

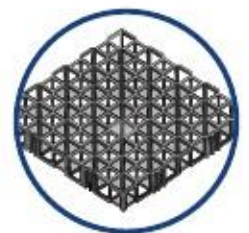


# Modular Geo-Void Systems

Total Water Management

## ESS EcoCell

Ecological Tank Systems



ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD

# Environmental Sustainable Solutions

Welcome to Environmental Sustainable Solutions; specialist suppliers and designers of geocomposites and water re-use systems. Environmental Sustainable Solutions can help you achieve innovative results for all your requirements:-

- ⊗ Stormwater Management
- ⊗ Gas Barrier Protection
- ⊗ Stormwater Attenuation
- ⊗ Contaminated Land Development
- ⊗ Stormwater Drainage
- ⊗ Ground Stabilisation
- ⊗ Rainwater Recycling Management
- ⊗ Structural Waterproofing
- ⊗ Gas Venting Systems
- ⊗ Damp-proofing projects

Over the last 12 years Environmental Sustainable Solutions, and associated companies, have designed and installed thousands of water recycling, drainage and attenuation tank systems for schools, car parks, retail parks, offices and sports arenas throughout Ireland, UK, Europe and the Middle East.

Our wide range of environmental protection products, surface water drainage modules and modular water storage tank systems provides maximum design flexibility for engineers and architects working on even the most demanding of storm water storage and recycling projects.

## Stormwater Management And Design

Stormwater is the phrase used to describe the excess rainwater that flows from rooftops, roads, car parks and other buildings. This water can contain many pollutants picked up from roofs and highways. In extreme weather conditions sudden heavy downpours of rain can cause major environmental disasters. Using our Rainmanager products; stormwater can not only safely be removed, but it can be stored and recycled for commercial and domestic use.

### How it works

#### - ESS Attenuation Tank

Stormwater enters the attenuation tank via the inlet manhole, which incorporates a silt collection sump and a galvanised leaf collection basket. Water passes through the tank and exits through the outlet manhole, which contains an AquaBrake flow control device.

This flow control device regulates the release rate of water from the tank, and in so doing, enables the tank to fill. As a result of water entering the tank at a greater rate than it can exit, the void space then fills with water. While the tank fills, air is vented from the tank.

The Inlet/Outlet pipe will act as a flushing channel. This perforated pipe is wrapped completely in High Flow Filtering Geotextile, which prevents silt entering the block area. As the tank continues to empty at a pre-determined rate, air re-enters the tank via the same air vent system. The roof of the completed tank must be lower than the lowest gully trap on site.

### Benefits

- ⊗ 100% sealed tank
- ⊗ Full installation service provided
- ⊗ 12 years experience as market leader
- ⊗ Quick installation – reduce site access delays
- ⊗ Increased land usage – tanks are sub surface
- ⊗ Economical – generally more cost efficient than any other equivalent sealed tank
- ⊗ Cost effective – reduced costs for excavation and disposal of material
- ⊗ Modular – easy to create any shape
- ⊗ Strong – designed to support shear loading
- ⊗ Lightweight – no cranes required
- ⊗ Determinate volume – one cubic metre of matrix tank modules contain 950 litres of water, whereas stone fill will only provide 300 litres of storage per cubic metre.

### Soakaway

The soakaway is normally best built as a long narrow structure.

The inlet pipe comes in at roof level and faces downwards so that the water can percolate into the tank.

The blocks are wrapped in Geotextile, to protect them and also to keep clay from filling up the void.

An air vent pipe is installed on the highest point with a cowl on top or vented back to an inlet manhole.

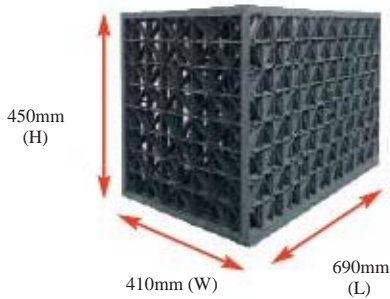
There is no outlet from a soakaway, therefore no flow control unit is required.

# Protecting the Environment

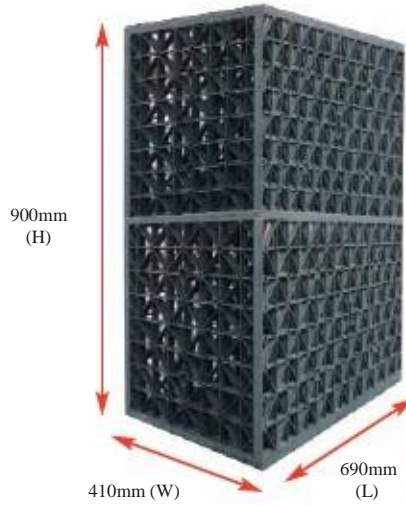
## Stormwater Storage Tank

SUITABLE FOR USE UNDER:

- Roadways
- Car parks
- Green areas



**Single**  
8 Modules/m<sup>3</sup>  
Flowrate - 2300 l/min



**Double**  
4 Modules/m<sup>3</sup>  
Flowrate - 4600 l/min



**Triple**  
2.6 Modules/m<sup>3</sup>  
Flowrate - 6900 l/min

**Notes:**

Blocks must be positioned in the correct orientation.  
See opposite above

### SPECIFICATION (SINGLE)

Weight (maximum)	9.17kg
Crush Strength (up to)	400kN/m <sup>2</sup>
Lateral Strength	80kN/m <sup>2</sup>
Minimum Cover (green areas)	500mm
(trafficked areas)	650mm
Maximum Cover	3m
Material	Polypropylene
Void Ratio (Internal)	>95%

#### Design Requirements:

- Tank storage capacity (m<sup>3</sup>)
- Depth restrictions
- Location (Road, Car Park, Green Area)
- Design constraints on site

### DESIGN CRITERIA

The attenuation tank is constructed using matrix module blocks. These blocks can take passing loads of up to 40 tonnes/m<sup>2</sup>. The void ratio of each block is 95%. The blocks are made from polypropylene.

The tank is sealed with a layer of Tuflex membrane, which is fully welded together to form a 100% seal. All pipe penetrations are fully sealed to the membrane. The Tuflex membrane is protected by a layer of heavy duty protection geotextile, to prevent damage from construction or backfilling. A number of air extraction vents/flushing points are placed in the roof of the tank.

**Note:**

It is vital that the underground tanks are fully sealed, otherwise ground water and silt particles may enter the void space and use up capacity. Preferably, the base of the tank should be 500mm above the ground water level. Otherwise ground water relief measures should be implemented.

A set of loading calculations specific to the site requirement will be done by ESS and submitted on all tanks





# Infiltration Swales & Underground Channels

Please refer to separate data sheets for the following products

## Modular VersaVoid System



### Benefits

#### G Quick

Reduce site access delays

#### G Lightweight

No cranes required

#### G Strong

Designed for maximum anticipated loads

#### G Maintenance Free Tank

All debris and sediment is pre-filtered

#### G Determinate Volume

One cubic metre of Tank modules contain 950 litres of water

#### G Cost Effective

Reduces excavation and disposal by up to 5 x compared with conventional soak wells

#### G High Infiltration

98% void surface area

#### G Totally Modular

For greatest flexibility designed to cope. Units start at 300mm deep

for shallow inverts to 3050mm+ deep in 250mm increments.

#### G Designed by Engineers for Engineers – to specify with confidence.

#### G Designing out Problems

with such systems (access, maintenance, loading etc.)

#### G Designing in Answers

to design requirements.

#### G Total 3D Access

For total maintenance with total confidence.

#### G Structurally Designed

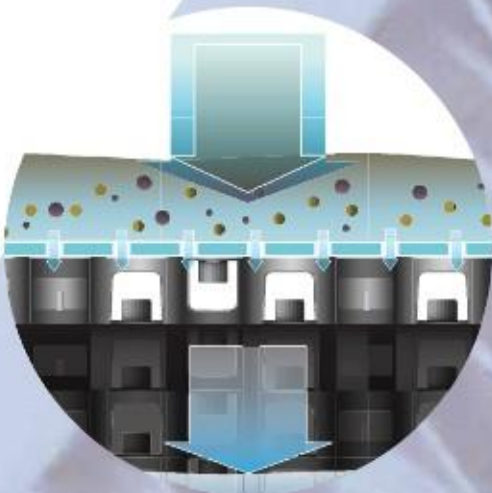
with built in safety factor to carry all loads with complete confidence.

16 clear vertical access chambers per m<sup>2</sup>.

#### G Total Void Creation

With the greatest strength from any modular systems.

## Oil Filtration



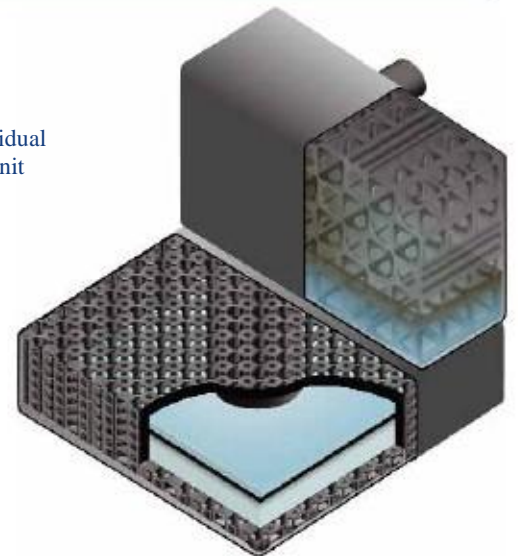
### Benefits

G Source control designed to handle catastrophic spillages

G Capture, filter and break down residual hydrocarbons - all in one compact unit

G Self-maintaining ecosystems decompose hydrocarbon compounds and clean filters

G Load bearing, modular components provide up to 200t/m<sup>2</sup> loading capacity



## Aquabrake



### Benefits

G Cost Savings

Can reduce upstream storage requirements by up to 30%.

G Durability

Corrosion resistant stainless steel.

G No energy requirements

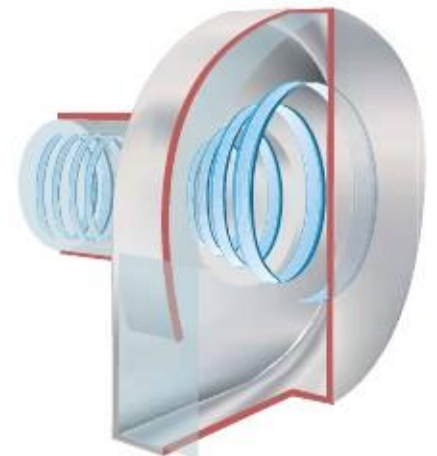
Self-activating solution with no moving parts.

G Clog Resistant

AquaBrake design prevents blockages likely to occur in traditional orifices.

G Flexible Design

Several options for attachment available.



# The ESS CombiSwale

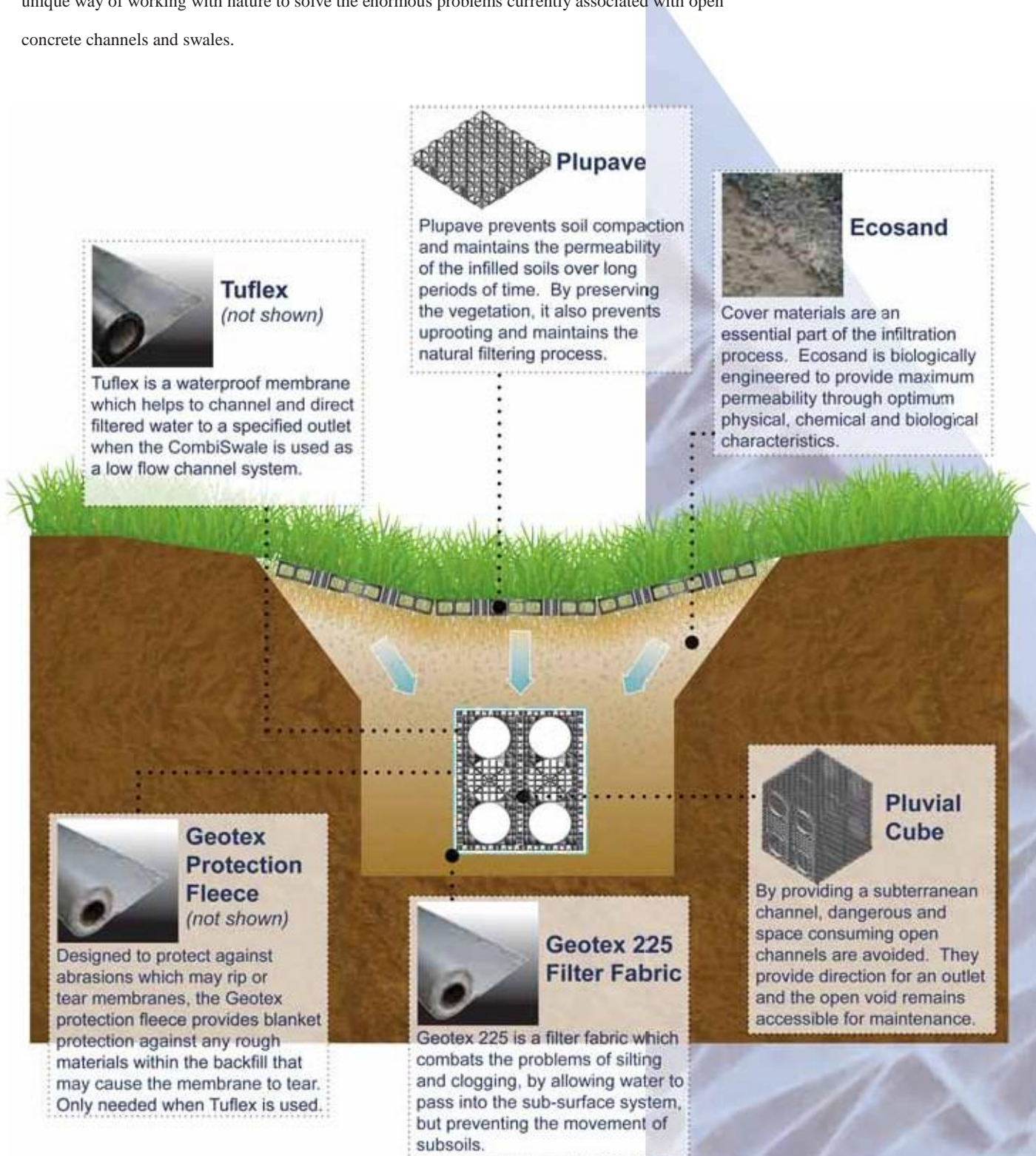
Please refer to separate data sheets for the following products

## Water Sensitive Urban Channels

### Surface and Sub-Surface Water Treatment

By combining surface and sub-surface channeling and treatment solutions, ESS has created the ideal in bioswale water management.

The CombiSwale system includes the addition of permeable sub-surface waterways that further restore water quality and recharge the natural environment. The sub-surface ESS channel system provides a unique way of working with nature to solve the enormous problems currently associated with open concrete channels and swales.



All products are manufactured to the highest quality, being subject to rigid quality control. However, the company cannot control conditions of application and use of its products, thus any warranty, written or implied, is given in good faith for materials only. ESS Ltd will not accept any responsibility for damage or injury arising from storage handling, misapplication or misuse of its products. All transactions are subject to our standard condition of sale, copies of which are available on request.

