HydroPlanter™

‘Plug and Play’ Raingarden

GreenBlue® URBAN

Establishing the future urban landscape

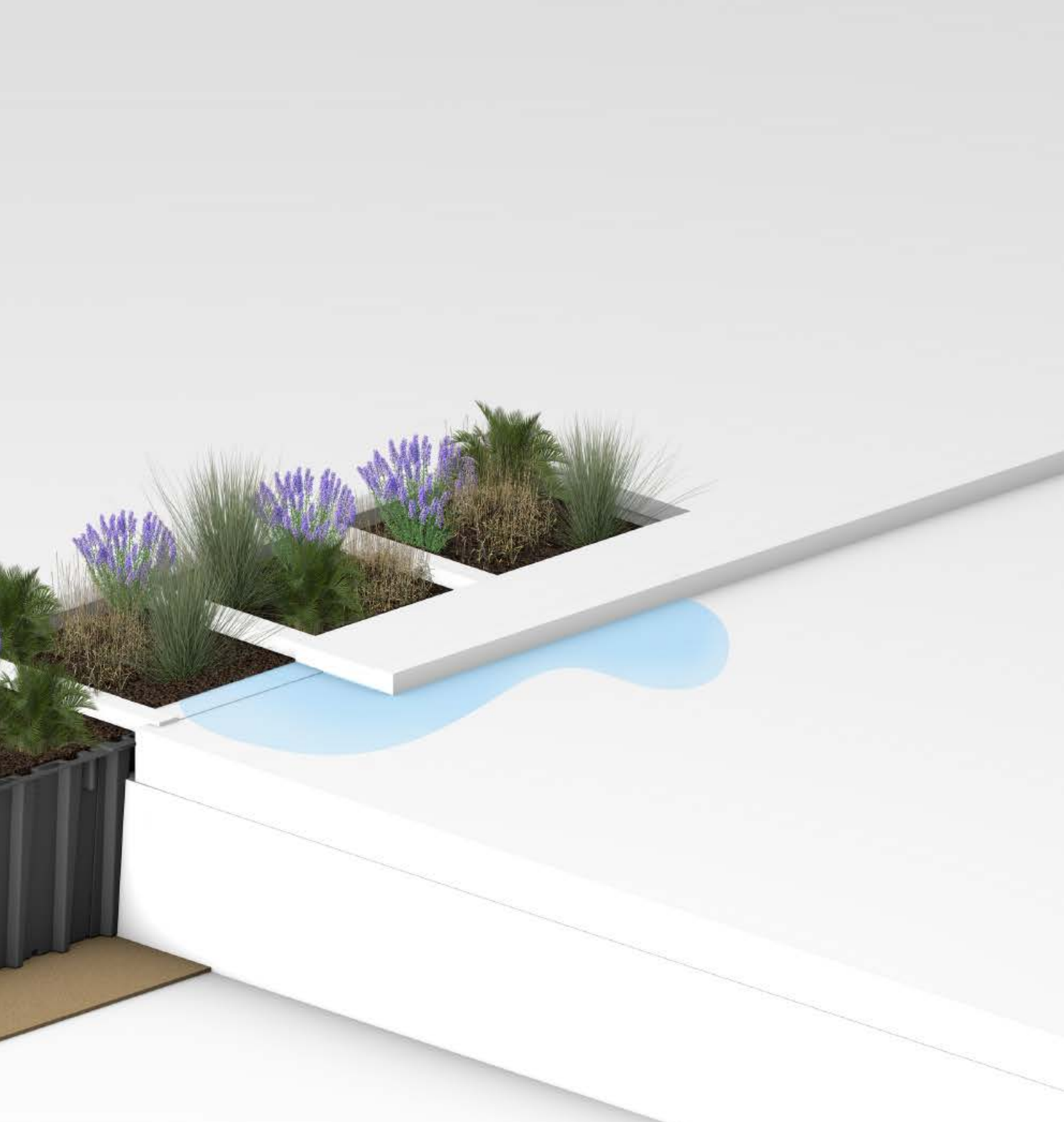
Introducing the **HydroPlanter**

We are excited to announce the launch of a new, modular, bioretention raingarden system, the HydroPlanter, that can be retrofitted into highways schemes and on new developments of any size.

This is a 'plug and play' sustainable urban drainage solution that can attenuate and cleanse storm water and provide amenity and biodiversity to new and existing spaces. The modules will be filled with a particular soil specification and planted wildflowers and biodiverse grasses.

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

The modular characteristics with pre-calculated hydrological performance statistics mean that specification and design is very simple for any given catchment area.



Manufactured in the UK from 100% recycled material

Modular, stackable ‘plug and play’ system makes for economic freight

Highly effective filtration & flow control

Provides amenity and biodiversity

HydroPlanter
SuDS Made Simple

Cost Effectiveness & Rapid Install

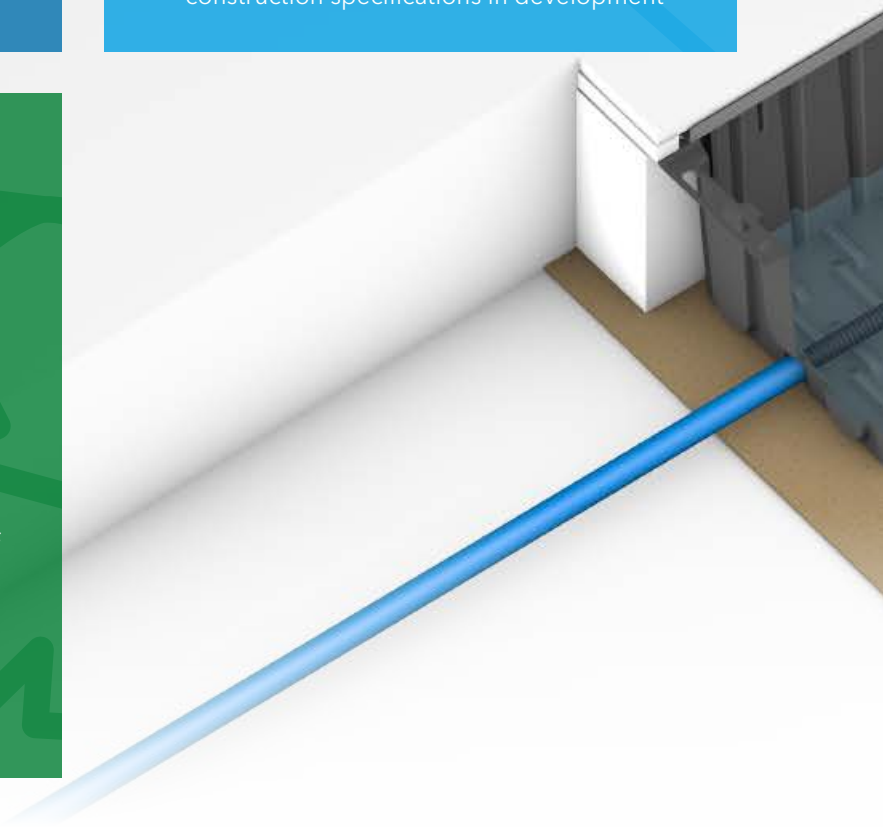
- Very simple and fast installation process
- Simple, off-the-shelf solution more cost-effective method than over-engineered hybrid geocellular/raingarden approaches
- Low weight units don't require mechanised handling Transport efficient product design
- Complete package available: soil, drainage stone, planting schemes

Modularity & Simplicity

- Scalable from stand-alone applications to large civic schemes
- Ease of calculation using off the shelf system including the potential to integrate into modelling software
- 'Plug and play' system eliminates detailed bespoke design work
- 'Drag and drop' CAD drawings and full construction specifications in development

Environmental Credentials

- Stackable design for transport and carbon efficiency
- Uses 100% recycled materials to reduce landfill and boost health of the environment
- Fully meets all requirements of the 4 Pillars of SuDS outlined in the CIRIA SuDS Manual



GBUHPSM1A

HydroPlanter Starter Module

GBUHPCM1A

HydroPlanter Continuation Module

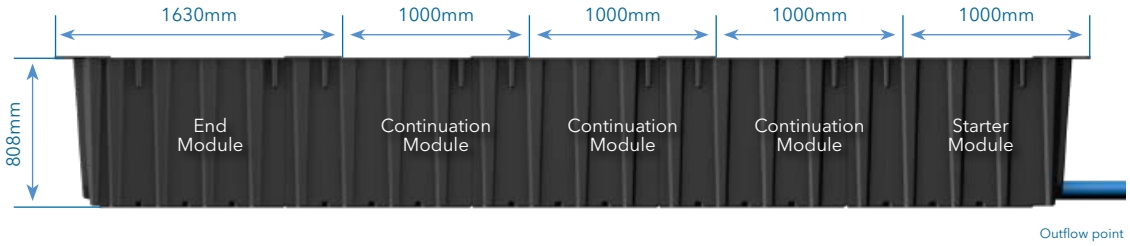
GBUHPEM1A

HydroPlanter End Module

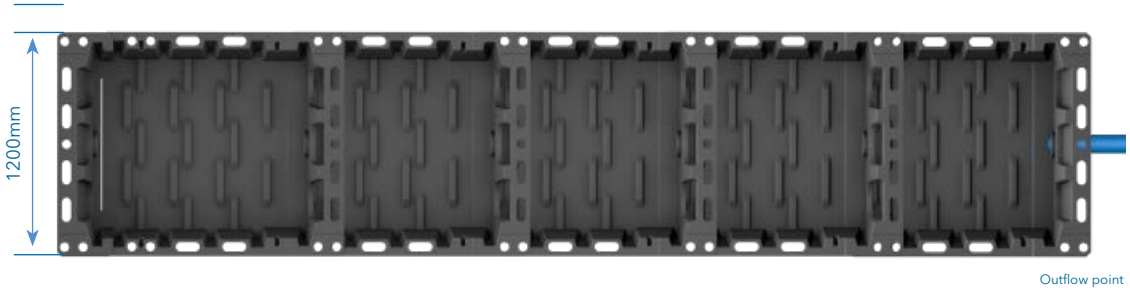
GBUHPIM1A

HydroPlanter Indivdual Module

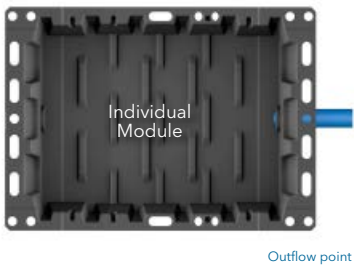
HydroPlanter
Components



Continuation run (Section view)



Continuation run (Plan view)



Individual module (Plan view)

Product code	Description	Internal volume
GBUHPSM1A	HydroPlanter Starter Module	0.8 cubic meters
GBUHPCM1A	HydroPlanter Continuation Module	0.8 cubic meters
GBUHPEM1A	HydroPlanter End Module	1.12 cubic meters
GBUHPIM1A	HydroPlanter Indivdual Module	1.12 cubic meters

Outlet point

Connectivity to 110mm drainpipe provided, pipe not included.

Included in the system:

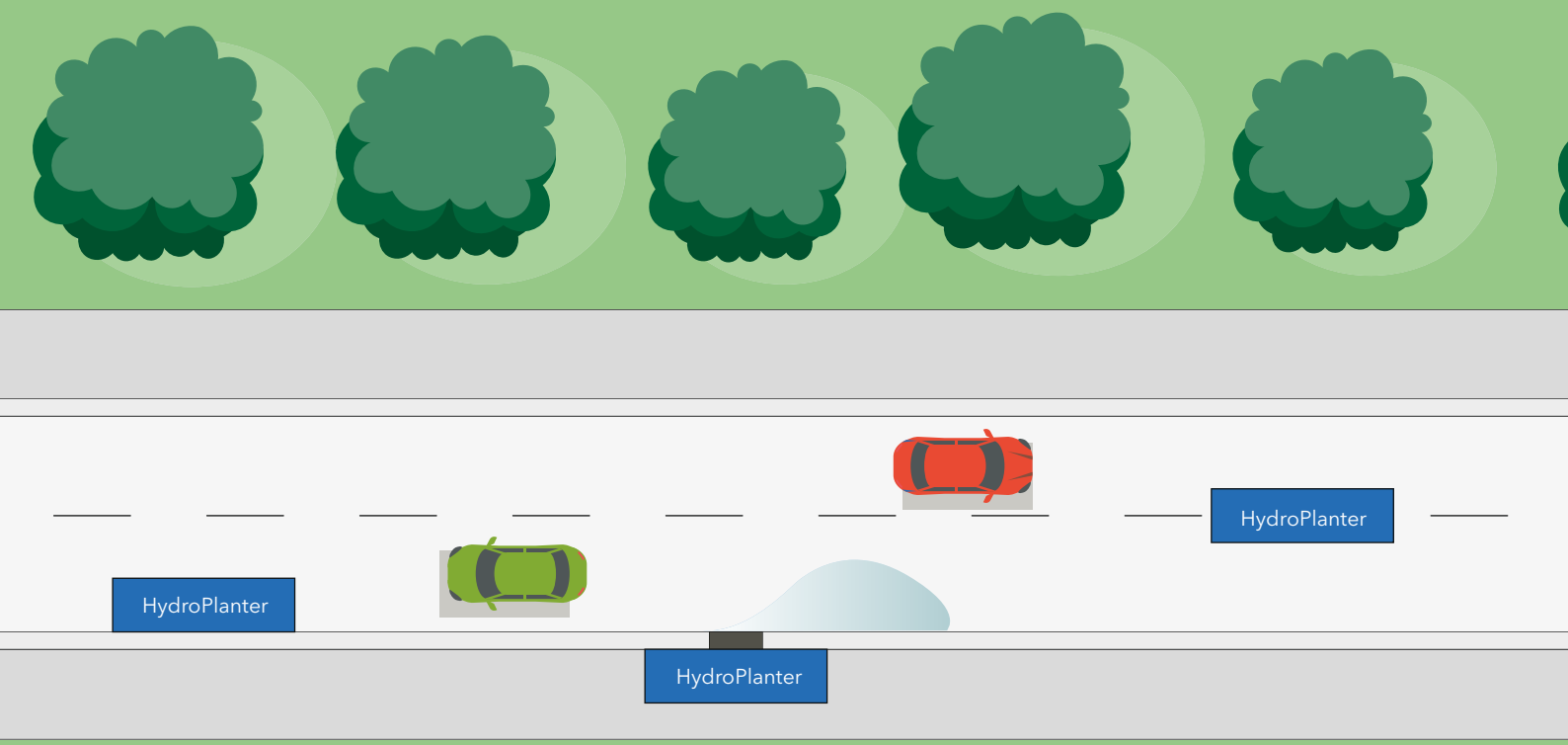
- Internal pipework
- Geotextile
- Fixing kit
- Joint sealant

Available to order:

- Exernal pipework
- Growing media
- Drainage media
- 110mm external pipe seal kit
- Concrete weir walls

Typical Situation & Water Inlet Options

We recommend 1 kerb inlet or opening for every 3-4 HydroPlanter units to maximise the water inflow from the road.

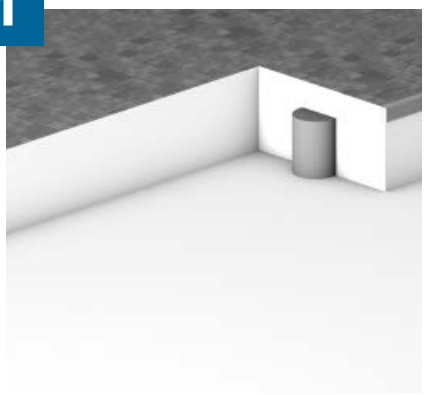


Lined or Infiltration

System is fully sealed and completely impermeable as standard - no lining of the excavation is required. Infiltration functionality is available to order if infiltration is required.

Installation
Overview

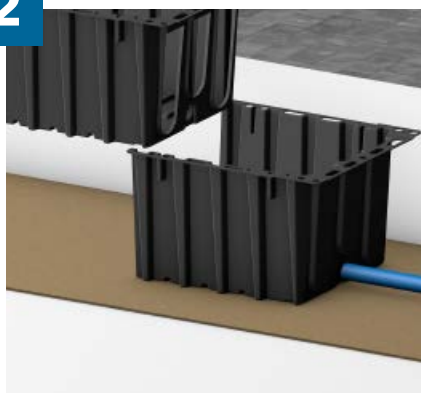
1



Excavation

*Survey for utilities

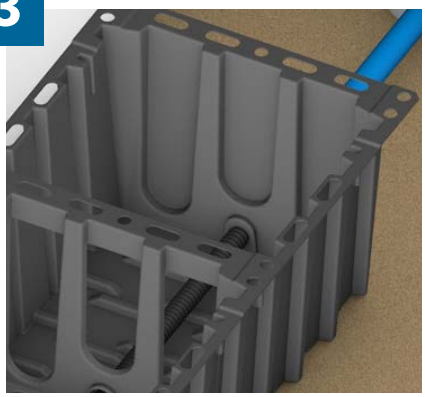
2



Install Troughs

*Sealant applied at each trough connection

3



Connect pipework

4

Install drainage stone and geotextile

5

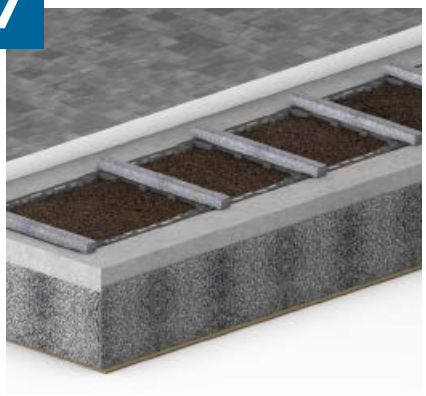
Install ArborSoil Hydro

6

Backfill with aggregate and concrete

*Backfill and soil should be applied simultaneously in 150mm lifts.

7



Paving surround

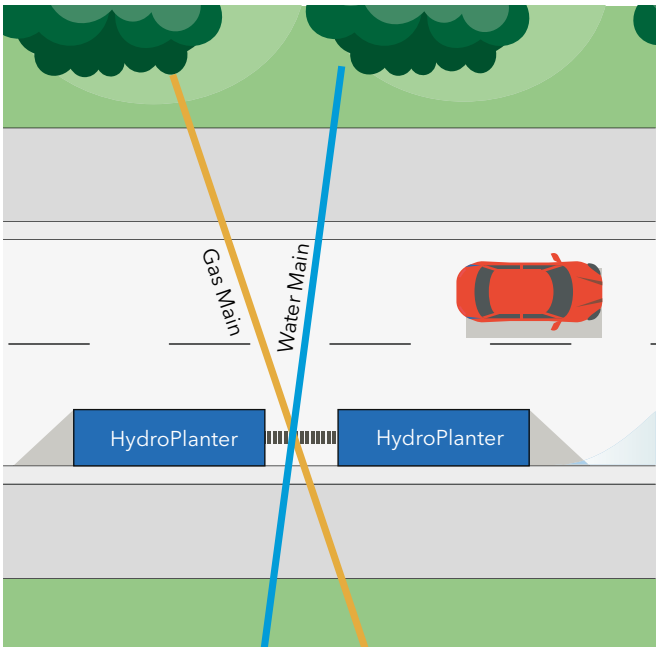
8

Planting Scheme

Scan the QR code to download the full installation instructions.

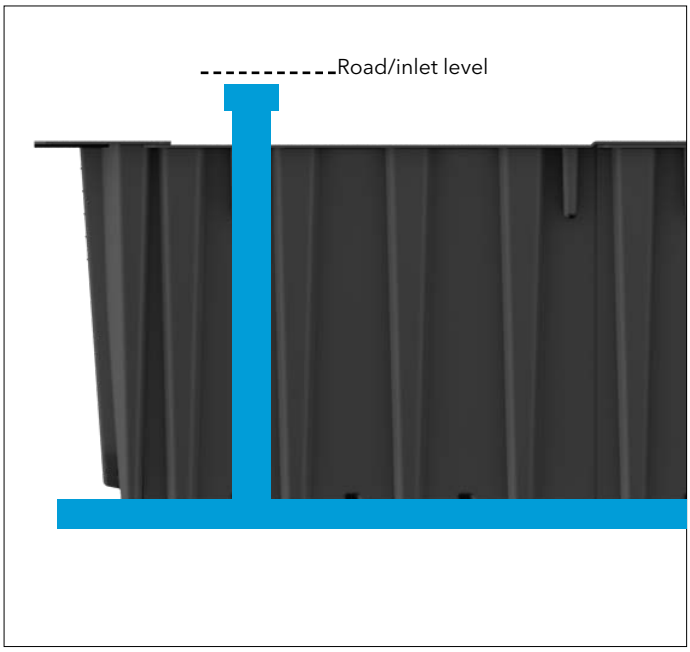
Managing Services

Services and utilities can be worked around by ‘bridging’ between two units with pipe



Optional exceedance flow facility

Exceedance flow, where required, can be directed simply to the outflow via a simple, optional overflow pipe



Hydraulic Performance
Design Tables

Catchment area and interception for HydroPlanter schemes can be simply calculated using the UK M5-60 Rainfall map and design tables.

These tables provide the maximum catchment that can drain to a HydroPlanter in order to achieve the required attenuation storage for a given return period. Maximum catchments are provided for 1m2 surface area within the HydroPlanter (a single unit).

If is often beneficial to use the HydroPlanter to provide attenuation storage for low return period events (which allows a greater catchment area to drain to it) and pass forward excess flows to the following parts of the management train via an overflow.

Step 1
M5-60 Rainfall Map

Identify your location on the map, and the correct reference colour

Step 2
Table 1 - Catchment area

Refer to the corresponding line on Table 1 and find the appropriate catchment area for a range of return periods and climate change factors

Step 3
Calculate number of HydroPlanter units required

Divide the scheme catchment area by the catchment area from Table 1 to find the total number of HydroPlanter units required

M5-60 Rainfall Map

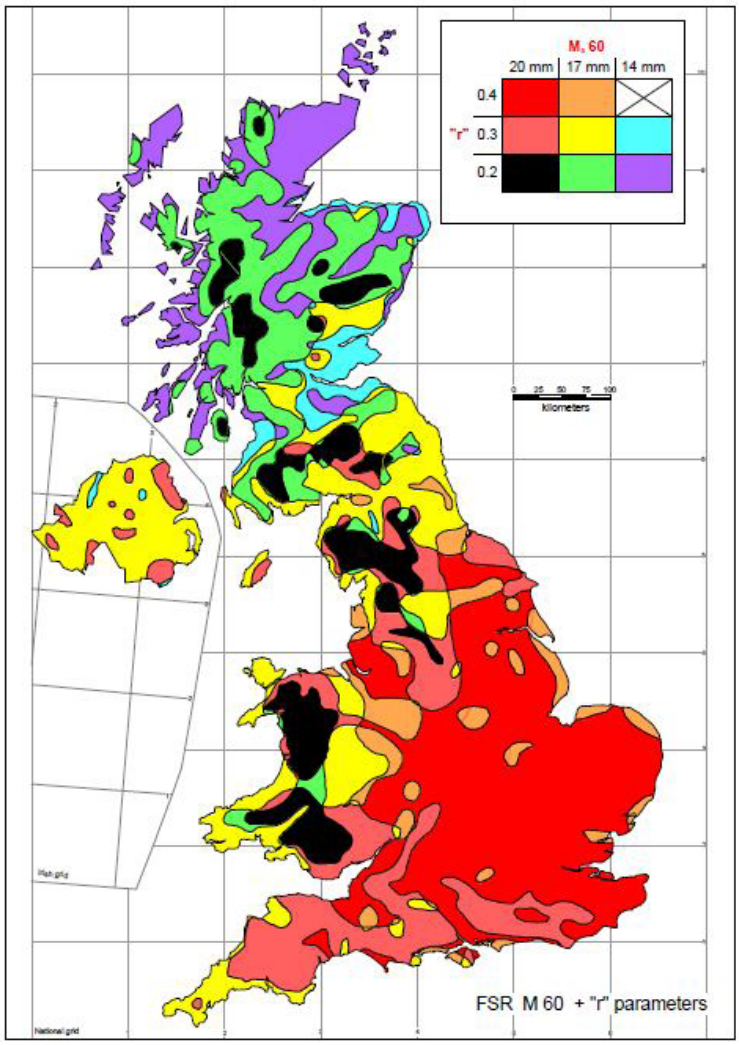


Table 1 - Maximum catchment area (m2) draining to one HydroPlanter unit (1m2)

M5-60	r	Return period (annual probability of occurrence)						
		1 in 1 (100%)	1 in 10 (10%)	1 in 30 (3.3%)	1 in 100 (1%)	1 in 100 + 20% (0.5%)	1 in 100 + 30% (0.25%)	1 in 100 + 40% (0.125%)
20	0.4	27.5	15	12.5	7.5	7.5	5	5
	0.3	25	15	10	7.5	7.5	5	5
	0.2	22.5	12.5	10	7.5	5	5	5
17	0.4	35	17.5	12.5	10	7.5	7.5	7.5
	0.3	32.5	17.5	12.5	10	7.5	7.5	7.5
	0.2	27.5	15	12.5	7.5	7.5	5	5
14	0.4	40	20	17.5	12.5	10	10	7.5
	0.3	40	20	15	12.5	10	7.5	7.5
	0.2	32.5	17.5	15	10	7.5	7.5	7.5

Water Quality Data

The HydroPlanter complies with the CIRIA SuDS Manual specification Table 26.4 'Indicative SuDS mitigation indices for dicharges to groundwater' (Refer Bioretention system)

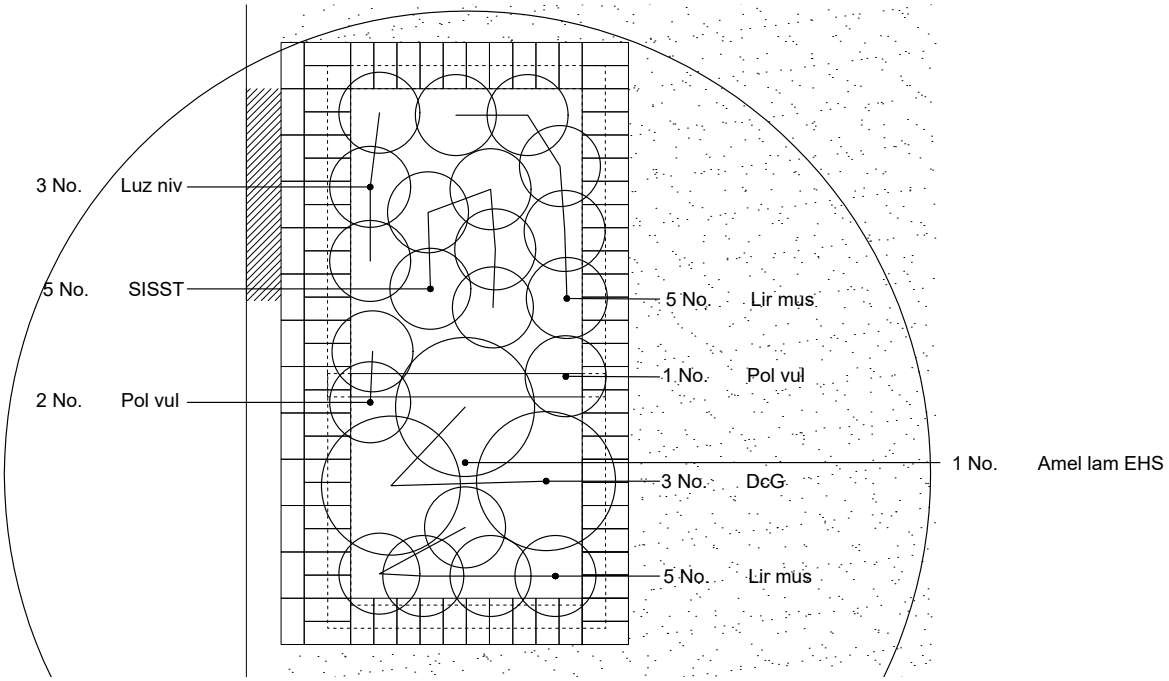
- TSS - 0.8
- Metals - 0.8
- Hydrocarbons - 0.8

Planting Schemes
Suggested Plants

This is a suggested list of plants which are suitable for raingardens. When building a planting palette, care must be taken to select plants that are drought tolerant, rather than choosing wetland plants, as the average UK raingarden would spend a considerable proportion of its working life in dry conditions. Also bear in mind any localised constraints, challenges or objectives which may impact plant selection, such as project specific pollution risks or restrictions imposed by relevant authorities (such as height limits adjacent to highways). We recommend a knowledgeable horticulturalist is employed to review plant selection. Care must be taken when selecting trees within HydroPlanter schemes, ensure rooting volume is sufficient for selected species – refer to 'Tree Species Soil Volume Guide'.

Common Name	**Latin Name**	**Habit**	**Sunlight and Aspect**
Guelder Rose	Viburnum opulus	Perennial shrub	Any
Dogwood	Cornus sanguinea	Perennial shrub	Any
Culvers root	Veronicastrum virginicum	Herbaceous perennial	Full sun or partial shade
Aster	Aster spp.	Herbaceous perennial	Full sun or partial shade
Black eyed susan	Rudbeckia hirta	Herbaceous annual or biennial	Full sun or partial shade
Stinking hellebore	Helleborus foetidus	Herbaceous perennial	Full sun or partial shade
Montbretia	Crocosmia spp.	Deciduous rhizomatous perennial	Partial shade
Bugle	Ajuga reptans	Rhizomatous perennial	Partial shade
Columbine	Aquilegia spp.	Herbaceous perennial	Full sun or partial shade
Inula	Inula hookeri	Herbaceous perennial	Partial shade
Hemp agrimony	Eupatorium cannabinum	Herbaceous perennial	Full sun or partial shade
Bellflower	Campanula glomerata	Herbaceous perennial	Full sun or partial shade
Sneezeweed	Helenium sp.	Herbaceous perennial	Full sun
Lesser periwinkle	Vinca minor	Perennial sub-shrub	Any
Elephants ear	Bergenia sp.	Rhizomatous perennial	Full sun or partial shade
Plantain lilies	Hosta spp.	Herbaceous perennial	Partial shade
Yellow flag	Iris pseudocorus	Rhizomatous perennial	Full sun or partial shade
Siberian flag	Iris sibirica	Rhizomatous perennial	Full sun or partial shade
Garlic and onions	Allium spp.	Bulbous perennial	Full sun
Soft rush	Juncus effusus	Evergreen perennial	Full sun or partial shade
Pendulous sedge	Carex pendula	Rhizomatous perennial	Full sun or partial shade
Zebra grass	Miscanthis sinensis	Deciduous perennial grass	Full sun
Switch grass	Panicum virgatum	Deciduous perennial grass	Full sun
Royal fern	Osmunda regalis	Deciduous fern	Any
Male fern	Dryopteris felix-mas	Deciduous or evergreen fern	Full sun or partial shade
Broad buckler fern	Dryopteris dilatata	Deciduous or evergreen fern	Full sun or partial shade

Planting Schemes
Trial Scheme



Trees

Abbriviation	Species	Common Name	Pot Size	Height	Girth	Specification	Number
Amel lam EHS	Amelanchier lamarckii	Snowy Mespilus	75-80L	400-450cm	12-14cm	Form - Standard (EH): Age-3x: Clear Stem-175-200cm: Root Condition-C: Min BreakS-3	1 No.

Total: 1 No.

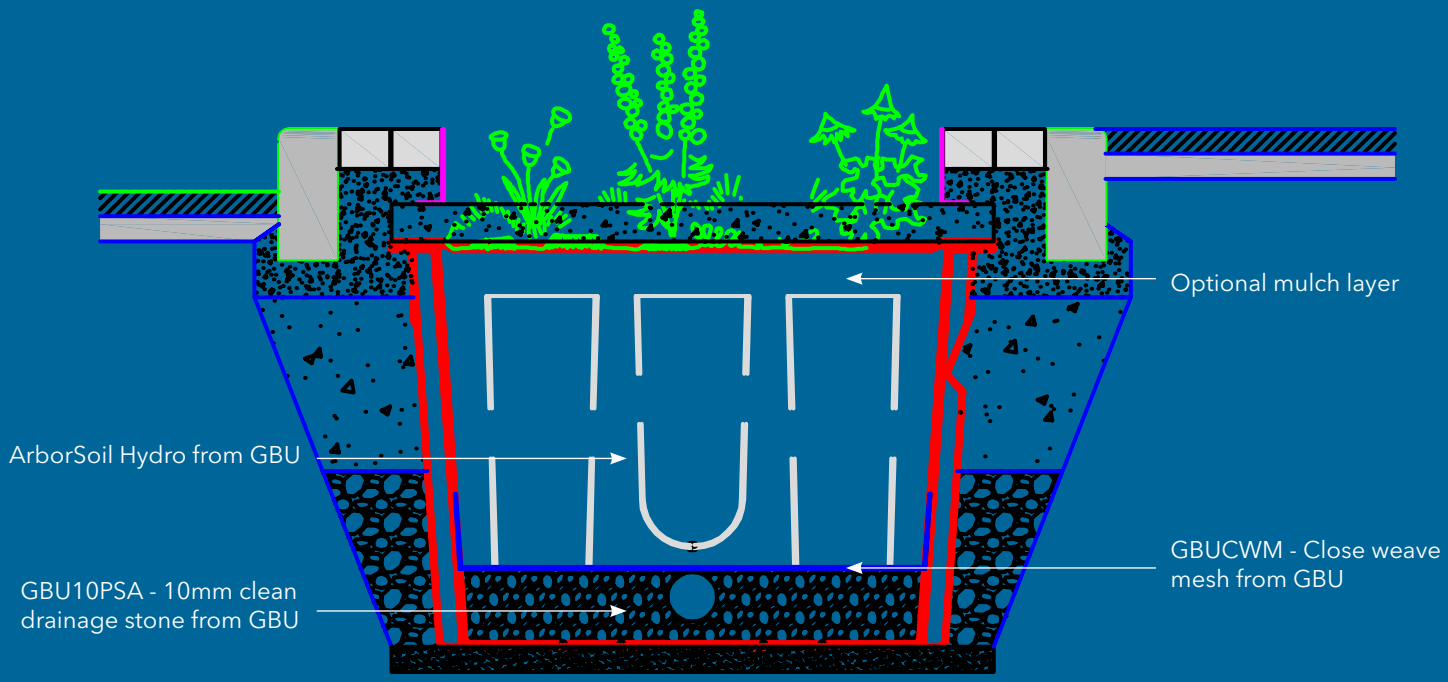
Herbaceous

Abbriviation	Species	Pot Size	Specification	Density	Number
DcG	Deschampsia cespitosa 'Goldschleier'	3L	Root Condition - C : Min Breaks - 0 : Min Buds - 3	Counted	3 No.
Lir mus	Liriope muscari	3L	Root Condition - C : Min Breaks - 0 : Min Buds - 0 : Propogation Method - V	Counted	10 No.
Luz niv	Luzula nivea	3L	Root Condition - C : Min Breaks - 0 : Min Buds - 0 : Propogation Method - S or V	Counted	3 No.
Pol vul	Polypodium vulgare	3L	Root Condition - C : Min Breaks - 0 : Min Buds - 0 : Propogation Method - S or V	Counted	3 No.
SISST	Sisyrinchium striatum	3L	Root Condition - C : Min Breaks - 0 : Min Buds - 0 : Propogation Method - V	Counted	3 No.

Total: 24 No.

(Note that care must also be taken when selecting trees within the planting pallette, ensure that rooting volume provided is sufficient for the selected species. Please review our publication 'Tree Species Soil Volume Guide')

Internal Build-up



ArborSoil Hydro Parameters	Unit	Typical Test Results
Texture:		
Clay (<0.002mm)	%	9
Silt (0.002 - 0.63mm)		
Very Fine Sand (0.05 - 0.15mm)	%	21
Fine Sand (0.15 - 0.25mm)		
Medium Sand (0.25 - 0.50mm)	%	45
Coarse Sand (0.50 - 1.0mm)	%	25
Very Coarse Sand (1.0 - 2.0mm)		
Stones (2 - 6mm)	%	1.6
Organic Matter (LOI)	% w/w	2.7
Ph (1:2.5 water extract)	units	8.4
Exchangeable Sodium Percentage	%	3.6

Phytotoxic Contaminants:		
Total Zinc	mg/kg	40.2
Total Copper	mg/kg	10.0
Total Nickel	mg/kg	13.1

Available Nutrients:		
Nitrogen	mg/l	0.11
Phosphorus	mg/l	43
Potassium	mg/l	651
Magnesium	mg/l	77
Carbon:Nitrogen Ratio	:1	14.55
Calcium Carbonate	% m/m	1.4

Additional Analysis:		
Electrical Conductivity (1:25 water extract)	µS/cm	808
Electrical Conductivity (1:2 CaSO4 extract)	µS/cm	2908

Additional Criteria:		
Saturated Hydraulic Conductivity	mm/h	90
Total Porosity	%	46.5
Air-filled Porosity	%	21.0
Capillary Porosity	%	25.5
Bulk Density	g/cc	1.42
Particle Density	g/cc	2.66

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