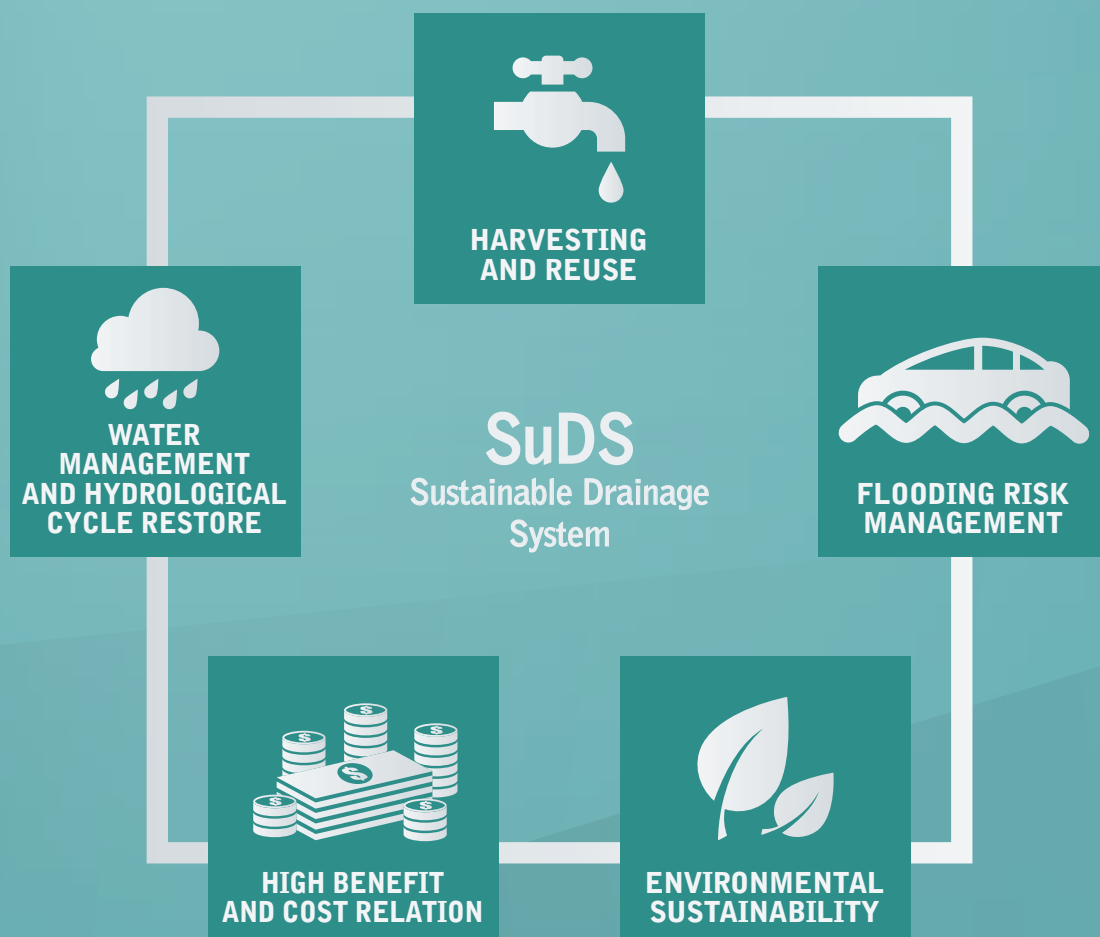
Sustainable Drainage (SuDS). Innovation is a way of being: built with passion, coherence and determination through experience, research and integration of knowledge. Our first aim is creating value innovation by a set of managerial decisions and actions leading to constant developing of new products and services, always settled on the higher plant efficiency and on the higher investment effectiveness. For this reason Refill-Tech Solutions designs technologies to an ever higher level.

The intense territory exploitation due to infrastructure and urban settlements has led to a large proportion of the soil being covered by impermeable surfaces, adversely affecting the natural water cycle.

In the traditional drainage systems, rainfall run off almost entirely from the impermeable surfaces and collect in the ductwork, while evaporation and groundwater feeding are severely limited, triggering sewage systems overload which become floods and pollution, causing as well reduction of supply aquifers, so destined to disappear.

For this reason Refill-Tech Solutions has embraced the philosophy of sustainable drainage through the creation of a specific business division, aimed at encouraging the natural water cycle in urbanized areas and the change of direction in the stormwater management, in order to overcome the traditional channeling of surface water run-off, privileging the ground re-permeabilization, the attenuation of stormwater and their collection for reuse.

Whether it's taking care of a client's project or it's an internal R&D process, our Technical Division is able to select the most suitable technology and polymers, both for yield and for mechanical and idraulical properties.



INFILTRATION AND ATTENUATION



The different construction typologies of sustainable urban drainage devices are divided into soakaways and attenuation systems: the first disperses rainwater directly at the source in the subsoil surface layers, while the second ones have function of temporary reservoirs for the gradual release into the downstream receptors.

INFILTRATION CONDITIONS

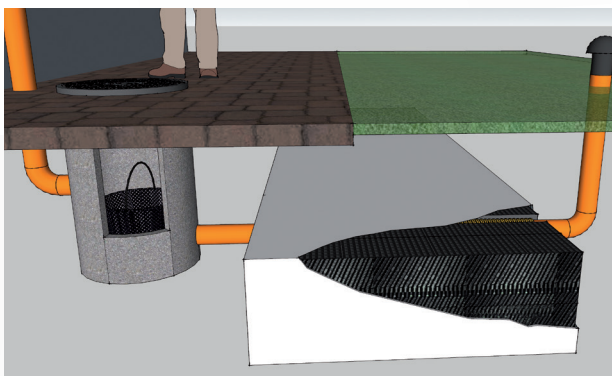
They may vary depending on county or local rules that limit the use of infiltration systems only to the second rain water or to roofs run-off, or again they may impose a ban for drinking water protection areas and polluted sites.

They may also depend on soil permeability and safety distances from substructures or aquifers.

If it were completely surrounded by a geomembrane and were integrated by an exhaust regulator downstream, the system would act as a pure attenuation storage.

Also, if the flow amount were to be higher than the local laws limit, it will be controlled through a vortex flow control, in order to allow the gradual and slow water release.

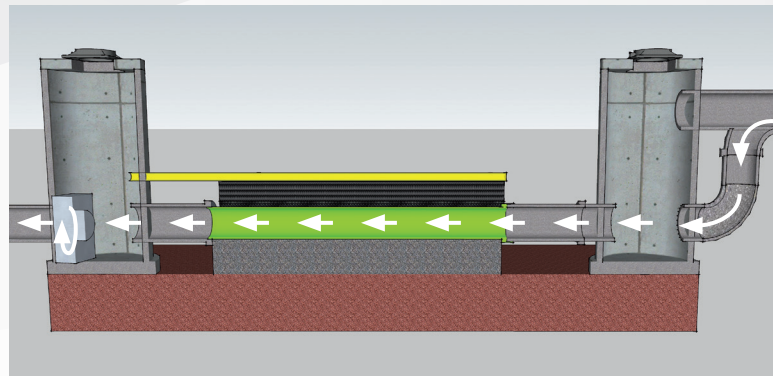
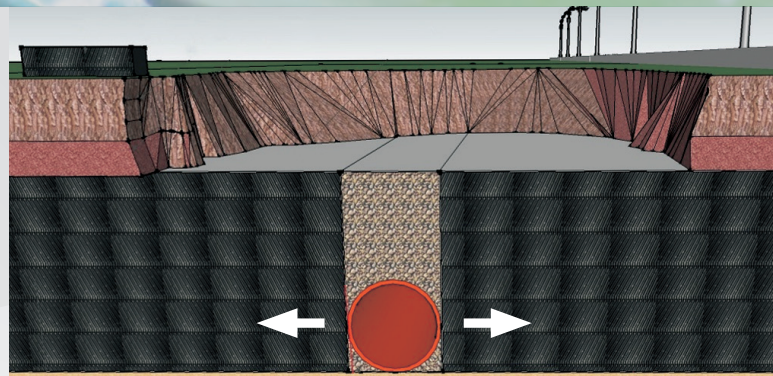
The system is integrable with further water treatment applications, such as sedimentation filters, coalescers (OWS) and storm water tanks, or phytodepuration basins.



DRAINAGE TRENCHES

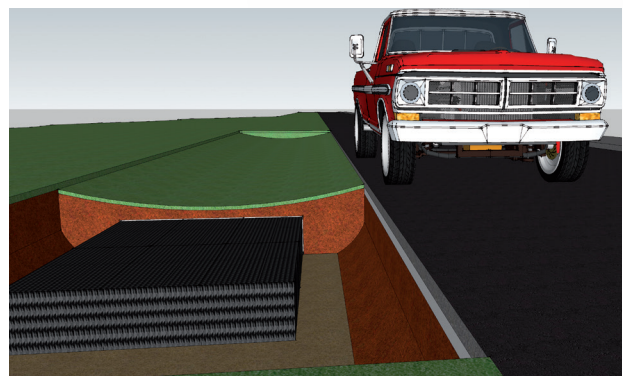
In small tanks or trenches it will be possible to insert reduced diameter pipes, directly within the modules, providing a simple inspection chamber upstream.

For waterproofed tanks it will be appropriate to provide ventilation pipes, to allow air leaking out during the filling phase, while for those which are small or with only direct infiltration function this will not be necessary.



SOLUTIONS

Refill-Tech Solutions' answer is made up of lightweight plastic modules obtained by assembling thermoformed PVC sheets. To both enable the water's dispersion in the ground and to avoid the alveolar structure to be clogged by the backfill material, the modules are covered by a geotextile layer.



ROAD DRAINAGE

Traditional systems realize open channels at the roads sides. Through underground drainage trenches, the innovative Refill-Tech Solutions' technology is instead designed as a sustainable drainage system that allows to avoid both the risk of serious accidents, repeatedly caused by this practice, and the occurrence of unsanitary conditions, due the infesting proliferation of algae and mosquitoes.

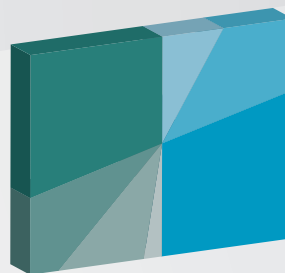
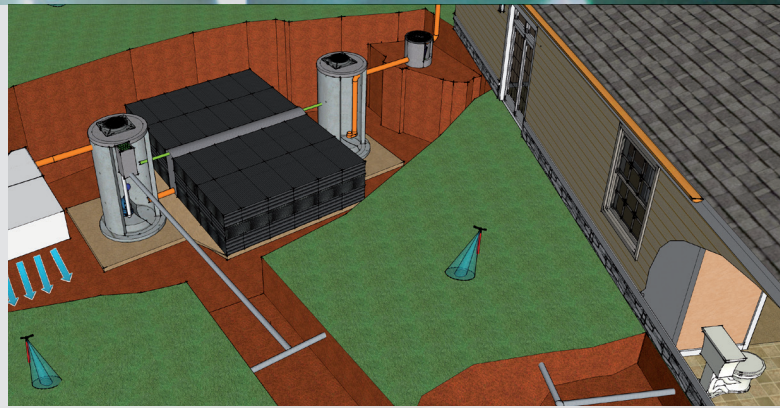
HARVESTING AND REUSE



Rain waters are a local renewable resource: their collecting systems can guarantee an ideal water storage, which would otherwise be lost, afterwards reusable for different uses than food and hygiene, eg irrigation, cleaning, water w.c. supply. Saving water and lightening sewer overloads are only a few of the many advantages.

While conventional systems use plastic or reinforced concrete tanks, Refill-Tech Solutions' technology is made of a buried collection system wrapped in a geomembrane, flanked by a reuse system with pump and distribution pipes.

The tank will be connected to a further infiltration system downstream. The solution, achievable in any shape and size, guarantees the area carriageability.



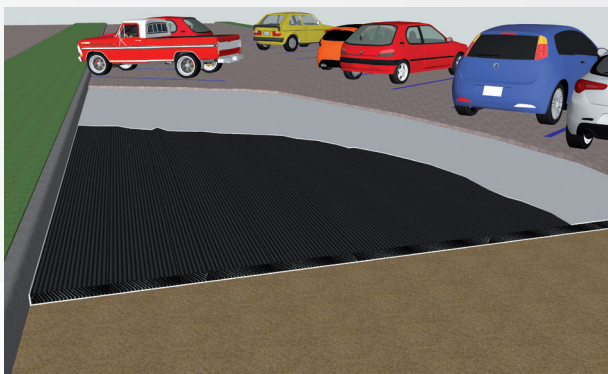
WATER' HARVESTING AND REUSE

RAINWATER

- 2% Cleaning up
- 8% Irrigation
- 10% Washing machine
- 30% WC flushing

DRINKING WATER

- 7% Washing up
- 13% Cooking and drinking
- 30% Personal washing (shower)



PERMEABLE PAVINGS



Where conditions allow, squares, footpaths, access, district and residential roads should be built permeable to water, facilitating the direct infiltration or temporary harvesting in case of heavy rainfall, ensuring the hydrological cycle restoration and the lightening of receptor systems.

The high load bearing strenght and the honeycomb structure of Refill-Tech Solutions' range of products allow the use below pavings both pervious and impervious.

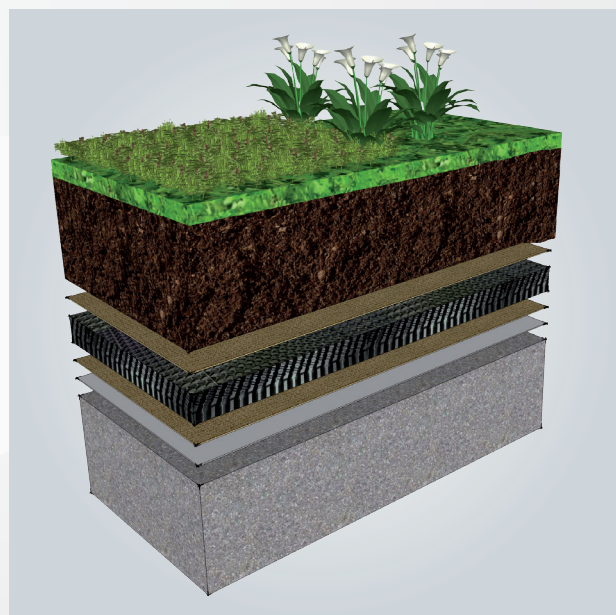
GREEN ROOF



Green roofs play an important role in the stormwater sustainable management as an attenuation system and outflows hydraulic adjustment. They have several advantages determining remarkable benefits on energy saving and life quality, including buildings thermal and acoustic insulation, reducing pollution and improving microclimate.

In accordance with Italian UNI 11235, Refill-Tech Solutions products are used as a drainage or retention layer (if drain connections are raised) whenever might be necessary to ensure:

- high mechanical strength and high drainage capacity;
- high lightness and modularity, to enable fast installation, independent from excavators or forklift's assistance and the construction of a reduced thickness drainage layer that doesn't weight down the floor;
- maximum functionality, with geotextile interposition to ensure an adequate protection of the anti-root waterproofing layer.





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