Rainwater Harvesting (RWH) Management Plan
Springvale Fields, Woodland Lane, Colgate
Planning Ref: DC/24/1697
06 July 2025

Introduction
This RWH management plan relates to condition 3 of the approved planning application DC/24/1697.
Please also refer to Lee Money's email to Halima Chowdhury 14 March 2025 at 15:20.
I quote: "*For the rainwater harvesting scheme the system outlined in the submitted documentation is acceptable for the most part. There is no detail on the installation of first flush diverters and a detailed site plan should be provided showing the locations of the pipe runs and treatment unit, evidencing that the rainwater harvesting supply system will be separate for the mains supply in line with the DWI recommendations".*
Below includes clarification regarding the 'first flush diverter', a more detailed system schematic showing RWH system and a site plan showing the locations of the pipe runs and treatment unit,

HDC Requirements
"Rainwater (and greywater) harvesting schemes can be highly contaminated, therefore in all cases where such systems are to be used within dwellings, even for non-potable uses such as toilets and washing machines, we will require details on (but not limited to) the likely contaminants, type of treatment that will be installed, the proposed sampling and testing regime, detail on the maintenance, servicing and cleaning of the tanks, water treatment equipment, pumps, all pipework etc for the lifetime of the development, and measures to ensure continuity of supply".
https://www.horsham.gov.uk/planning/water-neutrality-in-horsham-district/water-neutrality-and-planning-applications

Likely Contaminates
The Safe Drinking Water Act defines the term "contaminate" as meaning any physical, chemical, biological or radiological substance and matter in water.
The proposed RWH system will collect water from the property roof via the gutter system and it is to be expected that this water will be contaminated with the faeces of birds and other wildlife and may contain pathogenic organisms. Other possible contaminates include organic matter (leaves, moss etc), and non organic (grit, debris etc).

Type of Treatment
It is proposed that the harvested rainwater will supply just the toilets, washing machine and garden irrigation. It will NOT be used for drinking water.
Subject to the suppliers recommendations, it is proposed that the system will be fitted with an Ultra Violet (UV) Disinfection Unit designed for a flow rate of a minimum of 22.5 ltr/min. For example the Saphir 2: https://rainharvesting.co.uk/wp-content/uploads/2021/02/Saphir_UV_Kits.pdf

Note: A flow rate of 10-15 litres per minute is generally regarded as an acceptable water flow and water pressure, whereas anything above 15 litres per minute is usually considered good, resulting in you having good water pressure too (https://www.tapsuk.com/blog/understanding-water-pressure-in-your-home).

See Appendix B for details of the Saphir UV Disinfection unit.

Sampling Regime and Parameters
Where a system is classified as private water supply, sampling is to be undertaken by a UKAS accredited laboratory. It is proposed that water samples will be collected by the householder and sent to a UKAS accredited laboratory to be analysed on an annual basis. For example: https://ivario-lab.co.uk/products/water-test-kit-premium

The current proposed test system will test for:
Microbiological, culture testing:
Legionella
Indicator Parameters & Pathogens:
Colony count 22°, Colony count 36°, coliforms
Microbiological Parameters (Water Supply Regulations) & Pathogens:
E.coli, Enterococci
Metals and heavy metals:
Aluminium, Arsenic, Barium, Bismuth, Cadmium, Chromium, Cobalt, Copper, Gadolinium, Gallium, Lead, Nickel, Palladium, Scandium, Selenium, Silver, Strontium, Thallium, Uranium, Yttrium, Zinc
Minerals and substances causing hardness:
Beryllium, Boron, Calcium, Chloride, Iron, Lithium, Magnesium, Manganese, Sodium, Potassium, Phosphorus (Orthophosphate), Sulphate, Water hardness (mg/l calcium carbonate)
Nitrogen compounds:
Ammonium, Nitrite, Nitrate, Total nitrite/nitrate Salts and Esters: Bromide, Fluoride, Phosphate
Other values tested: Total anions, pH value, electrical conductivity

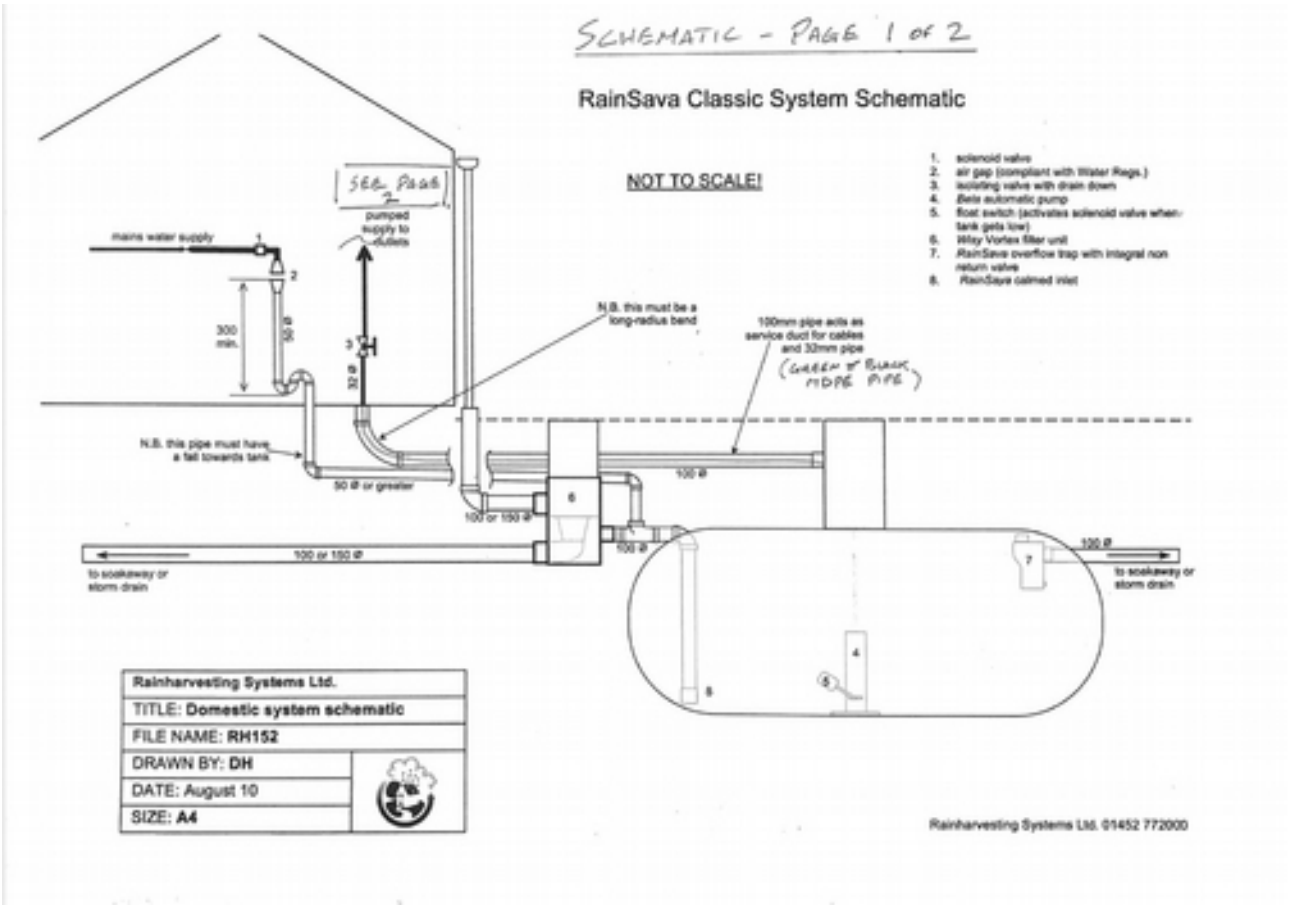
Sampling Failures:
In case of a failed test result being received, the switch over valve will be activated immediately to avoid any failed water entering the property. The only supply in such a condition will be mains water.

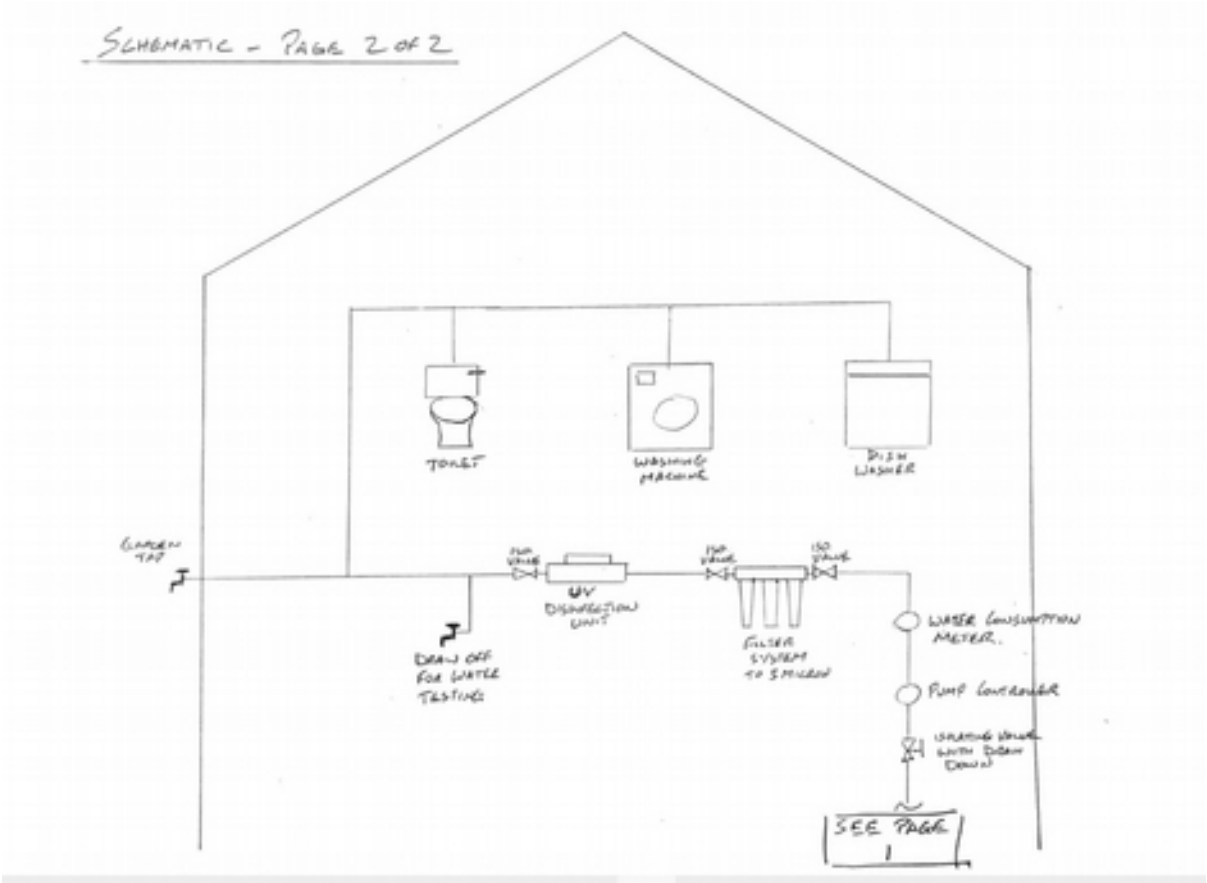
Professional help shall be sought immediately to rectify the situation before rainwater is used again. The local authority will be informed as soon as is practical and kept up to date on rectifying the supply.

Filter System
1. A suitable Wisy vortex rainwater filter will be fitted between the rainwater supply from the roof and the storage tank. The size of filter will be determined by the supplier taking into account facts such as the roof area of the property.
   Note: These filters act as a 'first flush diverter', removing leaves, insects and any other particles greater than 0.28mm (https://rainharvesting.co.uk/portfolio/1-wisy-vortex-filters/). See Appendix C.
2. An inlet diffuser to ensure gentle entry of the rainwater into the storage tank.
3. A suction filter will be fitted on the tank outlet feed to the property.
4. A 25 micron and then a 5 micron filter will be fitted prior to the UV disinfection unit.

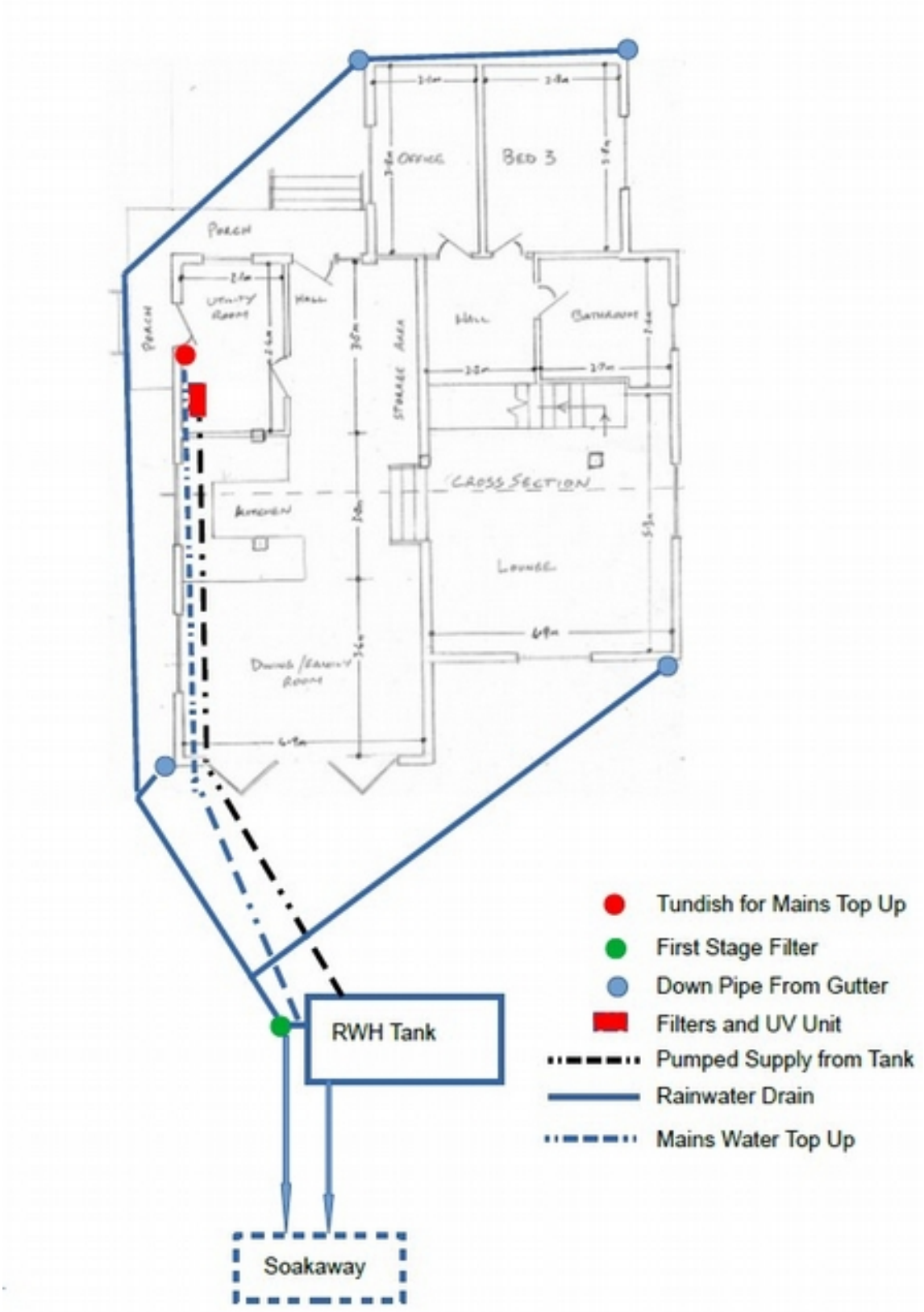
Measurement
A meter will be fitted to record water usage. See schematic below.
A tank gauge may also be fitted to monitor water levels in the storage tank.

System Schematic





RWH Site Plan – Showing main pipe work and tank location



Contingency Measures

1. Failure - A WRAS approved valve system from the mains supply (with an air gap between the water supply and RWH system), can replace harvested water after the filter and UV disinfection system to ensure continuity of supply during failure and maintenance of the system.
2. Concerns - Should any concerns arise professional help should be sought.
3. Reporting - If any laboratory tests give a fail, the local authority will within reasonable time, but no longer than 28 days, be notified in wring of the report, corrective action and follow up review including possible system improvements.

Management Plan

Training:

1. The householder will receive training from the supplier in operating the system upon installation and commissioning.

Cleaning and Maintenance:

1. Tank - This will be cleaned every 3 years in accordance with the manufacturer's guidelines.
2. Filters - These are to be cleaned or replaced (as appropriate), according to manufacturers guidelines. This is usually once per year but repeated after dry running or any maintenance work.
3. UV Disinfection unit - to be regularly serviced with lamp replacement when required in accordance with manufacturer's guidelines.
4. Emergency change over valve - This will be inspected annually.

Record keeping:

1. Sampling - A record of all samples taken and test results will be kept in writing and kept accessible to any user of the system and any maintenance worker.
2. Results of analysis - Results will be filed if everything passes. Any failures will be notified to the local authority and rectified immediately.
3. Inspection - Annual inspection of the system by a knowledgeable person will be undertaken and recorded. The inspection will include checks for leaks, deterioration, contamination and general condition.
4. Cleaning and maintenance - To be carried out by a knowledgeable person and a written record filed. See Appendix A for examples

Continuity of Supply

An emergency switchover valve is supplied which can replace harvested water in an emergency. The valve must be WRAS approved to ensure no contamination enters the mains water system.

The proposed system is designed to cope with drought periods in excess of 35 days. If a drought exceeds this period and the stored harvested water is exhausted, the systems automated water mains top-up unit will cut in to ensure continuity of supply (see no 5 on schematic diagram, appendix B),

Reactivation Process
If the system has been run dry or deactivated, it should be recommissioned according to the manufacturer's instructions, taking note of any new instructions in case parts of elements of the system have to be replaced.

Regulation 10 Assessment
(a) Those where the supply is <10m3 /day, where the water is NOT used as part of a commercial or public activity. Where the supply is not metered, this equates to approximately up to 50 persons using a supply for normal domestic purposes. These supplies include those that provide water to a work premises where employees use the water only for domestic purposes (where consumption is <10m3 per day).
(b) Those where the supply serves a single domestic dwelling unless it is used as part of a commercial or public activity (Regulation 9 supplies). Supplies to single domestic dwellings do not require regular monitoring and risk assessment. However, the exception is where an owner or occupier requests that a risk assessment and/or monitoring be carried out.

Monitoring and risk assessment:
Local authorities are required to monitor Regulation 10 supplies (but not SDDs unless requested) at least every five years and more frequently if indicated by the risk assessment, for the following parameters:
• Conductivity;
• Enterococci; • Escherichia coli (E. coli);
• Hydrogen ion (pH value);
• Turbidity.

Local authorities may monitor a supply to a single domestic dwelling by its own choosing (e.g. if it suspects a potential risk to human health), but it must not make a charge for this activity. However, local authorities must monitor a supply to a single domestic dwelling (for the same parameters) if requested to do so by the owner and/or occupier of that dwelling, which is chargeable.

APPENDIX A

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Records and Testing Register

Record of Annual Inspections					
Date	Done By	No leaks of pipes, gutters or the tank	No malfunction of pump or valves	No loose items / obvious damage to system	Emergency Changeover Valve Tested?

Record of Water sampling				
Date	Taken By	Sent to laboratory on	Results received on	If pass = OK, if fail = go to LA records below

Record of notification to LA (Local Authority)			
Date of report	Description of issue	System Repaired?	Date Recommissioned

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Filter Replacement Record			
Date	Replaced by	Notes	System OK?
3 yearly tank cleaning			
Date	Cleaned by	Notes	System OK?

APPENDIX B

RAINHARVESTING SYSTEMS DATA SHEET RAINHARVESTING SYSTEMS DATA SHEET

Saphir UV DISINFECTION UNITS

- Suitable for a range of domestic and commercial applications.
- Available in various sizes to suit required flow rates.
- Effective microbiological protection.
- Uses no chemicals & produces no by-products.
- Economical, safe & reliable
- Lamp operation indicator.
- Does not affect taste or odour.
- Long life lamps require only annual replacement.
- Simple to install & maintain.
- *Saphir+* version now available with additional telemetry.



Why use UV treatment?

The quality of untreated rainwater is such that it cannot be classified as potable or 'wholesome' and therefore is not fit for drinking. Even though it is widely used for drinking, bathing etc. in various parts of the world, it is not deemed acceptable practice for the UK.

Untreated rainwater is not considered safe for personal use due to the contamination risk, particularly from bird droppings. To be sure that any 'unwholesome' water is fit to drink it should therefore be treated, and the simplest and most reliable way of doing this on a small scale is to use Ultra-Violet (UV) sterilisation. The water to be treated must first be free of even microscopic particles, so it is usually necessary to fit sediment pre-filters prior to the water entering the UV unit.

How does it work?

UV disinfection works by destroying the DNA of potentially damaging micro-organisms, thus rendering them harmless. This process is instant, effective and reliable. No chemicals are involved and the process does not affect the taste of the water in any way. UV radiation is part of natural sunlight, and a UV lamp emits a particular wavelength at high concentration to destroy bacteria, viruses and cysts.



Saphir UV unit

Saphir UV

Standard units have:
- Stainless steel chamber
- High-output low-pressure UV lamp
- Lamp on indicator
- IP55 rated controls
- Control module can be chamber or wall mounted
- Chamber can be mounted vertically or horizontally
- Up to 10 bar pressure
- UK manufactured
-

Saphir+

The + version of the Saphir unit has several additional features:
- Micro processor control
- Lamp status indicator to show when the lamp needs changing
- Alarm & processer reset button
- volt-free contacts for remote alarm output.

UV treatment is safe, reliable and simple to maintain. It is generally deemed to be ecologically preferable to chlorination and reverse osmosis (RO). However, please note that UV treatment alone will not remove discolouration or bad taste.

Several models available to suit most applications

Model	flow rate @ 40mJ/cm²	flow rate @ 25mJ/cm²	Inlet / outlet size	Power consumption	Length mm
Saphir 1	13.5 l/min.	20 l/min.	¾" bsp	15w	405
Saphir 2	22.5 l/min.	36.5 l/min	¾" bsp	25w	554
Saphir 3	40 l/min.	63 l/min	¾" bsp	40w	554
Saphir 4	46.5 l/min.	73 l/min	1" bsp	36w	962
Saphir 7	89 l/min.	140 l/min	1" bsp	36w	962
Saphir 10	120 l/min.	183 l/min	1 ½" bsp	75w	962

** mJ/cm² = millijoules per cm² at end of lamp life*

Data Sheet UV/17/01

SEDIMENT PRE-FILTERS FOR USE WITH UV UNITS

- For use with pressurised water supplies.
- Sediment removal down to 5 microns.
- Available in a range of sizes to suit different flow rates.
- Replaceable polypropylene cartridges or bags.
- Simple cartridge changing.
- Nitrate and Carbon filters also available.

When using *Saphir* UV units to disinfect rainwater we recommend that additional filtration is added prior to the water passing through the UV chamber. It is important that the water to be treated is as clean as possbile, otherwise small particles can create a 'shadow' which the UV light cannot penetrate. We recommend that water is cleaned down to 5 microns prior to UV treatment.



The filters require pressure in order to work effectively so are suitable only for pumped supplies. The cartridges require regular replacement, frequency of which will vary according to the nature of the water they are treating.

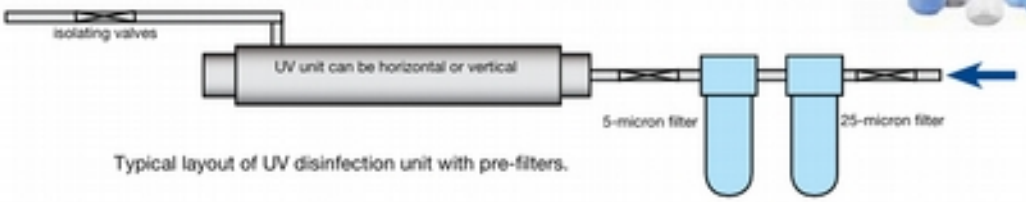


Water is normally pumped through 25-micron and 5-micron wound sediment filters to ensure that sufficient material is removed. These are available in a range of sizes to suit different flow rates. For larger UV units where a higher flow rate is required, a single 5-micron 'bag' filter is sufficient.

Filters are selected to match the flow rate of the UV unit

UV Unit	25-micron pre-filter	5-micron pre-filter	Connection size
Saphir 1	10" standard wound cartridge	10" standard wound cartridge	¾" bsp
Saphir 2	20" standard wound cartridge	20" standard wound cartridge	¾" bsp
Saphir 3	10" 'Big Blue' wound cartridge	10" 'Big Blue' wound cartridge	¾" bsp
Saphir 4	10" 'Big Blue' wound cartridge	10" 'Big Blue' wound cartridge	1" bsp
Saphir 7	N/A	10" 'Big Blue' bag filter	1" bsp
Saphir 10	N/A	10" 'Big Blue' bag filter	1½" bsp





Typical layout of UV disinfection unit with pre-filters.

Distributor:

Rainharvesting Systems Ltd.

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Stroud, Gloucestershire GL6 7BX
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Fax: 01452 772008
E-mail: sales@rainharvesting.co.uk
Website: www.rainharvesting.co.uk

NB continuous development may necessitate change in these details without notice E&OE. *Data Sheet UV/17/01*

Appendix C

RAINHARVESTING SYSTEMS DATA SHEET RAINHARVESTING SYSTEMS DATA SHEET

VORTEX FILTER - type WFF100

- Suitable for roof areas up to 200m²
- Connects to standard storm water pipes below ground
- Virtually all debris, moss, leaves, insects, etc. is washed through the uniquely constructed vertical filter by self-cleaning action
- Unique oxygen-enriching function
- No restriction or obstruction of water flow through the appliance (conforms to DIN1986)
- More than 95% efficient
- Minimum maintenance
- Tough polyethylene housing
- High quality stainless steel filter mesh
- 50cm extension tube can be trimmed to length to suit invert level
- Can also be wall-mounted

WFF filters can be used where rainwater from the roof is channelled through a horizontal underground pipe. The unit filters and diverts rainwater to a storage tank or cistern. Leaves, moss and other debris are washed through to drain or soakaway.



Rainwater enters the inlet connection in the side of the WFF unit. The inlet is designed to swirl the water in a vortex-like action around the surface of the stainless steel filter below. The rainwater is drawn through the vertical mesh walls of the fine filter by adhesion, then collected and fed through the outlet to the storage tank. Debris and particles too large for the filter are flushed through to the drain outlet by the action of water flowing down the surface of the filter. More than 95% of the rainwater entering the WFF is filtered and collected by this principle, .

Pitched roofs of slate, clay or concrete are the most suitable for collecting rainwater. Flat roofs can also be utilised but the volume of water collected is reduced. Planted roof areas or thatch are less suitable due to the low collection efficiency and discolouration of the collected water.



UNIQUE FEATURES OF THE VORTEX FILTER

- Vortex filters have a vertical filter mesh. This makes the filter insert virtually self-cleaning by the action of water flowing over the it. As debris enters the chamber, it simples drops or gets washed off by the incoming water.
- The action of water passing through the vertical mesh oxygenates as it flows. This has the effect of saturating the water with air as it passes to the tank, thus enhancing the quality of the water.
- There are no restrictions or obstructions on which debris can collect. The full cross-section of the rainwater drainage system is maintained right through the filter, so that excess rainwater is led directly to the storm drains or soakaway. This is especially important in hail storms and torrential rainfall. Even in such extreme cases much of the filtered water is transferred to the storage tank.

larger units are available to suit commercial and industrial applications







wisy

We are the UK's sole supplier of Wisy products for rainwater utilisation



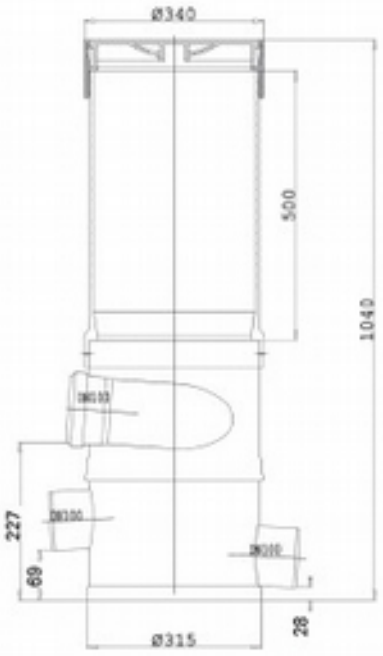
Products shown with this logo are included on the Water Technologies List making them eligible for Enhanced Capital Allowance.

Data Sheet WF/14/01

VORTEX FILTER - type WFF100

The WFF-100 Vortex filter:

- Polypropylene housing
- Stainless steel filter insert
- Rainwater inlet DN 100 (110mm pipe)
- Storage tank outlet DN 100 (110mm pipe)
- Drain outlet DN 100 (110mm pipe)
- Storage and drain outlets fixed at 180° to each other
- Rainwater inlet rotates through 360°
- 0.44mm or 0.28 mm mesh versions
- Supplied with 50cm extension tube and 63cm lifting handle

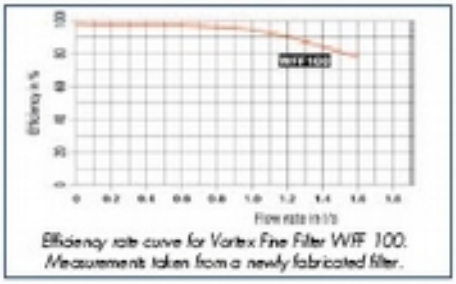


Dimensions of the Vortex filter unit with 500mm extension tube fitted. Note the tube can easily be cut to length to suit invert depth.



WFF filter components

1 - Lid
2 - Filter removal handle
3 - Upper ring
4 - Extension tube
5 - Parallel cutting lines
6 - Filter insert
7 - Rainwater inlet
8 - Clean water outlet
9 - drain outlet



Efficiency rate curve for Vortex Fine Filter WFF 100. Measurements taken from a newly fabricated filter.

WFF FILTER Accessories

50cm extension tube
For installations where the filter connects to a deep storm drain additional extension tubes are available. Easily cut to length due to the moulded-in parallel lines.

Extended filter handles
For use where one or more full length extension tubes are used. The longer handle enables easy removal of the filter insert for cleaning purposes. 100cm long.



Stainless-steel wall bracket
For mounting the unit to a wall, where the filter is used internally or is supplying an above-ground tank.



Stainless-steel strainer basket
Fits inside the WFF filter to prevent debris from passing to waste. Requires regular inspection to empty the contents.



Blind insert
For maintenance purposes, a blind insert is available. This can be used in place of the filter insert to divert all flow to the soakaway.





Paving can be laid around the end ring. The lid simply twists to remove.

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