



Modular Geo-Void Systems

Total Water Management



VersaVoid

**A Precipitation Collection System
and Versatile Void Former**



**Reduces Urban
flooding
and water
contamination**

**Modular design
provides
easy installation**

**Civil and
Environmental
Engineering
Applications**

General Information

Modular Geo Void System

Cost Effective

Geo Void is a cost-effective alternative to gravel and pipe based systems. When infiltration control methods are used as the first choice for surface water drainage their total capital cost can be up to 5 times cheaper than conventional pipe systems as stated in CIRIA Report 156 'Infiltration Drainage; Good Practice Manual.

Flexibility of Application

The drainage module is suitable for both vertical and horizontal applications. It can be supplied in pre-assembled sheet format in lieu of slotted/perforated drains, in loose form for horizontal applications (e.g. infiltration blankets/green roofs), and in a box construction for infiltration or attenuation tanks.

Flexibility in the adjustment of tank heights, widths and depths allows VersaVoid to be used in greater variety of site conditions than competing systems, including higher water table levels from 300mm to 3050mm+.

Exceptionally High Void Area

A 99% sectional void area ensures that the rate of absorption of water into VersaVoid will always be higher than the rate of percolation of water through the soil, maintaining a continuous discharge.

Environmentally Friendly

The high void to surface area ratio of VersaVoid means that less aggregate is required to achieve the same infiltration rate as full gravel construction. This reduces the impact of aggregate extraction on the environment.

Benefits

Quick

Reduce site access delays

Lightweight

No cranes required

Strong

Designed for maximum anticipated loads

Maintenance Free Tank

All debris and sediment is pre-filtered

Determinate Volume

One cubic metre of Tank modules contain 950 litres of water

Cost Effective

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

High Infiltration

98% void surface area

Totally Modular

For greatest flexibility designed to cope. Units start at 300mm deep for shallow inverts to 3050mm+ deep in 250mm increments.

Designed by Engineers for Engineers

– to specify with confidence.

Designing out Problems

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

Designing in Answers

to design requirements.

Total 3D Access

For total maintenance with total confidence.

Structurally Designed

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

16 clear vertical access chambers per m2.

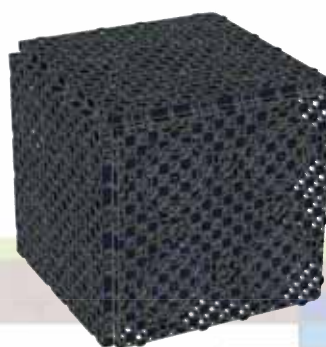
Total Void Creation

With the greatest strength from any modular systems.

System Components

VersaVoid Tank Modules

Inner Supports -	500 x 500 x 250 mm
Outer Plates -	500 x 500 x 25 mm
Installed Modules -	500 x 500 x 300 mm
	500 x 500 x 550 mm
	500 x 500 x 800 mm
	500 x 500 x 1050 mm
	500 x 500 x 1300 mm
	500 x 500 x 1550 mm
	500 x 500 x 1800 mm
	500 x 500 x 2050 mm
	500 x 500 x 2300 mm
	500 x 500 x 2550 mm
	500 x 500 x 2800 mm
	500 x 500 x 3050 mm+



See separate data for:

VersaVoid Filtration Units

Geotex Filtration Fabric

Tuflex Waterproofing Membrane

Geotex Protection Fleece

Ventilation Units

Preformed Pipe Connection Covers

Re-cycling Systems

Run-off Filtration Media - Ecosand

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

Total Stormwater Management

ESS Geo-Void 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. Geo Modular Systems offer a highly efficient option for Stormwater Management in any kind of soils.

Water Quality

ESS Geo-Void 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

ESS Geo-Void Modular Tank System performance supersedes outdated aggregate trenches. The ESS System provides a void space of over 90% compared to less than 20% in typical aggregate trenches. Consequently, the ESS 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 ESS Modular Tank Modules also make installation quicker, safer and cheaper. No sediment build up occurs in the VersaVoid System, unlike the clogging that is characteristic of aggregate based approaches.

Maintenance

ESS Geo-Void Modular Tanks System provide total all round access with clear access points and channels in all directions.

How To Use

Infiltration is the recommended method of water management whenever:

- Site water quality is of paramount importance.
- Control of nutrients and gross pollutants is required.
- No formalised drainage is available.
- Construction levels are below the level of street stormwater mains.
- The tank is part of a landscape component of the water reticulation system.

Significant benefits are available when you use the superior holding capacity and surface area of an ESS Infiltration System. Please contact our office for further details.

Load Bearing Capacity:

The unconfined load capacity of the VersaVoid Tank Modules when orientated in the width, length and depth configurations are determined by the designed use and ground conditions and the constant load factors achievable allows for any installations with built in safety factors. See technical data for certified loading characteristics.

Infiltration Tank

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

How it Works!

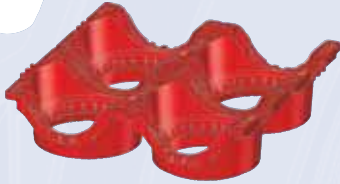
The system is designed to capture surface water through infiltration, and then clean and filter the water before it is allowed to recharge the water table providing moisture for surrounding vegetation. The **VersaVoid Filtration Unit** captures and cleans roof water before entry into the storage area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

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



VersaVoid Geo-Cell Tank Modules

1



Packs away for easy transportation

2



2 part Structure
Fix together to create easy access for effective Maintenance

3



Clip Together Block Construction
Identical parts fit together to create the required capacity

4



Outer Panels
Easily clip on and off to filter large objects from the storm water, but still provide easy access for Maintenance



MULTIPLE STACKS



CONNECTORS



FEMALE CONNECTOR

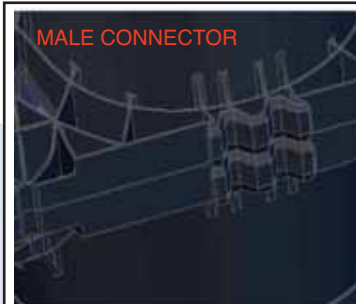
Each part has a 15° angle on top and bottom of connector. So it's possible to connect the boxes in anyway you want it.

The angle is 5mm on each side.

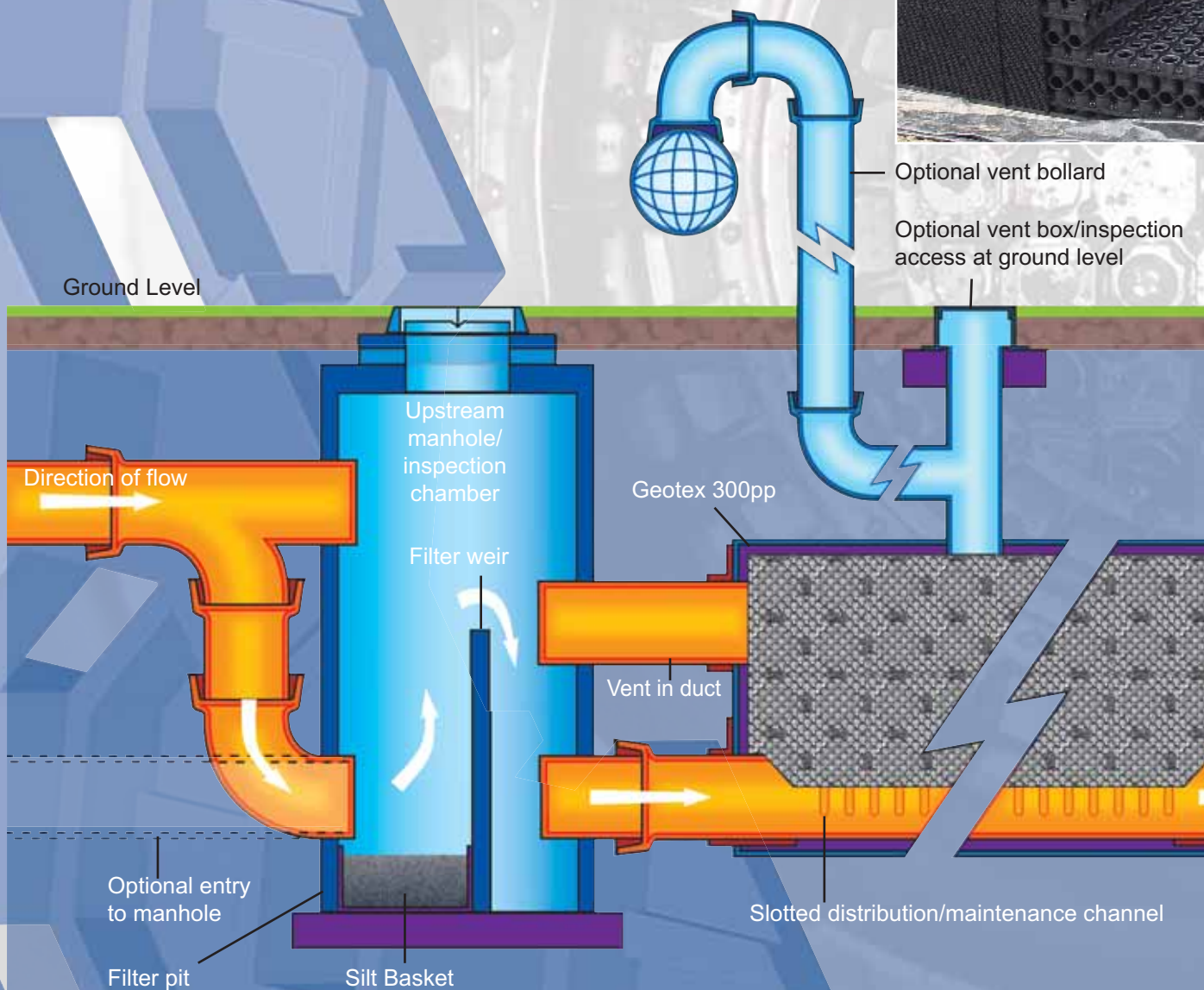
The rest of the surface is straight and directs the parts together.

MALE CONNECTOR

Same as Female.



Complete Access



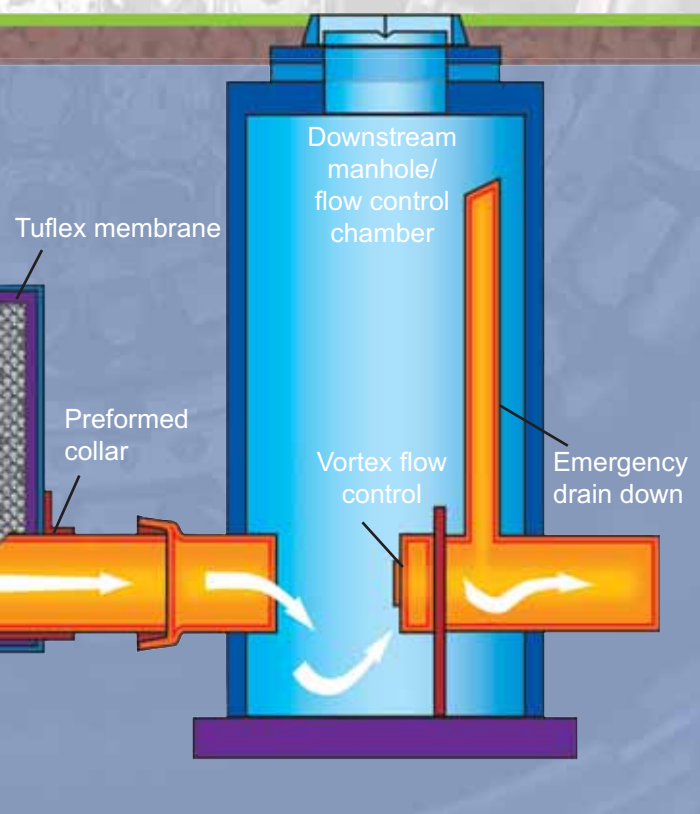


Horizontal Access

Vertical Access



Through system 4 channels per m² in both directions



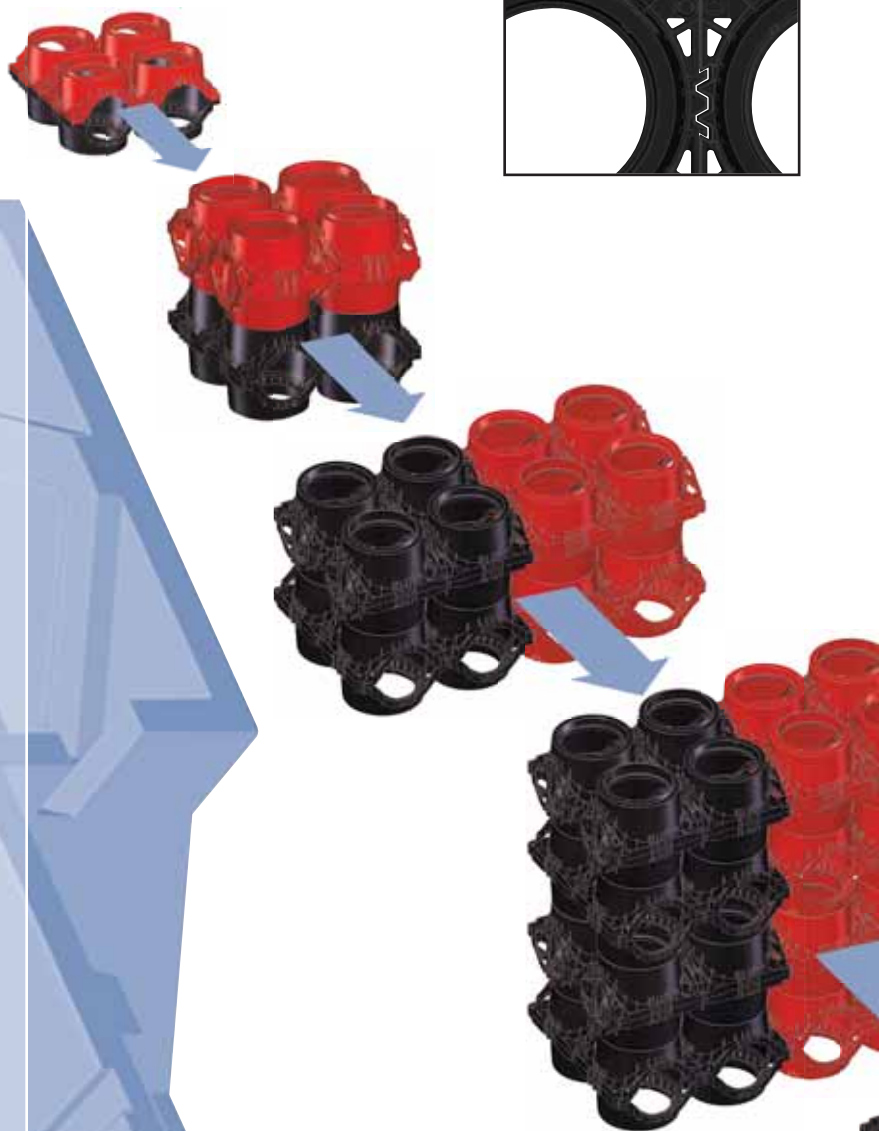
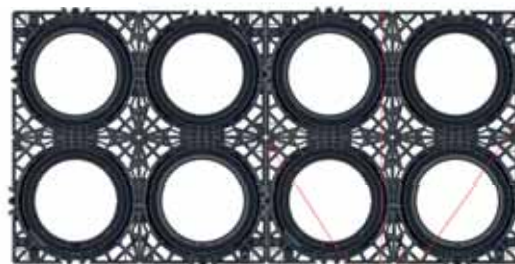
Installation Procedures

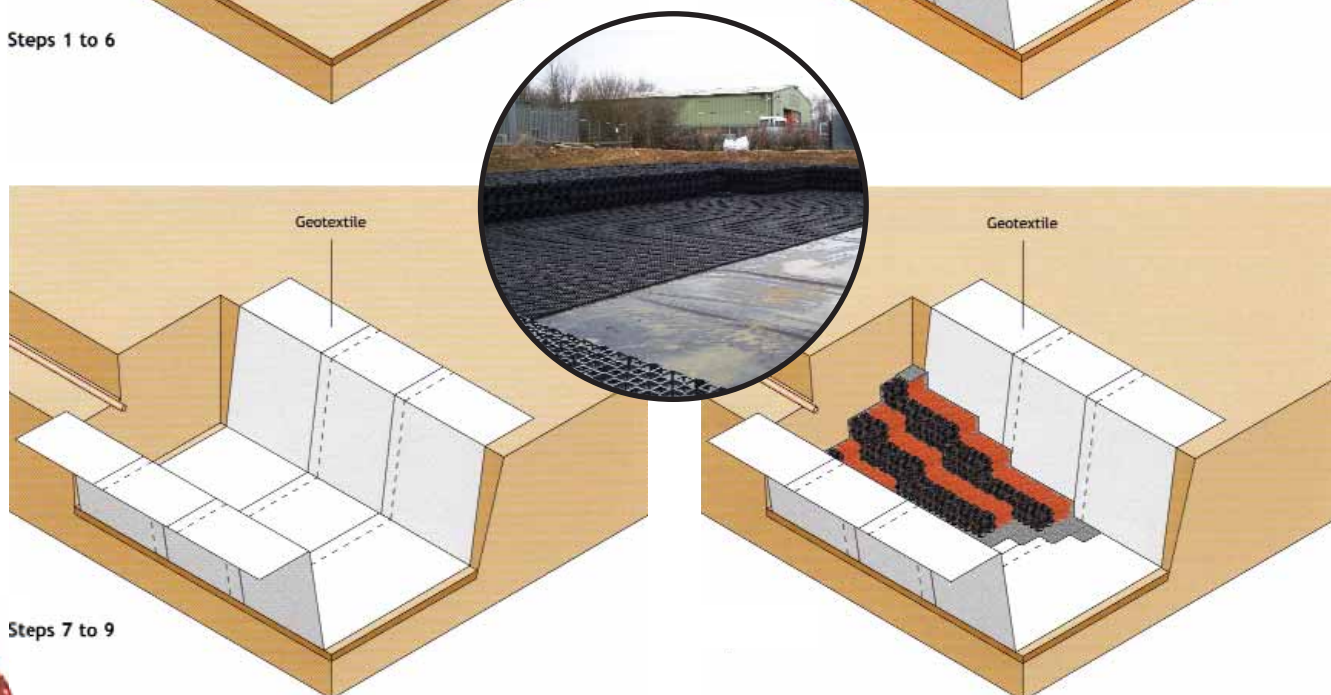
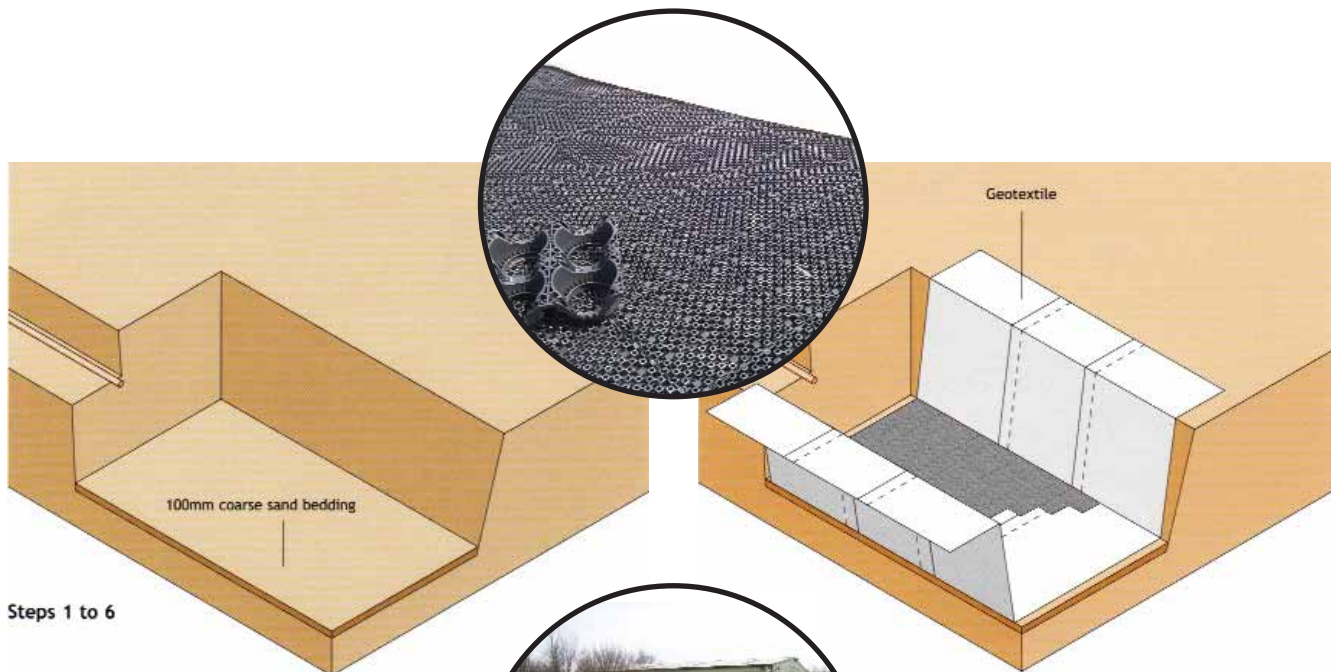
Infiltration Tanks

Installation Steps

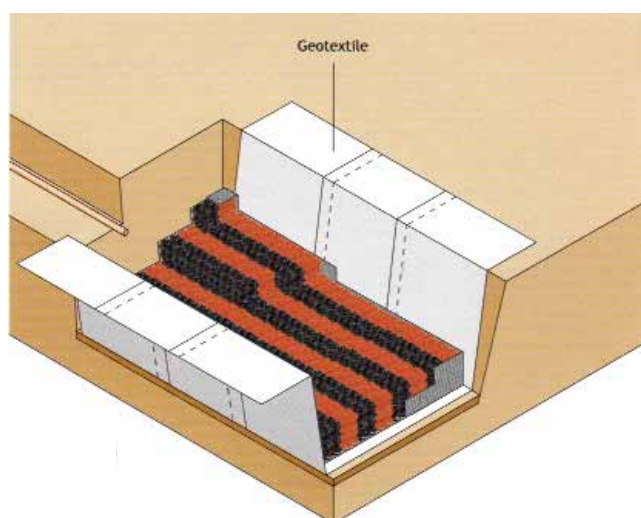
1. Excavate the pipe trench and lay the inlet pipe to the required fall and install silt traps in appropriate locations in the pipe run.
2. Excavate the hole or trench to the required dimensions to modular units, and any external inspection chamber(s) and / or silt trap(s).
3. Ensure that the base plan dimensions of the hole allows sufficient working space for the site operatives to manoeuvre the VersaVoid units and geotextile into position.
4. Ensure that the base of the excavation is smooth and level, batter back the sides of the excavation to a safe angle, and ensure that the safe access is provided for the site operatives.
5. Remove any soft spots from the excavation and replace with compacted granular material.
6. Lay 100mm coarse sand bedding to the base of the excavation and level.
7. Lay the geotextile, to the specification, over the sand bedding and up the sides of the excavation with minimum 200mm overlap joints between strips.
8. Ensure there is a minimum 200mm over-run of geo-textile at the end of each VersaVoid modular unit.
9. Inspect geotextile for damage. Lay baseplate to configured design.

TOP VIEW





10. Assemble the VersaVoid structural panels to form the required number of full module tanks. Laying the outer panels first, followed by the inner parts.

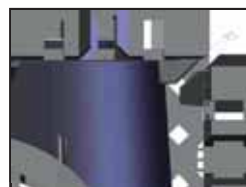
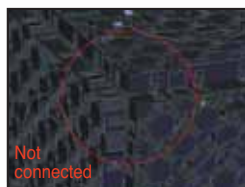


The illustrations show the correct relationships, orientation, and sequence of connection of each panel to form a basic full module tank (500 x 500 x depth).



Installation Procedures

11. Assemble the VersaVoid modular units to the configuration required with each full module tank being secured to another by the interlocking integral jointing clip, connect side panels and top to finished module, and place on the geotextile.



12. To receive the inlet pipe (and outlet/ inspection pipe if required). Insert tank connector and, using geotextile, form a wrap around apron of the tank connector spigot and secure using tape or jubilee clip. Ensure a minimum 50mm of spigot remains exposed.

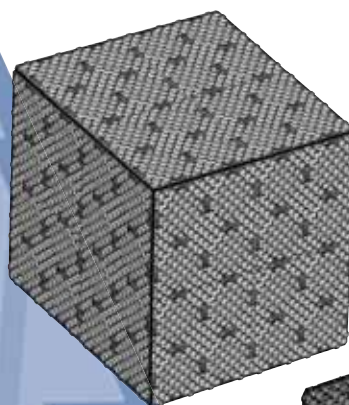


13. Continue with the geotextile encapsulation of the VersaVoid tank.



14. Fold the corners of the geotextile over-run at each end of the infiltration tank as shown.

15. Complete the encapsulation by wrapping the geotextile horizontally around the tank and tape into position.



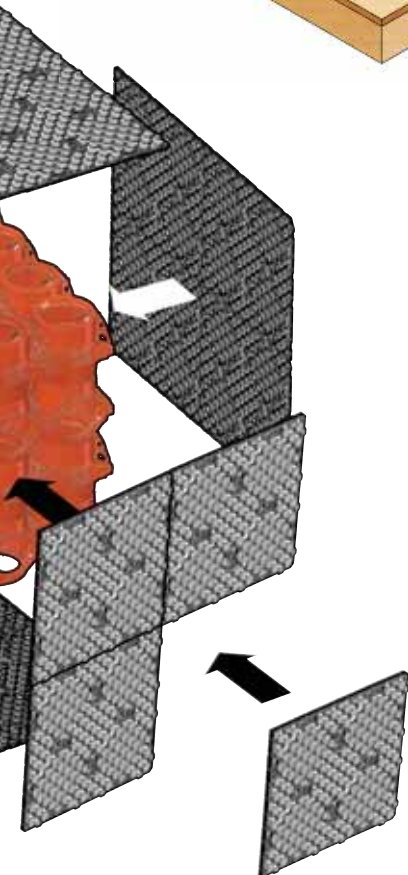
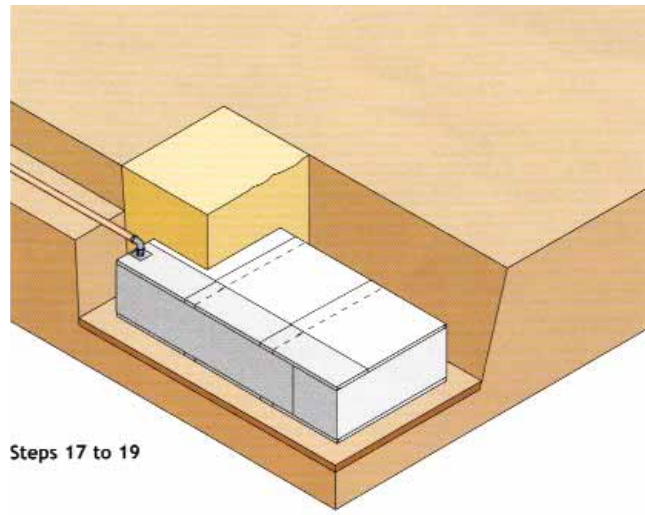
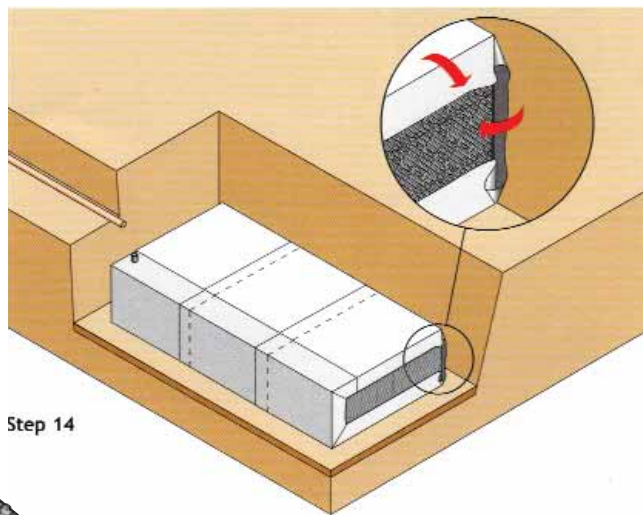
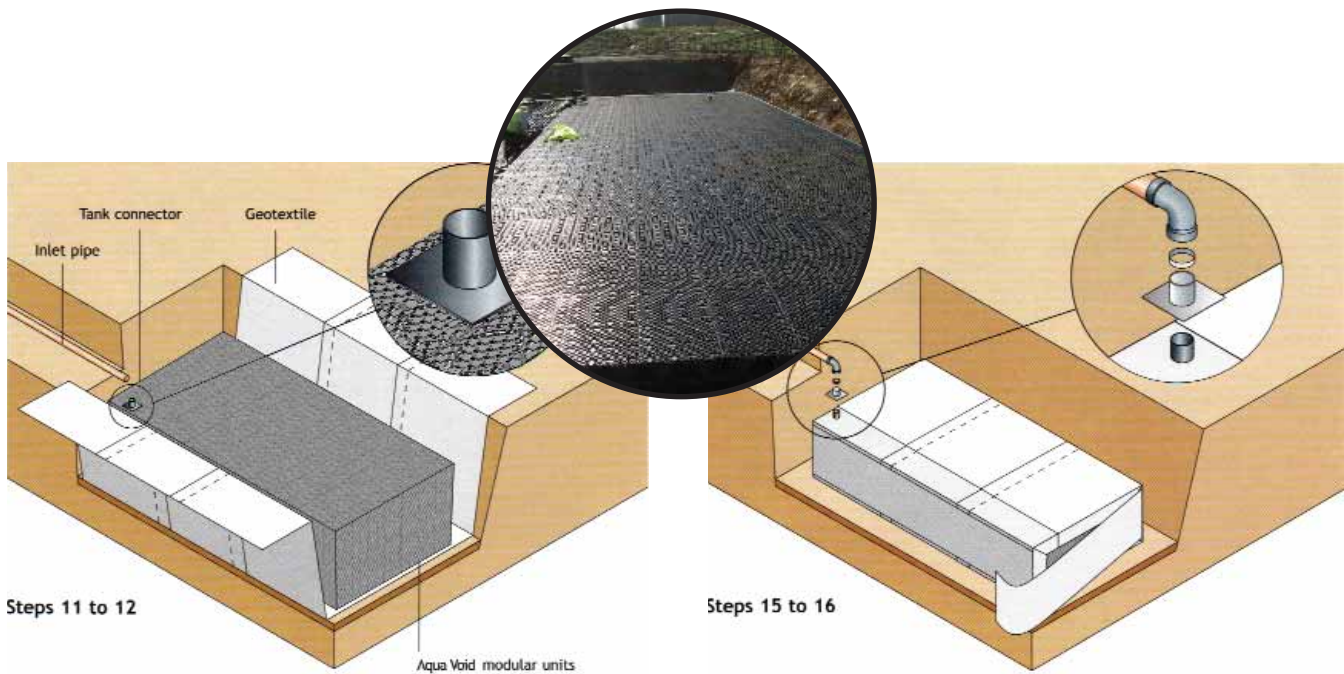
16. Connect inlet / outlet / vent pipe and inspection chambers using appropriate adaptors.

17. Backfill around excavation using type 1 or 2 sub base or selected granular material, and compact in layers of not less than 150mm. The first 500mm of any installation should be compacted by hand,

18. Use a coarse sand protection layer over the top of the VersaVoid tanks and geotextile and the back fill to the required depth using Type 1 or 2 sub base material. If the area is to be trafficked, or where the area is to be landscaped then as-dug material may be used provided sharp or large solid matter is removed.

19. The area should then be compacted using suitable compaction equipment in accordance with specification for highway Works.





1600m³ Soakaway 2 meters deep, 3 meters of cover

Installation Procedures

Attenuation Tanks

We strongly recommended, that the VersaVoid attenuation system is installed by a competent, qualified geomembrane lining contractor. Please consult ESS Ltd for further advice.

Installation Steps

1. Follow steps 1-9 as for infiltration but use protection fleece as specified. Also dependant on ground conditions (e.g. higher water table) site concrete layer may be preferable to sand base.

2. Fabricate the geomembrane liner on site and ensure that all welds are tested. The geomembrane must be installed by an approved contractor.

3. Apply a second (inner) protection fleece as steps 7-9 above and to specification inside the geomembrane tank liner (if required).

4. Form hole(s) in side or top of VersaVoid unit using 150mm diameter hole to receive the inlet pipe (and outlet/ inspection pipe if required).

5. Assemble the VersaVoid modular units to the configuration required with each tank being secured to another by interlocking, and place on protection fleece.

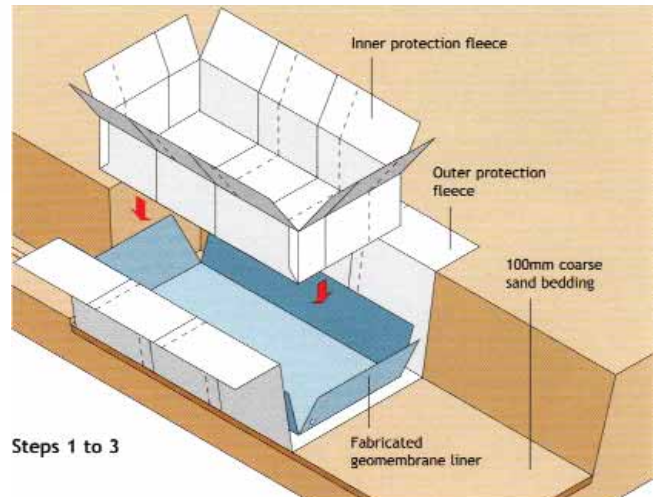
6. Cut geo-textile around inlet/ outlet pipes and insert tank connector, together with geomembrane top hat.

7. Carefully cut geomembrane around pipe protrusions and weld top hat to the geomembrane tank liner. Then weld geomembrane top hat to tank connector. Test all joints for leaks.

8. Continue with the inner protection encapsulation of the VersaVoid tank.

9. Place lid of geomembrane on tank and seal with weld. If protrusions exist for venting repeat step 7.

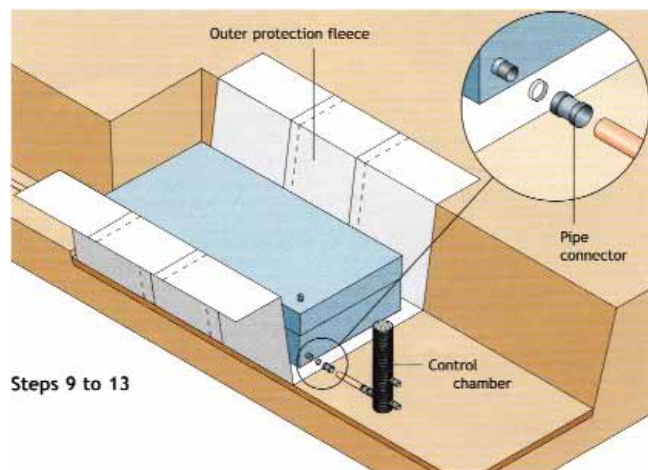
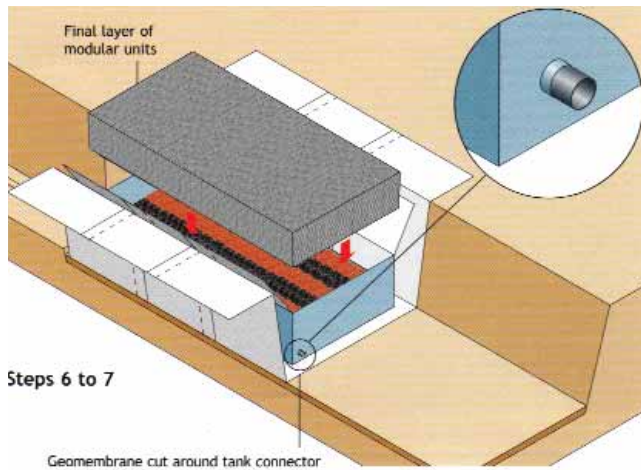
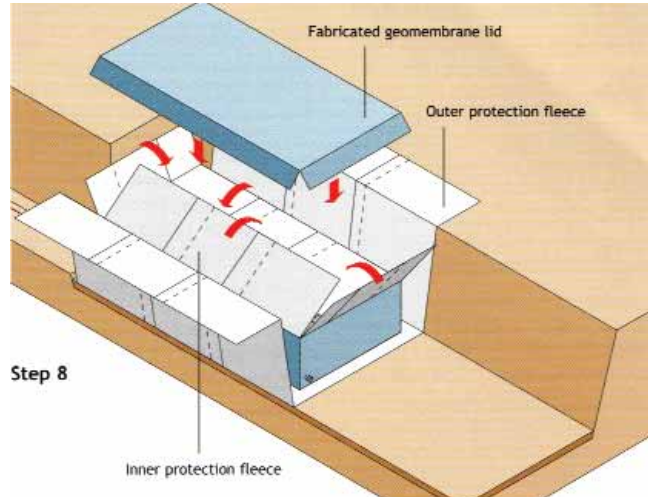
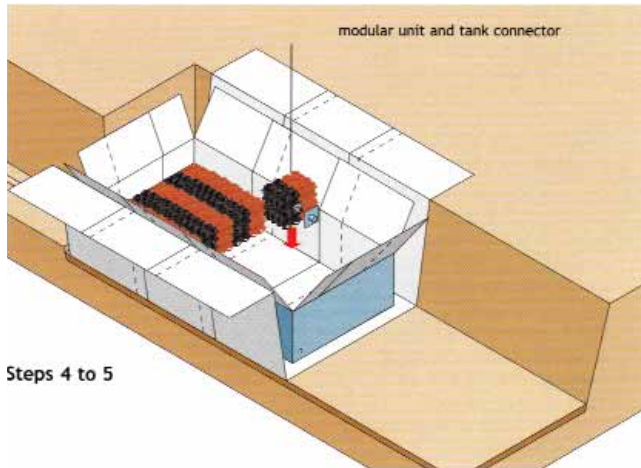
10. Check for leaks and test seals.



11. Continue with the outer protection encapsulation of geomembrane and VersaVoid tank. Fold the corners of the protection fleece over-run at each end of the attenuation tank as shown for infiltration tanks.

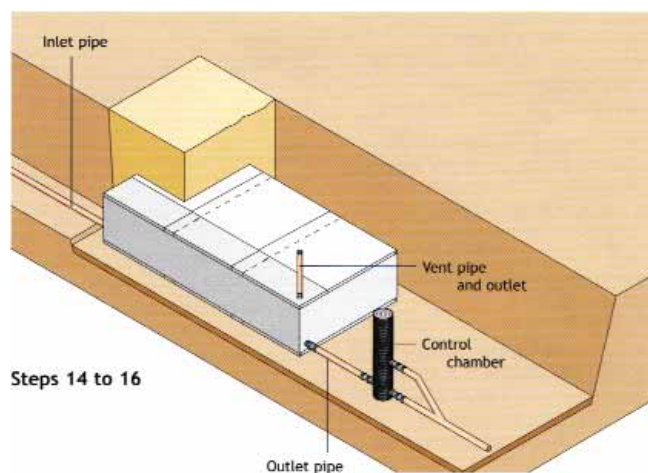
12. Complete the encapsulation by wrapping the protection fleece horizontally around the tank and tape into position.





13. Connect inlet/ outlet/vent pipe and control chambers using appropriate adaptors.

14. Backfill around excavation using type 1 or 2 sub base or selected granular material, and compact in layers of not less than 150mm. The first 500mm of any installation should be compacted by hand.



15. Use a coarse sand protection layer over the top of the VersaVoid tanks and geotextile and then back fill to the required depth using Type 1 or 2 sub base material if the area is to be trafficked. Where the area is to be landscaped then as-dug material maybe used provided sharp or large solid matter is removed.

16. The area should then be compacted using suitable compaction equipment in accordance with specification for Highway Works.



Other Uses



350 mm central access channel with multiple outlets

VersaVoid

The most versatile void former on the market

Complete access for all services - water, power, wiring, ventilation.

**Raised Flooring
Multi level void former**

Roof/Podium decks - for creating raised levels with no loading,

**Complete access for services
Multi-level versatility**

Internal / External applications

High Static loading - in excess of 15 tonnes / m²

Quick and easy installation

Lightweight

Simple, easy clunk / clip assembly

Allows for complete versatility



Horizontal access channel through system





Top access showing 3-D access channel through system



B parts exposed to show service channels for cables and pipes



350 mm access channel through system

Installation demonstrating stepping ability for multi-level finish if required

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.

To find out more about these systems and products please contact us



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