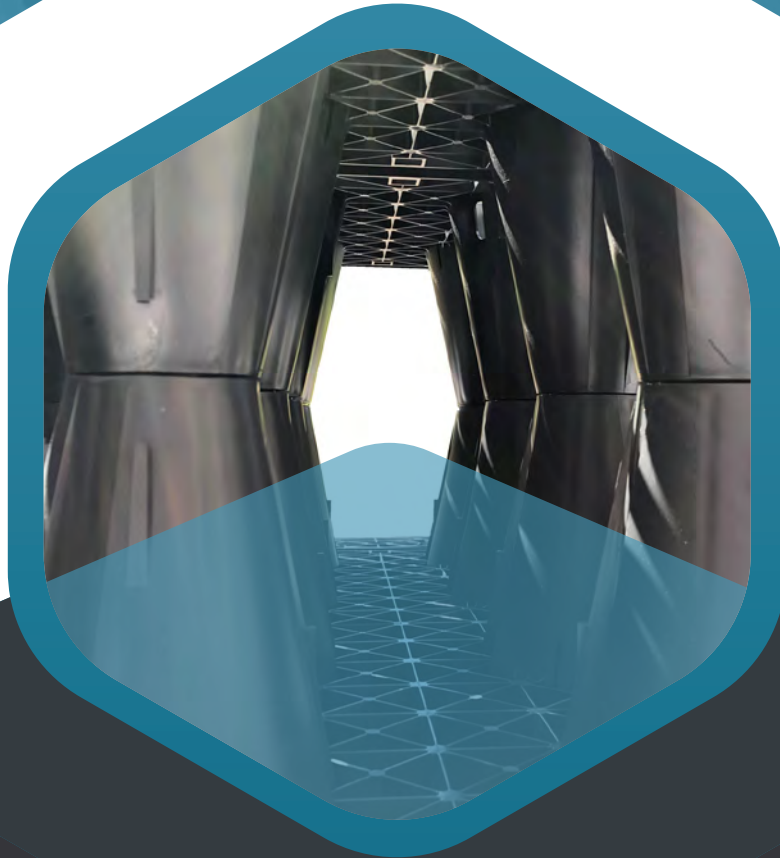




**StormMaster**  
ANTI FLOOD SYSTEM



ATTENUATION & INFILTRATION  
**SOLUTIONS**

# StormMaster

## Attenuation & Infiltration Solutions

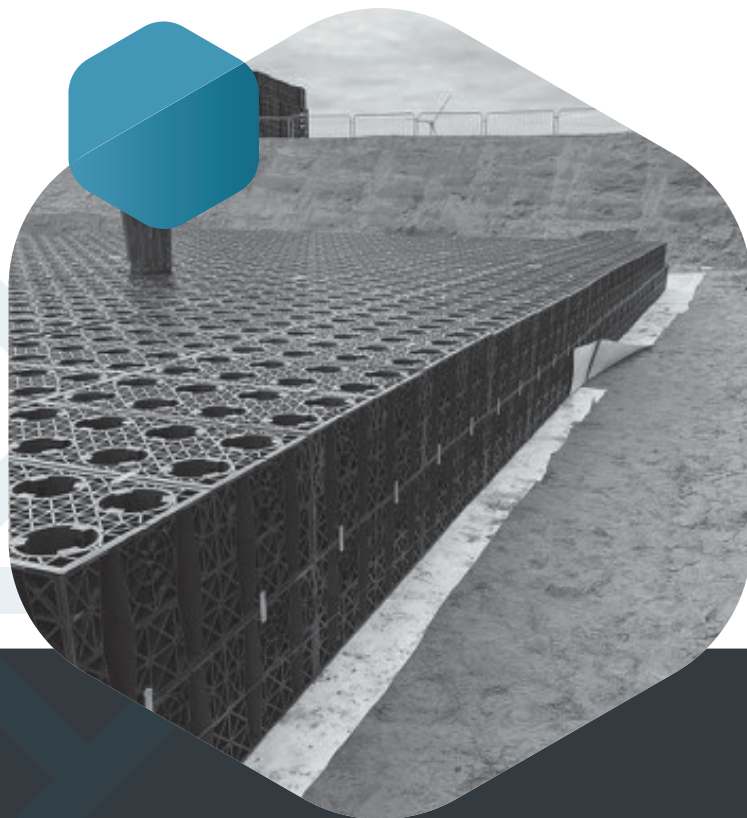
Balstreet was founded to offer the **StormMaster** range of specialised infiltration and attenuation crates for surface water management.

We have developed our range over many years and the relationships we have with our manufacturing partners enable us to constantly develop new systems within our core area of expertise which are tested and researched through local universities and international testing laboratories.

The **StormMaster System** is an extremely strong modular water-permeable polypropylene unit with a large storage capacity of 95.8%.

The StormMaster System has been designed specifically to meet the needs of sustainable construction as advocated by the UK Government and provides the means for rainwater, collected from roofs and pavements, to be infiltrated into the soil. The sewage system is relieved of additional loads and drying out of the sub-surface can be prevented.

These underground storage units are wrapped in a heavy duty non woven, needle punched geotextile to allow water discharge to the subsurface, but prevent any soil or sand particles to go through.



*Specification without complication*



Our solutions reduce **overall** project costs and offer high environmental benefit **with low** environmental impact.



Using 100% recycled **and** recyclable **materials**.

## The Principles of SUDs (Sustainable Urban Drainage)

**SUDS** or **Sustainable Urban Drainage Systems** are a sequence of water management practices and/or facilities designed to drain surface water in a manner that will duplicate the natural water cycle and can be physical structures built to receive surface water runoff. They are located as close as possible to where the rainwater falls and provide the options of infiltration and attenuation. Additionally, they treat surface water using the natural processes of sedimentation, filtration, absorption and biological degradation.

Recent research shows that typically up to 80% of sediment, 60% of phosphorous and 80% of nitrogen can be removed from stormwater through infiltration, together with substantial levels of heavy metals and hydrocarbons. This natural treatment provides the ideal opportunity for rainwater conservation and re-use (harvesting) for a variety of non-potable applications e.g. toilet/urinal flushing, irrigation, laundry, process water, vehicle washing, refrigeration, coolant use, etc. It also creates a cleaner output to the sewer or recharging of the groundwater where rainwater harvesting isn't used.

Such source control principles and techniques, also called Best Management Practices (BMPs) are part of planning controls in most areas and are becoming increasingly incorporated within new development projects.



### Guidance

Flood Risk Regulations - in connection with the European Floods Directive.

Permitted Development Rights.

Building Regulations (Part H) - Sustainable drainage is the preferred option for dealing with rainwater from a development.

Surface Water Management Plan (SWMP) - Gives guidance to Local Authorities.

National Standards for Sustainable Drainage Systems - EA, LA's & House Builders working together.

Guidance for Pollution Prevention (GPPs) - Replaces the old Pollution Prevention Guideline No.3 - Controlling pollution at its source.

Local Agenda 21 - furthering the Agenda 21 Process, agreed at the United Nations Conference on Environment and Development (the Rio Earth Summit) held in 1992.



### Legislation

Flood & Water Management Act - Received Royal assent in April 2010.

NPPF (National Planning Policy Framework) - Revised July 2021 (replaces various Planning Policy Statements such as PPS 25)

CIRIA C753F - The SUDs Manual - Best Practice Guidance.

CIRIA C698 - Site handbook for the construction of SUDS.

Flood and Water Management Act – Management of flood risk by DEFRA.

Water Framework Directive - Required all signatories to achieve "good status" for all rivers & waterways by 2027.

## The **four** basic principles of SUDs

1

Don't hard pave surfaces unnecessarily  
- Porous Paving

Soakaway where possible or attenuate  
if necessary - Stormwater Management

2

3

Re- use if possible - Rainwater Harvesting

Improve Water Quality

4

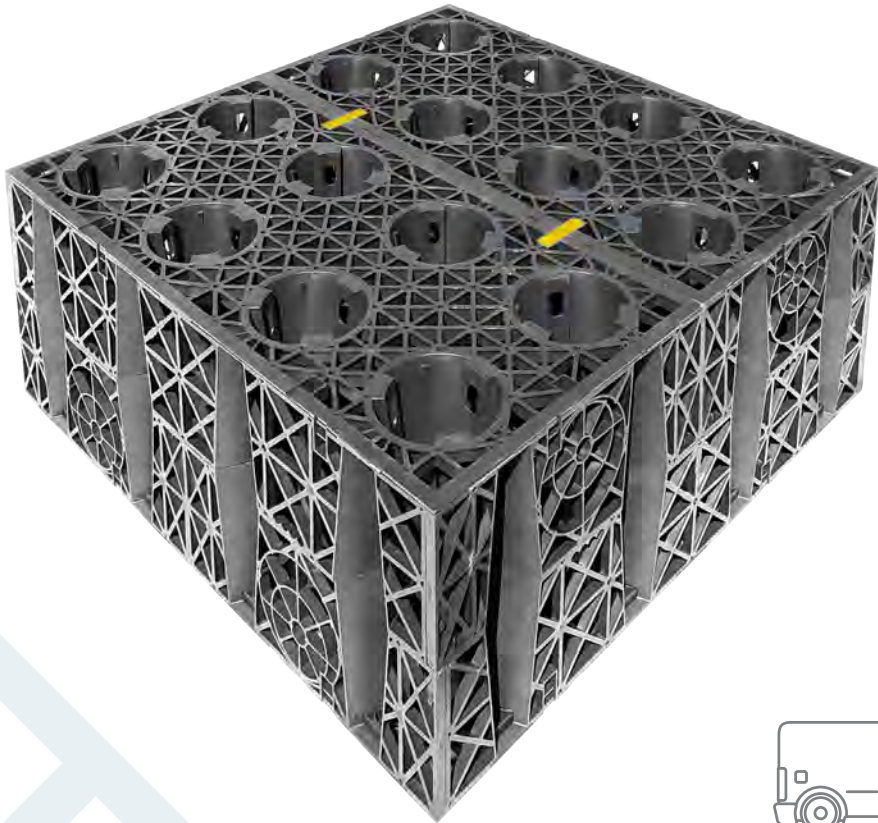
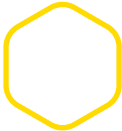
### BREEAM Points

SUDs techniques are a significant contributor to BREEAM points on a development



# The StormMaster Landscape

Not every scheme requires the extreme load bearing capabilities of our standard Heavy Duty crate. For these situations we have developed the Landscape crate - a lighter weight crate with all the features of the standard crate.



## Landscape 20T Crate

Our 100% recycled Landscape crate is designed for use in landscaped and pedestrian areas, or indeed any non-loaded situations. It has a bearing load of 20t/m<sup>2</sup>.

*a lighter weight crate with all the features of the standard crate.*

### Features:

Product Code	SM04-12
Plan Dimensions	1m x 1m
Colour	Grey
Height	0.4m
Weight	16.8kg
Volume	383 ltrs
Void Ratio	95.80%
Vertical Strength	200kN/m <sup>2</sup>
Lateral Strength	90kN/m <sup>2</sup>
Short Term Defl. (Vert)	35kN/m <sup>2</sup> per mm
Short Term Defl. (Lat)	5kN/m <sup>2</sup> per mm
Creep (Vertical)	0.279 Ln + 0.485
Creep (Lateral)	1.019 Ln + 3.86
Max Burial Depth*	2.4m
Suitability	Landscape/Garden

\* Depends on angle of shear

### Benefits:

- Prevents extreme peak flows to main drainage and water purification systems
- Rainwater is “cleaned” by geotextile surround
- Decreases flooding during heavy rain falls
- Promotes the balance in the groundwater position
- Decreases environmental problems caused by development
- Flexible - can easily be expanded in all directions
- Enables rapid construction of large storage capacities (95% voids)
- Economic to install (we offer a full commercial installation service)
- Choice of many diameters for incoming pipes
- Applicable for both high and low groundwater situations



**Yellow Clips** Unit to unit connections.



**Red Clips** For layer to layer connections, allow 2 per crate to replace the yellow clips.



**Yellow Closers** For the top finishing layer, clip 16 per crate into place to finish structure.

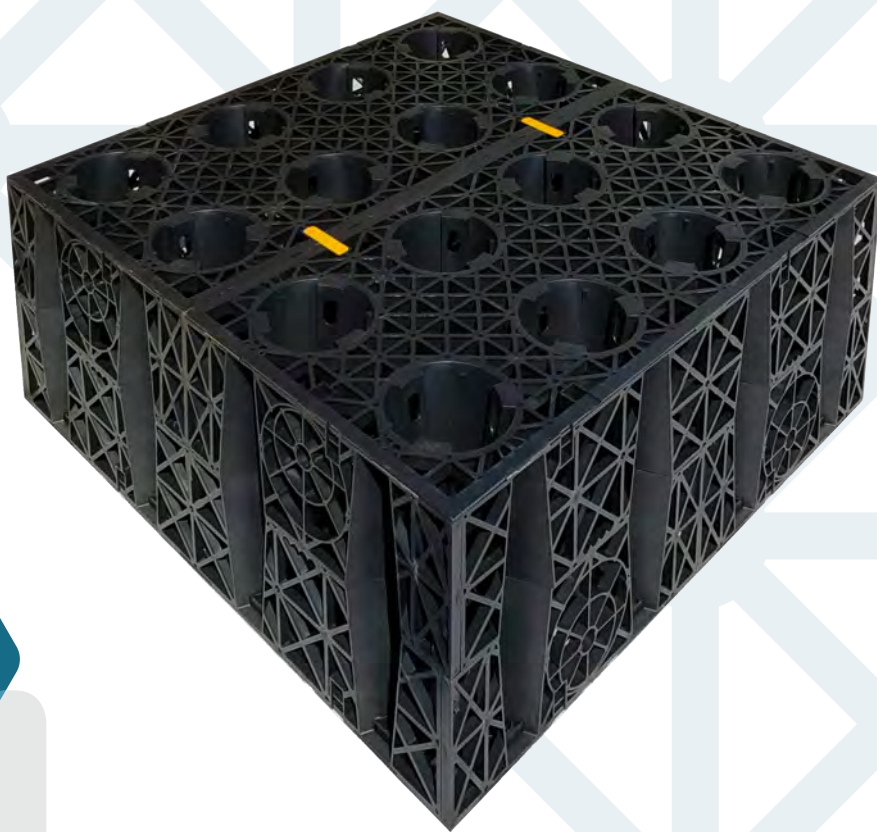




# The StormMaster General Duty

Our General Duty crate is suitable for most situations subject to vehicular use from car parks right up to major roads. With only 2.5 crates to a m<sup>3</sup> it is fast to install and the use of the unique inner and outer crates allow the water to flow in three dimensions without restriction whilst still maintaining the strength of the closed system. The open structure allows multiple routes for maintenance and inspection.

On larger tanks the StormMaster General Duty 40T will be supplied as inner and outer crates - these inner crates allow the water to flow freely throughout the structure and allow silt & inspection routes (if required) to be created through the structure for inspection & jetting. The outer crates are installed on two sides of the structure before infilling with the open crates with cones facing upwards, the open crates can then be turned through 90 degrees and simply clipped onto the male/female sockets created before the yellow clips between the units are tapped home. This enables large structures to be created very quickly and does away with the need for side plates as all sides of the structure are created using the closed crates.



General Duty Inner Open Crate



General Duty Outer Closed 40T Crate

Our 100% recycled General Duty crate is ideally suited for vehicular loads such as housing, commercial & infrastructure projects. It has a bearing load of 40t/m<sup>2</sup>.

## Features:

	Outer Closed Crate	Inner Open Crate
Product Code	SM04-10	SM04-11
Plan Dimensions	1m x 1m	1m x 0.5
Colour	Black	Black
Height	0.4m	0.22m
Weight	16.8kg	6.8kg
Volume	383 ltrs	n/a
Void Ratio	95.80%	96.50%
Vertical Strength	400kN/m <sup>2</sup>	400kN/m <sup>2</sup>
Lateral Strength	90kN/m <sup>2</sup>	90kN/m <sup>2</sup>
Short Term Defl. (Vert)	45kN/m <sup>2</sup> per mm	45kN/m <sup>2</sup> per mm
Short Term Defl. (Lat)	7kN/m <sup>2</sup> per mm	7kN/m <sup>2</sup> per mm
Creep (Vertical)	0.279 Ln + 0.485	0.279 Ln + 0.485
Creep (Lateral)	1.019 Ln + 3.86	1.019 Ln + 3.86
Max Burial Depth*	5.2m	5.2m
Suitability	General	General

\* Depends on angle of shear

## Benefits:

- Prevents extreme peak flows to main drainage and water purification systems
- Rainwater is “cleaned” by geotextile surround
- Decreases flooding during heavy rain falls
- Promotes the balance in the groundwater position
- Decreases environmental problems caused by development
- Flexible - can easily be expanded in all directions
- Enables rapid construction of large storage capacities (95% voids)
- Economic to install (we offer a full commercial installation service)
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# Stormwater Management

The management of Stormwater has become increasingly important in recent years, with climate change creating unexpected rainfall events resulting in localised flooding. Stormwater is the runoff from rooftops and roadways and other “sealed” surfaces and by its very nature it washes the area over which it travels picking up pollutants such as debris and hydrocarbons on its way. These pollutants have to be dealt with but also the volume of water has to be managed.

This management can take many forms; either by infiltration into the ground using soakaways or by attenuation (the temporary storage of the water until the storm has passed). Both these methods reduce the impact of storms on the UK’s beleaguered sewer system and help reduce flood risk dramatically adding to the sustainability of building schemes.

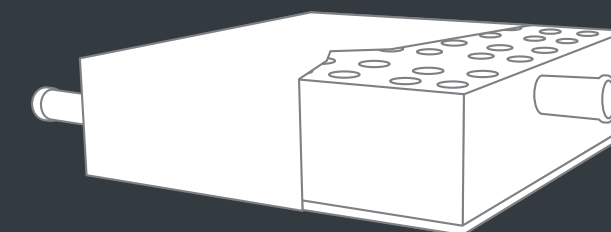
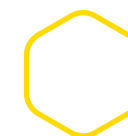


## Attenuation Systems

Attenuation means to temporarily store stormwater for a period of time, normally until the worst of the storm has passed, the water is then released to the sewer network.

This process uses a “sealed” storage box (attenuation tank) created from our the StormMaster system with both a geotextile and geomembrane surround as part of a SUDs scheme.

The stormwater is collected by normal road gullies and routed to the sewer in the usual way, but is passed through a “control manhole” that only allows a controlled volume of flow through to the mains. The water then backs up in the manhole and is fed into the temporary attenuation storage system and over a period of time this stored water continues to exit the system through the control manhole at a regular rate thus preventing flooding downstream. These systems tend to be commercial rather than private schemes and are a common method of a SUDs scheme.



## Infiltration Systems (Soakaways)

Where the surrounding ground is insufficiently permeable to allow the volume of water to infiltrate away naturally, the insertion of a soakaway structure as part of a SUDs scheme (StormMaster with a permeable geotextile surround) will help this process dramatically by providing an underground void for temporary storage of the stormwater whilst it infiltrates into the surrounding soil.



# Sectors



Supermarkets



Parking



Housing  
Development



Warehousing /  
Logistics



Airports / Travel  
Infrastructure

## Civil Engineer/Architect

As a Civil Engineer or Architect you are focused on the performance of the products you recommend, as well as their aesthetics. You need to ensure you specify the most effective scheme for your project.

If you are currently working on a scheme which uses SUDs solutions, StormMaster is here to help:

- Continuous Professional Development (CPDs)
- **BREEAM Points** - Don't forget that using our products in your designs will provide you with additional BREEAM points

## House Builder

As a House Builder considering a SUDs solution you are focused on cost, ease of installation, product availability and compliance with the specification.

## Contractor

As a contractor considering a SUDs solution you are focused on cost, professional installation, product availability and compliance with the specification. We provide a full installation service for our StormMaster system using approved partners.



## Contact Us

Our sales team can support you with:

- **Design Assistance** - If you have not used a SUDs solution before, you may need advice on which product is suitable for your customer's specific project and how to include it in your design. Just contact us for assistance.
- **Site Visit** - StormMaster can send a representative to your customers site to advise on the suitability of our products in their specific application. Click here to book a site visit.
- **Free Samples** - If you would like to examine any of our products up close, you can request a free sample
- We provide a full installation service for our StormMaster system using approved partners.
- **Installation Guidelines** - StormMaster products are quick and easy to install, often saving your customers time and money when compared to alternative solutions. We have **downloadable pdf installation guides** available online for all our products, as well as short video demonstrations.

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