WAVIN Stormwater Management

AquaCell Attenuation designed with accordance with CIRIA C697

Project & Site Details

Project Number	S20217	**Produced by**	Mark Henly
Client	KVB Architects	**Checked by**	
Site Name	54 Pembroke Road, Ruislip,		
Location	Hillingdon	**Date**	22/03/2021

Drainage Details

Area	228 m²	**Climate Change**	30 %
Catchment Type	Roof	**Effective Area**	267 m²
Area Reduction Factor	0.9	**Additional Inflow**	0.00 l/s

Discharge Parameters

Discharge Rate	2.30 l/s	**Soil Type**	Unknown
Factor of Safety	1	**Source**	Unknown
Effective Discharge	2.30 l/s		
Additional Outflow*	0.00 l/s	**Depth to Groundwater (m)**	Unknown

*flat rate from pump only

Rainfall Data

R value	0.4	**Storm Return Period**	1 in 100 years
M5-60	20	**Country**	England and Wales

Time	Z1 Value	y mm	Z2 Value	p mm	Inflow	Outflow	Storage
5min	0.38	7.60	1.84	13.98	3.73	0.690	3.040
10min	0.52	10.40	1.91	19.86	5.30	1.380	3.919
15min	0.63	12.60	1.91	24.07	6.42	2.070	4.350
30min	0.80	16.00	1.99	31.84	8.49	4.140	4.354
1hr	1.00	20.00	2.03	40.60	10.83	8.280	2.550
2hr	1.19	23.80	2.03	48.31	12.89	16.560	-3.672
4hr	1.44	28.80	2.01	57.89	15.44	33.120	-17.678
6hr	1.59	31.80	1.97	62.65	16.71	49.680	-32.969
10hr	1.81	36.20	1.97	71.31	19.02	82.800	-63.776
24hr	2.35	47.00	1.89	88.83	23.70	198.720	-175.024
48hr	2.69	53.80	1.81	97.38	25.98	397.440	-371.463

Attenuation Parameters

Length	4.0 m	**Width**	3.0 m
Depth	0.4 m	**Void**	95 %

Results

Critical storm duration (hrs)	30min	
Minimum Required Volume (m³)	4.354	
Volume From Dimensions	4.56	Pass

AquaCell Modular Units

No. Units Long	4	**No. Units Wide**	6
No. Units Deep	1		
Total Number of Units	**24**	**Unit Type**	**AquaCell Core R**

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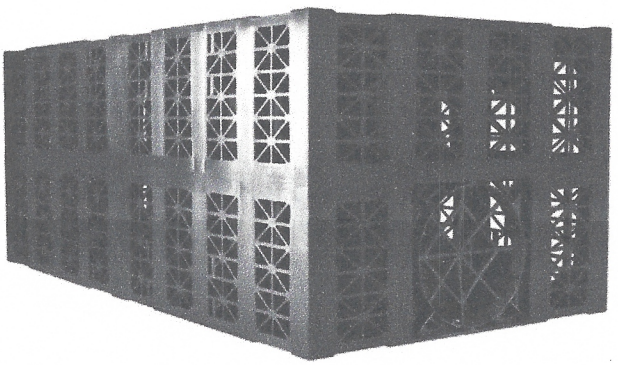
AquaCell Core-R

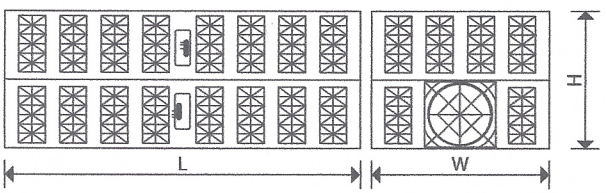
Application

AquaCell Core-R has been designed for use in deep applications, subject to regular and heavy traffic loadings, e.g. cars and HGV's. AquaCell Core-R can also be used for deep soakaways and landscaped applications.

Typically for use down to depths of 6.68m in landscaped areas (6.43m trafficked by cars) to the base of the units from ground level, in best soil conditions.

Trafficking by heavy construction plant on site, including mechanical equipment, must be avoided until the minimum cover depth of 1.11 metres is in place.

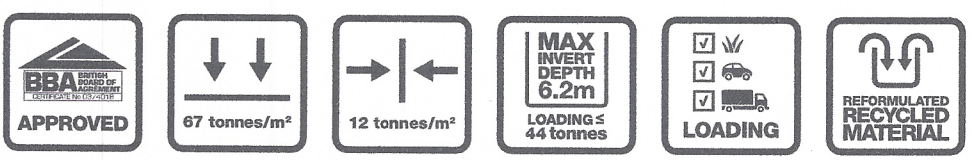




Features and benefits

- Suitable for regular and heavy traffic loadings
- Proven vertical loading capacity of: 66.9 tonnes/m² (669 kN/m²)
- Proven lateral loading capacity of: 12.3 tonnes/m² (123kN/m²)
- BBA approved – Certificate No 03/4018
- Ideal for all types of shallow and deep projects including major attenuation and infiltration schemes

Nominal size (mm)	Part number	Dimensions (mm) W	H	L
160	6LB150	500	400	1000



Maximum installation depths – to base of units (m)[1]

Typical soil type	Soil weight kN/m³	Angle of internal friction φ (degrees)[2,3]	Landscaped areas	Vehicle mass <9 tonnes[4,5]	Vehicle mass <44 tonnes
Over-consolidated stiff clay	20	24	3.85	3.61	3.36
Silty sandy clay	19	26	4.35	4.09	3.83
Loose sand and gravel	18	30	5.34	5.06	4.78
Medium dense sand and gravel	19	34	5.94	5.68	5.41
Dense sand and gravel	20	38	6.68	6.43	6.18

(1) Without groundwater present below base of units – AquaCell Core-R may be used where groundwater is present, contact Wavin for technical advice.
(2) 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 φ.
(3) The design is very sensitive to small changes in the assumed value of φ, therefore, it should be confirmed by a chartered geotechnical engineer. In clay soils, it may be possible to utilise cohesion in some cases.
(4) Applicable for car parks or other areas trafficked only by cars or occasional refuse collection trucks or similar vehicles (typically one per week).
(5) This category should be used when considering landscaped areas that may be trafficked by ride on mowers.

Assumptions made:
- Ground surface is horizontal
- Shear planes or other weaknesses are not present within the structure of the soil.

Source: BBA

SHEET 2 OF 2 (WAVIN)