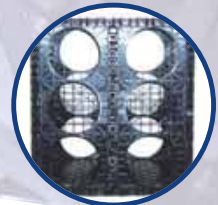
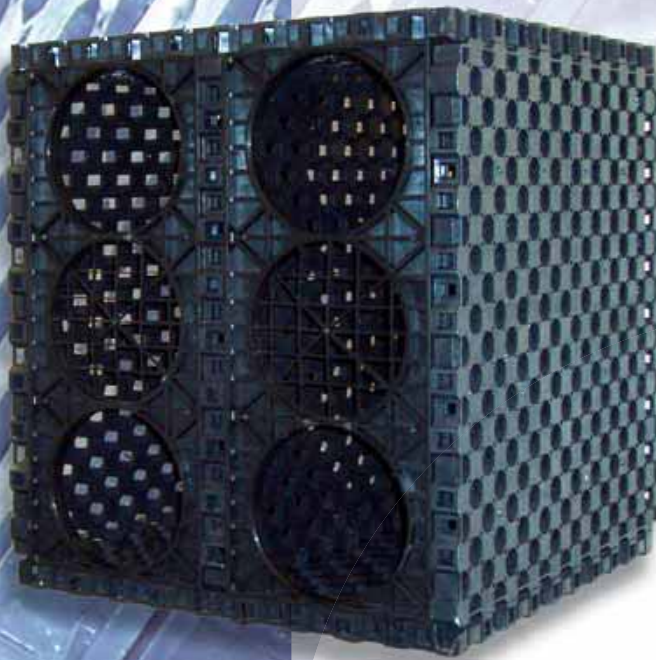




Modular Geo-Void  
Systems  
Total Water Management

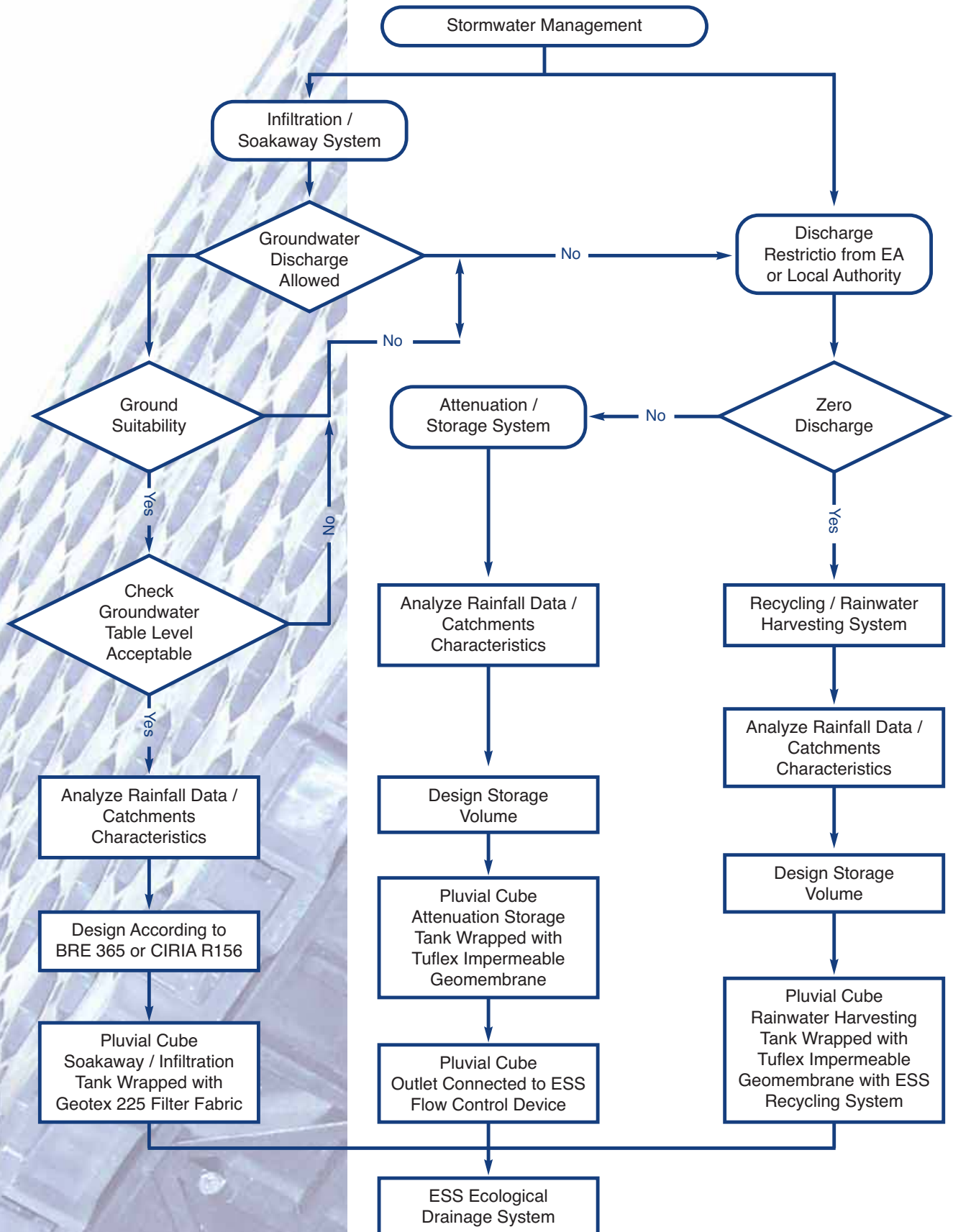
# Pluvial Cube

**Total Linear Access  
Precipitation Collection System**



**Unique Low Flow  
Channel System**

# Pluvial Tank System





# Flow Chart

## Infiltration, Detention and Re-use made easy...

### Total Stormwater Management

E.S.S. Geo-Cell Modular Tank systems use surface and sub-surface infiltration techniques, resulting in clean water that can be re-used or allowed to re-enter the natural water system. E.S.S. Geo-Cell Modular Systems offer a highly efficient option for Stormwater Management in any kind of soils.

### Water Quality

E.S.S. Geo-Cell Modular Tank Systems excel when there is a requirement to achieve a high water quality, particularly in the effective removal of nutrients and gross pollutants. In addition to the obvious environmental benefits, the sub-surface location of the tank system provides more usable space and an enhanced aesthetic setting compared to above ground concrete or plastic tanks.

### The Modular Advantage

E.S.S. Geo-Cell Modular Tank System performance supersedes outdated aggregate trenches. The E.S.S. System provides a void space of over 90% compared to less than 20% in typical aggregate trenches. Consequently, the E.S.S. System offers a smaller footprint to achieve the same storage capacity as an aggregate trench. This saves time and money in installation and civil works costs. The lightweight design of E.S.S. Modular Tank Modules also make installation quicker, safer and cheaper. No sediment build up occurs in the E.S.S. System, unlike the clogging that is characteristic of aggregate based approaches.

## System Components

**Pluvial Cube** Geo-Cell Tank Modules

**EcoSoil** biologically engineered soils

**E.S.S. Filtration Unit**

**Geotex** Filtration Fabric

**Tuflex** Waterproofing Membrane

**Geotex** Protection Fleece

**Ventilation Units**

**Preformed Pipe Connection Covers**

**Hydrobrake Flow Control Devices and Chambers**

*Refer to separate data sheets*

## Benefits...

### Complete Linear Access

#### Quick

Reduce site access delays

#### Lightweight

No cranes required

#### Strong

Designed for car loadings

#### Modular

Easily create any shape

#### Economical

Cheaper than concrete

#### Maintenance Free Tank

All debris and sediment is pre-filtered

#### Determinate Volume

One cubic metre of Pluvial Cube modules contain 950 litres of water

#### Cost Effective

Reduces excavation and disposal by two thirds compared with conventional soak wells

#### High Infiltration

90% void surface area

#### Structurally Designed

Supports shear loadings

### Unique Low Flow Channels

Ensuring complete removal of any silts

# Pluvial Tank System

**GeoCell 52** is a high density polypropylene grid structure that is specially designed to reinforce and stabilise turf grass.

When used in conjunction with the **Pluvial Cube** and 25mm **Drainage Cell** the **E.S.S.** **GeoCell** offers a stabilised, durable and lush grass surface.

**GeoCell 52 allows horizontal & vertical root growth.**



## E.S.S. GeoCell 52

**Part No:** 80002  
**Size:** (H) 52mm  
 (W) 260mm  
 (L) 480mm  
**Crush Strength:** \*125t/m<sup>2</sup>



\* Recommended maximum loading



Installation of E.S.S. **GeoCell 52**.

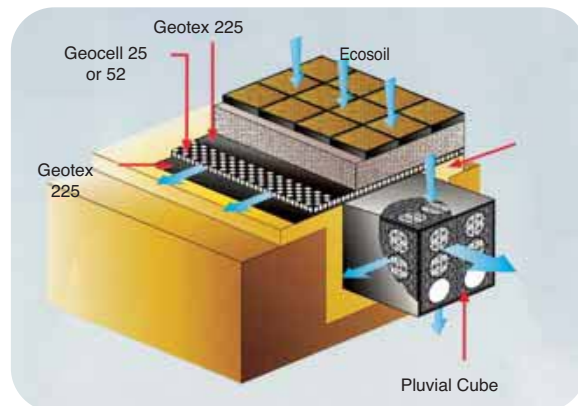


Finished installation in access road application.

## Immediate infiltration of rainfall on trafficable surfaces!

### E.S.S. GeoCell 52

#### Permeable Paving



#### Benefits...

**Highly Infiltration Rate**  
 50% of surface area.

**No surface Drains Required**  
 e.g. concrete pits, grated trench drains.

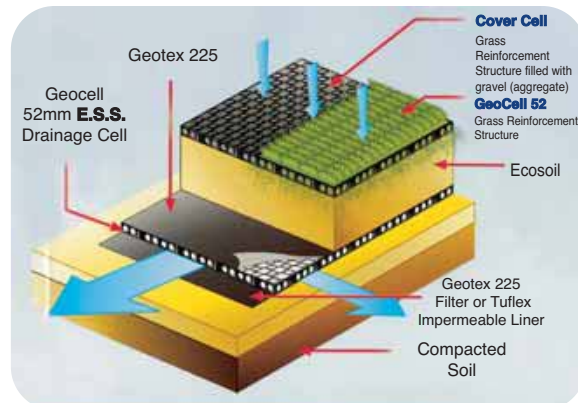
**High load bearing**  
 125 t /m<sup>2</sup>.

**Recharges Water Table**  
 Replenishes water supply to landscaped areas.

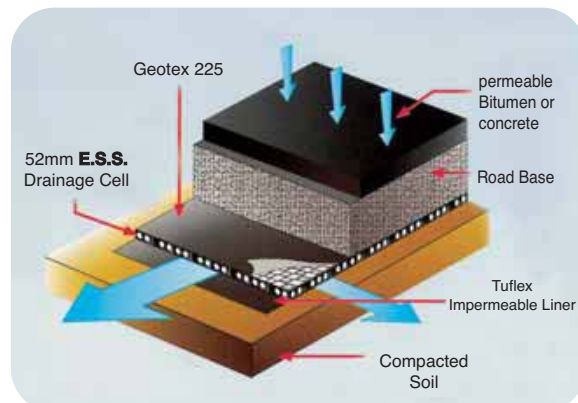
**Easy to Install**

**Rigid Clipping System**

#### Reinforced Grass/Gravel



#### Permeable Road





## Cover Materials

Cover materials are an essential part of the infiltration process. E.S.S. **EcoSoil** Biologically Engineered Soil is designed to provide maximum permeability through optimum physical, chemical and biological characteristics. To retain infiltration performance it is essential to choose the appropriate cover material and constantly maintain pH levels between 6 and 7.5.



## Trafficable Landscape - Compaction Prevention:

If a trafficable, soft landscape surface is required (i.e. grass or gravel car parks, road verges etc.), it is recommended to use **E.S.S. GeoCell 52** grass reinforcement structure. The addition of product will allow long-term permeability of the cover soil.

Loading	Minimum Cover
Pedestrian	300mm
Occasional traffic	500mm

## Pluvial Cube Geo-Cell Tank Modules

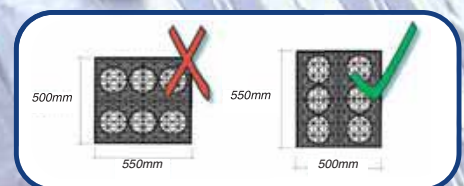
### Important Design Information

#### Load Bearing Capacity:

The unconfined load capacity of the Pluvial Cube Modules when orientated in the width, length and depth configurations are determined by the designed use and ground conditions and are manufactured to requirements.

#### Tank Module Orientation:

E.S.S. Tank modules must be installed with the correct orientation to ensure maximum load bearing capacity.



#### Depth Requirements for Cover Materials:

Note: Cover materials must be compacted at 300mm intervals.

Loading capacities can be increased in assembly by the inclusion of extra support parts. To meet design requirements.

*Please refer to fully Installation Guide for complete ground bearing Geotechnical and backfill requirements*



# system

## Road Edge Drainage



Road Edge Infiltration Area.



Car Park Infiltration Area.



Pervious Swales using **E.S.S. Modular Geo-Cell System** for large and efficient movement of water.

**ECOSOIL** bio engineered Soil  
**2<sup>nd</sup> STAGE: EcoSoil**  
 biologically engineered soil captures, treats and filters nutrients and biologically breaks down toxic elements.

**Pluvial Cube**  
**3<sup>rd</sup> STAGE:** Clean water infiltrates into pluvial Cube modules where continuous aeration and filtration through surrounding EcoSoil biologically engineered soil occurs.

## Clear Linear Access Through Open Subterranean Channels

### Water sensitive Urban Channels

The Channel Systems are based on permeable sub-surface waterways that restore water quality and recharge the natural environment. The sub-surface E.S.S. Channel System provides a unique way of working with nature to solve the enormous problems currently associated with open concrete channels and swales.

### Traditional Concrete Channels

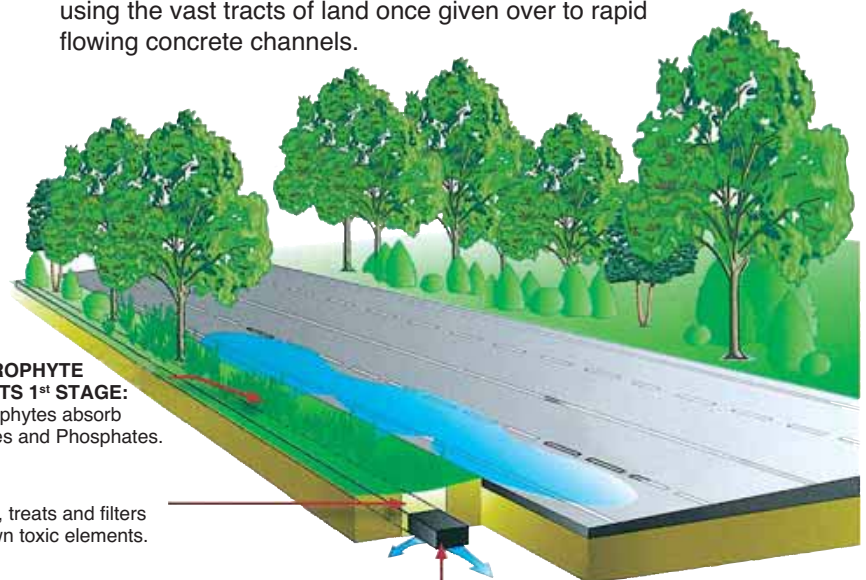
Open concrete channels and swales are currently one of the main methods of transporting large quantities of Stormwater for discharge into streams, rivers and oceans. Open channels are used widely in the urban landscape even though they are considered unsafe. Channels are also a breeding ground for vermin and vector that endangers human health. In addition to the health and safety problem, large concrete channels take up vast areas of land and have a negative impact on the amenity of the area.

### E.S.S. Channels

With the E.S.S. Channel System being a sub-surface system, these problems with open concrete channels are rectified. The permeable channel system can be designed to follow the inherent contours of the landform and emulate the flow of natural waterways. The curvilinear channel design creates vertical flow, turbulence and reduces the overall flow of velocity while increasing the self cleansing capacity of the channel bed to create healthy aerobic conditions. The clear access channels allow for continual and future maintenance

### Environmental Benefits

By replacing open concrete channels or swales with E.S.S. Channel Systems, cities can now benefit from increased environmental amenities, greater recreational space and healthier conditions by using the vast tracts of land once given over to rapid flowing concrete channels.



**MACROPHYTE PLANTS 1<sup>st</sup> STAGE:**  
 Macrophytes absorb Nitrates and Phosphates.



## Low Flow

### Provides Total Linear Access



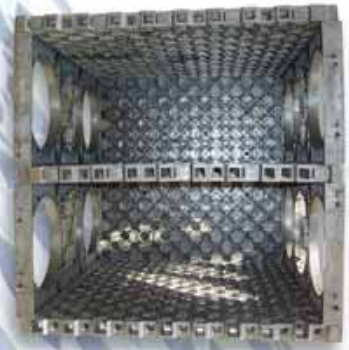
2 Clear Channels  
500mm x 210mm per 0.5mt width

### Controls Silt at Low Flow Velocity



4 x160mm Pipe  
Access Point

### Self Cleaning at High Flow Velocity



Top View  
Showing Clear Channel

The above channels can be multi-connected using preformed connectors to larger inlet / outlet pipes



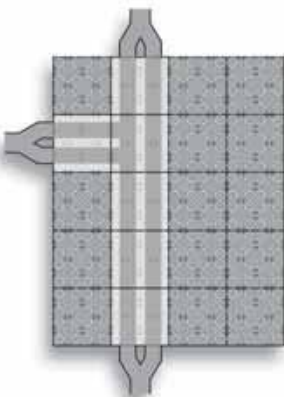
225 Low Flow Channel  
(if required)



300mm Dia Low Flow  
Channel (if required)



225 or 300mm  
Internal Dia Channel



Typical Installation  
Tank Format



Typical Installation Channel Format  
4 Clear Access Channels x 210mm



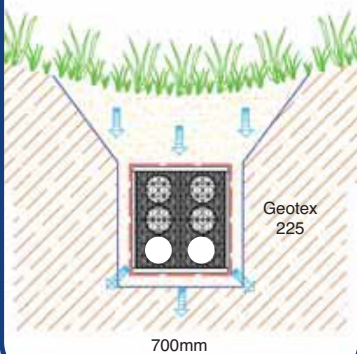
# s & Underground Channels

## Subsurface Road Channels / Swales

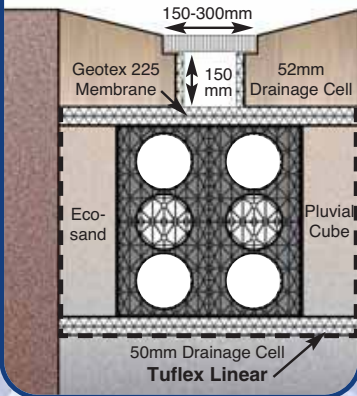
### Pluvial Cube Tanking System

provides an efficient way of managing road stormwater runoff. It allows high infiltration areas, preventing road accidents, water ponding, and mosquito infestation.

#### Typical Pluvial Cube Infiltration Swale Detail



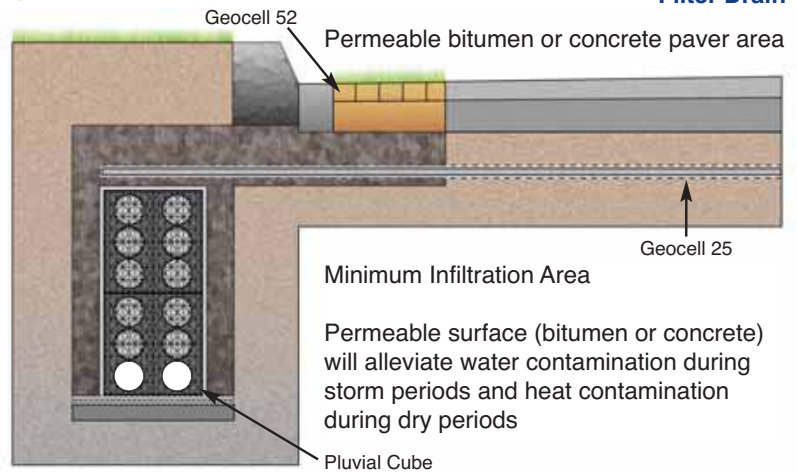
#### Typical Section Road Drainage Channel



Attenuation Tank under Park and Ride Scheme showing versatility of modular system.

### High Traffic Areas

#### Filter Drain



### Concrete Channel Retrofit into Infiltration Swale



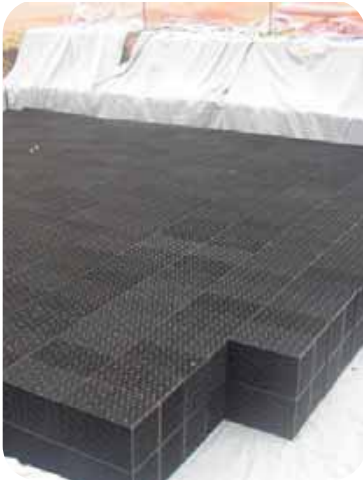
Provides new accessible space





# E.S.S. Systems

## Infiltration Tank



## Rainwater Harvest Tank



*Attenuation Tank Highlighting Number and Position of Access Points.*

## Heavy Duty Leach / Soakaway Drain



## Single Module



Size: 50cms x 50cms x 55cms  
Units / m3: 0.1375m3  
7.27 per m3

## Double Module



Size: 50cms x 50cms x 107.5cms  
Units / m3: 0.269m3  
3.72 per m3

## Triple Module



Size: 50cms x 50cms x 160cms  
Units / m3: 0.40m3  
2.50 per m3



## Infiltration Tank

The infiltration tank system is the ideal way to manage Stormwater runoff in permeable or semi-permeable soil conditions.

### How it Works!

The system is designed to capture surface water through infiltration, and then clean and filter the water before it is allowed to recharge the water table providing moisture for surrounding vegetation. The **E.S.S. Filtration Unit** captures and cleans roof water before entry into the storage area (**Pluvial Cube Tank Modules**).

**Applications:** New developments requiring to meet water sensitive urban design standards.

## Re-use Tank

The E.S.S. Re-use System has proven effective in providing a regular clean water supply for domestic and commercial applications.

### How it works!

The **E.S.S. Re-use System** captures water from roof and landscaped areas through surface infiltration and the **E.S.S. Filtration Unit**. **E.S.S. EcoSoil** biologically engineered soil remediates contaminated stormwater runoff where it is collected for Re-use in E.S.S. Tank Modules.

**Applications:** Irrigation of commercial and domestic landscaping. Domestic Re-use for toilet flushing and washing machine use.

*Refer to separate data*

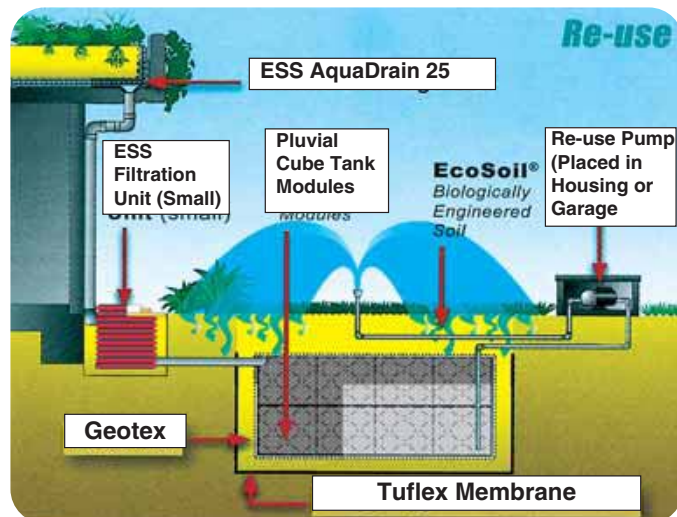
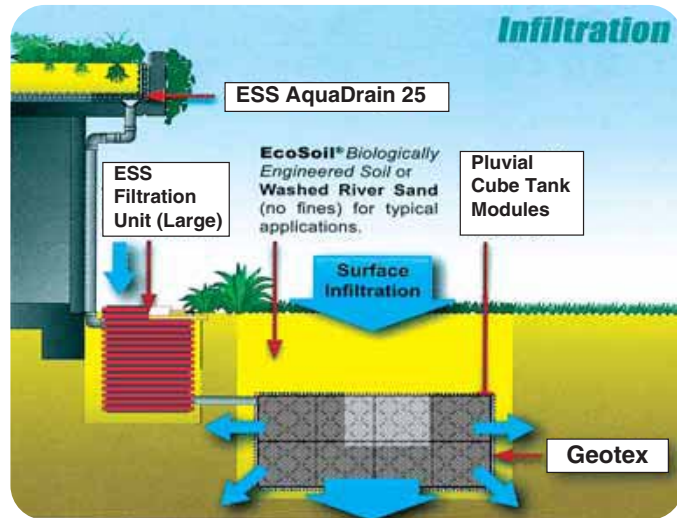
## Detention Tank

The E.S.S. detention System is a cost effective solution that can also address water quality. The system offers flexible design options saving installation time and site access delays.

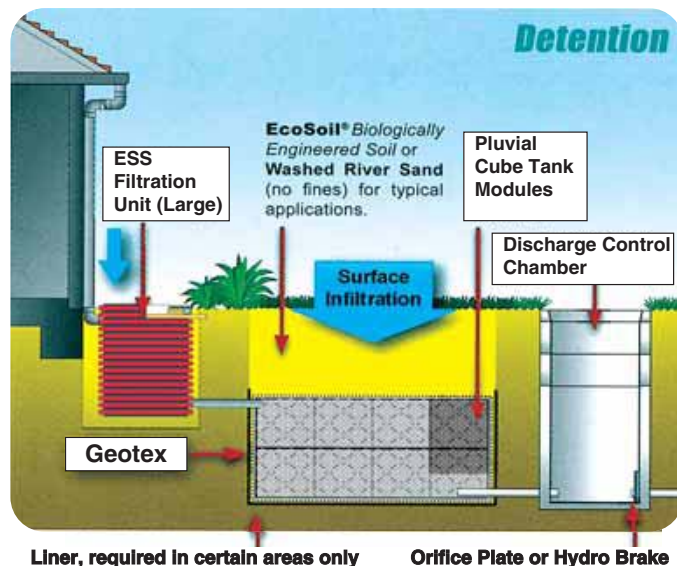
### How it Works!

The **E.S.S. Filtration Unit** captures and cleans roof water before entry into the storage area. Water is slowly discharged through the discharge control unit.

**Applications:** Developments that need to meet local Council Stormwater requirements.



See separate data for Re-cycling System. Domestic and Commercial. Stormwater and Greywater Systems.





# Module 1

## Easy Step by Step Instructions

**Note:** Tuflex liner only required for rainwater harvesting tanks and attenuation systems

### Step 1



Excavation (to Engineering detail)  
Base to be engineered to support  
load when tank is full

### Step 2



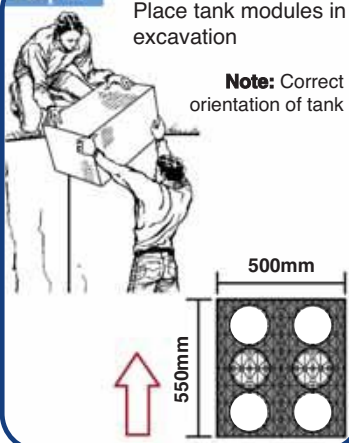
Utilize sand to level base of  
excavated area. Sand shall be  
compacted or site concrete for  
Tuflex liner.

### Step 3



Lay geotextile then lay tuflex liner  
if a Rainwater Tank is desired  
along base and walls of  
excavated area

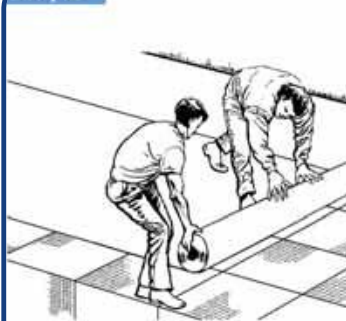
### Step 4



Place tank modules in  
excavation

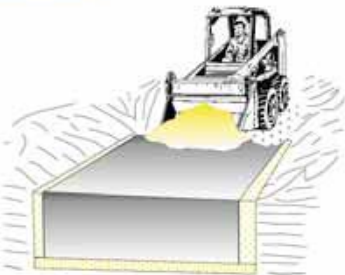
**Note:** Correct  
orientation of tank

### Step 5



Cover tank modules with geotextile  
and seal joints with tape ensuring a  
complete seal is made. Fabric overlap  
should be minimum (100mm)

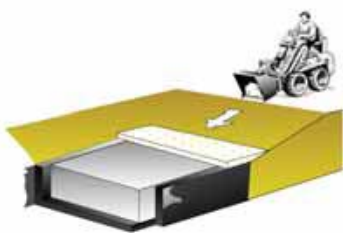
### Step 6



Backfill all sides of one tank with sand  
or compactible material, use suitable  
lightweight equipment to compact it.  
**Note:** Backfill sand shall be free of  
any rocks, rubble or debris

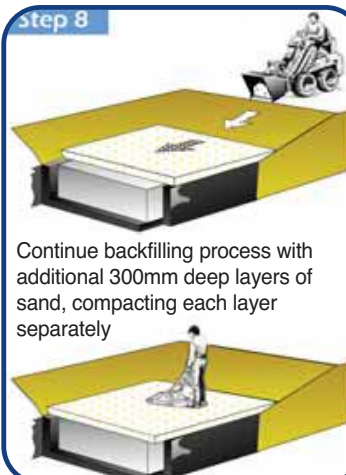
### Step 7

**Backfill procedure shall be  
done in stages**



(300mm) layer of sand shall be used  
to cover the top of the tank. Suitable  
lightweight equipment shall be used  
to compact each layer.

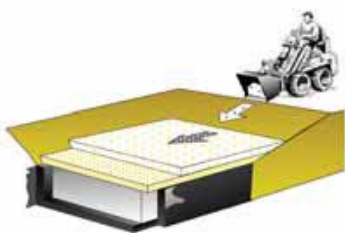
### Step 8



Continue backfilling process with  
additional 300mm deep layers of  
sand, compacting each layer  
separately

### Step 9

Complete backfilling with clean sand



Pluvial Cube modules can be  
covered with a maximum of 3m of  
sand. Or contact Technical Dept' for  
advice if deeper.

**NB:** For contract specific details contact technical department

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