Quotation for the supply of Rainwater Harvesting Equipment

Client :

Alex Zdroba
Green Contractors

Site Reference :

Rain Activ for
32 Hillgate, Gedney Hill. PE12 0NN

Prepared by:

Ian Woodcock

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01733 405104 / 07736 45 46 45

Our reference : IMW222519

Date of proposal : 29/02/2024

Your Proposal

Thank you for your enquiry and as requested please find the following information regarding our proposed system.

SHALLOW DIG F-LINE TANK	
	7500
Weight Kg	310
Length	3340
Width	2310
Overall Height	1415 - 1815
Ground to Invert VS60 (Pedestrian 635mm Shaft)	**310 - 710**
Minimum Attenuation Volume	**5200 litres**
Invert to Outlet	**817**

EXCAVATION	
Length	3740
Width	2710
Overall height VS60	1515 - 1915

Overall height allows for 100mm compacted aggregate

The overall height difference above is because up to 400 mm can be cut off of the 635 mm shaft on site so as to achieve your exact invert level.

Please see Drainage Calculation Summary on page 7

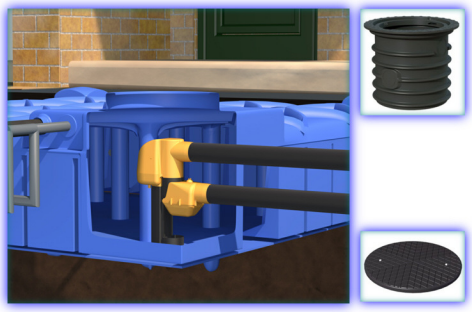
Rainwater Harvesting Limited is a private family owned company, our strong service ethos has been built on many years of experience and this is reflected in our ability to offer both simple to install rainwater harvesting systems and mix and match components to provide bespoke solutions reflecting clients 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-7599FL-RA**

7,500 Litre Rain Activ Attenuation System



Components

Product Code	Description	Qty
RWFT7500	F-LINE 7500L TANK	1
RWDS0062	F-LINE TANK 635mm EXTENSION SHAFT - VS60	1
RWDS0066	F-LINE TANK WALK ON LID	1
RWH-RV01	RAINVANTAGE FILTER KIT INC SIPHON & OVERFLOW	1
RWH-RA02	**RAIN ACTIV SUDS COMPONENT SITE SPECIFIC AND PRE FITTED ALLOWING FOR A MINIMUM OF 5200 LITRES WORTH OF ATTENUATION WITH A CONTROLLED DISCHARGE RATE OF 4.0 LITRES PER SECOND**	1
RWH-RA01	MICRO DRAINAGE CALCULATIONS	1

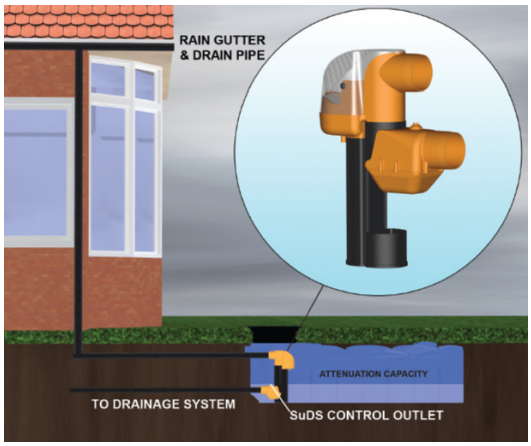
Price : £3,085.00 (£3,702.00 Inc. VAT)

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.



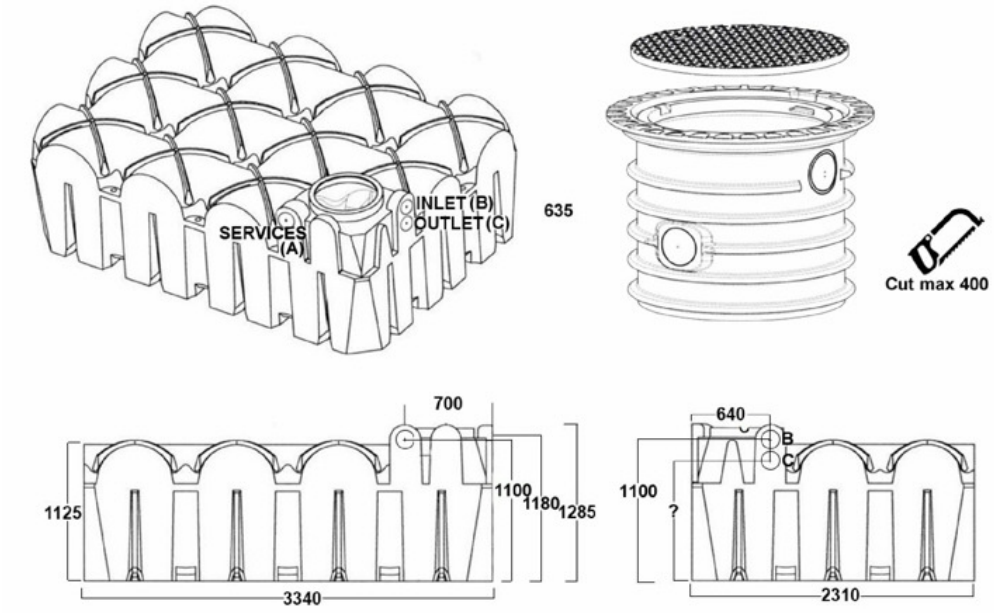
- Ultra-low discharge SuDS system.
- Peak discharge rates as low as 0.05 L/sec per property.
- Primary solution reduces secondary SuDS infrastructure and costs.
- Each system individually calibrated to site requirement.
- Can be used in combination with Rainwater Harvesting.

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.

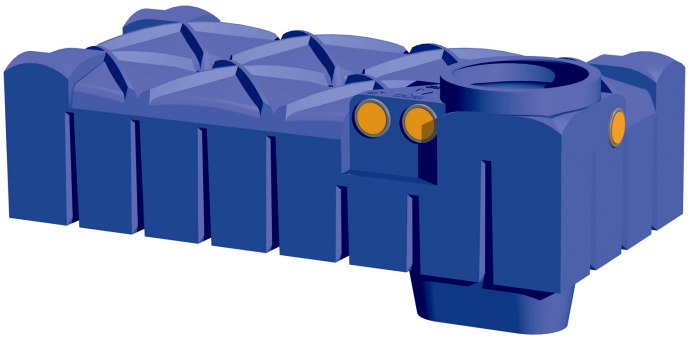
Where applicable, Rain Activ can be used in conjunction with Rainwater Harvesting by simply adding a pump and management system.

7500L F-Line



Please check your invert / outlet levels carefully, details can be found on page 2, if the outlet cannot connect to the drains so the system discharges by gravity you will require a pumping station (which we do not supply)

F-Line Flat Tank shallow dig underground tank



Why buy this tank?

- The F-Line is a high quality, rotationally moulded, one piece rainwater tank that can be installed without the need for concrete, thereby minimising installation costs and supported by our long term 25 year tank guarantee.
- Minimal installation depth
- Easy and quick to install
- Small excavation pit and little earth excavation preserves your garden
- Ideal for installation in new or existing properties
- Can be installed in ground water up to tank shoulder
- Easy to install

The F-line flat tank can be installed into much higher water tables than a standard round tank. If you don't know what your water table will be like in the winter, you're safer to install a flat tank. The F-Line tanks are flat and the installation depth is up to 60% less than other rainwater tanks. The excavation can be up to 70% less, meaning little earth excavation, easy handling and less cost for you! The small excavation pit is easily filled in and your garden will look just like it did before.

Drainage Calculation Summary

The calculations below have been based on the following criteria:

1:100 Year Storm Event

40% Climate Change

Geographical Location; 32 Hillgate, Gedney Hill. PE12 0NN

Total impermeable area = 250 sqm

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

- 7500L tank with a 38mm orifice, providing 5200 litres of attenuation with a peak discharge of 4.0 l/s

- The highest stress put on the system was during the 1:100 year (+40%), 30 minute winter storm.

- Various other events were trailed; (38 in total) all at or below a peak discharge of 4.0 l/s

The reason we can use a very small orifice (between 5-44mm) 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

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	0.587	0.587	3.6	0.0	3.6	4.3	O K
30 min Summer	0.640	0.640	3.8	0.0	3.8	4.7	O K
60 min Summer	0.608	0.608	3.7	0.0	3.7	4.4	O K
120 min Summer	0.494	0.494	3.3	0.0	3.3	3.6	O K
180 min Summer	0.400	0.400	2.9	0.0	2.9	2.9	O K
240 min Summer	0.330	0.330	2.7	0.0	2.7	2.4	O K
360 min Summer	0.235	0.235	2.2	0.0	2.2	1.7	O K
480 min Summer	0.178	0.178	1.9	0.0	1.9	1.3	O K
600 min Summer	0.141	0.141	1.7	0.0	1.7	1.0	O K
720 min Summer	0.116	0.116	1.5	0.0	1.5	0.8	O K
960 min Summer	0.085	0.085	1.2	0.0	1.2	0.6	O K
1440 min Summer	0.055	0.055	0.9	0.0	0.9	0.4	O K
2160 min Summer	0.044	0.044	0.7	0.0	0.7	0.3	O K
2880 min Summer	0.038	0.038	0.5	0.0	0.5	0.3	O K
4320 min Summer	0.031	0.031	0.4	0.0	0.4	0.2	O K
5760 min Summer	0.026	0.026	0.3	0.0	0.3	0.2	O K
7200 min Summer	0.023	0.023	0.2	0.0	0.2	0.2	O K
8640 min Summer	0.021	0.021	0.2	0.0	0.2	0.2	O K
10080 min Summer	0.020	0.020	0.2	0.0	0.2	0.1	O K
15 min Winter	0.666	0.666	3.8	0.0	3.8	4.9	O K
30 min Winter	0.715	0.715	4.0	0.0	4.0	5.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	133.067	0.0	6.2	0.0	14
30 min Summer	86.654	0.0	8.1	0.0	22
60 min Summer	53.779	0.0	10.1	0.0	40
120 min Summer	32.300	0.0	12.1	0.0	72
180 min Summer	23.685	0.0	13.3	0.0	102
240 min Summer	18.910	0.0	14.2	0.0	134
360 min Summer	13.666	0.0	15.4	0.0	194
480 min Summer	10.856	0.0	16.3	0.0	252
600 min Summer	9.077	0.0	17.0	0.0	312
720 min Summer	7.839	0.0	17.6	0.0	370
960 min Summer	6.216	0.0	18.6	0.0	492
1440 min Summer	4.476	0.0	20.1	0.0	734
2160 min Summer	3.218	0.0	21.7	0.0	1076
2880 min Summer	2.544	0.0	22.9	0.0	1436
4320 min Summer	1.825	0.0	24.6	0.0	2164
5760 min Summer	1.440	0.0	25.9	0.0	2880
7200 min Summer	1.198	0.0	27.0	0.0	3640
8640 min Summer	1.030	0.0	27.8	0.0	4336
10080 min Summer	0.907	0.0	28.6	0.0	5136
15 min Winter	133.067	0.0	7.0	0.0	15
30 min Winter	86.654	0.0	9.1	0.0	24

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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
60 min Winter	0.650	0.650	3.8	0.0	3.8	4.7	O K
120 min Winter	0.478	0.478	3.2	0.0	3.2	3.5	O K
180 min Winter	0.356	0.356	2.8	0.0	2.8	2.6	O K
240 min Winter	0.273	0.273	2.4	0.0	2.4	2.0	O K
360 min Winter	0.174	0.174	1.9	0.0	1.9	1.3	O K
480 min Winter	0.124	0.124	1.5	0.0	1.5	0.9	O K
600 min Winter	0.095	0.095	1.3	0.0	1.3	0.7	O K
720 min Winter	0.076	0.076	1.1	0.0	1.1	0.6	O K
960 min Winter	0.056	0.056	0.9	0.0	0.9	0.4	O K
1440 min Winter	0.044	0.044	0.7	0.0	0.7	0.3	O K
2160 min Winter	0.036	0.036	0.5	0.0	0.5	0.3	O K
2880 min Winter	0.031	0.031	0.4	0.0	0.4	0.2	O K
4320 min Winter	0.025	0.025	0.3	0.0	0.3	0.2	O K
5760 min Winter	0.022	0.022	0.2	0.0	0.2	0.2	O K
7200 min Winter	0.020	0.020	0.2	0.0	0.2	0.1	O K
8640 min Winter	0.019	0.019	0.2	0.0	0.2	0.1	O K
10080 min Winter	0.018	0.018	0.1	0.0	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	53.779	0.0	11.3	0.0	42
120 min Winter	32.300	0.0	13.6	0.0	76
180 min Winter	23.685	0.0	14.9	0.0	106
240 min Winter	18.910	0.0	15.9	0.0	136
360 min Winter	13.666	0.0	17.2	0.0	196
480 min Winter	10.856	0.0	18.2	0.0	254
600 min Winter	9.077	0.0	19.1	0.0	314
720 min Winter	7.839	0.0	19.8	0.0	372
960 min Winter	6.216	0.0	20.9	0.0	490
1440 min Winter	4.476	0.0	22.6	0.0	730
2160 min Winter	3.218	0.0	24.3	0.0	1072
2880 min Winter	2.544	0.0	25.6	0.0	1424
4320 min Winter	1.825	0.0	27.6	0.0	2196
5760 min Winter	1.440	0.0	29.0	0.0	2912
7200 min Winter	1.198	0.0	30.2	0.0	3608
8640 min Winter	1.030	0.0	31.2	0.0	4432
10080 min Winter	0.907	0.0	32.0	0.0	5048

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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)	19.000	Shortest Storm (mins)	15
Ratio R	0.422	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.025

Time (mins) From:	To:	Area (ha)
0	4	0.025

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Model Details

Storage is Online Cover Level (m) 1.100

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	7.3	0.825	7.3	0.826	0.0

Orifice Outflow Control

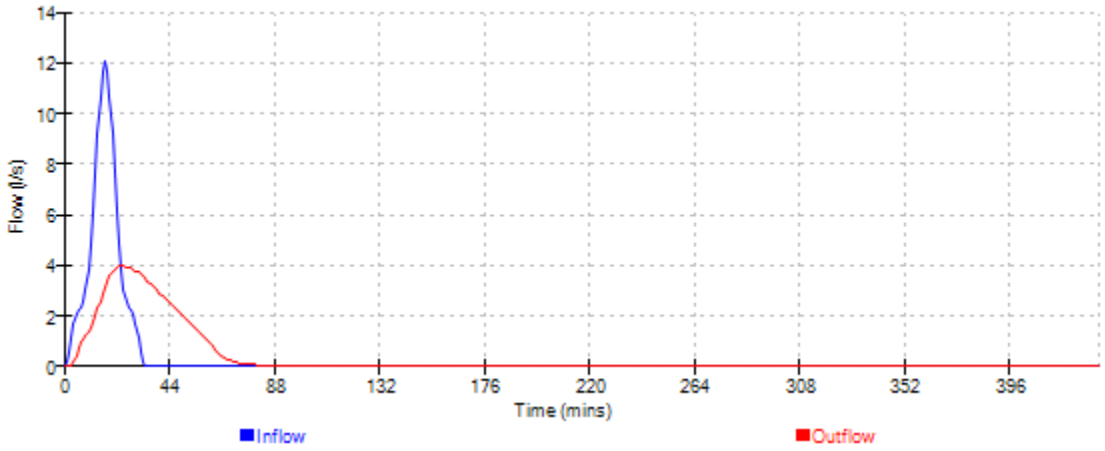
Diameter (m) 0.038 Discharge Coefficient 0.950 Invert Level (m) 0.000

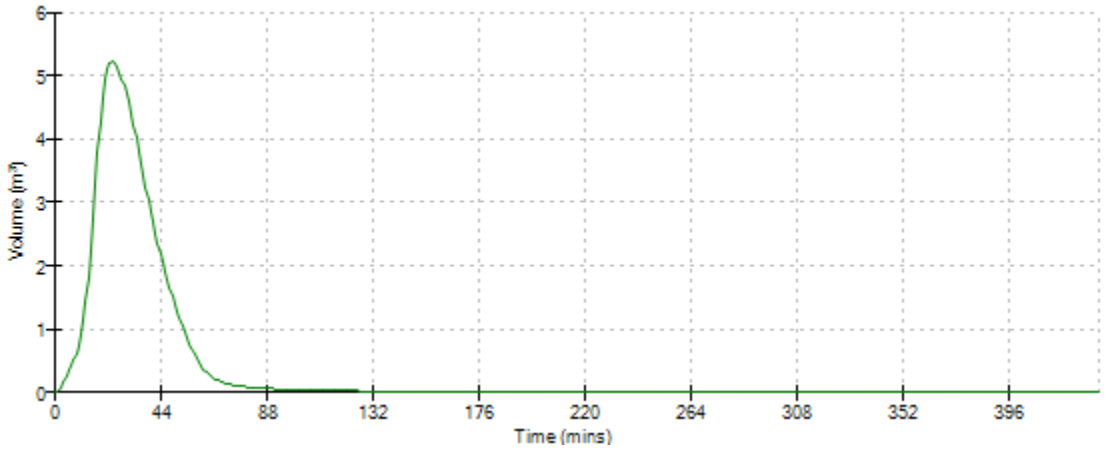
Orifice Overflow Control

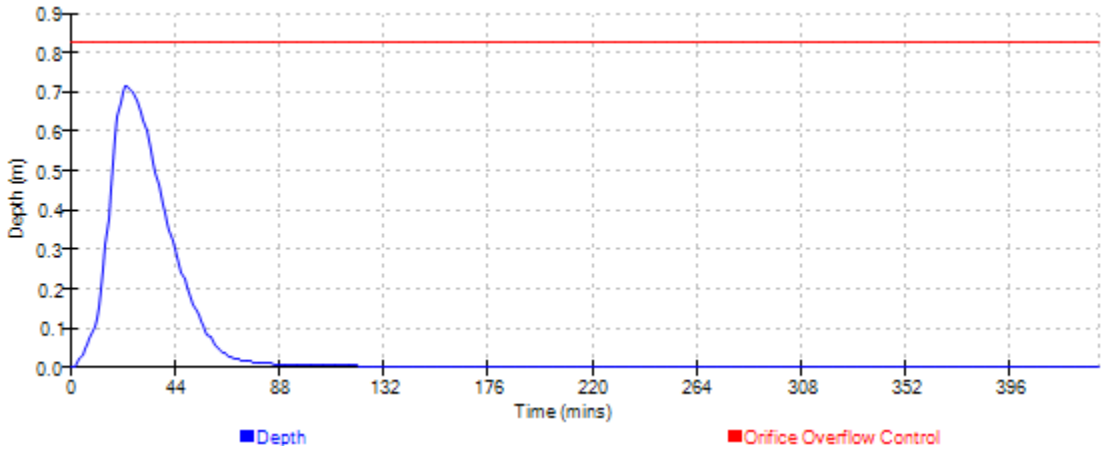
Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 0.824

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Event: 30 min Winter





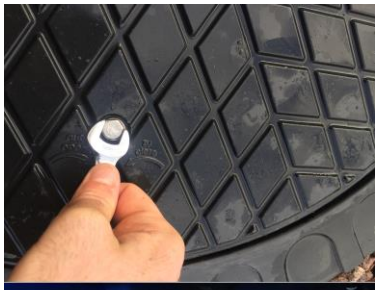


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Rain Activ maintenance schedule.

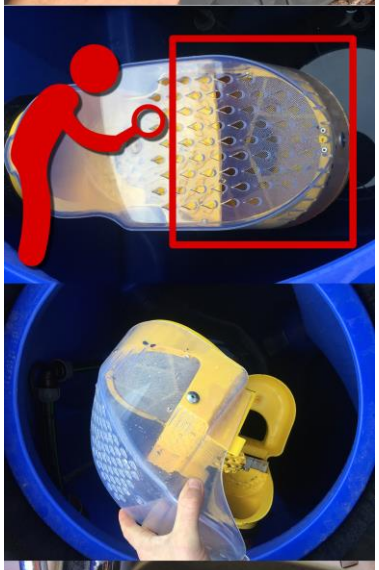
Filter: *Warranty 2 years. Expected service life 100 years.*

Self cleaning filter with 1000 micron screen.



Every 6 months. Visually check the filter for larger blockages.

1. Release child locks on the lid. (13mm bolt).



2. Inspect filter for visible large blockage.
If large or non moving debris is found refer to stage 3. Is none is found refer to stage 6.

NB: Small debris will we periodically self cleaned during storms. Leaves, moss and other smaller debris will self clean and do not require removing unless obvious they are causing a blockage.

3. (If a blockage has been found) Remove filter lid.



4. Remove debris, wash filter head under a tap.



5. Replace filter head.

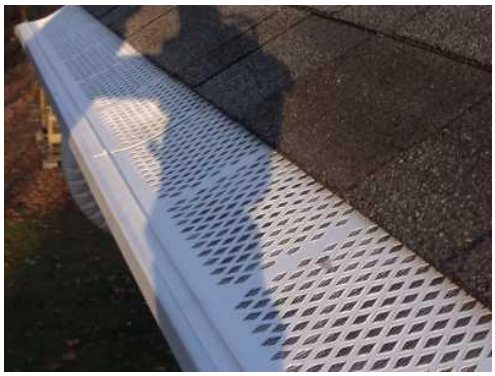


6. Replace lid, ensure 13mm child safe locks are tight.

Risk if neglected: Very low, possible reduction of filter efficiency. Reduction in quality of water for rainwater harvesting.

NB: the filter is fully self cleaning under normal conditions. Only abnormal or large debris from gutters can cause a blockage.

Maintenance frequency can be reduced by adding additional leaf and debris guards to gutters. Dependant on the quality of guarding and location, maintenance intervals can be reduced to 12, 18, or 24 months.
Examples of gutter guarding systems.





F-Line Tank. *Warranty 25 years. Expected service life 100 years.*

Every 10 years. Pump out completely and clean sidewalls with pressure washer, pump out using dirty water pump. (Around 0.5cm of very fine silt builds per year.)
Risk if missed: Low, potential reduction in water quality for rainwater harvesting. If missed multiple times (circa 50 years), potential blockage of outlet orifice.



Gutters: N/A

Clean every 10 years to reduce strain on self cleaning filter. Remove all leaf matter, moss, debris. Wash through.
Risk if missed: Very low, increased fine sediment entering the tank.