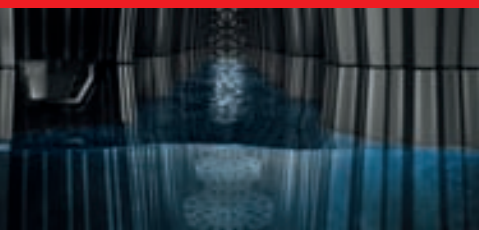


# ACO Water Management:

## Civils + Infrastructure

Uniclass L2123 + JR12 + JS10 + L71121 + L731	EPIC J3413
CI/SfB (52.5)	

ACO StormBrixx



*ACO StormBrixx - Stormwater attenuation and infiltration system*  
**Specification and technical data**



For more information please visit  
[www.stormbrixx.co.uk](http://www.stormbrixx.co.uk)



# Introduction to the ACO Group

Throughout the world ACO branded drainage and surface water management systems are recognised for their innovative design, high quality manufacture, environmental excellence and industry leading performance.

Today the ACO Group has a research and production base that reaches across four continents. This unmatched resource pioneers the development of solutions that are tailored to individual applications, meeting the need for high performance, sustainable products that deliver optimum value throughout their operational life.

## ACO Technologies plc

ACO operates as ACO Technologies plc in the United Kingdom. Founded over 25 years ago, the company has grown quickly on a reputation for design innovation and customer service.

There are 5 divisions within ACO Technologies that serve every sector of the construction industry, providing solutions for applications as diverse as rail, highways, airports, landscaping, retail, distribution centres and environmentally sensitive projects.



To help architects, designers and contractors meet the legal requirements that now tightly control the way surface water is managed, ACO has created its unique 'Surface Water Management Cycle' – Collect, Clean, Hold, Release – the four core processes required for the complete and sustainable management of surface water drainage.



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# Introduction to ACO StormBrixx

ACO StormBrixx is a unique and patented plastic geocellular stormwater management system. Designed for surface water infiltration and storage, its versatility allows it to be used in applications across all construction environments as a standalone solution or as part of an integrated sustainable urban drainage (SUDS) scheme.

## What is ACO StormBrixx?

Plastic geocellular systems are a widely accepted method of creating infiltration and attenuation systems throughout the UK. They have been installed in a variety of applications for a number of years.

One drawback of these types of systems is an overall lack of accessibility for maintenance. Improving accessibility would enable Local Authorities and Water Companies to adopt them.

ACO StormBrixx has been developed to satisfy these adoption needs and the ongoing maintenance requirements of private drainage installations.

The Flood and Water Management Act 2010 now gives overall ownership responsibilities for SUDS systems to Local Authorities. As part of the National Standards within the Act, adopting authorities are required to maintain and ensure ongoing operation of all sustainable drainage systems - requirements which cannot be met by most current geocellular systems.

ACO StormBrixx addresses the primary adoption needs of the Local Authorities by providing true 3D access for inspection and maintenance, whilst retaining the structural integrity of the installation.

The system can form part of the design of any integrated drainage scheme, such as open parking areas, commercial premises, retail or residential developments.



## The ACO StormBrixx system

The ACO StormBrixx system consists of a single recycled polypropylene body that can be assembled in a variety of ways to form an open bonded structure.



ACO StormBrixx's unique pillar configuration gives a high void ratio of 95%. This minimises the excavation required to achieve a specified storage capacity, reduces the aggregate needed for backfilling, and improves the flow characteristics of runoff through the installed tank.

Side panels are added to the perimeter of the system for lateral support and top covers are added to ensure consistent vertical support for the cover fill material.

ACO StormBrixx benefits from a patented cell brick and cross bonding feature which provides unparalleled stability in the construction of the tank. Where brickbonding is not used or for multilayered tank structures, connectors are available to support the integrity of the structure.

Additional accessories available include inspection point and pipe connectors, geotextiles and geo-membranes, as well as a 600 x 600mm access chamber for full inspection and maintenance.

ACO StormBrixx can be configured to minimise silt accumulation and has the added feature of a low flow and drain down facility ensuring that the system can be properly maintained throughout its life.

### Structural Integrity

The ACO StormBrixx system has been independently tested to certify the structural integrity and the long term life expectancy of the system.

The patented brickbonding and cross bonding feature provides a strong, long term installation and also helps to improve the construction speed of the tank.

### Access and maintenance

ACO StormBrixx addresses the fundamental requirement of access and maintenance for SUDS Approval Boards (SABS) and water companies. The open cell structure permits completely free access for CCTV and jetting equipment which allows the whole system, including all the extremities, to be inspected and maintained from just a few access points.

### Simplified handling and logistics

ACO StormBrixx simplifies delivery, site logistics and installation as a result of its stackable design. Each single injection moulded body nestles, optimising logistical and installation cost significantly, thus helping to reduce the carbon footprint of the system.



### System benefits

- ▶ Brick bonded and cross bonding stacking for optimum stability
- ▶ Low flow, draindown and silt management facility
- ▶ 3D inspection access to tank interior
- ▶ Environmentally efficient solution, minimising carbon emissions in manufacture, transportation and on-site assembly
- ▶ High void ratio minimises excavation volume
- ▶ Fully certified performance
- ▶ Manufactured from recycled and recyclable polypropylene
- ▶ Suitable for all industrial, commercial and residential applications including highways



If you need help with specification, design or installation, or just wish to learn more about this and other Surface Water Management products from ACO, contact our free, no obligation ACO Water Management Design Services Team who can provide advice and dedicated design support for your project – call 01462 816666 or visit [www.aco.co.uk](http://www.aco.co.uk).

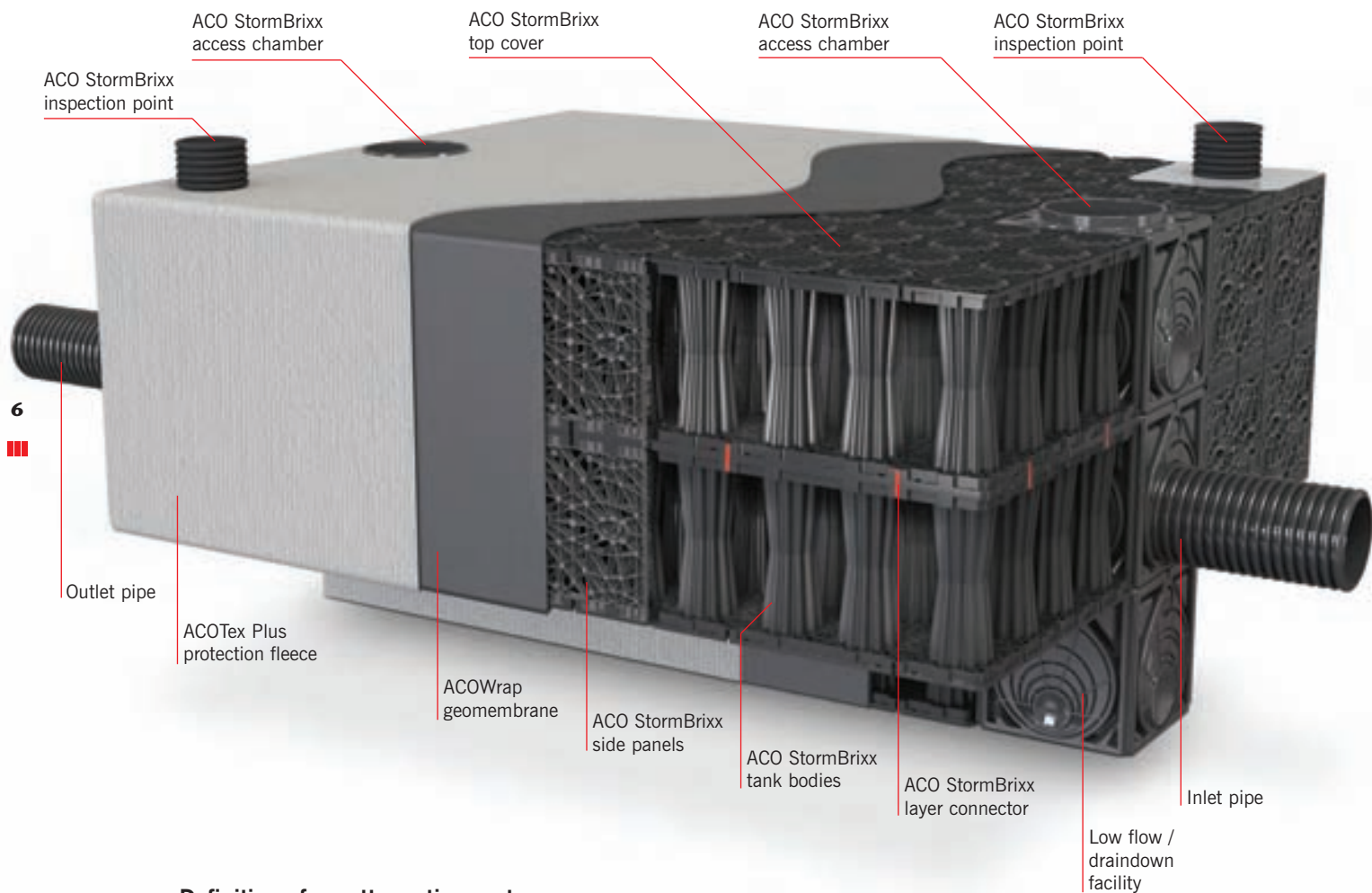


# ACO StormBrixx attenuation and infiltration system layout

ACO StormBrixx has a range of key features which are common to both attenuation and infiltration systems and are listed below. ACO StormBrixx attenuation and infiltration systems also have a set of features specific to their configuration. These features are highlighted on the product images below.

- ▶ ACO StormBrixx can be assembled in a variety of different tank configurations to satisfy installation and site requirements
- ▶ The patented brickbonding and crossbonding feature delivers a strong and robust tank installation
- ▶ Silt management and control achievable through tank configuration layout
- ▶ The open cell structure provides simple access for remote CCTV and maintenance equipment to inspect all levels and areas of the system
- ▶ The system has a unique 'draindown' facility – a simple access and clean feature of the tank (Attenuation only)
- ▶ Access chamber provides access for cleaning, large pipe diameter inlets and silt management
- ▶ Delivery, site logistics and installation are all dramatically simplified, as a result of the system's stackable design
- ▶ A clip-in 3-way connector improves the structural integrity of multilayered tank structures and where brickbonding is not used
- ▶ Inspection point for camera or jetting equipment

## ACO StormBrixx attenuation system features



## Definition of an attenuation system

Attenuation is the process of spreading the peak flow of a storm event over a longer period of time, releasing the water slowly, and mitigating the surge effect downstream.

- ▶ Clear column 'pathways' simplify cleaning
- ▶ Smooth surfaces prevent silt build-up
- ▶ Top covers support infill material
- ▶ Clip-in 3-way connector and the crossbonding feature permits off site construction of the system

The stackable design reduces transportation costs and improves the carbon footprint of the product

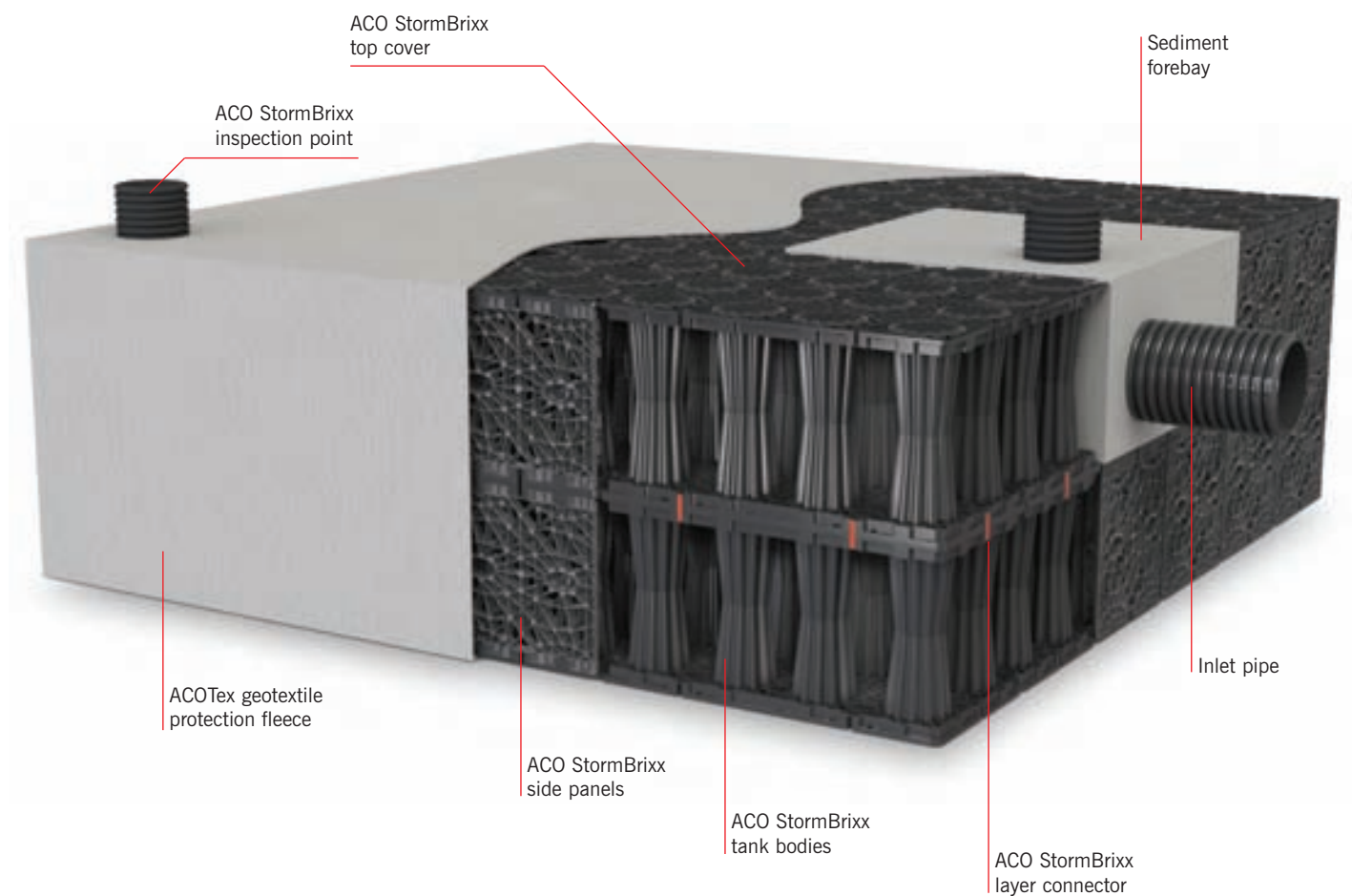


#### Example:

280m<sup>3</sup> storage volume is required for project A. Using ACO StormBrixx the project requirement can be transported on a single vehicle whereas up to four vehicles may be required for other comparable systems.



## ACO StormBrixx infiltration system features



## Definition of an infiltration system

Infiltration is the passage of water through a myriad of voids in the receiving ground strata. The process includes sedimentation and biodegradation, freeing the water from impurities.

ACO STORMBRIXX MAIN COMPONENTS

Side panels



Recycled polypropylene side panels are added to the perimeter of the system to give lateral support against surrounding soils.

Layer connectors



Clip-in connectors are available to aid the alignment and installation of single and double layer ACO StormBrixx configurations.



Recycled polypropylene construction provides tough, highly corrosion resistant structure

Lightweight design for easy manual handling and fast installation

High strength ribbed columns



Access groove provides a clear path for inspection cameras or jetting equipment

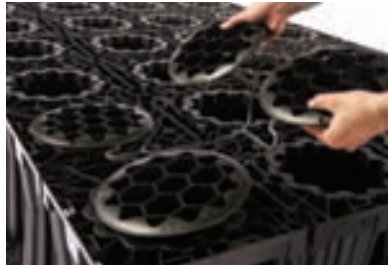




### Top covers



Units can be cut in half to accommodate tank configurations

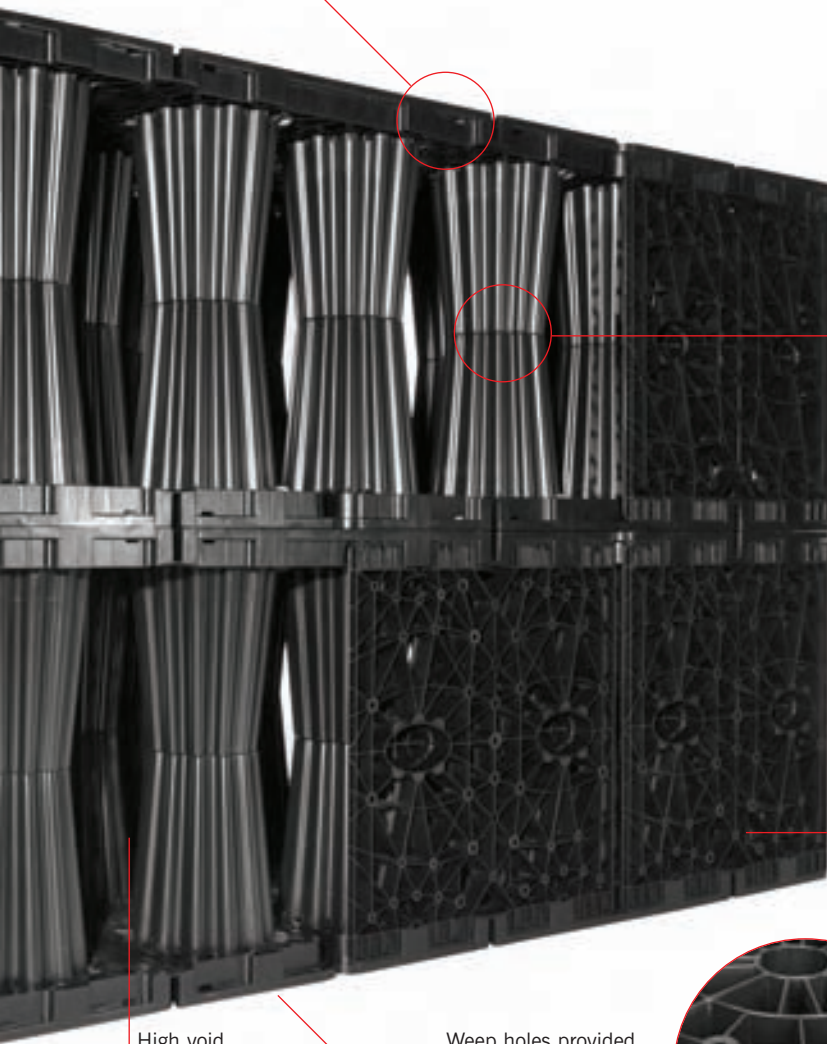


Recycled polypropylene top covers are added to the top layer of the system to ensure consistent vertical support for the cover fill material.

### Inspection points



An Ø225mm inspection point connector provides access for remote CCTV and jetting equipment from the surface of the system to different levels and areas of the tank installation.



Two injection moulded bodies clip together to form one single tank unit



Side walls create debris and silt traps and provide additional lateral support



High void ratio – 95%

Weep holes provided to maximise void ratio



## ACO StormBrixx access chamber

The access chamber is designed to provide complete 3D access to any ACO StormBrixx system for simple inspection and maintenance. The modular stackable chamber is designed to be incorporated into any ACO StormBrixx attenuation or infiltration system, and forms an integral part of the system's overall volume, removing the need for expensive upstream catch pit manholes.

Each ACO StormBrixx access chamber module provides 150mm, 225mm, 300mm and 375mm inlet and outlet pipe connections, reducing the need for expensive and time-consuming manifold connections.

A 375mm cut can be made in the ACO StormBrixx access chamber module to enable complete inspection of all levels and areas of the system. A 100mm or 150mm vent can be created by removing the cut outs provided in the top half of the access chamber.

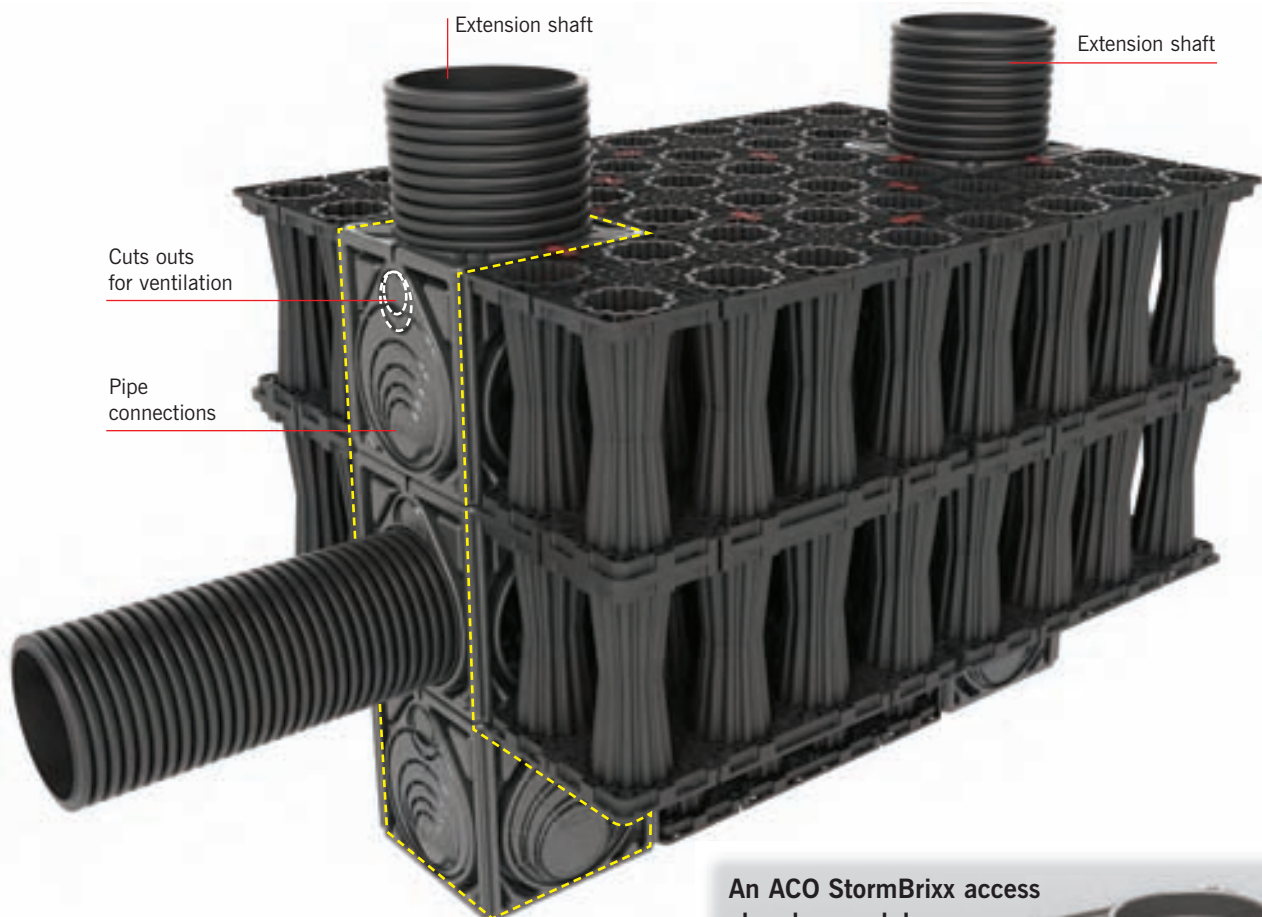
### Cover and frame

A Load Class D 400 Ø450mm solid ductile iron cover and frame is available to complete the ACO StormBrixx access chamber installation.



#### Low flow and drain down feature

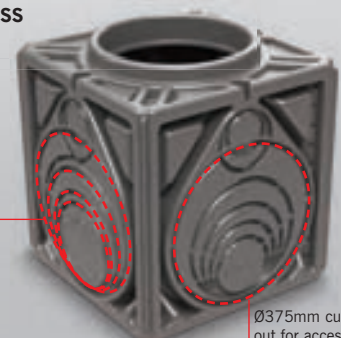
The ACO StormBrixx access chamber provides the ability to create a low flow and drain down facility (as below and on page 26). This function enables the system to be drained and sediment and debris removed as part of the maintenance program.



### An ACO StormBrixx access chamber module

Pipe connections

Perimeter of the ACO StormBrixx access chamber



### Cutting the unit for pipe connections



Inlet and outlet pipe connections are provided on each side of the access chamber module. Depending on the pipework requirements, cut and remove the appropriate panel. Recessed cutting lines are provided for guidance. Secondly remove 375mm panels from each side of the unit requiring access.

### Making pipe connections



Push up to 65mm of the pipework into the access chamber module.

### Cutting the base for a multi layered access chamber



If using more than one access chamber module in a stack, it will be necessary to remove the base from all modules except the base unit. Cut along the recessed cutting line provided and remove base.

### Building the access chamber



Once the bases of the upper module(s) have been removed, simply stack the units on top of each other ensuring that each module is clipped to the main structure using the ACO StormBrixx layer connectors.



Layer connectors should be incorporated before the next module is added to the access chamber stack.

### Adding a raising piece

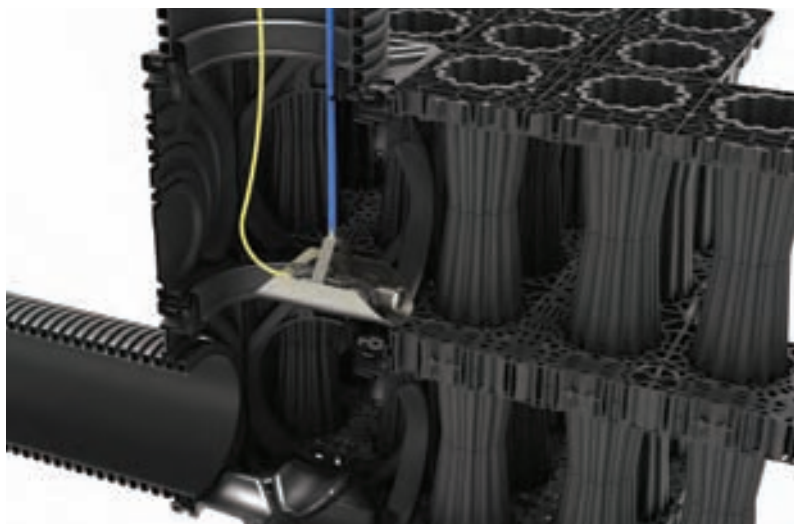


Once the main access chamber has been constructed it will be necessary to add a 450mm ID raising piece cut to length and placed over the top of the access chamber unit.

## MAINTENANCE AND INSPECTION

The access chamber enables all levels and areas of the ACO StormBrixx structure to be inspected by either tracked or push rod CCTV inspection equipment. Where required, the ACO StormBrixx system can be jetted using standard equipment.

When the ACO StormBrixx access chamber has been configured to create a low flow draindown channel (see page 10) or a silt trap (see page 27), the unit allows for the removal of silt and debris.





# ACO StormBrixx accessories overview

## Pipe connectors

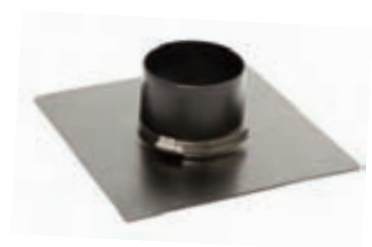


ACO StormBrixx has a range of PVC-U pipe connectors available to provide connection to underground drainage pipework.



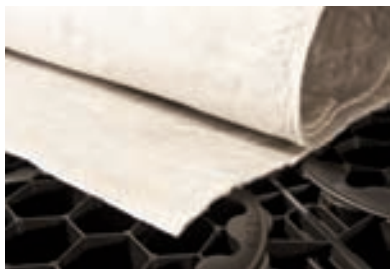
Standard features include inlet / outlet connection for Ø110mm, Ø160mm, Ø225mm and Ø300mm pipes and flanged plates to aid connection to the ACO StormBrixx system.

## Top hats



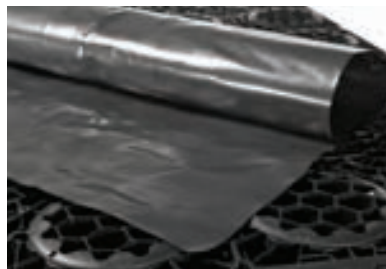
ACO StormBrixx has a range of flexible membrane pipe connectors for use in conjunction with ACOWrap to form pipe seals.

## Protection fleece - ACOTex Plus



Manufactured from polypropylene this thick non-woven protection fleece is used to protect a geomembrane from mechanical damage due to ground and thermal movement. The protection fleece is placed on the outer side of the geomembrane. ACOTex Plus can be used with ACOWrap or with a welded geomembrane system.

## Geomembranes - ACOWrap



An impermeable self-install geomembrane using taped joints for 'non sensitive' attenuation applications.

For sensitive applications ACO recommends the ACO StormBrixx system is installed by ACO recommended lining contractors using a geomembrane system with 100% watertight welded joints.

## Geotextiles - ACOTex



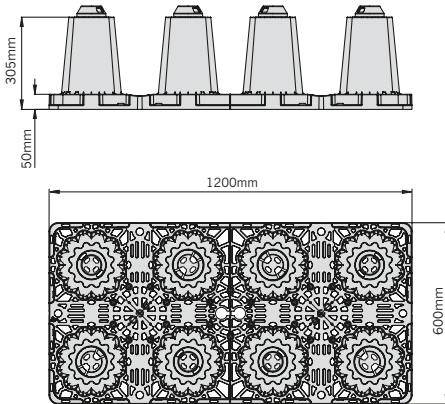
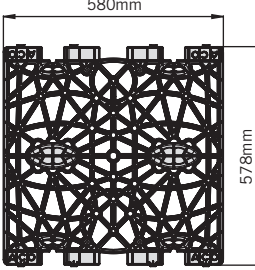
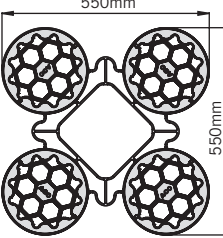

A polypropylene permeable non-woven geotextile, for use in infiltration applications. ACOTex permits the passage of water into and out of ACO StormBrixx system, and also prevents the entry of sediment into tanks incorporating sediment forebays.



An ACO StormBrixx geotextile and geomembrane selection guide and typical examples can be found on pages 16 - 17.



# Technical data

ACO StormBrixx tank body*							
	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)	Vertical compressive strength kN/m <sup>2</sup>	Lateral compressive strength kN/m <sup>2</sup>	Product code
	1200	600	305	10	420	90	314020
ACO StormBrixx side panel							
	580	578	35	1.6	-	-	314021
Top cover for ACO StormBrixx (set of 4)							
	550	550	43	0.8 (per set)	-	-	314022
Layer connectors							
	100	40	46	0.1	-	-	314023


\*1 assembled tank unit consists of:

	No. of assembled units per m <sup>3</sup>	Gross storage volume m <sup>3</sup>	Nett storage Volume m <sup>3</sup>	Void Ratio
2 x tank bodies	2.28	0.439	0.417	95%


Technical data

Access chamber module					
	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)	Product code
	594	594	610	32	27034
Access chamber Ø450mm ductile iron cover Load Class D 400					
	-	Ø528	110	38	27033
Inspection point connector with flange					
	-	Ø225	200	2.5	27018
Inspection point Ø225mm ductile iron cover Load Class D 400					
	410	410	180	52	27032

### Ø110mm and Ø160mm pipe connector with flange

	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)	Product code
	-	Ø110	-	0.75	27056
	-	Ø160	-	1.25	27057

### Ø225mm and Ø300mm pipe connector with flange

	-	Ø225	-	1.40	27058
	-	Ø300	-	1.75	27059

### ACO StormBrixx geotextiles

Product code	Description	Length (m)	Width overall (m)	Thickness (mm)	Mass per unit area (g/m <sup>2</sup> )	Weight (kg)
27038	ACOTex infiltration geotextile	100	4.0	1.0	125	57 per roll
27041	ACOTex Plus protection fleece	100	4.0	2.9	325	130 per roll

ACO StormBrixx geotextiles listed above sold per roll. For information on functionality see page 24 and for specification and performance data see pages 16 & 17.

### ACO StormBrixx geomembranes

Product code	Description	Length (m)	Nominal width overall (mm)	Thickness (mm)	Mass per unit area (g/m <sup>2</sup> )	Weight (kg)
27042	ACOWrap	12.5	4000	0.45	460	23.0
27044	ACO double sided butyl mastic tape	15	100	1.5	-	3.70
27045	Ø110 flexible top hat	-	Ø100	0.9	-	0.10
27046	Ø160 flexible top hat	-	Ø150	0.9	-	0.10
27047	Ø225 flexible top hat	-	Ø225	0.9	-	0.10
27048	Ø300 flexible top hat	-	Ø300	0.9	-	0.10

ACO StormBrixx geomembranes listed above sold per roll. For details on specification, performance and functionality see pages 16 & 17.

# ACO StormBrixx geotextiles and geomembranes: specification and performance data

## ACOTex Plus protection fleece

Product code	Unit	27041
Description		Mechanically bonded continuous filament non-woven sheet
Material		100% UV stabilised polypropylene
Sheet dimensions	Length (m)	100
	Width (m)	4
Material thickness (for 2 kPa)	(mm)	2.9
Material mass per unit area	(g/m <sup>2</sup> )	325
CBR puncture resistance	(N)	3850
Strip tensile strength (md)	kN/m	24
	(cd)	24
Elongation at maximum load	(md)	100%
	(cd)	40%
Cone drop test	(mm)	15
Opening size	μm	90
Permeability vertical	l/m <sup>2</sup> /s	60

## ACOWrap geomembrane

Product code	Unit	27042
Description		Geomembrane suitable for taped joints
Sheet dimensions	Length (m)	12.5
	Width (m)	4
Material mass per unit area	(g/m <sup>2</sup> )	460
Colour		Black

## ACOTex infiltration geotextile

Product code	Unit	27038
Description		Mechanically bonded continuous filament non-woven sheet
Material		100% UV stabilised polypropylene
Sheet dimensions	Length (m)	100
	Width (m)	4.0
Material thickness (for 2 kPa)	(mm)	1
Material mass per unit area	(g/m <sup>2</sup> )	125
CBR puncture resistance	(N)	1500
Strip tensile strength (md)	kN/m	9
	(cd)	10
Elongation at maximum load	(md)	90%
	(cd)	65%
Cone drop test	(mm)	24
Opening size	μm	105
Permeability vertical	l/m <sup>2</sup> /s	115



# ACO StormBrixx geotextiles and geomembrane selection guide

This chart below provides guidance on the selection of wrapping required depending on the system design and the application requirement.

Non-sensitive attenuation	Site-sensitive attenuation	Infiltration
ACO Wrap ACOTex Plus Double side butyl mastic tape Flexible top hat Pipe connector	Welded geomembrane	ACOTex Pipe connector

## A non-sensitive attenuation system

**ACOWrap** is a self-install taped geomembrane system which should only be used where ground conditions can accept minor leakages from the tank. ACOWrap should NOT be used in sensitive applications such as, but not limited to:

- ▶ Within 5m of any building line
- ▶ Where there is a high groundwater table
- ▶ Where land is contaminated or the risk of contamination from surface water is high.

### ACOWrap accessories:

**Tape:** A double sided butyl mastic tape used to join sheets of ACOWrap (Product code 27044, see page 15 for details).

**Top Hats:** Flexible membrane pipe connectors used in conjunction with ACOWrap to form pipe seals (see page 15 for details).

**ACOTex Plus** is a heavy duty non-woven protection fleece used to protect ACOWrap against punctures. ACOTex Plus completely envelops the ACO StormBrixx system and the ACOWrap. ACOTex Plus can be used with ACOWrap and any other geomembrane system.

## A site-sensitive attenuation system

The correct choice of geomembrane is essential to the overall performance of any attenuation system. In applications where there are site-sensitive issues, a geomembrane with properties similar to those outlined in the table below should be used and installed by a lining contractor with UKCAS CSWIP accreditation.

Site Sensitive applications include, but are not limited to:

- ▶ High groundwater table
- ▶ Contaminated ground
- ▶ Within 5m of any building line
- ▶ Where there is a risk of contamination to groundwater from polluted surface waters



## An infiltration system

**ACOTex** is a non-woven polypropylene geotextile with excellent filtration and drainage properties used to minimise sediment build up within an ACO StormBrixx infiltration (soakaway) system. ACOTex completely envelops the ACO StormBrixx system as well as the sediment forebay or tunnel where specified.

ACOTex is suitable for infiltration systems only.

ACOTex is simple to install – fitting does not require a specialist contractor.

## Welded geomembrane: recommended specification

Tested Property	Unit	Test Method	Minimum Values*
Thickness**	mm	ASTM D 5199	1.0
Density (max)	g/cm <sup>3</sup>	ASTM D 792 / 1505A	≤0.939
Tensile properties (each direction)		ASTM D 6693, Type IV, Speed: 50mm/min	
Strength at break	N/mm <sup>2</sup>		27
Elongation at break	%	G.L. = 50mm	800
Tear resistance	N	ASTM D 1004	100
Puncture resistance	N	ASTM D 4833	250
Carbon black content	%	ASTM D 1603	2.0
Carbon black dispersion	Category	ASTM D 5596	1/2†

\* Value at 95% confidence interval

\*\* Average value of 10 specimens taken across roll width. No value to be less than 90% of average value

† Dispersion only applies to near spherical agglomerates. 9 of 10 views should be category 1 or 2. No more than 1 view from category 3.



For further advice, please contact the ACO Water Management Design Services Team - Tel: 01462 816666 Email: technical@aco.co.uk

# Designing an ACO StormBrixx system

Under the Flood and Water Management Act 2010 it will be a planning requirement for any drainage scheme submittal to be approved by a local authority SUDS Approval Board (SAB).

Therefore consultation should occur with the relevant planning or adopting authority at the outset in order to determine their policy on the adoption of different SUDS systems, as this may fundamentally affect the choice of Sustainable Urban Drainage System available.

The local authority, highways authority and water authority all have powers to adopt ACO StormBrixx systems where appropriate, and therefore early consultation with the relevant authority is strongly advised. To design and install ACO StormBrixx, specifiers need to consider three major factors:

- 1 Hydraulic Design
- 2 Structural Design
- 3 Maintenance



## 1. Hydraulic design

Hydraulic design looks at the temporary storage of water in storm events and its flow path, seeking to reduce the volume, speed, and frequency of surface water runoff. All of these factors will be site specific. Calculations for hydraulic design should be undertaken using the methods highlighted in CIRIA C697 The SUDS manual.

## 2. Structural design

Structural design considers the load bearing capacity of ACO StormBrixx to ensure that the installed system can safely carry the loads it will be subjected to. The initial decision must be made on the type of system required, infiltration or attenuation, and then the following design parameters should be considered:

- ▶ Soil type
- ▶ Vertical and horizontal loading
- ▶ Groundwater
- ▶ Depth of cover
- ▶ Surface finish

Structural calculations should be carried out using the methodology detailed in CIRIA C680 – “Structural design of modular geocellular drainage tanks”. For further advice please consult ACO Water Management Design Services Team.

### Loading design parameters for ACO StormBrixx<sup>†</sup>

	Vertical loading on top face	Lateral loading on side face
Short-term ultimate compressive strength at yield (kN/m <sup>2</sup> )	420	90

<sup>†</sup>A partial factor of safety materials, F<sub>m</sub>, of 2.75 for ultimate limit state and 1.15 for serviceability limited state, should be applied to these values for a design life of 20 years.

### Minimum cover depths<sup>(1)</sup> over top of ACO StormBrixx

Location	Minimum cover depth (m) <sup>(2)</sup>
Non-trafficked area i.e. landscaping	0.5 <sup>(3)</sup>
Car parks, vehicle up to 2,500kg gross mass	0.6
Car parks, occasional vehicle greater than 2,500kg <sup>(4)</sup> gross mass	0.8

<sup>(1)</sup>Assumes 27 degree load distribution through fill material and overlying surface asphalt or block paving

<sup>(2)</sup>Please check minimum frost cover depths for geographical location

<sup>(3)</sup>Minimum cover depth to avoid accidental damage from gardening / landscaping work

<sup>(4)</sup>Occasional trafficking by refuse collection or similar vehicles (typically one per week)

### Maximum installation depths (to base of units)<sup>(A)</sup>. Design criteria in accordance with C680 guidelines\*

Soil description	Typical angle of friction <sup>(B)</sup> (°)	Maximum installation depth (from invert of structure) (m)			
		No groundwater present		Groundwater present 1.0m below ground level (attenuation)	
		Trafficked area (cars only)	Non- trafficked	Trafficked area (cars only)	Non- trafficked
Over consolidated stiff clay	24	3.1	3.1	2.3	2.3
Silty, sandy clay	26	3.3	3.3	2.3	2.3
Loose sand and gravel	30	3.9	3.9	2.5	2.5
Medium dense sand and gravel	34	4.7	4.7	2.6	2.6
Dense sand and gravel	38	5.6	5.6	2.8	2.8

(A) Design table is only applicable for car parks or other areas trafficked only by cars or occasional refuse collection trucks or similar vehicles (typically one per week). Assumptions are made:

- ground surface is horizontal

- Shear planes and other weaknesses are not present within the structure of the soil

(B) Loosening of dense sand or softening of clay by water can occur during installation. The designer should allow for any such likely effects when choosing an appropriate value of  $\phi$

(C) The design is very sensitive to small changes in the assumed value of  $\phi$ , therefore, it should be confirmed by a chartered geotechnical engineer.

\*Available from CIRIA website ([www.ciria.org](http://www.ciria.org)).

### 3. Maintenance

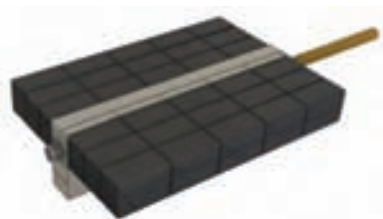
As part of the National Standards within the Flood and Water Management Act 2010, adopting authorities are required to maintain and ensure ongoing operation of all sustainable urban drainage systems.

ACO StormBrixx's open cell structure addresses these adoption needs as it permits completely free access for CCTV and jetting equipment to inspect all levels and areas of the system. ACO StormBrixx can limit silt build up within the system with the correct design and use of ACO StormBrixx access chamber on all connecting inlets.

Consideration should be given to silt forebays, sediment tunnels and the draindown facility at the design stage.

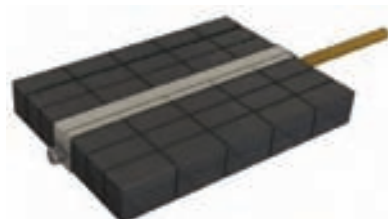


#### Silt tunnels



Silt tunnels are designed to be incorporated within 'online' attenuation systems. A silt tunnel will direct any particles mobilised by stormwater through the system to an outlet pipe. The outlet pipe is connected to a downstream silt or flow control manhole where the silt and debris particles are captured and removed. An inner tunnel is created by adding side panels to a line of cells and wrapping where appropriate with a non-woven geotextile. The choice of geotextile used for the sediment tunnel needs to take into account particle size and the potential for clogging of the textile.

#### Low flow and draindown facility



ACO StormBrixx can be configured to ensure that the whole system completely drains down. A line of ACO StormBrixx completely encapsulated is added below the invert level of the outlet pipe. With some other attenuation systems, a small volume of water and potentially silt is continually trapped due to the depth and positioning of the tank inlet / outlet and the cell base layer.

ACO StormBrixx's draindown facility (see pages 6, 10 & 26) ensures that the system completely drains down to maximise its storage volume, whilst retaining the majority of silt in the lower sump where it can be easily removed. When used in conjunction with a silt tunnel this can become an effective method of minimising silt build up within the ACO StormBrixx system. Conventional systems can become clogged with silt over time and reduce storage volumes by between 10-20% over their operational life.

#### Sediment forebays



Sediment forebays are generally used for soakaway applications and 'offline' attenuation systems. The forebay is designed to capture and hold any silt that has not been retained in a silt catchpit, or has been mobilised during a storm, in a small area of the system where it can be confined and then removed. A sediment forebay is created by adding additional side panels within the tank configuration and adding where necessary a non-woven geotextile. The choice of geotextile used for the forebay needs to take into account particle size and the potential for clogging of the textile.

## ACO StormBrixx system configurations

Depending on the design and installation requirements, a variety of unit configurations and tank sizes can be achieved. In its simplest form, a single 1200 x 600 x 610mm unit can be constructed by placing one unit on top of another.

### Single unit configuration

A single ACO StormBrixx tank body consists of eight columns, four with spigots and four with sockets. To create a complete single unit, invert a second tank body and place it on top of the first. Align the spigot and sockets and push the two bodies together ensuring all column clips are engaged. Once clipped, the two bodies are designed to stay connected.



### Brick or cross bonding

ACO StormBrixx benefits from a patented cell brick and cross bonding feature which provides unparalleled stability in the construction of the tank. By utilising this feature, it is possible to create a single layer of interlocked units.



### Double, treble or quadruple unit configuration

It is possible to make a double unit of 1200 x 1200 x 610mm, a treble unit 1800 x 1200 x 610mm or a quadruple unit 2400 x 1200 x 610mm

#### Creating a double unit:

Lay two tank bodies side by side ensuring there are no gaps between them and that there are four male or female columns in the centre of the configuration. Invert two tank bodies and fix them to the lower tank bodies in the opposite direction.



#### Creating a treble unit:

Lay two tank bodies side by side and lay another tank body 90° at the end of the first two. Ensure there is one block of four female and one block of four male columns in the middle of the configuration.



----- Indicates orientation of tank body.



Indicates cross bonding of tank bodies.



## Cutting the unit

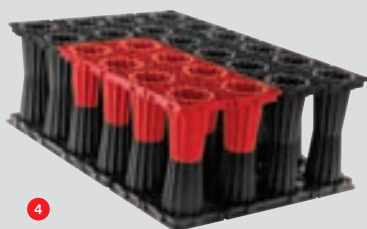
If required, ACO StormBrixx can be cut in half along the central rib. A handsaw or jigsaw should be used.



Both halves of the unit can be connected to the rest of the system using the 3-way connector. Ensure the cut face is orientated towards the inside of the tank system.

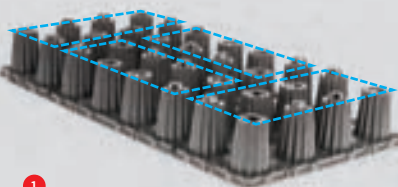


Invert three tank bodies and repeat the above step turning all three bodies 180° to create the top level of the unit.



## Creating a quadruple unit:

Lay two tank bodies side by side and another two tank bodies at a 90° at either end of the first two. Depending on which way the lower units are laid, there should either be one block of four female, one block of four male and one block of four female columns in the middle of the configuration or vice versa.



# ACO StormBrixx system configurations

There are multiple ways an ACO StormBrixx system can be configured. These designs depend on a number of factors including the size of the system, site restrictions and the installation timetable.

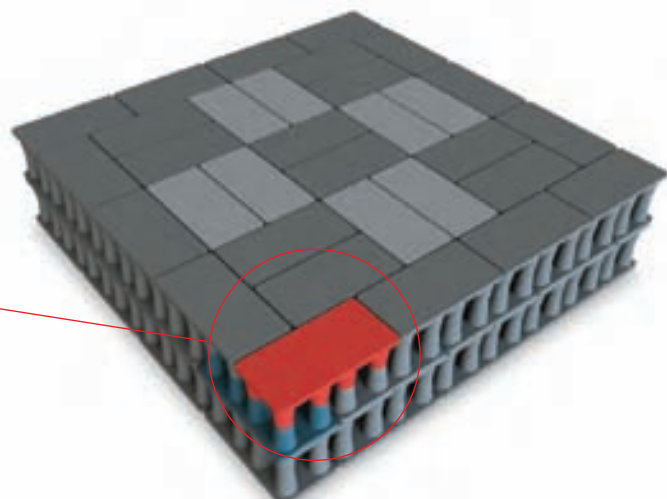
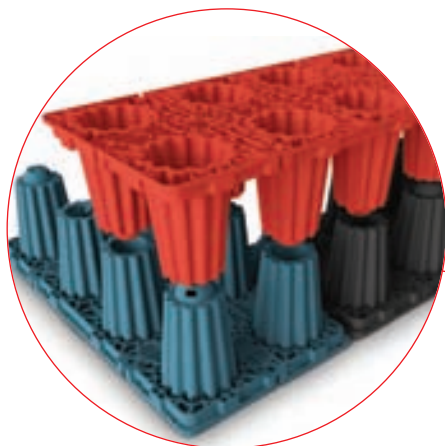
Here are two typical ACO StormBrixx system configurations which utilise a mixture of installation techniques to provide a simple but strong and robust structure:

- ▶ Perimeter Ring Layout
- ▶ Concentric Ring Layout

## Perimeter ring layout

**For this configuration only the perimeter of the system is brick bonded. The internal units are a series of single, double, treble, or quadruple units.**

1. The installer should ensure that the footprint of the system is clearly marked out on the prepared and levelled base of the excavation. Lay geotextile and/or geomembrane.
2. The perimeter edge of the system should now be laid. Place two ACO StormBrixx tank bodies on the ground. Take a third tank body, invert it and place it in a brick bonded method on top of the first two bodies. Continue laying bottom and top bodies alternately until a completely bonded outer ring is formed. See information box below.
3. Assemble single to quadruple units. Assembly methods for these cell configurations are provided on pages 20-21. Place the units inside the perimeter ring to suit and connect to adjacent units using the ACO StormBrixx layer connector.
4. Repeat for subsequent layers using the connectors to bond layers to one another.



### Cross bonding guidance

Please see page 20 and 21 for guidance on creating double, treble or quadruple units.

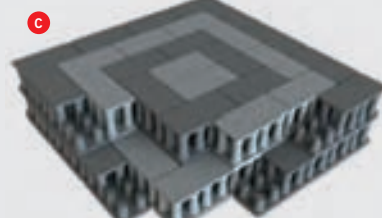
### Brick bonding guidance

To brick-bond ACO StormBrixx units ensure that the bottom layer of the units is such that there are always two male or female columns adjacent to one another when laid end to end.

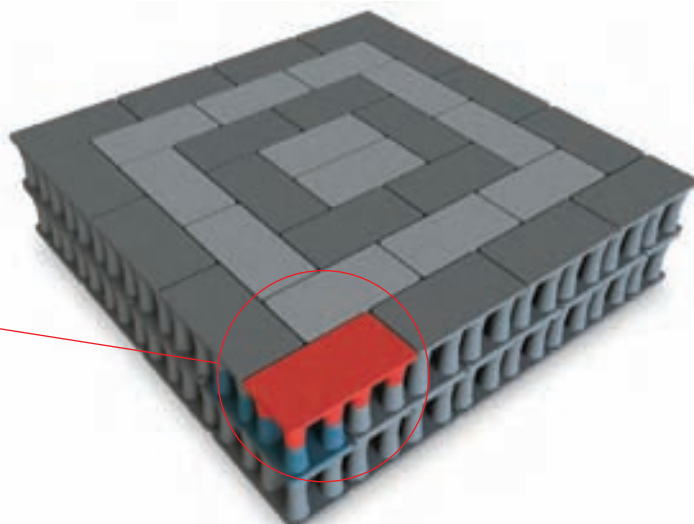
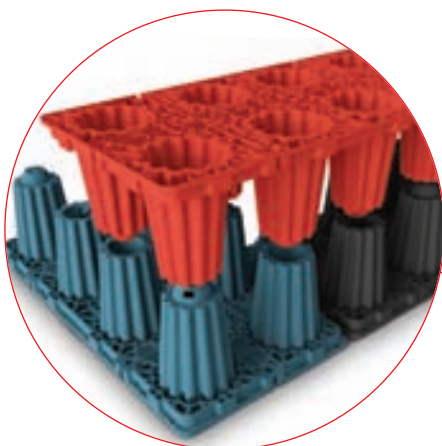
## Concentric ring layout

**This is a series of ever decreasing rings converging towards the centre of the system.**

1. The installer should ensure that the footprint of the system is clearly marked out on the prepared and levelled base of the excavation. Lay geotextile and /or geomembrane.
2. The perimeter edge of the system should now be laid. Place two ACO StormBrixx tank bodies on the ground. Take a third tank body, invert it and place it in a brick bonded method on top of the first two bodies. Continue laying bottom and top bodies alternately until a completely bonded outer ring is formed.
3. This installation method should then be repeated to create each internal ring. Each ring should be clipped to the next outer ring using the ACO StormBrixx layer connector. See double vertical and lateral connection note on page 24.
4. It may be necessary to cut a body to complete the bond, particularly as you get towards the centre of the system. See Cutting the unit on page 21.
5. Repeat for subsequent layers using the connectors to bond layers to one another.



- 3a. Alternatively, due to site limitations, it may be necessary to work from a corner or one end or side. Should this be the case then follow step 2 except that you should also commence the inner ring configurations at the same time see images A-C ensuring that you use layer connectors where necessary to bond unit 'rings' and layers to one another.





## Preparing the system for installation

This section provides guidance on the preparation steps that may be required for the installation of ACO StormBrixx.

### Adding the side panels

Push fit the side panel into the slots provided in the bottom and top tank bodies ensuring all clips are engaged. Two side panels are required on each length and one side panel on each width of a single cell configuration.



### Fitting the pipe connectors

Using a hole saw or jigsaw cut the appropriate diameter hole in the side panel of the ACO StormBrixx. The side panel has pre-set cut outs for 110 and 160mm pipe, and pre-marked eccentric cut outs marked on the inside of the side panel to ensure the lowest invert to the tank can be cut. Ensure that the flange of the pipe connector does not protrude below the invert of the tank.

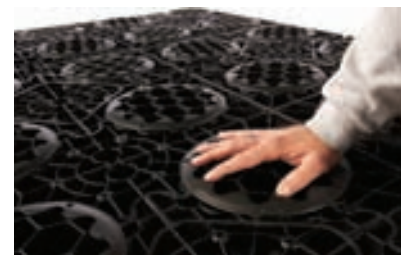
Fix the connector to the side panel through the holes at the corners of the flange. Ensure that the pipe connector is fitted so that there is adequate spigot for the joining pipework to connect to (minimum 75mm).



The geomembrane or geotextile is then fixed to the flange by an appropriate method to give a firm seal.

### Top covers

ACO StormBrixx top covers are only required on the top surfaces of an installation. The top covers ensure the integrity of the geotextile / geomembrane and the final surface finish of the installation. Top covers are supplied as a 4-piece unit on a lightweight frame.



They locate easily on the tops of the boxes and need only be lightly pushed in to ensure an exact fit.

### Vertical and lateral layer connectors

The ACO StormBrixx connector provides three different connections:

#### Lateral unit to unit connection



Align the necessary loose ACO StormBrixx units next to each other so that the clip holes align. Push the layer connector into the hole until the clip is properly seated.

#### Single vertical connection



Snap a layer connector in half and push the two ends together to form a single vertical connector. Place this into the lower unit and then align the top unit and lower into position.

#### Double vertical and lateral connection



It is possible to connect loose lateral and vertical units by joining layer connectors together.

Depending on the ACO StormBrixx design configuration, it is possible to use minimum vertical connectors and no lateral connectors. Please consult the ACO Water Management Design Services Team for further advice.



## Creating an inspection point

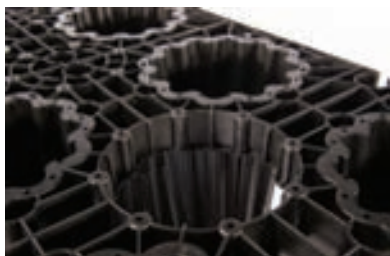
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The inspection point permits remote access and inspection and where necessary jetting of the system. The access arrangement enables the inspection of all layers within the ACO StormBrixx system.

Select the ACO StormBrixx unit which will be used to provide the inspection point. Cut a circular hole in the top tank body with a jigsaw. A cutting guide is provided and can be found centred between four columns. Holes should be cut in the same location on all intermediate top and bottom panels to allow access to all layers of the tank.

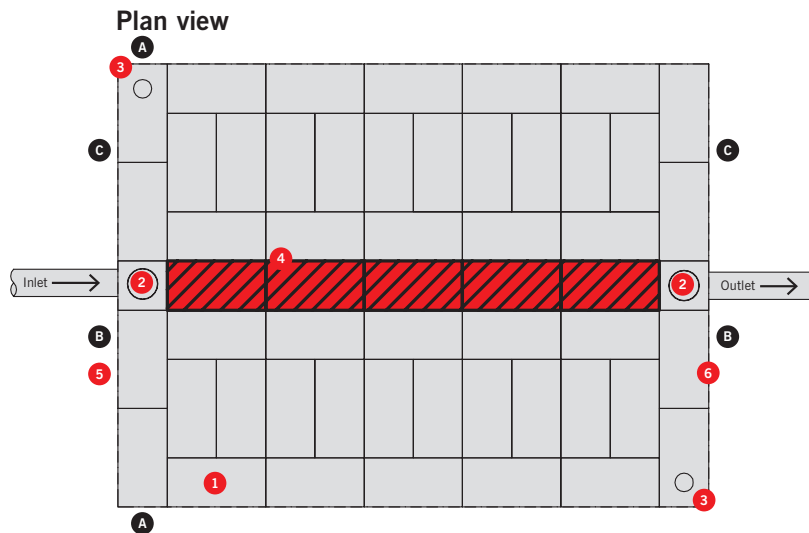
Place a inspection point connector over the centre of the hole, ensuring the flange covers all four columns. Using plastic rivets, fix to the ACO StormBrixx unit. If an extension piece is required, use 225mm twinwall pipe cut to length and fix with a proprietary coupling to the inspection point connector.

Use an ACO StormBrixx Ø225mm ductile iron access cover to complete the installation.



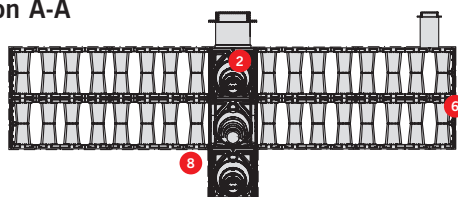
# Installation details

## ACO STORMBRIXX ATTENUATION SYSTEM

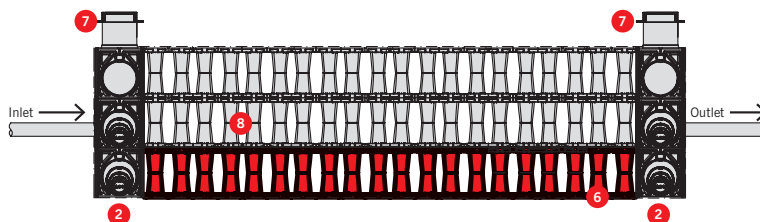


- 1 Individual ACO StormBrixx tank unit
- 2 ACO StormBrixx access chamber
- 3 ACO StormBrixx inspection point with ductile iron cover and frame
- 4 ACO StormBrixx tank units complete with side panels wrapped in ACOTex geotextile to form sediment tunnel
- 5 ACO StormBrixx side panels installed around perimeter of the system
- 6 Perimeter of ACO StormBrixx complete with side panels enveloped with welded geomembrane layer and protected with ACOTex Plus protection fleece.
- 7 ACO StormBrixx inspection point with extension raising piece and ductile iron cover and frame
- 8 ACO StormBrixx tank units wrapped in ACOTex geotextile to form sediment tunnel

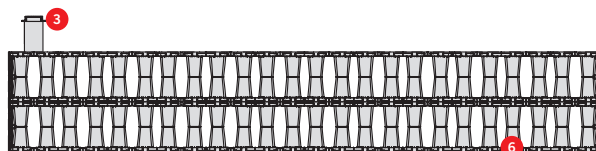
**Section A-A**



**Section B-B**



**Section C-C**



### ACO StormBrixx attenuation system with low flow and drain down

The configuration of this ACO StormBrixx system is designed to offer the optimal level of access for maintenance and inspection by providing a tunnel to direct sediment and debris through a low flow channel sump.

Due to the flexibility of the ACO StormBrixx system it is possible to create a number of variations of this layout – please consult the ACO Water Management Design Services department for further options.

In order to create this layout it will be necessary to install both access chambers and the low flow and sediment tunnel first, ensuring that the correct apertures are cut and removed where necessary.

The low flow channel is created by installing a row of ACO StormBrixx units below the design invert of the main tank. This low flow channel volume should not be included in the calculated volume of the tank as it is designed to hold sediment and is therefore sacrificial.

Inlet and outlet connections must be made above the level of the sump but within the height of the sediment tunnel.

The low flow sump and sediment tunnel c/w side panels and 125gsm non woven geotextile (ACOTex) will need to be fixed to the rest of the ACO StormBrixx structure with the connectors. The rest of the ACO StormBrixx structure is installed around the low flow and sediment tunnel.

Inspection points can be located at each corner of the tank as required, and can be used to show the footprint of the system after installation. The inspection points allow the extremities and all levels of the system to be inspected if required.

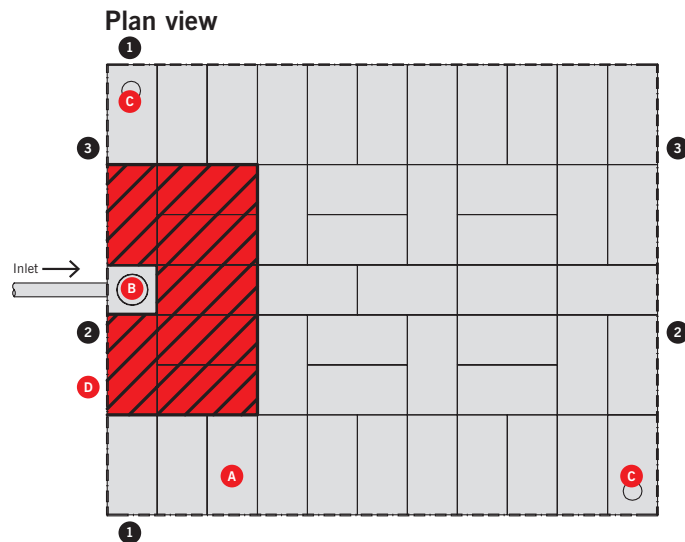


#### Installation guidance

ACO can give guidance with respect to the most suitable methods of installation for the ACO StormBrixx range. ACO StormBrixx should be installed using acceptable levels of workmanship and according to the National Code of Practice (UK: BS 8000: Part 14:1989).

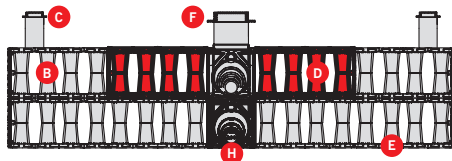
Detailed installation statements and methodologies will vary for all sites as each will have different aspects deserving particular consideration, consequently the relevant approvals should be sought from the consulting engineer and/or the installer.

## ACO STORMBRIXX INFILTRATION SYSTEM

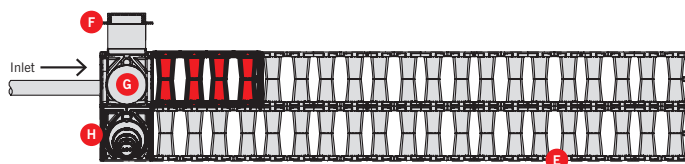


- A** Individual ACO StormBrixx tank unit
- B** ACO StormBrixx access chamber
- C** ACO StormBrixx inspection point with ductile iron cover and frame
- D** ACO StormBrixx tank units complete with side panels wrapped in ACOTex geotextile to form sediment forebay.
- E** Perimeter of ACO StormBrixx infiltration system complete with side panels, completely enveloped with ACOTex non-woven geotextile.
- F** ACO StormBrixx inspection point with extension raising piece and ductile iron cover and frame
- G** ACO StormBrixx access chamber with a Ø375mm cut to 3 sides of the chamber module to enable access to the system
- H** ACO StormBrixx access chamber silt trap

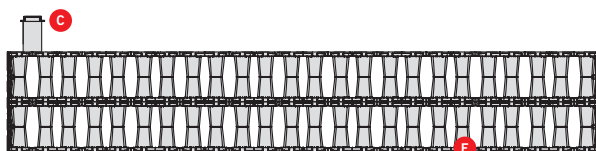
**Section 1-1**



**Section 2-2**



**Section 3-3**



### ACO StormBrixx soakaway system with sediment forebay and integral catchpit

This soakaway layout is designed to minimise the potential for silt and sediment to blind the base of the soakaway by ensuring larger debris and silt is retained in an area that allows for its removal and cleaning of the system.

The sediment forebay and catch pit is created by first installing the catchpit and access chamber and connecting the inlet pipe. The lower part of the access chamber should not have any panels removed so that it forms a catchpit, a second access unit is placed on top with the base and three panels removed and then connected to the inlet pipe.

Place all units for the lower layer and use layer connectors to connect the access chamber to the main structure. Once this has been completed it will be necessary to construct the sediment forebay to the desired size and place this around the upper level of the access chamber. The whole of this construction requires side panels and to be completely enveloped in ACOTex non-woven geotextile.

After this has been completed the remaining units can be placed and the whole system wrapped in geotextile material.

The integral catchpit and access chamber allows for the removal of sediment from one central point.

Inspection points can be located at each corner of the tank as required, and can be used to show the footprint of the system after installation. The inspection points allow the extremities and all levels of the system to be inspected if required.



An electronic version of the ACO StormBrixx installation detail is available to download from the ACO website. Visit [www.aco.co.uk](http://www.aco.co.uk).

# Guide to installing an ACO StormBrixx attenuation system

## General advice

If the ACO StormBrixx system is to be located in areas of high groundwater table, contaminated land, close proximity to buildings, or where the risk of contamination from surface water is high, ACO strongly recommend that the lining system is installed by a competent, qualified geomembrane lining contractor. Please consult the ACO Water Management Design Services Team for further advice.

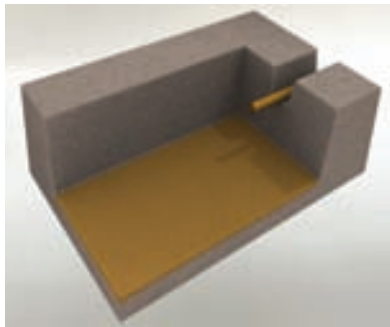
## Installation guidance

ACO can give guidance with respect to the most suitable methods of installation for the ACO StormBrixx range. ACO StormBrixx should be installed using acceptable levels of workmanship and according to the National Code of Practice (BS 8000-14:1989).

Detailed installation statements and methodologies will vary for all sites as each will have different aspects deserving particular consideration, consequently the relevant approvals should be sought from the consulting engineer and/or the installer.

### Step 1

Excavate the pipe trench and lay the inlet pipe to the required fall and invert level, install silt traps in appropriate locations in the pipe run or use the ACO StormBrixx access chamber.



### Step 2

Excavate the hole or trench to the required dimensions to receive the ACO StormBrixx tanks, and any external inspection chamber(s) and/or silt trap(s).

### Step 3

Ensure that the base plan dimensions of the hole allow 300mm working space on all sides for the site operatives to manoeuvre the ACO StormBrixx units, geotextile and geomembrane into position. Ideally mark out the plan area with spray paint or chalk line.

### Step 4

Ensure that the base of the excavation is smooth and level and capable of withstanding the design loads, batter back the sides of the excavation to a safe angle, and ensure that safe access is provided for the site operatives. The excavation should be carried out in accordance with BS 6031:2009 with particular attention paid to safety procedures.

### Step 5

Ensure that ground bearing capacity at formation level is adequate for design loads. Remove any soft spots from the excavation and replace with compacted granular material.

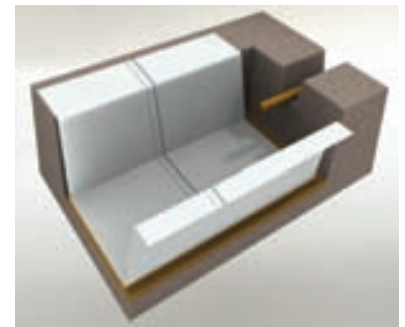
### Step 6

Lay 100mm compacted Type 1 or 2 bedding layer to the base of the excavation and level. It is essential that the bedding layer is correctly levelled and smoothed, and that the base ground bearing capacity is adequate for design loads.



### Step 7

Lay the geotextile, to the specification on page 16 and 17, over the Type 1 bedding and up the sides of the excavation with minimum 300mm overlap joints between strips. Inspect geotextile for damage.



### Step 8

Fabricate the geomembrane liner, bearing in mind the general advice above and the specifications on page 16 and 17, and ensure all joints or welds are tested. If in doubt please consult the ACO Water Management Design Services Team for further advice.



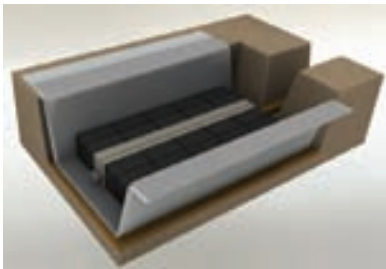
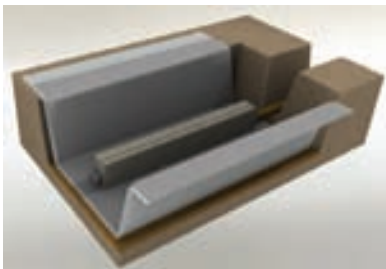
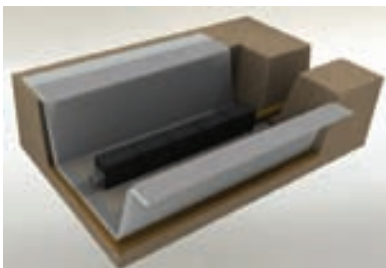
### Step 9

Assemble the ACO StormBrixx modular units to the plan size and unit configuration required and place on the geomembrane. Ensure any loose complete units are fixed together using the ACO StormBrixx layer connector.

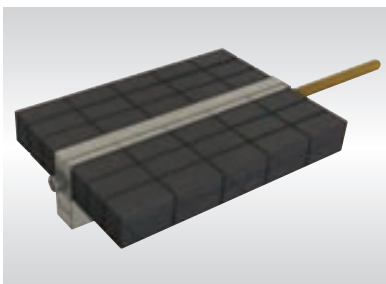


## Step 10

If a sediment tunnel has been specified, lay the units with two side panels directly inline with the inlet and outlet pipes and encapsulate in ACOTex geotextile. Place the remainder of the ACO StormBrixx units either side of the sediment tunnel. Where necessary, insert ACO StormBrixx connectors between the layers of the ACO StormBrixx units. At the perimeter of the tank construction use side panels on all external boxes to create a rigid sidewall.



If a low flow drain down facility has been specified it will be necessary to install a row of ACO StormBrixx units in a trench below the main attenuation volume in line with the inlet & outlet connections. This row needs to have side panels on all outer edges and to be enveloped with a protection fleece and geomembrane on three sides.



## Step 11

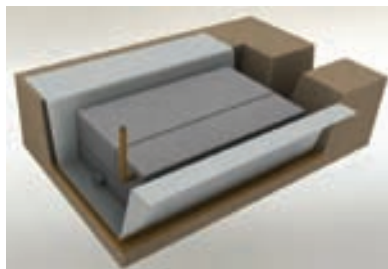
Form hole(s) in the side panel of ACO StormBrixx unit using a hole saw and jigsaw to receive the inlet pipe (outlet/inspection/vent pipe if required). Insert tank connector together with geomembrane top hat if required. Ensure top covers are installed on the top layer of the system.

## Step 12

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

## Step 13

Continue with the geomembrane encapsulation using welded or taped joints as appropriate. If protrusions exist for venting then repeat step 12.

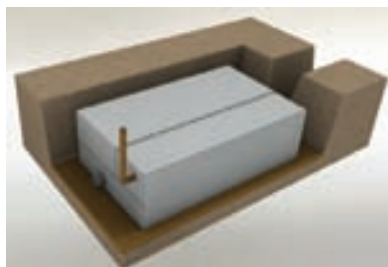


## Step 14

Check for leaks and test seals.

## Step 15

Continue with the outer protection encapsulation of the geomembrane and ACO StormBrixx system. Fold the corners of the protection fleece over-run at each end of the attenuation tank.



## Step 16

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

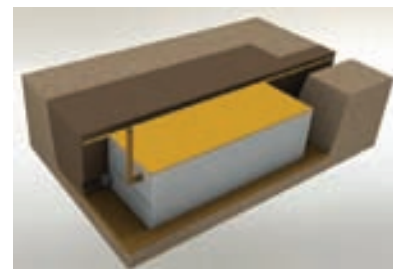
## Step 17

Connect inlet/outlet/vent pipe and access chamber using appropriate adaptors. Only one Ø110mm vent pipe is required per 7500m<sup>2</sup> of the area to be drained.

## Step 18

Backfill evenly around excavation using Type 1 or 2 sub-base or selected granular material in layers of 150-300mm and compact. The first 500mm of any installation should be compacted by hand.

## Step 19



Use a 100mm minimum coarse sand protection layer over the top of the ACO StormBrixx units and geomembrane and then backfill. There should be a minimum 400mm backfill cover before compaction plant is used.

## Step 20

The area should then be compacted using suitable compaction equipment in accordance with the Manual of Contract Documents for Highway Works (MCHW) volumes 1 & 2:

- ▶ **Trafficked areas (eg restricted access car parks):** Type 1 or 2 sub-base material compacted in 150 mm layers in accordance with MCHW Volumes 1 & 2. Compaction plant over top of system should not exceed 2300kg per metre width. Where the units are to be installed beneath a paved area the pavement sub-base may form part of the backfill material provided minimum cover depths are maintained (refer to page 18).
- ▶ **Landscaped and non-trafficked areas:** selected as-dug material with size of particles less than 40mm within 300mm of the top of the units. Above this level selected as-dug material may be used. Place backfill and compact in layers no greater than 300mm. Compaction plant over top of system must not to exceed 2300kg per metre width.



# Guide to installing an ACO StormBrixx infiltration system

## General advice

The ACO StormBrixx units should be installed in accordance with the installation instructions and relevant legislation. Special attention should be paid to temporary work requirements in excavations.

## Installation guidance

ACO can give guidance with respect to the most suitable methods of installation for the ACO StormBrixx range. ACO StormBrixx should be installed using acceptable levels of workmanship and according to the National Code of Practice (BS 8000-14:1989).

Detailed installation statements and methodologies will vary for all sites as each will have different aspects deserving particular consideration, consequently the relevant approvals should be sought from the consulting engineer and/or the installer.

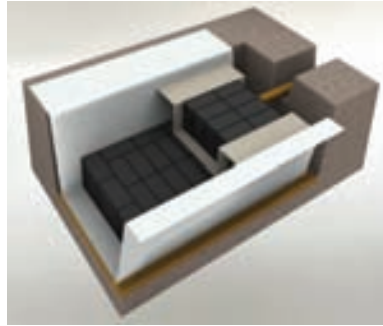
## Step 1

Follow steps 1-7 from the Guide to installing an ACO StormBrixx attenuation system (page 28) except lay 100mm coarse sand bedding to the base of the excavation and level instead of a compacted Type 1 or 2 bedding layer. For infiltration applications use coarse sand or class 6H selected granular material in accordance with the Manual of Contract Documents for Highway Works (MCHW) Volumes 1 & 2. It is essential that the bedding layer is correctly levelled and smooth.



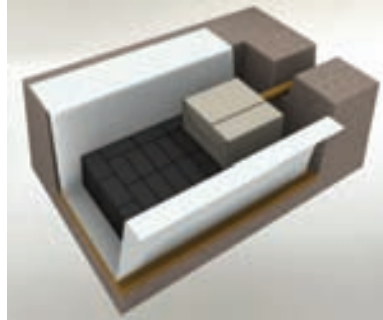
## Step 8

Assemble the ACO StormBrixx modular units to the plan size and unit configuration required and place on the geotextile. Ensure any loose complete units are fixed together using the ACO StormBrixx layer connector.



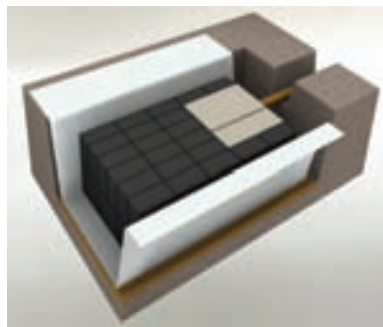
## Step 9

Where a sediment forebay has been detailed, form the forebay containment structure around the pipe inlet using side panels on the correct units to the dimensions specified. Encapsulate using ACOTex. Ensure top covers are installed on the top layer of the sediment forebay.



## Step 10

Form the remainder of the ACO StormBrixx units to complete the overall dimensions specified.

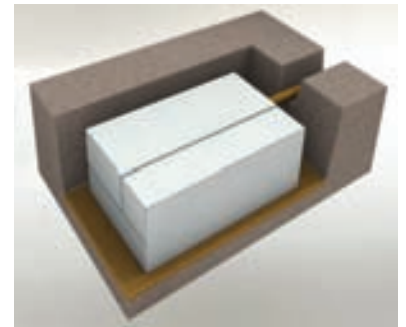


## Step 11

Where necessary insert ACO StormBrixx connectors between layers of the ACO StormBrixx units. At the perimeter of the tank construction use side panels on all external boxes to create a rigid sidewall. Ensure top covers are installed on the top layer of the system.

## Step 12

Form hole(s) in the side panel of the ACO StormBrixx unit using a hole saw or jigsaw to receive the inlet pipe (and outlet/inspection/vent pipe if required). Insert tank connector and using ACOTex 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.



## Step 13

Continue with the geotextile encapsulation of the ACO StormBrixx system.

## Step 14

Connect inlet/outlet/vent/inspection using the appropriate adaptors. Only one 110mm vent pipe is required per 7500m<sup>2</sup> of area drained.

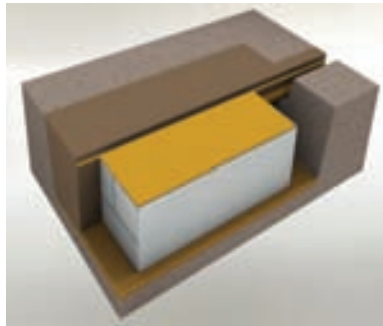
## Step 15

Backfill evenly around excavation using 6N or 6P selected granular material in accordance with MCHW volumes 1 & 2, in layers of 150-300mm and compact. The first 500mm of any installation should be compacted by hand.



## Step 16

Lay a minimum 100mm coarse sand protection layer over the top of the ACO StormBrixx units and geotextile and then backfill. There should be a minimum 400mm backfill cover before compaction plant is used.



## Step 17

The area should then be compacted using suitable compaction equipment in accordance with Manual of Contract Documents for Highway Works (MCHW) Volumes 1 & 2:

- ▶ **Trafficked areas (e.g. restricted access car parks):** Type 1 or 2 sub-base material compacted in 150mm layers in accordance with MCHW volumes 1 & 2. Compaction plant over top of system should not exceed 2300kg per metre width. Where the units are to be installed beneath a paved area the pavement sub-base may form part of the backfill material provided minimum cover depths are maintained (refer to page 18).
- ▶ **Landscaped and non-trafficked areas:** selected as-dug material with size of particles less than 40mm within 300mm of the top of the units. Above this level selected as-dug material may be used. Place backfill and compact in layers no greater than 300mm. Compaction plant over top of system must not exceed 2300kg per metre width.

## Step 18

The pavement construction or landscaping is completed over the ACO StormBrixx system. Please read Post-installation protection of ACO StormBrixx below.



### Post-installation protection of ACO StormBrixx

The ACO StormBrixx system is designed to withstand loadings from landscaped areas, car parks and service yards (subject to design criteria). However, after installation and backfilling, but prior to final surfacing, we recommend that the tank area is fenced off with high visibility fencing and traffic is prohibited from using the footprint area of the tank.

ACO StormBrixx is not designed to provide a load platform for construction traffic and should be treated accordingly. This action will protect the long term loading performance of the tank's structure.

The client should provide sign posts indicating maximum loads allowable over the tank footprint, to ensure the long term stability of the system is assured.

# Maintenance and inspection guidance

## Maintenance guidance

The definition of ownership and the responsibility for maintenance of conventional pipe drainage system is provided in 'Sewers for Adoption 7<sup>th</sup> Edition' and 'Sewers for Scotland 2<sup>nd</sup> Edition'. However guidance for Sustainable Drainage Systems is a little less obvious, particularly where it relates to geocellular structures.

Therefore ACO would advise that the relevant potential adopting authority should be contacted and consulted before submitting planning applications if the intention is to have the ACO StormBrixx system adopted.

## Maintenance procedures

It is important to note that failure to control and remove sediment build-up in SUDS is the single largest cause of system failure. The incorporation of a sediment forebay in an ACO StormBrixx infiltration system, or a sediment tunnel and / or draindown feature in an ACO StormBrixx attenuation system, can ensure the effective management of silt.

The open design of ACO StormBrixx allows the system to be inspected by remote CCTV either through the inlet connection, access chambers, inspection points or pipes at the edges of the ACO StormBrixx system. This allows the system to be inspected for sediment build-up and for the collected sediment to be removed from a soakaway or flushed through in the case of an attenuation system.

In the event that a sediment forebay or tunnel has not been incorporated within the ACO StormBrixx system, it will be necessary to carry out the procedures following procedures:

### *Infiltration systems*

In order to periodically check the effectiveness of the ACO StormBrixx infiltration system, a BRE 365 percolation test can be carried out in the tank and compared with the original data. If there is a significant decrease in the infiltration rates, the infiltration tank should be filled via the inspection chamber to the invert level of the inlet pipe. It should then be flushed through with water in order to remove sediment and unblind the geotextile.

### *Attenuation systems*

In order to clean the ACO StormBrixx system, if a sediment draindown sump has not been incorporated, it will be necessary to block the outflow control device, but not the overflow pipe, before filling the attenuation tank to the invert level of the vent pipe. The tank should then be filled and flushed as above and the water effluent removed and disposed of by a pumped tanker.

If a draindown facility has been installed, simply lift the access chamber cover and using a gully sucker remove all water in the draindown sump and jet the sump channel as required to remove all sediment.

The frequency of the maintenance procedure for the tank will be determined by the inspection regime, however CIRIA C697 recommends that a programme of not less than twice-yearly inspection is carried out, and during the first year after every significant storm event.

In order to minimise silt build-up CIRIA C697 recommends the use of pretreatment systems upstream of the attenuation device.

**As sediment has the potential to carry high levels of pollutant, it is important that any sediment removed from the system is disposed of by a licensed contractor and in accordance with local regulations.**

## MODEL SPECIFICATION CLAUSE

The Stormwater attenuation/infiltration system shall be ACO StormBrixx by ACO Technologies plc. The system shall have been tested in accordance with CIRIA C680 guidelines.

The ACO StormBrixx shall be 1.20m (L) x 0.600m (W) x 0.610m (H) and cross and brick bonded throughout. Ultimate vertical strength should be 420 kN/m<sup>2</sup> and ultimate lateral strength 90 kN/m<sup>2</sup>.

The units shall allow for free access for CCTV / jetting equipment and be configured to allow for the management of silt utilising a sediment forebay/sediment tunnel/low flow and draindown facility\*.

### NBS Specification

ACO StormBrixx should be specified in NBS section R17:315. Assistance in completing this clause can be found in the ACO Technologies entry in NBS Plus or a model specification can be downloaded from [www.aco.co.uk](http://www.aco.co.uk). For further assistance, please contact the ACO Water Management Design Services Team.

\*delete as appropriate

## Product Testing

Product performance tests carried out on the ACO StormBrixx system have been conducted using the methods recommended in CIRIA C680 “Structural design of modular geocellular drainage tanks”. Data supplied can be supported by qualified third party independent certification.

Ultimate load bearing capacity has been established under laboratory testing conditions during short and long term load testing. A summary of the structural parameters of ACO StormBrixx can be found on page 18 – Designing an ACO StormBrixx system.

Please contact the ACO Water Management Design Services Team on 01462 816666 for advice when designing ACO StormBrixx schemes.



## Recycled content

ACO Technologies aim to incorporate as much recycled material or waste material as is practicable in their manufactured products without compromising performance. Typically PP materials contain 50% plus recycled plastic and ductile iron materials contain 40% to 90% recycled iron.

The ACO StormBrixx products are themselves intended for a long life with low maintenance, to reduce the need to recycle, but when eventually they are no longer needed, their materials can be readily recycled with a very low risk of pollution to the environment.



# ACO's sustainable water management system

To help architects, designers and contractors meet the legal requirements that now tightly control the way surface water is managed, ACO has created its unique 'Surface Water Management Cycle' – Collect, Clean, Hold, Release – the four core processes required for the complete and sustainable management of surface water drainage.

## Collect



The point at which run-off enters the surface water management system. Drainage channels can be used individually or in combination to ensure optimal removal of all surface water.

With the most comprehensive range of channels available, ACO systems are manufactured from a variety of materials and are suitable for load bearing in domestic applications through the car park, highway, dock and airport applications.



ACO Qmax® – New sizes available



ACO MultiDrain™ MD



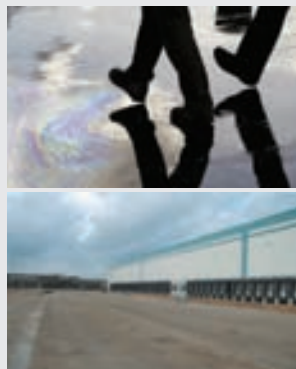
ACO KerbDrain®

## Clean



Run-off that picks up surface pollutants and silt will need to be treated before discharge.

Oil separators such as ACO Q-Ceptor offer an effective solution providing full or bypassed treatment of oil polluted surface water.



ACO Q-Ceptor





## Hold



Storage for controlled discharge or infiltration into the immediate environment is an important aspect of managing surface water in the SUDS approach. ACO StormBrixx provides an ideal method of delivering effective management of surface water where swales and ponds are not possible.



ACO StormBrixx



## Release



Controlling the release of clean surface water into the natural environment requires appropriate upstream controls which culminate in an appropriately managed flow. This can be achieved via a flow controller such as ACO Q-Brake Vortex or through a soakaway.



ACO Q-Brake Vortex



## ACO Technologies plc

- ACO Water Management  
Civils + Infrastructure  
Urban + Landscape
- ACO Building Drainage
- ACO Technic
- ACO Sport
- ACO Wildlife

### ACO Water Management: Civils + Infrastructure

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**The ACO Group: A strong family you can depend on.**

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