



Quotation for the supply of Rainwater Harvesting Equipment

Client :

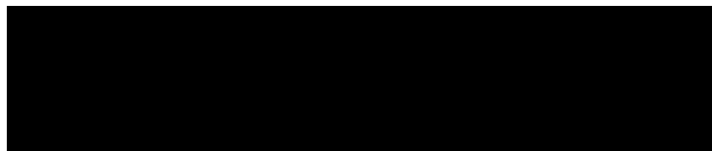
Chris Scott

Site Reference :

**Above Gd Rain Activ for Flamsteed, Lake Lane,
Barnham, West Sussex. PO22 0AD**

Prepared by:

Ian Woodcock



Our reference : IMW230666

Date of proposal : 15/06/2020



Your Proposal

Thank you for your email and time on the telephone earlier and as requested please find the following information regarding our proposed system.

Please see Drainage Calculation Summary on page 5

Wall tanks are available in Green, Black or Sandstone

Rainwater Harvesting Limited is a private family owned company, our strong service ethos has been built on many years of experience and this is reflected in our ability to offer both simple to install rainwater harvesting systems and mix and match components to provide bespoke solutions reflecting clients needs. At our 100,000sq ft warehouse in Peterborough we hold over 3000 stock items, we are the largest stockholder of the Shallow Dig Rewatec tanks in the UK and we regularly despatch to site complete rainwater harvesting systems within 5-7 days of order , we also provide full technical support on all our products.

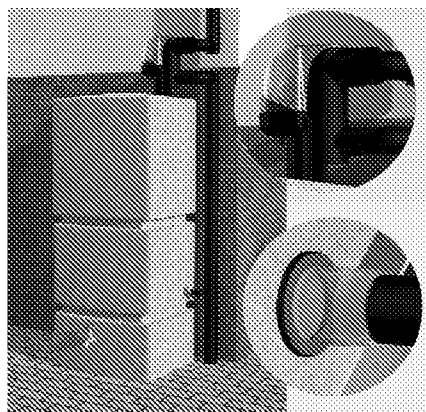
We would welcome the opportunity of supplying your rainwater harvesting system and I can easily be contacted either by phone or email as shown on the previous page.



Components and Prices – Supply Only

Product Code : **RWH-1599FL-RA**

1,600 Litre Rain Activ Attenuation System



Components

Product Code	Description	Qty
RWH-RA02	RAIN ACTIV SUDS COMPONENT SITE SPECIFIC AND PRE FITTED ALLOWING FOR A MINIMUM OF 1300 LITRES WORTH OF ATTENUATION WITH A CONTROLLED DISCHARGE RATE OF 3.3 LITRES PER SECOND	1
RWH-RA01	MICRO DRAINAGE CALCULATIONS	1
RWH-800PIL-B	800 LITRE WALL TANK (H 1790 x W 820 x D 620 mm)	2
RWH-WTWTC	WALL TANK TO WALL TANK CONNECTOR	1

Price : £1,250.00 (£1,500.00 Inc. VAT)

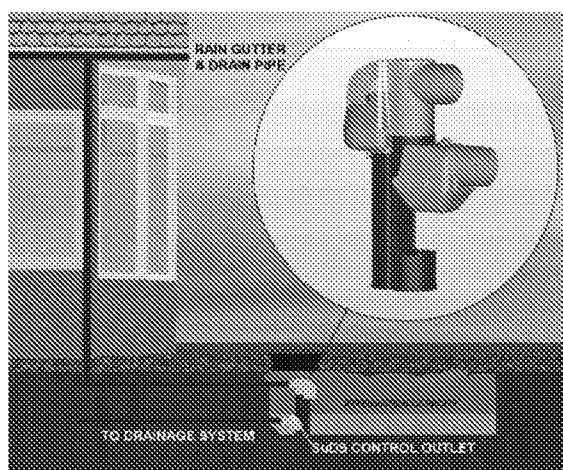
UK delivery is included in the price (Highlands and islands extra)



Rain Activ SuDS Solution

Rain Activ is a totally new concept within the storm attenuation market. Utilising shallow dig underground water tanks as well as a filtration and controlled discharge module.

Rain Activ collects water from the roof and removes debris via a self-cleaning filter. Once inside the tank, the clean water is attenuated and discharged slowly at a calculated rate through an orifice.



- Ultra-low discharge SuDS system.
- Peak discharge rates as low as 0.05 L/sec per property.
- Primary solution reduces secondary SuDS infrastructure and costs.
- Each system individually calibrated to site requirement.
- Can be used in combination with Rainwater Harvesting.

Rain Activ is ideal for sites where low rates of storm water discharge are required. With peak discharge rates as low as 0.05 L/sec, the system provides a solution for applications where flow is typically not sufficient for vortex flow control systems.

By collecting and slowing the water at source, the scale and cost of secondary SuDS infrastructure such as balancing ponds and geocellular storage can be heavily reduced. For many developments this can increase the available land for development.

Where applicable, Rain Activ can be used in conjunction with Rainwater Harvesting by simply adding a pump and management system.



Drainage Calculation Summary

The calculations below have been based on the following criteria:

1:100 Year Storm Event

40% Climate Change

Geographical Location; Flamsteed Lake Lane, Barnham. PO22 0AD

We have run the Micro Drainage Calculations (see pages below) and designed a site specific system as follows;

Total impermeable area Pre Development = 71.5 sqm

- Uncontrolled discharge rate of 4.4 lps (see pages below)

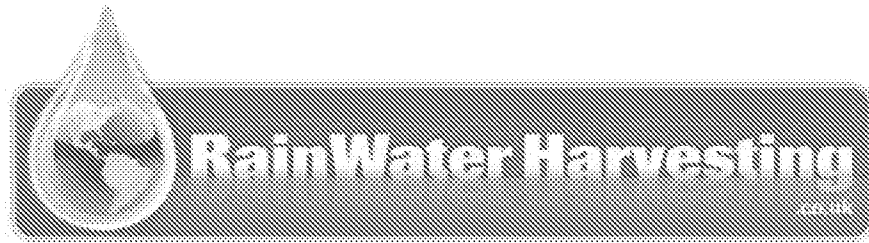
Total impermeable area Post Development = 110 sqm

- 1600L tank with a 30 mm orifice, providing 1300 litres of attenuation with a peak discharge of 3.3 l/s
- The highest stress put on the system was during the 1:100 year (+40%), 15 minute winter storm.
- Various other events were trailed; (38 in total) all at or below a peak discharge of 3.3 l/s

The reason we can use a very small orifice (between 5-50mm) without risk of blockage is because;

- High quality pre filtration, removing any particles larger than 1000 micron. (*So nothing larger than 1mm can enter the tank.*)
- The filter is self cleaning but does require an annual check for any major debris. As detailed in the maintenance guide.
- The orifice and filter have been developed for simple auditing. (Remove the manhole and look directly below to check for blockage.)

THE SITE SPECIFIC CALCULATIONS BELOW ARE BASED SPECIFICALLY ON OUR TANKS AND SUDS MODULE, THEY ARE NOT VALID FOR ANY OTHER SOLUTION



Pre Development

Rainwater Harvesting Ltd					Page 1
Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ					
Date 15/06/2020 14:56		Designed by RainWater Harves...			
File IMW PO22 0AD PRe.SRCX		Checked by			
XP Solutions		Source Control 2016.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Overflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.139	0.139	4.3	0.1	O K
30 min Summer	0.137	0.137	3.7	0.1	O K
60 min Summer	0.133	0.133	2.9	0.1	O K
120 min Summer	0.124	0.124	1.9	0.1	O K
180 min Summer	0.118	0.118	1.4	0.1	O K
240 min Summer	0.115	0.115	1.2	0.1	O K
360 min Summer	0.112	0.112	0.9	0.1	O K
480 min Summer	0.109	0.109	0.7	0.1	O K
600 min Summer	0.108	0.108	0.6	0.1	O K
720 min Summer	0.107	0.107	0.5	0.1	O K
960 min Summer	0.106	0.106	0.4	0.1	O K
1440 min Summer	0.104	0.104	0.3	0.1	O K
2160 min Summer	0.104	0.104	0.3	0.1	O K
2880 min Summer	0.103	0.103	0.2	0.1	O K
4320 min Summer	0.103	0.103	0.2	0.1	O K
5760 min Summer	0.102	0.102	0.1	0.1	O K
7200 min Summer	0.102	0.102	0.1	0.1	O K
8640 min Summer	0.102	0.102	0.1	0.1	O K
10080 min Summer	0.101	0.101	0.1	0.1	O K
15 min Winter	0.140	0.140	4.4	0.1	O K
30 min Winter	0.135	0.135	3.3	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	
15 min Summer	125.313	0.0	1.5	9	
30 min Summer	84.482	0.0	2.1	18	
60 min Summer	54.368	0.0	2.8	34	
120 min Summer	33.771	0.0	3.4	62	
180 min Summer	25.171	0.0	3.9	92	
240 min Summer	20.280	0.0	4.2	122	
360 min Summer	14.940	0.0	4.6	182	
480 min Summer	12.016	0.0	5.0	240	
600 min Summer	10.140	0.0	5.2	298	
720 min Summer	8.821	0.0	5.5	366	
960 min Summer	7.074	0.0	5.8	498	
1440 min Summer	5.173	0.0	6.4	720	
2160 min Summer	3.774	0.0	7.0	1028	
2880 min Summer	3.013	0.0	7.5	1412	
4320 min Summer	2.190	0.0	8.2	2284	
5760 min Summer	1.744	0.0	8.7	2904	
7200 min Summer	1.462	0.0	9.1	3632	
8640 min Summer	1.266	0.0	9.5	4192	
10080 min Summer	1.122	0.0	9.8	5032	
15 min Winter	125.313	0.0	1.7	10	
30 min Winter	84.482	0.0	2.4	17	
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Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ					
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File IMW PO22 0AD PRe.SRCX		Checked by			
XP Solutions		Source Control 2016.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Overflow (l/s)	Max Volume (m³)	Status
60 min Winter	0.129	0.129	2.2	0.1	O K
120 min Winter	0.118	0.118	1.4	0.1	O K
180 min Winter	0.114	0.114	1.1	0.1	O K
240 min Winter	0.111	0.111	0.9	0.1	O K
360 min Winter	0.108	0.108	0.6	0.1	O K
480 min Winter	0.107	0.107	0.6	0.1	O K
600 min Winter	0.106	0.106	0.4	0.1	O K
720 min Winter	0.105	0.105	0.4	0.1	O K
960 min Winter	0.104	0.104	0.3	0.1	O K
1440 min Winter	0.103	0.103	0.2	0.1	O K
2160 min Winter	0.103	0.103	0.2	0.1	O K
2880 min Winter	0.103	0.103	0.2	0.1	O K
4320 min Winter	0.102	0.102	0.2	0.1	O K
5760 min Winter	0.102	0.102	0.1	0.1	O K
7200 min Winter	0.102	0.102	0.1	0.1	O K
8640 min Winter	0.101	0.101	0.1	0.1	O K
10080 min Winter	0.101	0.101	0.1	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	
60 min Winter	54.368	0.0	3.1	30	
120 min Winter	33.771	0.0	3.9	64	
180 min Winter	25.171	0.0	4.3	94	
240 min Winter	20.280	0.0	4.7	118	
360 min Winter	14.940	0.0	5.2	176	
480 min Winter	12.016	0.0	5.6	240	
600 min Winter	10.140	0.0	5.9	292	
720 min Winter	8.821	0.0	6.1	330	
960 min Winter	7.074	0.0	6.6	478	
1440 min Winter	5.173	0.0	7.2	658	
2160 min Winter	3.774	0.0	7.9	984	
2880 min Winter	3.013	0.0	8.4	1496	
4320 min Winter	2.190	0.0	9.2	2024	
5760 min Winter	1.744	0.0	9.7	2608	
7200 min Winter	1.462	0.0	10.2	3632	
8640 min Winter	1.266	0.0	10.6	5008	
10080 min Winter	1.122	0.0	11.0	4808	
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Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ		
Date 15/06/2020 14:56 File IMW PO22 0AD PRe.SRCX	Designed by RainWater Harves... Checked by	
XP Solutions Source Control 2016.1		

Model Details

Storage is Online Cover Level (m) 1.000

Tank or Pond Structure

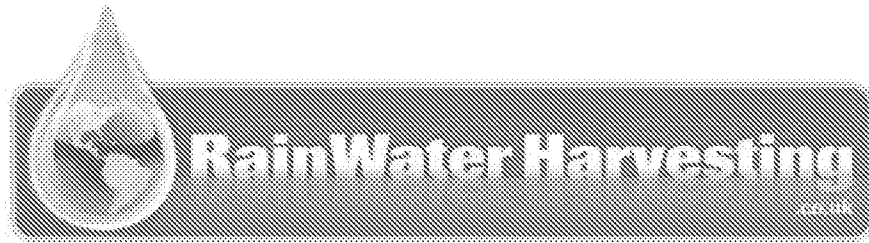
Invert Level (m) 0.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	0.1	0.001	0.1	0.002	0.0

Orifice Overflow Control

Diameter (m) 1.000 Discharge Coefficient 0.950 Invert Level (m) 0.100

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Post Development

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Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ								
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XP Solutions				Source Control 2016.1				
Summary of Results for 100 year Return Period (+40%)								
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	
15 min Summer	1.145	1.145	3.2	0.0	3.2	1.1	O K	
30 min Summer	1.157	1.157	3.2	0.0	3.2	1.2	O K	
60 min Summer	0.955	0.955	2.9	0.0	2.9	1.0	O K	
120 min Summer	0.632	0.632	2.3	0.0	2.3	0.6	O K	
180 min Summer	0.441	0.441	1.9	0.0	1.9	0.4	O K	
240 min Summer	0.325	0.325	1.7	0.0	1.7	0.3	O K	
360 min Summer	0.203	0.203	1.3	0.0	1.3	0.2	O K	
480 min Summer	0.142	0.142	1.1	0.0	1.1	0.1	O K	
600 min Summer	0.108	0.108	0.9	0.0	0.9	0.1	O K	
720 min Summer	0.086	0.086	0.8	0.0	0.8	0.1	O K	
960 min Summer	0.061	0.061	0.6	0.0	0.6	0.1	O K	
1440 min Summer	0.041	0.041	0.5	0.0	0.5	0.0	O K	
2160 min Summer	0.033	0.033	0.3	0.0	0.3	0.0	O K	
2880 min Summer	0.029	0.029	0.3	0.0	0.3	0.0	O K	
4320 min Summer	0.024	0.024	0.2	0.0	0.2	0.0	O K	
5760 min Summer	0.020	0.020	0.2	0.0	0.2	0.0	O K	
7200 min Summer	0.018	0.018	0.1	0.0	0.1	0.0	O K	
8640 min Summer	0.017	0.017	0.1	0.0	0.1	0.0	O K	
10080 min Summer	0.016	0.016	0.1	0.0	0.1	0.0	O K	
15 min Winter	1.260	1.260	3.3	0.0	3.3	1.3	O K	
30 min Winter	1.193	1.193	3.2	0.0	3.2	1.2	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
15 min Summer	125.313	0.0	2.6	0.0	12			
30 min Summer	84.482	0.0	3.5	0.0	20			
60 min Summer	54.368	0.0	4.5	0.0	36			
120 min Summer	33.771	0.0	5.6	0.0	66			
180 min Summer	25.171	0.0	6.2	0.0	96			
240 min Summer	20.280	0.0	6.7	0.0	126			
360 min Summer	14.940	0.0	7.4	0.0	186			
480 min Summer	12.016	0.0	7.9	0.0	246			
600 min Summer	10.140	0.0	8.4	0.0	306			
720 min Summer	8.821	0.0	8.7	0.0	366			
960 min Summer	7.074	0.0	9.3	0.0	482			
1440 min Summer	5.173	0.0	10.2	0.0	726			
2160 min Summer	3.774	0.0	11.2	0.0	1088			
2880 min Summer	3.013	0.0	11.9	0.0	1464			
4320 min Summer	2.190	0.0	13.0	0.0	2148			
5760 min Summer	1.744	0.0	13.8	0.0	2840			
7200 min Summer	1.462	0.0	14.5	0.0	3608			
8640 min Summer	1.266	0.0	15.0	0.0	4280			
10080 min Summer	1.122	0.0	15.5	0.0	5168			
15 min Winter	125.313	0.0	2.9	0.0	13			
30 min Winter	84.482	0.0	3.9	0.0	21			
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Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ			Designed by RainWater Harves... Checked by				
Date 15/06/2020 15:01 File IMW PO22 OAD Post.SRCX							
XP Solutions			Source Control 2016.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	0.861	0.861	2.7	0.0	2.7	0.9	O K
120 min Winter	0.474	0.474	2.0	0.0	2.0	0.5	O K
180 min Winter	0.296	0.296	1.6	0.0	1.6	0.3	O K
240 min Winter	0.204	0.204	1.3	0.0	1.3	0.2	O K
360 min Winter	0.120	0.120	1.0	0.0	1.0	0.1	O K
480 min Winter	0.084	0.084	0.8	0.0	0.8	0.1	O K
600 min Winter	0.064	0.064	0.7	0.0	0.7	0.1	O K
720 min Winter	0.052	0.052	0.6	0.0	0.6	0.1	O K
960 min Winter	0.041	0.041	0.5	0.0	0.5	0.0	O K
1440 min Winter	0.033	0.033	0.3	0.0	0.3	0.0	O K
2160 min Winter	0.027	0.027	0.3	0.0	0.3	0.0	O K
2880 min Winter	0.024	0.024	0.2	0.0	0.2	0.0	O K
4320 min Winter	0.019	0.019	0.1	0.0	0.1	0.0	O K
5760 min Winter	0.017	0.017	0.1	0.0	0.1	0.0	O K
7200 min Winter	0.016	0.016	0.1	0.0	0.1	0.0	O K
8640 min Winter	0.015	0.015	0.1	0.0	0.1	0.0	O K
10080 min Winter	0.014	0.014	0.1	0.0	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)		
60 min Winter	54.368	0.0	5.0	0.0	38		
120 min Winter	33.771	0.0	6.2	0.0	68		
180 min Winter	25.171	0.0	7.0	0.0	96		
240 min Winter	20.280	0.0	7.5	0.0	126		
360 min Winter	14.940	0.0	8.3	0.0	186		
480 min Winter	12.016	0.0	8.9	0.0	244		
600 min Winter	10.140	0.0	9.4	0.0	304		
720 min Winter	8.821	0.0	9.8	0.0	364		
960 min Winter	7.074	0.0	10.5	0.0	488		
1440 min Winter	5.173	0.0	11.5	0.0	734		
2160 min Winter	3.774	0.0	12.6	0.0	1072		
2880 min Winter	3.013	0.0	13.4	0.0	1480		
4320 min Winter	2.190	0.0	14.6	0.0	2132		
5760 min Winter	1.744	0.0	15.5	0.0	2896		
7200 min Winter	1.462	0.0	16.2	0.0	3600		
8640 min Winter	1.266	0.0	16.8	0.0	4376		
10080 min Winter	1.122	0.0	17.4	0.0	5400		
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XP Solutions		Source Control 2016.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.344	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.011

Time (mins)	Area
From: To: (ha)	
0 4	0.011

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Unit A Harrier Park Orton Southgate Peterborough PE2 6YQ		
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XP Solutions Source Control 2016.1		

Model Details

Storage is Online Cover Level (m) 2.000

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1.0	1.750	1.0	1.751	0.0

Orifice Outflow Control

Diameter (m) 0.030 Discharge Coefficient 0.950 Invert Level (m) 0.000

Orifice Overflow Control

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 1.749

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Event: 15 min Winter

