

# EnviroModule™

modular underground tank systems



EcoClean Technology Sdn. Bhd.  
STORMWATER SOLUTIONS

Rainwater harvesting  
Infiltration  
On-site Detention  
Bio-remediation  
CDS Filtration

# Our Mission

EcoClean Ausdrain recognizes water is one of our most precious natural resources, an asset to be conserved and re-used wherever possible.

EnviroModule™	features	benefits
	<ul style="list-style-type: none"> <li>• Sub-surface</li> <li>• Modular</li> <li>• High compressive strength</li> <li>• High durability</li> <li>• High void storage</li> <li>• Open structure</li> <li>• Lightweight</li> <li>• Low maintenance</li> <li>• Connectors</li> <li>• Flat-pack form</li> <li>• Slide and lock assembly</li> <li>• 100% recycled</li> </ul>	<ul style="list-style-type: none"> <li>• More useable land area</li> <li>• Design flexibility</li> <li>• Trafficable</li> <li>• Long life expectancy</li> <li>• Cost-effective</li> <li>• High flow rate</li> <li>• Install by hand</li> <li>• No cleaning required</li> <li>• Makes installation easy</li> <li>• Economical to transport</li> <li>• Quick to assemble</li> <li>• Environmentally friendly</li> </ul>

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Our water resources are limited and at present the world's consumption of this resource far exceeds its natural replenishment. Too much of our stormwater is wasted, escaping via stormwater channels out to sea.

Systems for stormwater infiltration, rainwater harvesting and bio-remediation contribute towards better management of this precious resource.

EcoClean Ausdrain products have been designed and developed to fit with the principles and best management practices for Water Sensitive Urban Design. Conservation and re-use of stormwater is making an important contribution to the challenges facing mankind over the coming decades.

EcoClean Technology Sdn Bhd has made a commitment towards improving the methods of stormwater conservation to assist in creating a more sustainable future for us all.



# EcoClean Ausdrain EnviroModule™

## Product specifications

### Technical data

Length:	600mm
Width:	400mm
Height:	450mm
Weight:	4-5 kg
Void area:	95%
Storage volume:	105 litres
Unrestricted flow rate:	3510 litres/min

#### Compressive strength

Standard duty module - 3 braces:	24.5 tonnes/m <sup>2</sup>
Extra duty module - 4 braces:	28.6 tonnes/m <sup>2</sup>

#### Minimum cover recommended

Standard duty module:	400mm
Extra duty module:	400mm

#### Maximum cover recommended

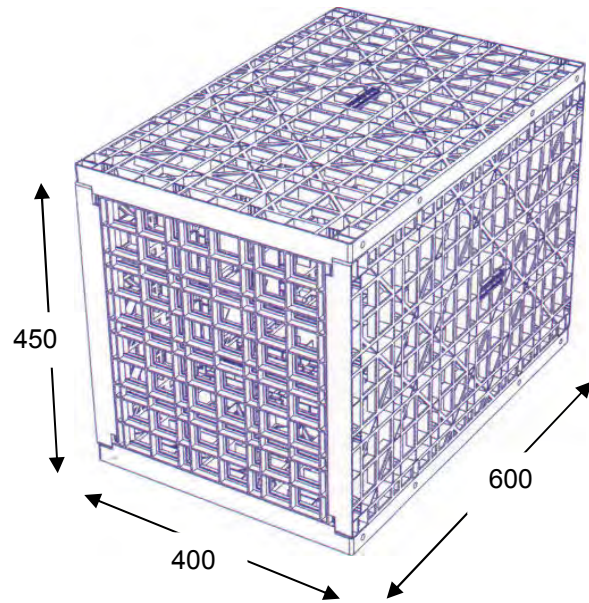
Standard duty module:	1200mm
Extra duty module:	1800mm

#### Overall maximum depth

Standard duty module:	2400mm
Extra duty module:	3000mm

#### Maximum height of modules

Standard duty module - 4 high:	1800mm 2250mm -
Extra duty module - 5 high: Service temperature: Module material:	30°C+120°C recycled polypropylene



EnviroModule

### Important design information

1. EcoClean Ausdrain EnviroModules must be installed with the 450mm side as the height to ensure maximum strength.
2. Standard duty modules are suitable for landscaped areas only.
3. Extra duty modules are required for trafficable areas such as driveways and car parks and where greater depth of cover is needed. A suitable pavement designed by a certified engineer is required over the surface of the tank.
4. Compressive strength tests were conducted by a certified testing authority and represent the maximum strength in a controlled environment that replicates the case when soil is uniformly distributed under a short term static load.
5. Safety factors should be employed to the compressive strength results. This is to allow for actual site conditions, possible variations in recycled material and any potential creep factors.



Pipe connector



Connector pin

## Rainwater harvesting Residential

### Create your own underground water supply with an EcoClean Ausdrain EnviroModule Tank!

The EcoClean Ausdrain EnviroModule Rainwater Harvesting Tank is the cost-effective and flexible solution to your underground water storage requirements.

Rainwater is collected from your roof and fed into a CDS Filtration Unit where it is pre-filtered prior to being collected in the EcoClean Ausdrain EnviroModule Tank. As the water is stored underground it is kept cool which assists in maintaining water quality and avoiding the possibility of algae growth.

Water is then pumped in and around your home providing a lifetime supply of clean natural water ideal for non potable uses including garden irrigation, toilets, laundry and pool refilling. Upon request EcoClean Ausdrain EnviroModule Tanks can be manufactured using food grade material and supplied for potable water purposes.



### Beat water restrictions, water rates & secure your future water supply!

Our water resources are limited and with water restrictions here to stay, installing an EcoClean Ausdrain EnviroModule Tank means investing in your water future.

It is predicted that the cost of water will rise considerably in the future. So even if your lifestyle is not disadvantaged by restrictions on when and how much water you can use, by installing an EcoClean Ausdrain EnviroModule Tank today, you are protecting against the rising cost of water tomorrow.

### Save time, money & the environment!

Choosing to install an EcoClean Ausdrain EnviroModule Tank will not only save money but you are also helping to save the environment by installing a product manufactured from quality recycled materials. Not only that but an EcoClean Ausdrain EnviroModule Tank can be installed faster than any other underground system saving time on your building project and minimising the disruption to your home life.



### Create the tank dimensions & capacity you require without taking up valuable land area!

Installing an EcoClean Ausdrain EnviroModule underground tank won't compromise valuable land area and avoids the unsightly visual impact created by above ground water tanks. EcoClean Ausdrain EnviroModule Tanks can be supplied in standard sizes or individually designed to the required dimensions that best suits the available land space. For assistance with tank design contact an EcoClean Technology Sdn Bhd or phone us on +603-91718160.





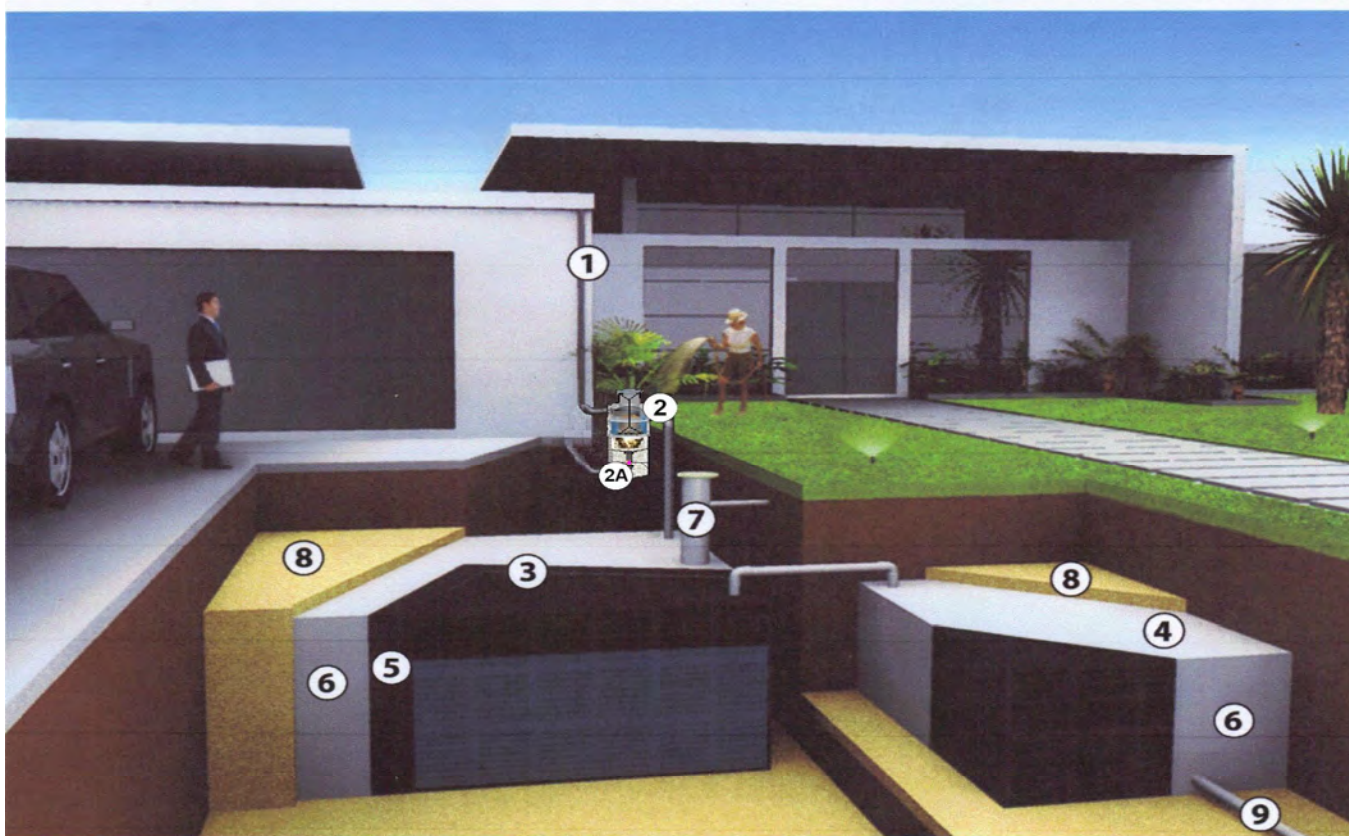
# EcoClean Ausdrain EnviroModule™

## Rainwater harvesting tank (Residential)

features	benefits
<ul style="list-style-type: none"> <li>• Cost-effective</li> <li>• Sub-surface</li> <li>• Modular</li> <li>• High strength</li> <li>• Durable</li> <li>• Lightweight</li> <li>• Quick to install</li> <li>• Low maintenance</li> <li>• 100% recycled</li> </ul>	<ul style="list-style-type: none"> <li>• Cheaper than other systems</li> <li>• No use of valuable land area</li> <li>• Create any size &amp; dimension</li> <li>• Install under a driveway</li> <li>• &gt; 50 years life expectancy</li> <li>• Carry and install by hand</li> <li>• Minimises site disruptions</li> <li>• No cleaning required</li> <li>• Environmentally friendly</li> </ul>

standard tank dimensions		
Capacity (l)	Dimensions (m)	Modules
3000	2.0 x 1.8 x 0.9	30
5000	2.4 x 2.4 x 0.9	48
10000	2.4 x 3.2 x 1.35	96
20000	4.8 x 3.2 x 1.35	192
50000	4.8 x 6.0 x 1.8	480
100000	9.6 x 6.0 x 1.8	960

EcoClean Ausdrain EnviroModule Tanks can be supplied suit required capacity and dimensions.

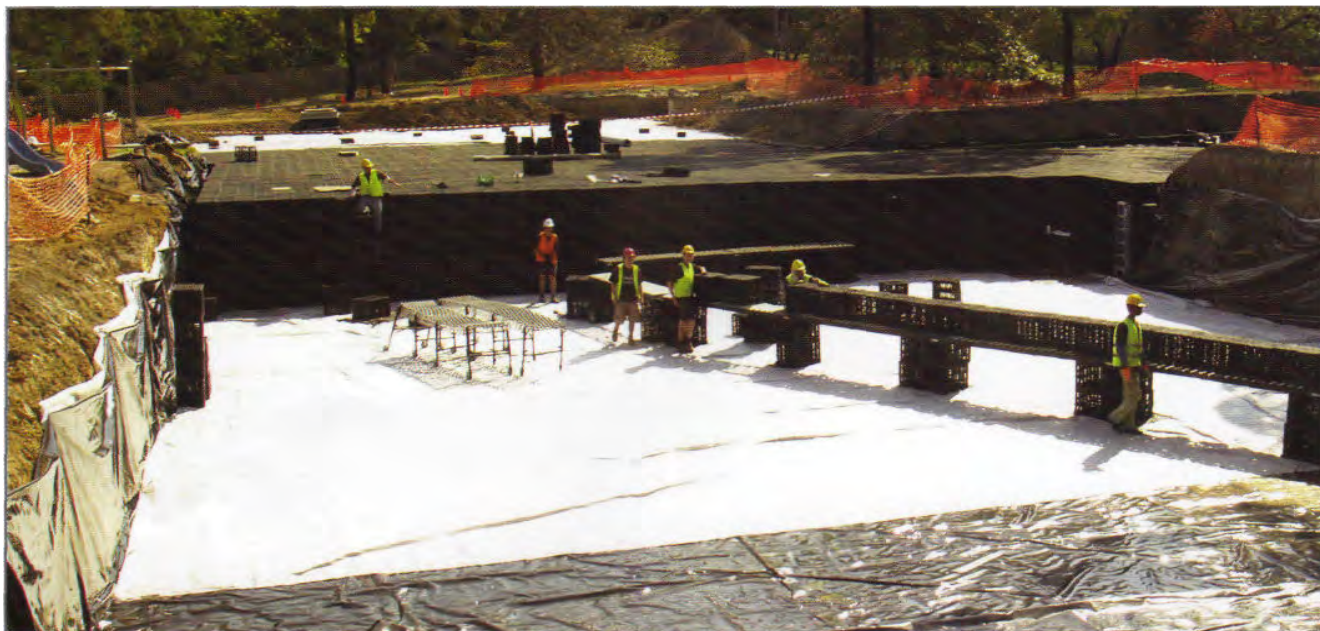


- |                             |                                  |                        |
|-----------------------------|----------------------------------|------------------------|
| 1 Downpipe                  | 4 Infiltration or Detention Tank | 7 Pump suction well    |
| 2 CDS Filtration Unit       | 5 Welded waterproof liner        | 8 Sand backfill        |
| 2A First Flush Unit         | 6 Geotextile fabric              | 9 Outlet to stormwater |
| 3 Rainwater Harvesting Tank |                                  |                        |



## Rainwater harvesting Commercial

The high compressive strength and durability of EcoClean EnviroModules makes them suitable for installation under driveway and carpark areas, thus making the most of valuable and often limited land area.



The EcoClean Ausdrain EnviroModule Rainwater Harvesting Tank provides a cost-effective and flexible solution to underground water storage requirements. The modular flexibility of the system offers enormous scope to maximize the amount of water storage and design a tank that best suits each individual project.

EcoClean Ausdrain tanks can be installed in landscaped areas and under trafficable areas such as a driveway or carpark where external space is limited. When installed in a trafficable area, a pavement consisting of stabilized road base and asphalt or a reinforced concrete slab is required over the surface of the tank according to engineer's specification.

The EcoClean Ausdrain tank is recommended for car and light commercial vehicle traffic. The tank can be designed for heavy vehicle traffic in certain situations. This will require consultation with EcoClean Technology and approval by a certified engineer.

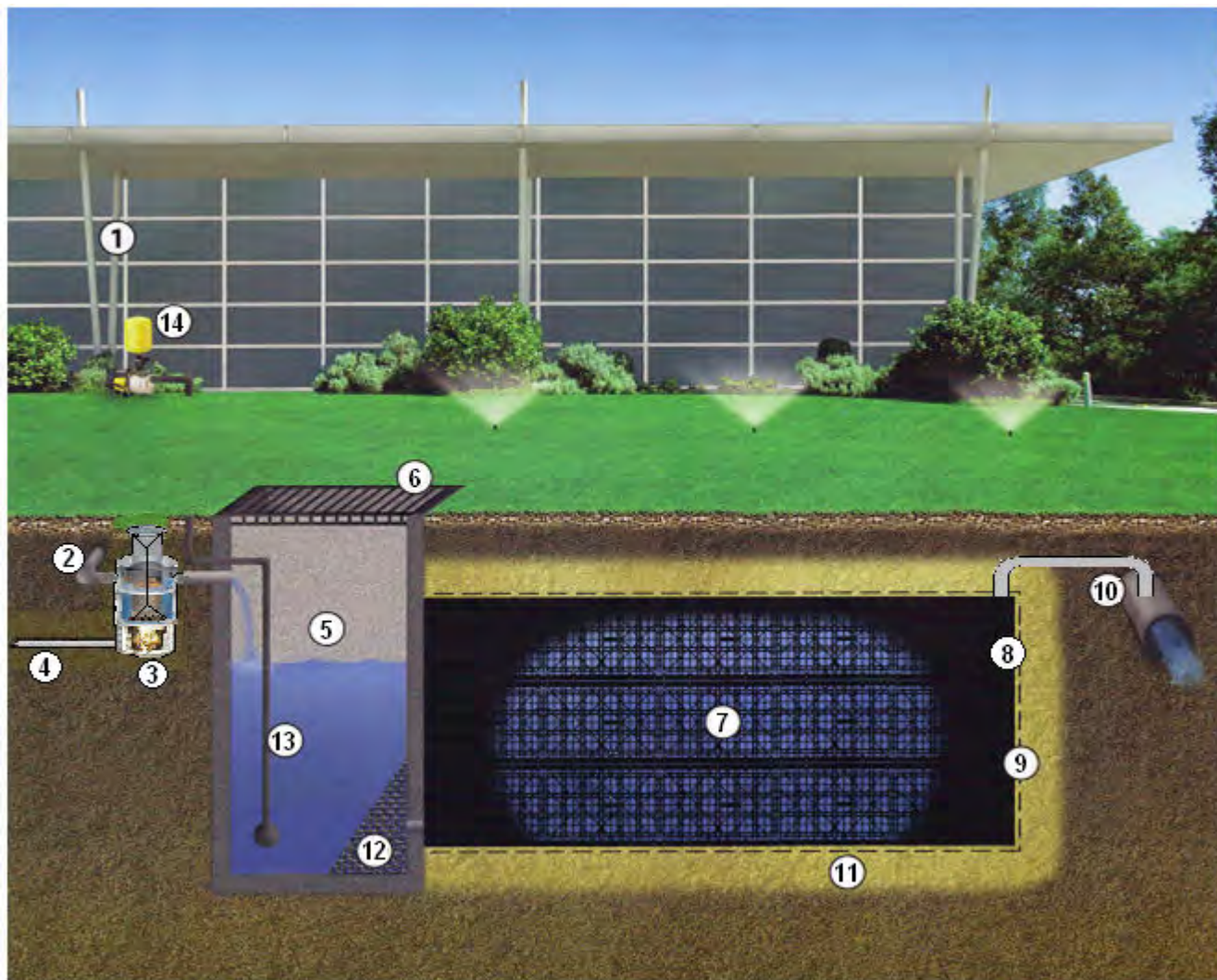
The EcoClean Ausdrain EnviroModule tank is surrounded in a durable, high tensile strength factory welded waterproof liner. The liner is supplied as a base and cap and is made to order according to specific tank dimensions. The cap overlaps the base and does not require joining or sealing on site ensuring that each tank is completely watertight.

Inlets and outlets connect to a pre-cast pit that sits within the liner of the tank. This pit acts as a maintenance and inspection chamber for the tank and houses either a suction line connected to an above ground pump or a submersible pump.

It is essential that water entering the tank is pre-filtered to avoid long term and costly maintenance of the tank. Either an EcoClean CDS unit or a suitable Gross Pollutant Trap (GPT) should be installed to prevent sediment and gross pollutants from reaching the tank. In the event that the tank surcharges, excess water is discharged through an overflow pipe to a designated stormwater outlet.

# EcoClean Ausdrain EnviroModule™

## Rainwater harvesting tank (Commercial)



- |  |                         |
|--|-------------------------|
| 1 Down pipe                                | 8 Welded tank liner     |
| 2 Inlet pipe                               | 9 Protection fabric     |
| 3 CDS Filtration Unit                      | 10 Overflow pipe        |
| 4 Discharge pipe to drain or soak away pit | 11 Coarse sand backfill |
| 5 Discharge Control pit                    | 12 Maximesh screen      |
| 6 Lockable lid/grate                       | 13 Suction line         |
| 7 EcoClean Ausdrain EnviroModules          | 14 About ground pump    |

### System components

- EcoClean Ausdrain EnviroModules – 9.6 modules per 1000 litres
- Connector pins (optional)
- EcoClean CDS unit
- Factory welded tank liner
- Geotextile fabric



## Infiltration

Compared to conventional gravel systems, the EcoClean Ausdrain EnviroModule Infiltration tank offers 95% void storage that reduces tank sizing by up to two thirds saving on excavation and spoil removal costs.



The continued development of our cities and greenfields has resulted in the requirement to provide on-site water management systems. This enables the replenishment of underground aquifers and prevents stormwater discharge that may result in downstream flooding.

The EcoClean Ausdrain EnviroModule Infiltration Tank has proven to be one of the most efficient and cost-effective solutions to the environmental issues of stormwater management that have resulted in local authority requirements for on-site infiltration and retention.

The EcoClean Ausdrain EnviroModule Tank is constructed from high strength modules that have been engineered to allow stormwater to be captured and efficiently discharged inside a structural void surrounded in geotextile fabric.

Water entering tank is stored temporarily and naturally dissipates back into the surrounding ground at a rate depending on soil type.

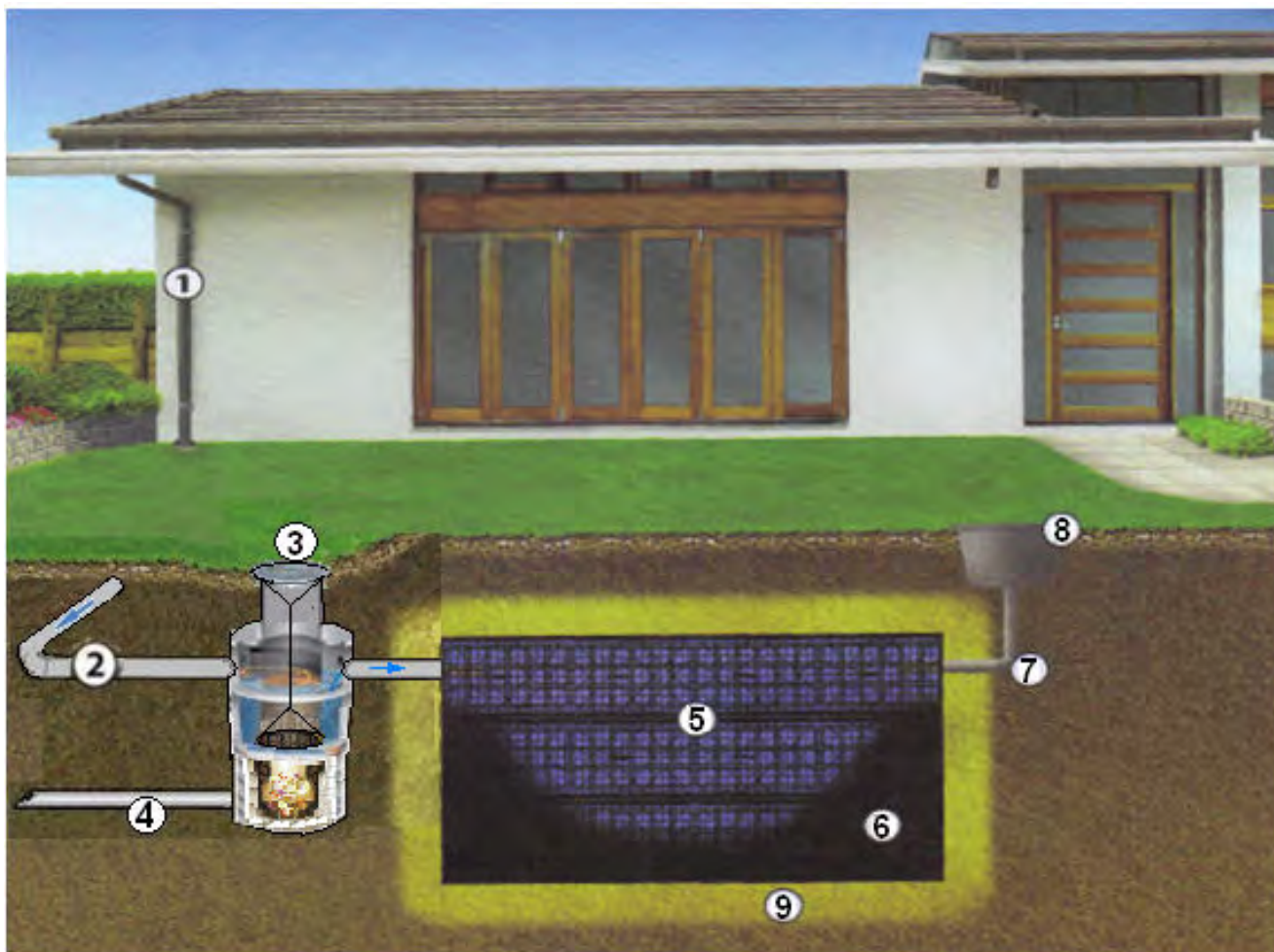
The EcoClean Ausdrain EnviroModule tank can be installed in a variety of soil types due to the remarkable infiltration rates proven to be up to six times greater than gravel filled systems. The high compressive strength of the modules enables tank installations under trafficable areas such as carparks and driveways.

Pre-filtering of stormwater is essential for a well designed system. Combined with the EcoClean CDS Filtration unit or a suitable Gross Pollutant Trap (GPT), this system provides a complete stormwater management solution.



# EcoClean Ausdrain EnviroModule™

## Infiltration tank



- 1 Down pipe
- 2 Inlet pipe
- 3 CDS Filtration Unit
- 4 Discharge to drain or soak away pit
- 5 EcoClean Ausdrain EnviroModules

- 6 Geotextile fabric
- 7 Discharge pipe
- 8 Overflow pit
- 9 Coarse sand backfill

### System components

- EcoClean Ausdrain EnviroModules – 9.25 modules/ cubic metre
- EcoClean CDS unit
- Connector pins (optional)
- 150mm pipe connector (optional)
- Geotextile fabric

## On-site Detention

**Manufactured from 100% recycled plastic, the EcoClean Ausdrain Detention Tank can be installed in a fraction of the time required to construct a concrete tank.**



EcoClean Ausdrain EnviroModule Detention Tanks are easily installed on any project saving valuable time and money. Compared to a concrete tank there are no footings, slabs, blockwork or reinforcement required. Each tank is sealed with a strong and durable waterproof liner.

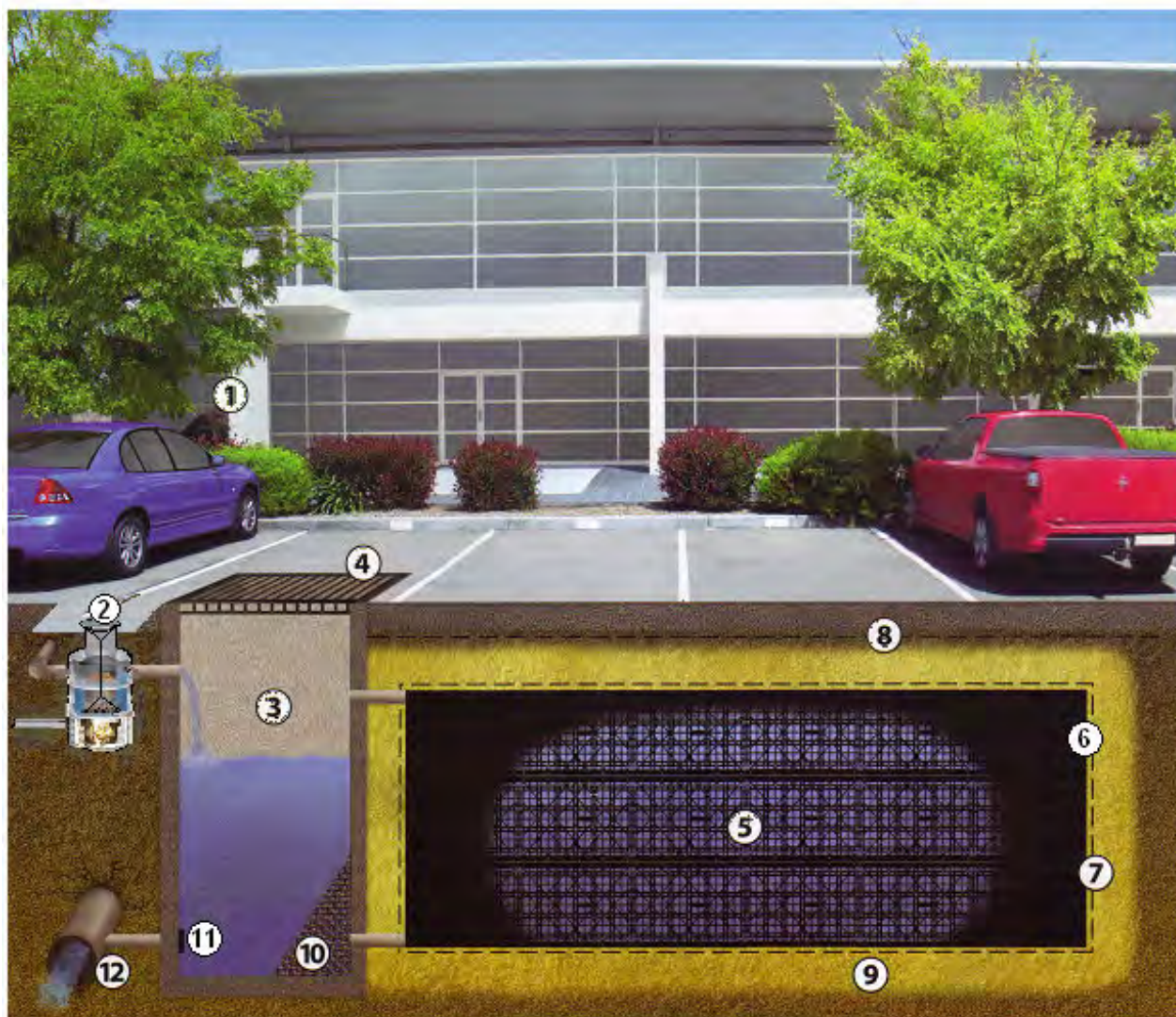
EcoClean Ausdrain EnviroModules create the required void storage allowing stormwater to be temporarily stored inside the tank before discharging to a designated outlet. EcoClean Ausdrain EnviroModules are available in standard duty suitable for installation under landscaped areas or extra duty for trafficable situations. The modular nature of the tank allows greater scope for design flexibility and tank sizing.

Stormwater is pre-filtered via CDS unit or GPT. This provides valuable at source water quality benefits and reduces the need for long-term tank maintenance. The water then enters a pre-cast pit that is fitted with an orifice plate to reduce the rate of discharge from the tank to the designated stormwater outlet.



# EcoClean Ausdrain EnviroModule™

## Detention tank



- |                                   |                         |
|-----------------------------------|-------------------------|
| 1 Down pipe                       | 7 Protection fabric     |
| 2 CDS Filtration Unit             | 8 Geogrid under carpark |
| 3 Discharge control pit           | 9 Coarse sand backfill  |
| 4 Lockable lid/grate              | 10 Maximesh screen      |
| 5 EcoClean Ausdrain EnviroModules | 11 Orifice plate        |
| 6 Tank Liner                      | 12 Outlet to stormwater |

### System components

- EcoClean Ausdrain EnviroModules – 9.25 modules/ cubic metre
- Connector pins (optional)
- 150mm pipe connector (optional)
- EcoClean CDS filtration unit
- Pre-cast discharge control pit
- Tank liner
- Geotextile fabric

## Bio-remediation

Stormwater flowing from roadways, carparks and pavements contain toxic and gross pollutants. Heavy metals such as zinc, copper and lead are deposited on our roadways and are washed into the stormwater drains with each rainfall.



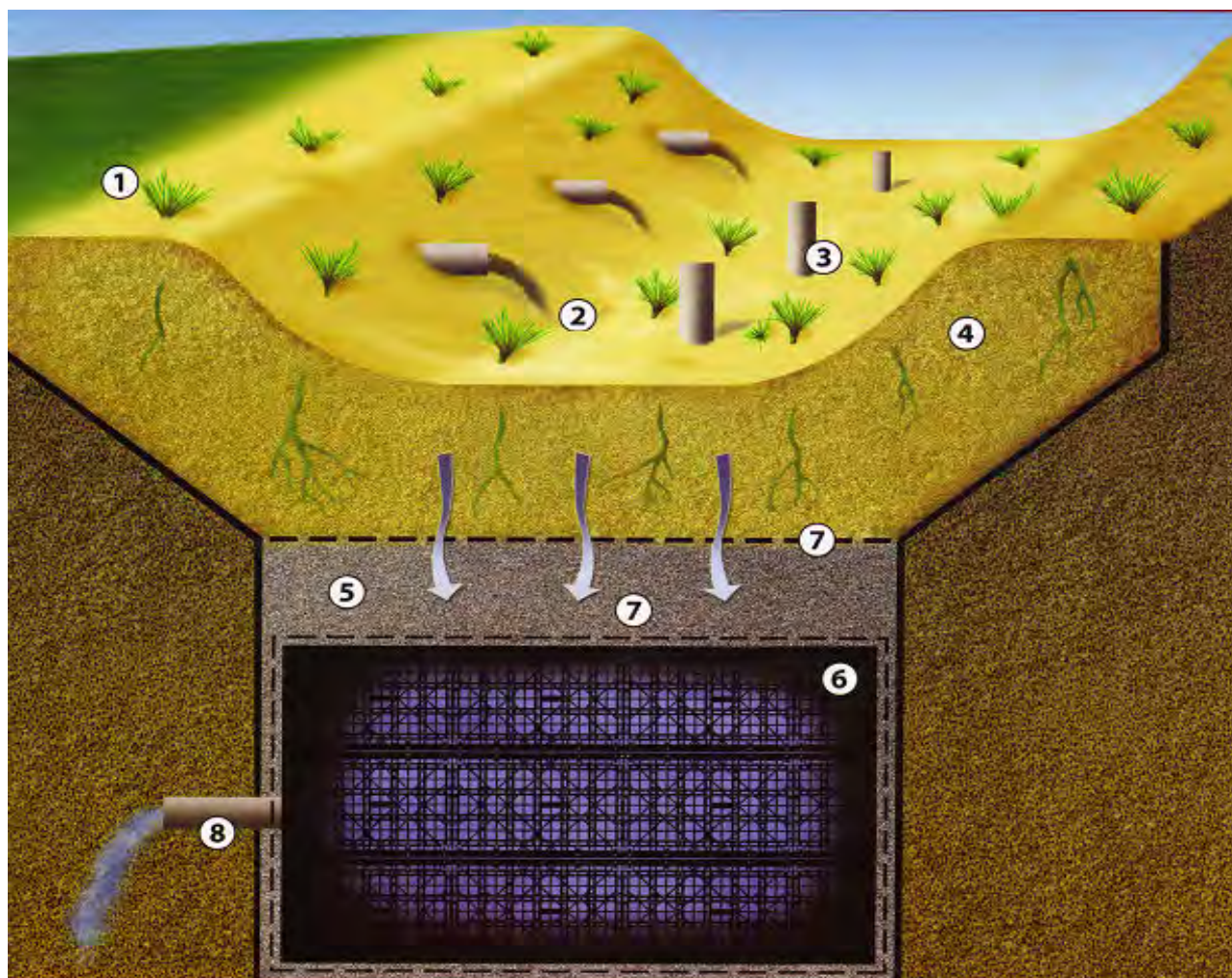
Other stormwater pollutants include nutrients from decaying organic matter, detergents and pathogens from animal waste. Without proper management this polluted water will end up in our oceans and waterways seriously impacting aquatic ecosystems.

Gross Pollutant Traps (GPT's) are effective in capturing solids such as litter, sediment and organic waste. However, in most cases it is not possible to treat stormwater for nutrients and heavy metals using such systems. A secondary stage of filtration is required based on treatment techniques used by other technologies such as constructed wetlands, sand filters and bio-retention systems.

EcoClean Ausdrain EnviroModules can be effectively used to create a secondary treatment system. This system has proven to be extremely effective in the treatment of stormwater run-off. During light to medium rainfall all stormwater is directed to the system for treatment. During large storms the system adequately treats the initial "first flush" runoff containing the major concentration of pollutants.



# EcoClean Ausdrain EnviroModule™ Treatment System



- 1 Vegetation
- 2 Untreated Stormwater
- 3 Inspection point
- 4 Coarse washed river sand

- 5 Clean 7mm gravel
- 6 EcoClean Ausdrain EnviroModules
- 7 Geotextile fabric
- 8 Clean Stormwater

### System components

- EcoClean Ausdrain EnviroModules – 9.25 modules/ cubic metre
- Connector pins (optional)
- 150mm pipe connector (optional)
- EcoClean CDS filtration unit of GPT
- Geotextile fabric

# Filtration

## Ecoclean CDS Unit

The EcoClean CDS Unit has been developed as a low cost, effective and easy to maintain stormwater filtration unit.



**Selection Table – CDS Rainwater Treatment Unit**

Model Reference	Catchment Area (ha)	Pollutant Storage Volume (m <sup>3</sup> )	Chamber Diameter (mm)	Outside Pipe Diameter (mm)
F 0404	≤ 0.5	0.25	640	150 / 225
F 0506	≤ 1.0	0.3	1100	≤ 375
P 0708	≤ 2.0	0.7	1750	1000
F 0908	≤ 4.0	1.4	1540	1200
F 0912	≤ 6.0	1.7	1540	1500
P 1009 to P 3030		Please refer CDS Catalogue		

### Model Designation

CDS unit models are firstly identified by the letter F for Fibreglass and P for Precast unit. A four digit number represent the screen diameter and screen height the follows to give the standard model designation for a CDS screen for installation into standard commercially available i.e. F 0908 Example; designates fibreglass with a separation screen dia 0.9m and screen heights of 0.8m.

Stormwater flowing from roof areas and pavements is directed into the Ecoclean CDS Unit via downpipes or a surface grate. The EcoClean CDS Unit traps sediment and gross pollutants allowing clean water to flow through the filter.

Each unit consists of FRP pit and a removable filter bag on stainless steel rim with handles. The filter bag has a 200 micron base section and a 400 micron overflow. The filter bag is easily removed for maintenance. This involves discarding the contents of the bag as compost and washing the bag before replacing.

The EcoClean CDS unit is available with a solid plastic lid or galvanized grate. When required, a riser is also available allowing flexibility for required pipe invert levels.

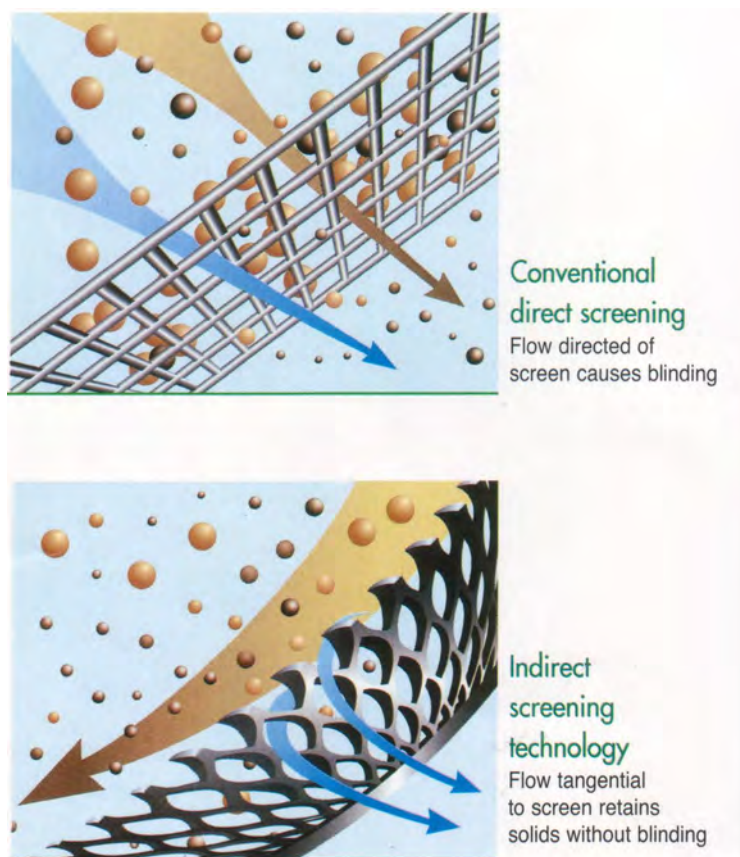
The EcoClean CDS unit is suitable for residential and smaller size projects and is recommended for installation in any situation subject to area design.



# Introduction to CDS Technology

Continuous Deflective Separation (CDS) is an innovative screening technology for the separation of solids from liquid streams. Unlike direct screening, which operates by impinging particles in the flow directly onto the screen, CDS utilizes the principle of indirect screening where the particles are carried by the flow across the face of the screen (Fig. 1). This, in conjunction with hydraulic balancing across the screen, delivers a process capable of removing solids from high flows of water and wastewater.

**Figure 1 - Illustration of direct (top) and indirect (bottom) Screening**

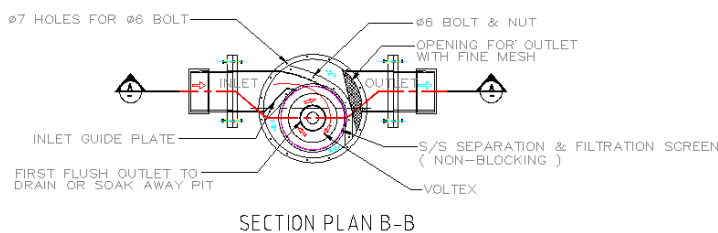
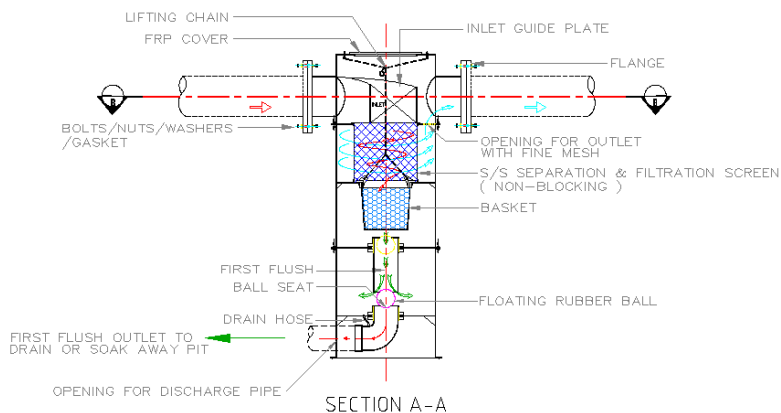


The technology utilizes a cylindrical screen with tangential inlet for the fluid above the screen and a sump below the screen. The tangentially introduced flow rotates inside the screen, keeping the screen surface free of solids while a small proportion of the fluid passes through each of the apertures in the screen. Solids are retained inside the screen on the rotating column of fluid if neutral density, sink into the sump of settleable, or float to the surface of the fluid in the unit.

Characteristics of the technology include non-blinding operation, high loading rates (up to 32 m<sup>3</sup>/s), capture performance that is independent of flowrate, and low operation and maintenance requirements.

**Features:**

- **Guaranteed Non-blocking.**  
(No premature bypass of pollutants)
- **Off-line pollutant storage.**  
(No loss of captured pollutants)
- **“Self-cleaning” screen.**  
(Continuous operation and lower maintenance costs)
- **Durable material construction.**  
(FRB/Stainless Steel  
Choice of Lids – including trafficable)
- **Storage of settled pollutants off-line and out of flow path.**  
(Pollutants remain captured and screening area is free of pollutants)
- **Auto removal of first flush water.**



**CDS RAINWATER FILTRATION UNIT & FIRST FLUSH REMOVAL SYSTEM (FRP TYPE)**

**Performance:**

Description :	CDS Target Capture
<b>Floatable Pollutants</b>	<b>100%</b>
<b>Gross Pollutants (0.2mm)</b>	<b>98%</b>
<b>Fine Sediments (0.1 mm)</b>	<b>85%</b>
<b>Total Solid Suspension (TSS)</b>	<b>70%</b>
<b>Total Phosphorous (TP)</b>	<b>30%</b>

**Life Expectancy**

> 50 Years

**Safety**

- Below ground or above ground operation
- No moving parts.
- Entry not required for regular cleaning.
- Large opening for pollutant removal.

**Maintenance:**

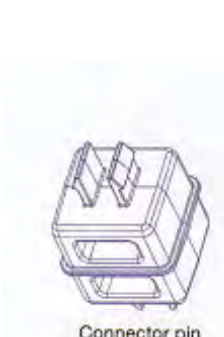
CDS Units are claimed to be the easiest, fastest and safest proprietary filtration devices to clean on a repetitive maintenance plan. The large surface opening allows for complete access from the surface to the pollution stored in the Unit. The “self cleaning” screen should never need cleaning or backwashing to free debris that would normally be stuck in a traditional screen.



## Product Guide

Code	Product Description	Dimensions
<b>EcoClean Ausdrain EnviroModule</b>		
100212	Standard duty module - 4 sides / 3 braces	600 x 400 x 450mm (9.25 per cubic metre)
100214	Extra Duty module - 4 sides / 4 braces	600 x 400 x 450mm (9.25 per cubic metre)
100216	Double module - standard or extra duty	600 x 400 x 900mm (4.6 per cubic metre)
100218	Trip Module - standard or extra duty	600 x 400 x 1350mm (3.1 per cubic metre)
<b>EcoClean Ausdrain EnviroModule Connector</b>		
100210	EnviroModule Connector pin	4 per double module / 8 per triple module
100215	EnviroModule 150mm pipe connector	
<b>EcoClean CDS Filtration Unit</b>		
		Range from F0404 to F0912, beyond these bigger CDS units can be used. (please refer to CDS Catalogue)
<b>EcoClean Ausdrain Tank Liners</b>		
101010	Geotextile Fabric	2 x 25m/ 2 x 50m/ 4 x 50m
101020	Detention tank flat sheet liner	Made suit to tank dimensions
101030	Rainwater harvesting tank flat sheet liner	Made suit to tank dimensions
101040	Rainwater harvesting tank fitted liner	Made suit to tank dimensions
<b>EcoClean Ausdrain EnviroModule Rainwater Harvesting Tanks</b>		
R 2500	2500 litre rainwater harvesting tank	1200 x 1600 x 1350mm
R 5000	5000 litre rainwater harvesting tank	2400 x 1600 x 1350mm
R 10000	10000 litre rainwater harvesting tank	2400 x 3200 x 1350mm
R 20000	20000 litre rainwater harvesting tank	4800 x 3200 x 1350mm

Please note: EcoClean rainwater harvesting tanks can be supplied to any dimension/capacity required





Manufactured from 100%  
environmentally friendly recycled  
plastics

For more in-depth information  
about EcoClean Ausdrain Systems and the products  
the company provides, please contact:

### EcoClean Technology Sdn Bhd

Tel : 03-91718160  
Fax : 03-91719160  
Email : [ecoclean@streamyx.com](mailto:ecoclean@streamyx.com)  
Website : [www.ecoclean.com.my](http://www.ecoclean.com.my)

Address : 12A-02 & 03, Wisma Zelan,  
Jalan Tasik Permaisuri 2,  
Bandar Tun Razak, Cheras,  
56000 Kuala Lumpur, Malaysia

