East of Eden SuDS Rain Garden Planters

East of Eden SuDS Rain Garden planters (Also called gutter or stormwater planters) are a sustainable flash flood and stormwater management solution with an internal water reservoir and slow release drainage system.

Many flash flooding incidents are due to unprecedented heavy rainfall, combined with failing defences or drainage systems that are insufficient or blocked and cannot absorb the surface area flows. This is when SuDS Rain Garden Planters are at their most effective, and with these incidents becoming more frequent, offer a more affordable solution when retro groundworks options are inappropriate or too expensive.

East of Eden SuDS Rain Garden planters offer a number of advantages

- Suds Planters are designed on the principles of Sustainable Drainage System (SuDS*)

- Manage rainwater run-off from domestic and commercial roofs, reducing the impact of heavy rainfall flash flood situations by slowing surface water flows. Thus significantly reducing surface water flood risk, particularly in urban areas with extensive sloping roof areas

- Sustainably manage storm overflows that carry both rainwater and foul sewage and they prevent properties from flooding following intense rainfall

- Provides a cost effective, low maintenance, aesthetic living purification, water storage and slow release system, as alternative to expensive and higher maintenance SuDS groundwork alternatives

- Suitable for retro fitting as well as for new housing developments, tackling SuDS solutions when space is at a premium

- With the internal rainfall capture, storage and slow release drainage system, SuDS Rain Garden planters are designed to be connected into the building roof drainage system, preventing run off into the road and pavements, reducing the volume engorging road drains

- The SuDS slow release and overflow pipes are fed directly the building drains, and thus prevents overwhelming the drainage grates and grids of the building and adjacent road, and consequent surface water flows.

- By management of runoff and capture stormwater, plus filtration of pollutants, SuDS Rain Garden planters improve the quality of surface water entering streams and rivers.

- Being based on a living ecological system, SuDS Rain Garden planters additionally provide enhanced biodiversity to new and existing spaces, adding BNG(Biodiversity Net Gain) value of the site development**.**

- Aesthetically enhanced sustainable drainage system

- Main body constructed from UK sustainably grown Grade A Larch

* SuDS**:** Sustainable drainage systems include a range of techniques for holistically managing water run-off to reduce the quantity, of surface water that drains into sewers from a development. The SuDS also and increase the quality of the water release slowly by a natural filtering and purification processes. In general SuDS mimic natural systems, and manage rain close to where it falls. SuDS not only reduce the burden on our sewerage system, they can also help wildlife to thrive in urban areas, with many of the drainage systems being intrinsically wildlife friendly.

Principle of the SuDS Rain Garden Planter

SuDS Rain Garden planters collect rooftop runoff and work like a rain garden in a planter allowing for sustainably manage flash flood and stormwater. They effectively enhance the capacity of the surface water piped drainage network by capturing and storing rainfall, allowing it to soak into the ground, or release it slowly back into the main piped network.

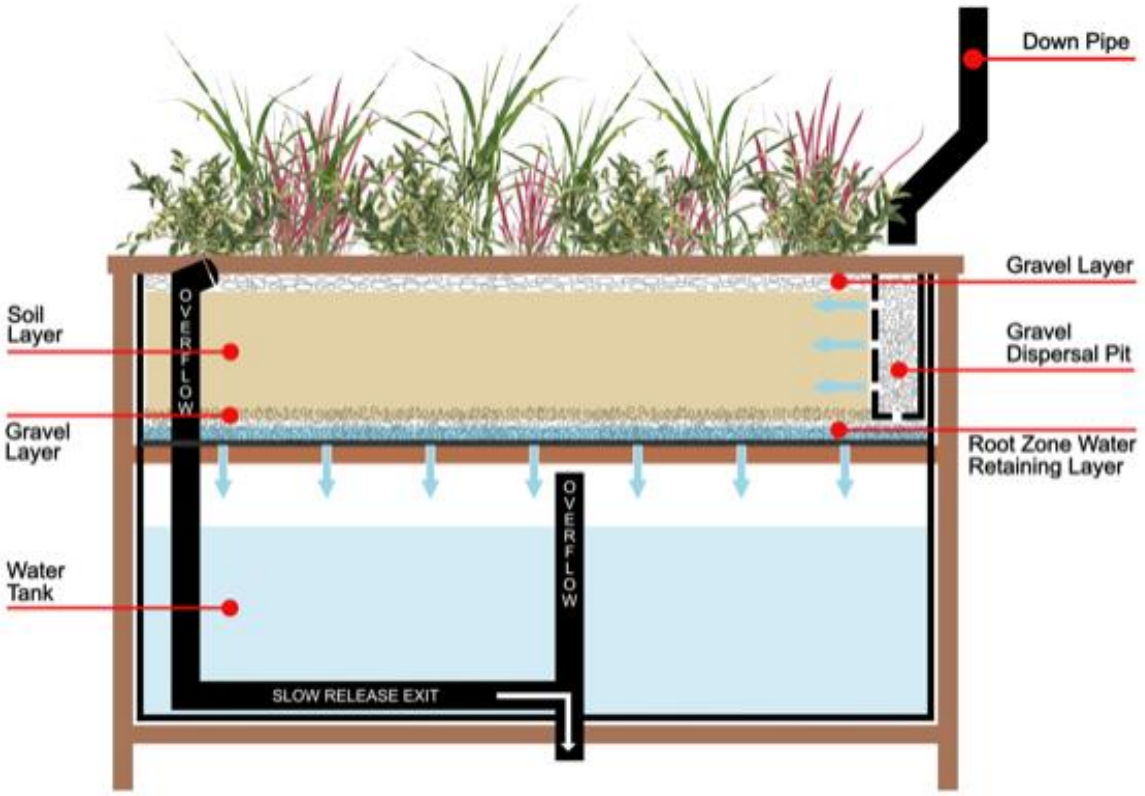


Fig 1. Section through a Larch SuDS Rain Garden Planter showing each component of the system

A SuDS rain garden planter makes use of the water that lands on the roof. Water from the downpipe is directed into the planter. The soil / compost mix absorbs and stores the rainwater for the plants to use. Excess rainwater filters through a separating Geotextile membrane, supported by a raised free draining raised floor, into the water storage cavity at the bottom of the SuDS planter, where it is stored and released from the base drainage pipe at a controlled rate.

The SuDS Rain Garden Planter is an attractive adaptation of the SuDS principle, which slows surface water flows and reduces surface water flood risk. With both bioretention and additional internal storage, the SuDS Rain Garden Planter is an innovative solution to property level retro-fit SuDS, and can work out very much less expensive than most groundworks intervention.

Fig 2. East of Eden Larch SuDS Rain Garden Planter with water storage area and internal drainage below a Geotextile layer

SuDS Rain Garden planter sizes and Bespoke Service

We produce five standard sizes of SuDS Rain Garden Planters.

Size (mm)
1000 x 650 x 900
1200 x 650 x 900
1500 x 650 x 900
1800 x 650 x 900
2000 x 650 x 900

Our commercial quality SuDS Rain Garden Planters are often bespoke sized and made to order to suit the specific needs of each site and location.

Embodied Carbon

- Made from FSC sourced UK grown Larch – Carbon Neutral
- Internal graduated perforated drainage pipe system for controlled release with sealed storage area to reduce plastic (recycled)components.
- Installation above ground to reduce installation energy impact.
- Plus linked directly to drainage system to reduce flash flood impact without being inundated with oil residues, wastes, pesticides etc often released into waterways following storm surges
- Supports permanent aerial plant growth, which in turn:-
  - Promotes carbon sequestration,
  - Provides BNG (Biodiversity Net Gain) value of development
  - Enhances aesthetic value of the site – Promotes wellbeing
  - Supports biodiversity, including nectar feeders.
  - Constructed in the United Kingdom by UK based craftsmen

Larch SuDS Larch Planter Construction Details

Our preferred material to construct our commercial quality Planters, as in the examples throughout this guide. This is because they are produced by UK specialist craftsmen using Larch from sustainably grow UK larch woodlands. One special property of larch is that it produces its own internal preservative, providing a very long planter life without the use of toxic preservatives. Alternative materials are linked to non-sustainable production issues.

East of Eden Planters have an expected life up to 20 years, and have a 5 year warranty against manufacturing defects

Benefits of using larch for our SuDS planters include:

- Natural resistance to decay. Larch produces its own internal natural preservative, Hence no need to impregnate the wood with toxic preservatives, as used for other soft woods.
- Aesthetically beautiful timber, which permits high manufacturing standards
- Impressive stability, with no time distortion
- Low maintenance.
- Constructed from hand selected Larch from sustainably managed woodlands

The following properties are responsible for the durability of larch.

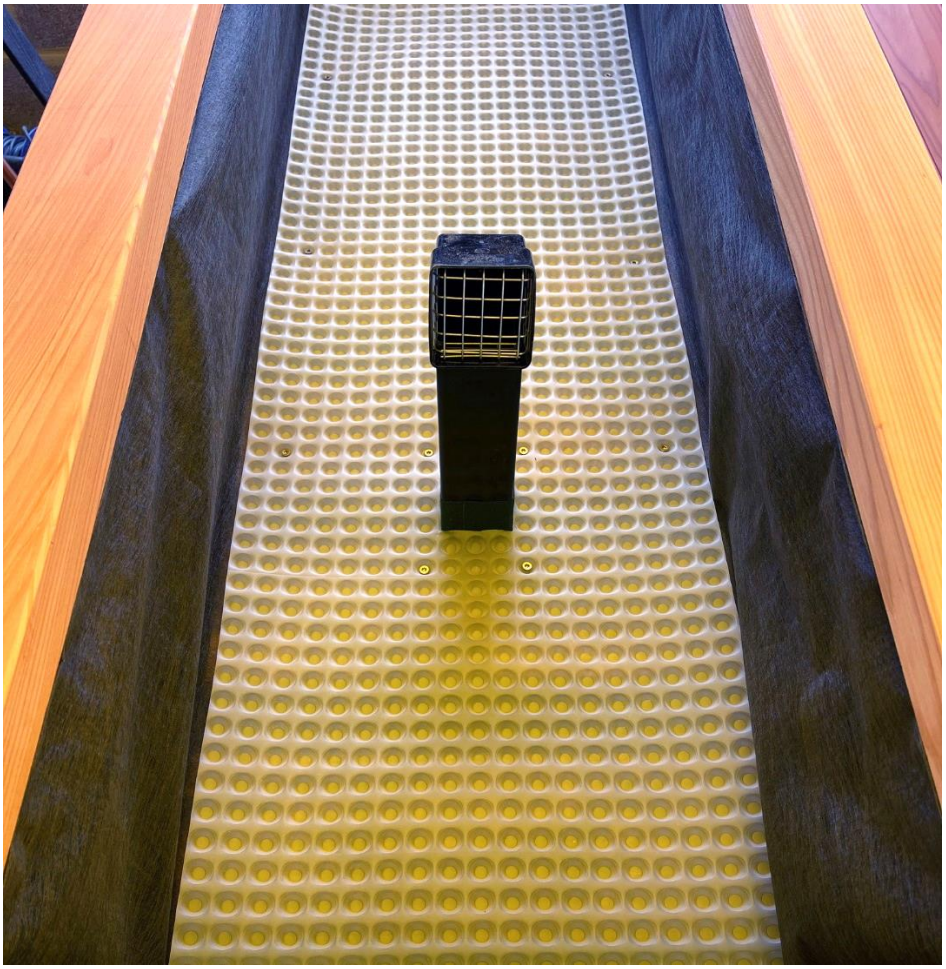
- High Density and Large Content of Heartwood –. Heartwood is denser, less permeable, and more durable than the surrounding sapwood.

- The structural properties of Larch are far superior to treated pine and really are better than any softwood out there. Larch is the hardest softwood around
- Unlike Cedar and Pine, and Redwood, Larch does not need you to apply a wood preservative or paint layer to survive the outdoor elements, which with other woods, requires re-applying yearly. None of this tiresome task is required for Larch planters
- If you want to change the appearance, we suggest staining the wood. Larch takes a stain very well and with its grain features it can be amazingly beautiful when stained.
- We offer a planter colouring service. We offer five standard colours, but at an additional premium, we can colour them to any RAL colour.

East of Eden SuDS planters and Biodiversity Net Gain(BNG)

Our unique SuDS planter design has been developed so that there is an additional internal overflow flow system so that in the rare occasion that the water storage area fills to the top it will not inundate the separate soil/compost area.

With the enhance design of our SuDS planters they can be used for any type of plants specific to the needs of the client, and local climatic conditions. As such they can significiantly contribute to a developments BNG In terms of the schools, this will make them ideal for growing veg, pollinators etc.



Geotextile layer with overflow ready for planting

They are supplied lined, with the complete internal drainage system fitted, including screened overflow and drainage pipe outlet ready to fit into your site drainage system.

Most of our SuDS planters are made to order. They are supplied complete and ready to install into your drainage system via the 68mm outlet that can be located in the base or sided panels to suit the site location.

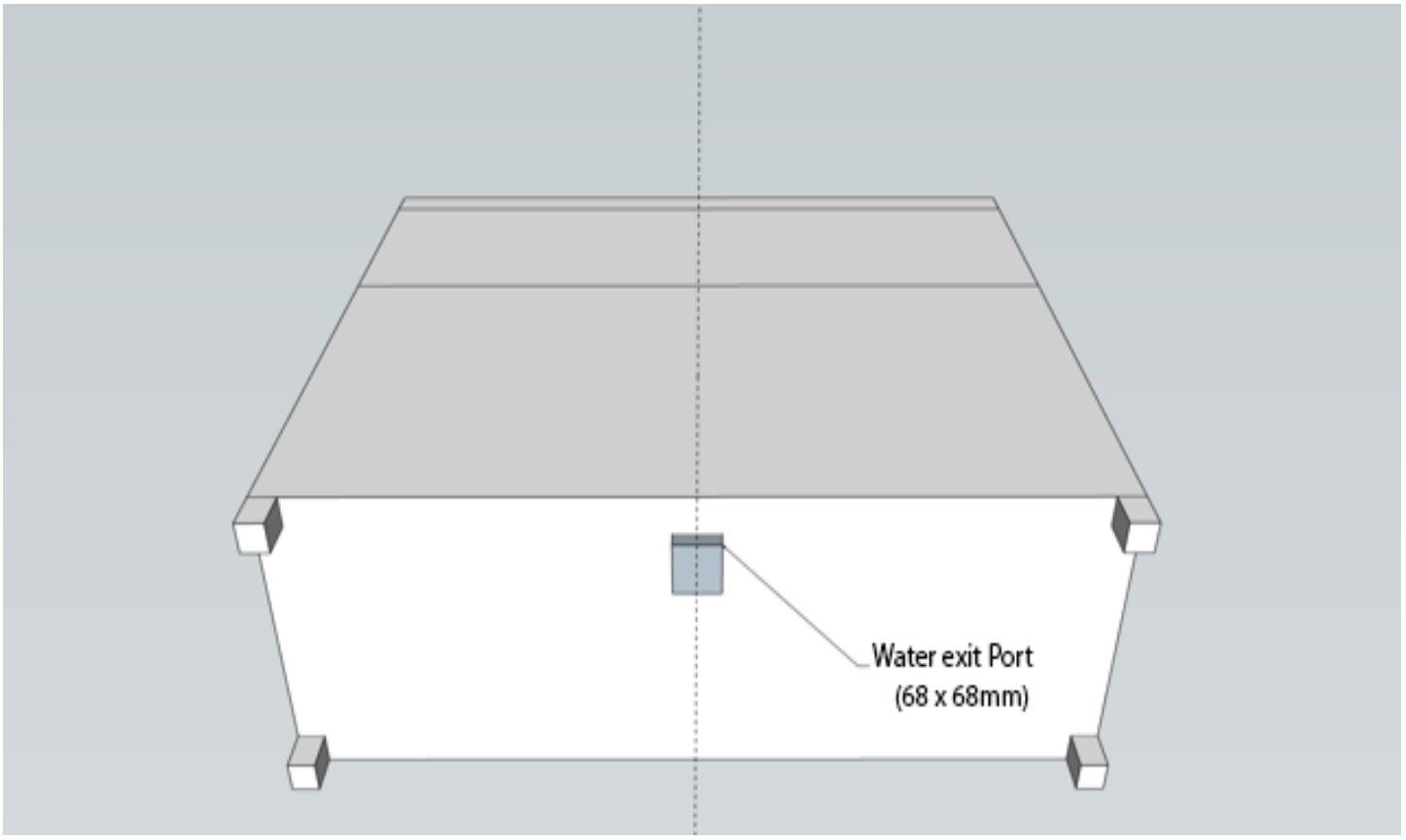
The concept is flexible, scalable and each unit provides a convenient solution that any subcontractor can work with and install. Installation is fast, simple and offers significant cost savings to alternative methods.

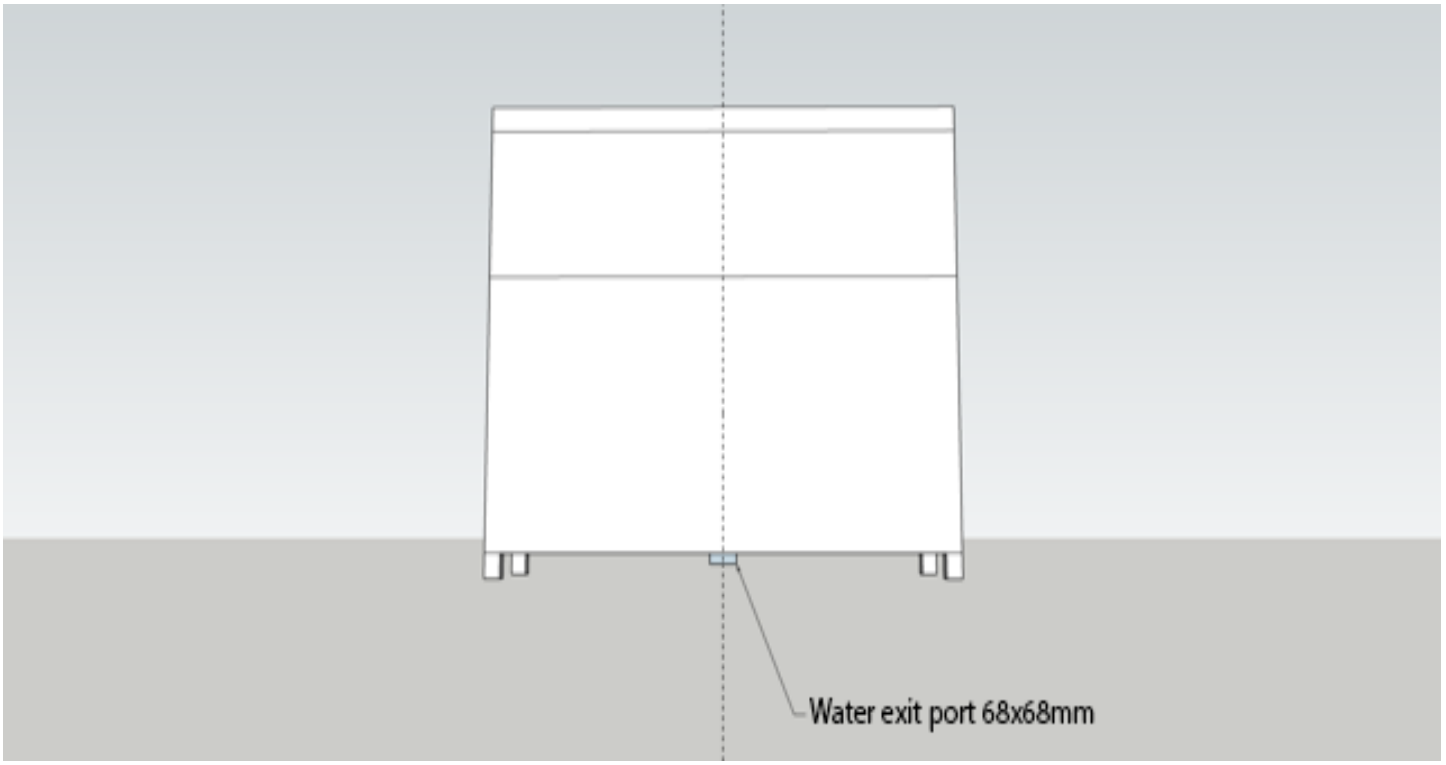
The East of Eden SuDS planter is supplied ready to be filled with layers of drainage clay pebbles, specialist compost soils and surface mulch, which is isolated from the water management system by a geotextile layer. The planter is lined to form a waterproof seal to retain the stormwater for regulated slow release.

With another special design feature of our SuDS Rain Garden planters include a maximum water storage layer in the base, which releases storm water slowly via the standard square 68mm drainage outlet.

The drainage outlet from the internal slow release system can be located to suit your specific site requirements. In most situations the outlet is required to feed into the downpipe drain that already exists, which will therefore located directly below the planter. For these projects the outlet feeds through the base of the rain garden SuDS Rain Garden planter, as shown in the figures shown on the next page.

Drainage outlet.





Some clients have requested an outlet form the lowest point from a side wall, as shown in the SuDS Rain Garden planter on page 4. During the construction of the planters, our workshop manager will contact you to discuss the location of the outlet

East of Eden SuDS Rain Garden Planters on site ready for installation

SuDS Planter in situ ready for connection

Internal controlled drainage system

The standard SuDS Rain Garden planter outflow rate is controlled by the combined effect of the geotextile layer and perforated base drainage pipe. To enhance the water storage we have created a pure water storage layer rather than gravel or clay pebbles, which is usually used. This significantly increases the water storage area, which combined with an internal slow release drainage system acts as an Attenuation Tank, which essentially acts as a large container/detention tank, functioning as a buffer to store excess rainwater and remove the risk of flooding of a residential area in a controlled way. Excess rainwater detained in the storage area/tank is then released at a controlled rate by the internal hydrocontrol drainage system.

Attenuation Rain Garden planters allow surface water to be stored and gradually released back to the ground or sewer network slowly. Attenuation and infiltration can help to control the level of surface water.

For longer runs along buildings, rather than specifying unmanageable planters longer than 2 meters, we recommend combining units fed by split down pipes from the gutter.

This will enable you to deal with any roof surface catchment area

East of Eden Rain Garden SuDS Technical Data

Planter construction material	Larch – High Grade AB
Unit Dimensions	See Standard range table (p.4) Bespoke sizes also available
Support Larch feet height	75mm – Permits moving with fork lift
Waterproof Liner material	Iko Rubershield Pro Low resistance Membrane
Separating filter membrane	Draintex Non-Woven Geotextile Fabric
Top Water retention layer	Delta HDPE Dimple sheet
Drainage pipe material	BS 4514 EN 1329-1 underground soil pipe PVC
Drainage pipe couplings	CE Std Number EN 295-4:2013
Base drainage pipe diameter	68 mm square diameter
Drainage outlet diameter	68 mm square diameter
Internal downpipe diameter	68 mm square diameter
Leaf guard drain diameter	68 mm square diameter

SuDS Rain Garden Planter Storage and Flow Rates

A simple, but helpful fact for calculating the volume of rain coming from a roof is based on the method of measuring rainfall rates using a rain guage. ie the precipitation (rainfall) in millimeters in height during a certain period.

This is equivalent to litres per square meter that it is falling on the surface.

Hence, if you know the area of the roof, and the rainfall rate (from slight to storm rainfall periods), you can calculate the volume of rain in litres that will come from the roof under the different conditions of rainfall. Obviously, the main value of a SuDS planter is during storm rainfall periods when the drain and sewer systems are in danger of becoming overwhelmed.

The storage volume and retention and subsequent outflow rates will vary with the dimension of the planter to be incorporated into the.

The SuDS Manual states that typically the surface area of a bioretention feature would be 2-4% of the overall site area being drained, to prevent rapid clogging of the bioretention surface. Based on this guidance, the surface area of any planter (or combination of planters) should not be less than 2-4% of the roof area it is draining.

The recommended surface area of the planter is based on the height being our standard 900mm. Where possible, the size of the planter should reflect this recommendation.

We offer a range of standard planter sizes to use in projects to attenuate rainfall from roof systems connected via the roof drain downpipes. (See page 11 for standard sizes)

These sizes are based on large, but manageable and movable sized units using a fork lift. This offers practical sized unit options to be used in combination to achieve the recommendation catchment areas stated above.

As well as the standard sizes, we can also construct the SuDS Rain Garden planter to bespoke requirements, but recommend a maximum length of 2500mm. For greater catchment we advise to install multiple planters fed by the same drain downpipe connected via the top of the planters.

Water Storage Layer

A major advantage of East of Eden SuDS Rain Garden planters is that they have a suspended permeable Draintex geotextile lined floor with Delta dimpled sheet providing a substate layer reservoir of water to sustain the plants during dry periods.

Importantly, this also means that the sub base layer is completely dedicated to water storage, in contrast to most other designs where the water stored is part of the substrate layers, significantly reducing their water storage capacity. With a dedicated water only storage area, our SuDS Rain Garden planters are able to hold almost twice as much water, which is critical during a deluge, which will then be released slowly.

The storage volume will depend on the dimensions of the planters.

With a planting layer of 300 mm, this leaves the remaining internal volume below the raised permeable planting layer for water storage within our unique storage and slow release drainage system, which maximises the volume of storm water that can be stored. See water storage values of our standard SuDS planters in the table below.

Water Storage Volume for Standard SuDS Planters

SuDS Planter size (mm)	Water Storage Volume (Litres)
1000L x 650D x 900H	208.08
1200L x 650D x 900H	257.04
1500L x 650D x 900H	330.48
1800L x 650D x 900H	403.92
2000L x 650D x 900H	452.88

Outflow and Infiltration rates

The standard SuDS Rain Garden planters are drained via a perforated drainage pipe running along the bottom of the planter. A number of factors influence the drainage rate including the drainage pipe diameter, soil mix and therefore infiltration rate, impact of plants and soil conditions prior to any particular rainfall event will be important.

We recommended using an open, free draining peat free soil mix of 15% loam soil or John Inness No 3 with 85% Peat free Multipurpose compost. If planted with shallow, light rooting plants, the outflow rate ranges from 15 to 20 litres per hour depending on height of head of water. We recommend light rooting planting, as the infiltration rate will be mostly impaired by the formation of a dense root network from more mature shrub-like plants. Annual planting that can significantly enhance the BNG value of your SuDS planters can be replenished each year. Hence they are ideal for creating wildflower pollinators, long summer flowering and a minimum rooting system, that can be cultivated annually to retain a free draining soil/compost mix.
(RHS plants for Pollinators. Click HERE)

Combination of SuDS Rain Garden planters with Rain Gardens

Water may discharge from a planter into the normal drains or it could be diverted further into a Rain Garden. For an enhance biophilic and aesthetic effect, we like to encourage the construction of landscaped features that the water could travel along and slowly percolate into the soil, such as an attractively constructed rill, gulley or channel into a garden bed, as in the example below

Rain garden planters make use of the water that lands on the roof and works in the following way:

1. Water from the downpipe is directed into the planter.

2. The soil / compost mix absorbs and stores the rainwater for the plants to use.
3. Excess rainwater filters into the lower internal storage reservoir and subsequently slowly drains out the perforated base drainage pipe connected to the building drainage pipe system. These planters are particularly useful if you have a significant amount of rain water traveling from the rooftop or other impervious surface directly into a drain causing flooding on your property or local drainage system.

Combined with SuDs Rain Garden Planters, rain gardens further enhance the effectiveness of SuDS Rain Garden planters to provide an inexpensive and instant way to create an attractive attenuating Sustainable Drainage System (SuDS) that will significantly enhance the Amenity and Biodiversity value of an area.

For a SuDS planters quote, please complete our Contact form

CLICK HERE