

## Attenuation Crates Product Data Sheet

### Product Description

The Stormsaver attenuation crates are supplied fully assembled and ready to install. This means they are delivered to site for simple and rapid installation.

The crates are available in standard duty, or high load bearing, that is suitable for locating under HGV trafficked areas. The crates come in various sizes, ensuring versatility in both size and shape of storage and are lightweight, with each unit being under 15kg.

Flow controls can be supplied separately and should be fitted to the overflow. The flow rate of this will be determined by the sites requirements.

All crates are manufactured in the UK in accordance with current planning regulations - England, Planning Policy Statement 25 - Development and Floods, Wales, Technical Advice Note 15, and covered in Scotland by Planning Advice Note 61.

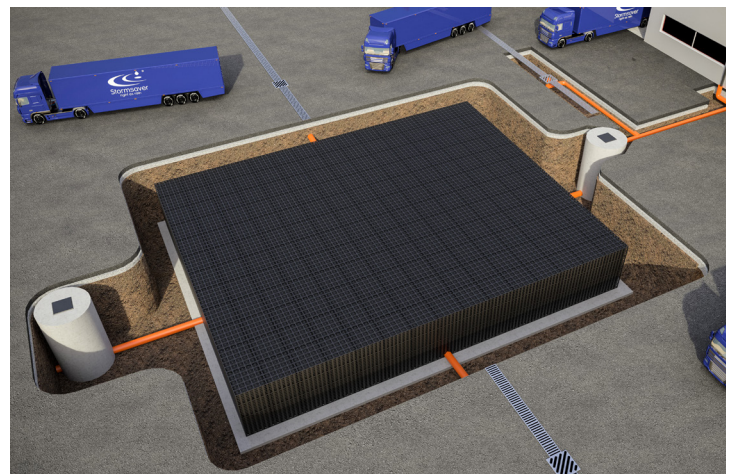
The system can be easily combined with a Stormsaver rainwater harvesting systems to not only retain water, but re-use it.

### Variobox - Technical Information

	Type 100	Type 150	Type 200	Type 300	Type 400	Type 600
Length mm	600	600	600	600	600	600
Width mm	600	600	600	600	600	600
Height mm	100	150	200	300	400	600
Structure Volume m <sup>3</sup>	0.036	0.054	0.072	0.108	0.144	0.216
Storage Volume m <sup>3</sup>	0.034	0.0513	0.0684	0.1026	0.1368	0.2052
Weight kg	1.8	2.7	3.6	5.4	7.2	10.8

Product	Vertical	Lateral
Variobox Plus	700kN/m <sup>2</sup>	200kN/m <sup>2</sup>
Variobox Traffic	400kN/m <sup>2</sup>	100kN/m <sup>2</sup>

Volumetric Void Ratio 95%  
Average effective perforated surface area 60%



### Ancillaries

Name	Details
Control End Plate	For optional Control box
Connector options	Cross, shear and lug connector
Soakaway Geotextile - HSG1000	80g/m <sup>2</sup>
Attenuation Protective Fleece - HP40	100% PP non-woven geotextile. Predicted to be durable for a minimum of 25 years in natural soil with 4 < pH < 9 and temperatures < 25°C
Attenuation Standard Membrane	0.75mm thick
Membrane for Contaminated Land	1mm thick

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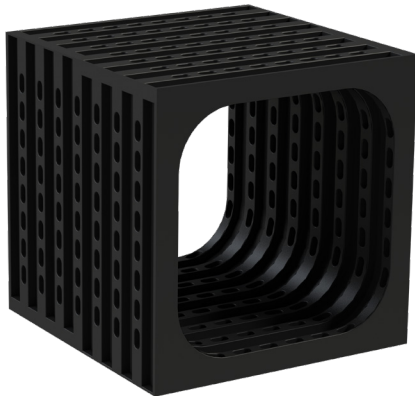
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## Optional Control box - Technical



	Type 300	Type 600
<b>Length mm</b>	300	600
<b>Width mm</b>	600	600
<b>Height mm</b>	600	600
<b>Structure Volume m<sup>3</sup></b>	0.108	0.216
<b>Storage Volume m<sup>3</sup></b>	0.103	0.205
<b>Weight kg</b>	5.18	10.36

Vertical	Lateral
200kN/m <sup>2</sup>	200kN/m <sup>2</sup>

Volumetric Void Ratio 95%

## Design Considerations

Minimum cover required for Variobox Traffic and Plus.

Car park areas 600mm

HGV trafficked areas 800mm

For lesser cover, a detailed design is necessary, please contact Stormsaver.

### Factors of Safety

Partial factors of safety should be applied to material properties and loads.

For Variobox the following material factors should be used:

Ultimate Limit State - 2.75

Serviceability Limit State - 1.5

Appropriate partial safety factors for loads in the ultimate limit state are typically:

Live load - 1.6

Dead load - 1.4

## Legislation and Standards

Variobox tank structures should be designed following guidance within CIRIA V680 "Structural Design of Modular Geocellular Drainage Tanks".

Site installations should be compliant with recommendations within CIRIA C697 "The SUDS Manual" and CIRIA C698 "Site Handbook for the Construction of SUDS".

## Installation Information

### Field Conditions

The backfill material that lies within 300mm above the Variobox units should be free from particles exceeding 40mm in diameter, in accordance with Class 8 material to MCHW, Volume 1, Series 600. Final backfilling up to finished ground level may be achieved using selected as-dug material. Backfill material should be placed and compacted in layers no greater than 300mm, in compliance with the approved specification.

### Lightly Trafficked

Backfill with Class 1 or 2 material in accordance with MCHW, Volume 1, Series 600. Backfill material should be placed and compacted in layers not greater than 150mm. Where the Variobox units are installed beneath a paved area, the pavement sub-base may form part of the backfill material provided that minimum cover depths are maintained.

### Heavily Trafficked

Contact Stormsaver for further information and guidance. Stormsaver can provide site specific calculations including live and dead loads to ascertain product and design suitability.

Complete pavement construction or landscaping over the Variobox system.

It should be noted that infiltration systems are not generally installed under roads due to reduction in load bearing capacity of saturated soils. Specialist advice should be sought where this type of installation is proposed.

In attenuation and soakaway systems, where groundwater may be present, a buoyancy check should be undertaken by a qualified engineer to ensure that the imposed overburden pressure exceeds any uplift forces generated.

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