Water Neutrality

SYSTEM SPECIFICATIONS

Ransoms, Station Road, Pulborough



Purple Pepper Partnership Ltd

14 June 2024

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Introduction

The application is for Demolition of existing mixed use building and erection of a three storey building to provide 8no flats with associated access, parking, bin store and cycle store.

The rainwater harvesting system has been approved under planning reference DC/22/1059 on 19 April 2024. A planning condition has been added as follows:

7 Pre-commencement (slab level) Condition:

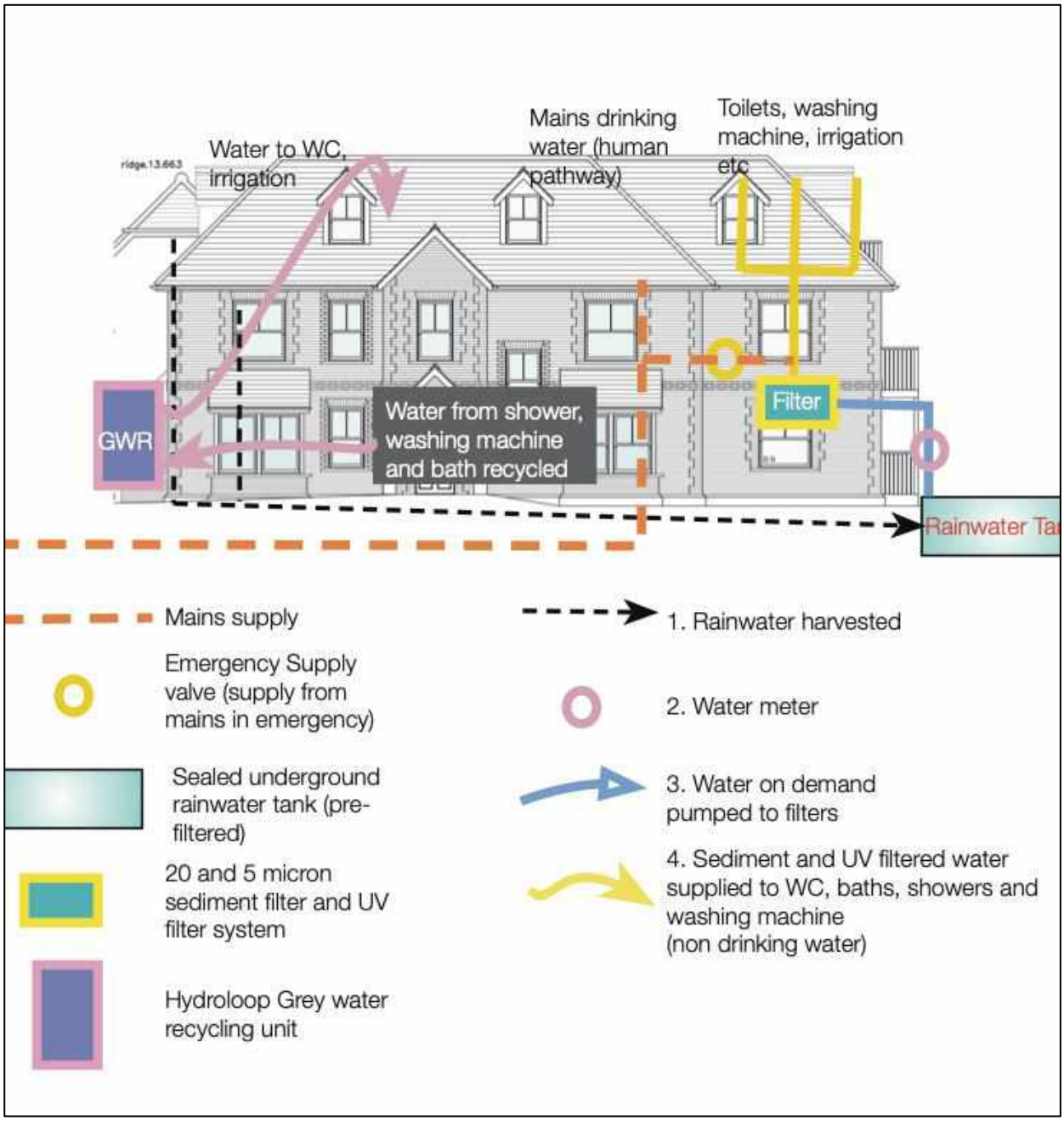
No development above ground floor slab level shall commence until full details of the water efficiency measures and rainwater harvesting system, as required by the approved water neutrality strategy (V22Aug22) have been submitted to and approved in writing by the Local Planning Authority. The rainwater harvesting tank shall be sized so as to provide 35+ day drought tolerance capacity. The agreed measures shall be implemented in accordance with the approved details prior to first use of the development hereby approved, and shall be retained, operated and maintained at all times thereafter.

Harvesting System Diagram

A loop is created where rainwater is harvested and greywater is recycled. On demand this is pumped via the filter system which is sediment filters (to remove particles to a smaller standard than mains drinking water) and the UV filtered to kill all microbes and odours.

This water is then supplied to all points excluding drinking water (kitchen taps).

Although the water is safe to drink, a mains water supply is still of critical importance.


Water to WC, irrigation
Mains drinking water (human pathway)
Toilets, washing machine, irrigation etc
GWR
Water from shower, washing machine and bath recycled
Filter
Rainwater Ta
Mains supply
Emergency Supply valve (supply from mains in emergency)
Sealed underground rainwater tank (pre-filtered)
20 and 5 micron sediment filter and UV filter system
Hydroloop Grey water recycling unit
1. Rainwater harvested
2. Water meter
3. Water on demand pumped to filters
4. Sediment and UV filtered water supplied to WC, baths, showers and washing machine (non drinking water)

Calculations

Assumptions:

Item	Basis / Number	Notes
Occupancy/Dwelling proposed by HDC	1.67	Based on Southern Water standard for Sussex North (*Combination Assessment* Section 3.2.1)
Habitat Regulations Max Daily use	100 litres pppd	Horsham Local Plan Habitats Regulations Assessment (July 2021) Technical Note Appendix E
Rainfall per year: Avarage	817mm	The Met Office (Note: This is a 20 year average and therefore already provides for the effects of droughts. See table below)
Drought year rainfall	610mm	In order to provide a robust solution, the lowest rainfall over the last 20 years has been used as a secondary baseline.

Part G Water use

Calculate Part G Water use

Installation Type	Unit of Measure	Capacity/Flow rate (1)	Use Factor (2)	Fixed use (litres/person/day) (3)	Litres/person/day = [(1)x(2)] + (3) (4)
WC (single flush)	Flush Volume (litres)		4.42	-	-
WC (dual flush)	Full flush Volume (litres)	6	1.46	-	8.76
	Part flush Volume (litres)	4	2.96	-	11.84
WC (multiple fittings)	Average effective flushing Volume (litres)	4.66	4.42	-	-
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	5.70	1.58	1.58	10.59
Bath (where shower also present)	Capacity to overflow(litres)	173.00	0.11	-	19.03
Shower (where bath also present)	Flow Rate(litres / minute)	8.00	4.37	-	34.96
Bath Only	Capacity to overflow(litres)		0.50	-	-
Shower Only	Flow Rate (litres/minute)		5.60	-	-
Kitchen/Utility room sink taps	Flow rate (litres/minute)	12.00	0.44	10.36	15.64
Washing Machine	(Litres/kg dry load)	7.17	2.1	-	15.06
Dishwasher	(Litres/place setting)	0.90	3.6	-	3.42
Waste disposal unit	(Litres/use)	Present	3.08	-	-
Water Softener	(Litres/person/day)		1.00	-	-

(5)	Total Calculated use (litres/person/day) =SUM(column 4)	119.29
(6)	Contribution from greywater (litres/person/day) (See 1d below)	69.05
(7)	Contribution from rainwater (litres/person/day) (See 1c below)	23.56
(8)	Normalisation factor	0.91
(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)	24.29
(10)	External water use	5.00
(11)	**Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)**	**29.29**

The LPA Habitats Regulations require "Best case re-use – New homes would include both greywater recycling and rainwater harvesting reducing water use to a minimum of 62 l/h/d". Conclusion: this proposal performs better than the Habitats Regulations minimum requirement.

Installation specification

Installation Type	Make/Model (mandatory)	Litres/Person/Day
WC (dual flush)	Metro Close Coupled Modern Toilet	20.6
Taps	EUROSMART COSMOPOLITAN Monobloc	10.59
Baths (shower(s) present)	Monza 1700 x 700 Single Ended Rectangular Bath	19.03
Showers (bath(s) present)	Triton EXE Lever Inclusive Bar Mixer Shower	34.96
Kitchen Taps	Hansgrohe Logis Single lever kitchen mixer 260	15.64
Washing Machines	Beko WTK62051W 7155243000	2.18
Dishwasher	Bosch 45cm slimline integrated	3.42

Contribution from Rainwater





The rainwater harvesting system will be installed which collects rainwater from the roof with 90% efficiency, and filter before storing it in an underground tank. When needed the stored water will be pumped through an ultraviolet and sediment filter, and supplied to a holding tank in each property. From there it will supply the baths, showers, washing machines and external taps. Dishwashers and drinking water will be supplied by mains water. Luminor Blackcomb UV Steriliser 11lpm to 79lpm × 1 and Hydra-Rainmaster Trio Rainwater Filter × 1 will be used.

Annual Rainwater Yield

Collection area (sqm) (a)	**280**		***See above***
Yield Coefficient (allowing for pitched and flat roof combination) (b)	70%		
	Average 20 years	**Min last 20 years**	*Drought Stress Testing: Lowest Annual Rainfall in last 20 years applied*
Rainfall Average / Year (c)	817.77	610.60	mm (*See table below*)
Average Daily Rainwater Collection (litres) (a x b x c = d)	439.21	327.94	litres
Annual Maximum Rainwater yield (d x 365 = e)	**160,312**	**119,699**	litres
Occupancy / dwelling (f)	**13.92**	**13.92**	Persons (HDC Standard)
Yield per person per day (e / f / 365 = g)	31.55	23.56	litres per person per day

Greywater recycling

Using the Hydraloop system, 90% of all greywater can be recycled, filtered and reused

Bath (where shower also present)	19.03
Shower (where bath also present)	34.96
Washing Machine	15.06
Total supply of potential recycling	69.05
Total greywater recycling at 95% efficiency (i)	65.59 litres / person / day
Note: The Recycled Greywater Contribution have been reduced from a potential 65.59 litres to 35.56 litres, to (a) allow recycling headroom in case of RWH malfunction, and (b) to ensure max rainwater harvesting capacity is utilized in the first instance.	



Annual Non-Potable demand (taken from Part G above)

Installation	Unit (litres)	

Toilet Flushing	20.60	
Washing Machine	15.06	
Garden	5.00	
Shower	34.96	* Note: With use of UV and 5 micron sediment filters
Bath	19.03	
Total non-potable demand per person per day (h)	94.65	litres per person per day
The total rainwater harvesting capacity to be lowest of "g" (see 1c above) or "h"	**83.12**	litres per person per day

Tank Size

Tank Size Calculation		BS8515:2009 "... storage capacity should be the lesser of 5% of the annual rainwater yield or 5% of the annual non-potable water demand."	
*Total occupancy (**f**)*	17.26		
*Daily non-potable demand per dwelling (**f x g = i**)*	1,633.61		
Annual non-potable demand (i x 365 days)	**596,267**		
Tank Size: Minimum of			
5% of annual non-potable water demand OR	**29,813**		
5% of annual rainwater yield	9,205		
Size needed	**17,549 litres**		
Horsham District Council has a higher threshold than BS8515:2009, being 35 days' storage: 35 x 29.05 litres x 17,26 occupancy = 17,549 litres			

Appendices:

Freeflush System Details

Filter System

Water Management System



(//www.freeflush.co.uk/cdn/shop/files/G70091-scaled_bbc74781-cfcd-493c-9ed4-b4b111f11cb7_1400x.jpg?v=1705417772)



Carat XL/XXL Rainwater Harvesting System 8,500l, 10,000l, 16,000l, 22,00(26,000l and 32,000l

Capacity

~~8,500l~~

System Type

~~Direct~~

Access Cover

~~Pedestrian~~

1 £4,579.00 **Add to Cart**

DESCRIPTION | DOCUMENTATION | DELIVERY | REVIEWS

For tanks of 16,000L and above, please get in touch prior to purchase.

32,000l tanks are special order, priced on application.

If you need assistance with tank sizing use our rainwater harvesting calculator here (https://www.freeflush.co.uk/pages/rainwater-harvesting-calculator) o our garden rainwater tank sizing blog here (https://www.freeflush.co.uk/blogs/freeflush-rainwater-harvesting-blog/how-much-water-do-i-need-to-water-my garden-and-other-useful-watering-tips).

Four main rainwater harvesting packages are offered in four tank sizes and two lid options:

1. Garden Comfort Package for irrigation only

2. Direct Rainwater Harvesting System - the most cost effective solution. A submersible pump maintains pressure and delivers rainwater where it is required. A mains top up unit, tops up the tank if it runs low on rainwater.

3. Indirect Rainwater Harvesting System - the submersible pump tops up a header tank which drains by gravity to feed rainwater to where it is required. The header tank has a mains top up valve if rainwater runs low.

4. Eco Plus Rainwater Harvesting Package - An external pump ans console draws rainwater from the tank and deliver it to where it is required. If the tan is low on rainwater a small amount of mains water is delivered to the console and the pump continues to deliver this water.

1. Freeflush Garden Comfort Package

Garden Comfort scope of supply:

1. Carat® tank incl. 4 prefitted DN 100 lip seals
2. Tank cover suitable for pedestrian or vehicle loading depending on the version

3. Tank filter package for the garden consisting of:
    - Internal filter basket incl. suspension
    - Overflow siphon with integrated rodent guard
4. Garden-Comfort technical package consisting of:
    - Integra INOX stainless steel submersible and suction pump incl. floating extraction setup
    - 10m pressure hose 1"
    - Internal water connection box
    - External water connection box

2. Freeflush House Direct -Supply Package

- Simple & quick to install
- Submersible pump supplies harvested rainwater on demand to WCs, washing machine & external tap
- Carat The quiet & conveniently sized Mains-on-Tap unit will fit in a kitchen or utility cupboard for very low visual impact
- Innovative float sensor detection on Mains-on-Tap unit ensures that the underground tank is kept supplied with mains water but only the amoun necessary to maintain supply to toilets and washing machine, leaving as much volume as possible in the tank to collect rainwater when availabl

House Direct scope of supply:

1. Underground tank (choice of tanks available, sizes vary according to property type)
2. Telescopic lid (choice of telescopic lid available, depending on tank location)
3. Filter (Minimax filter supplied in accordance with type of tank)
4. Submersible pump with floating water intake
5. Mains-on-Tap unit
6. Float sensor (connected from Mains-on-Tap unit to the underground tank)
7. 100mm diameter duct pipe to contain; float sensor cable, power cable for pump, also bringing mains water to underground tank as and when required

3. Freeflush House Indirect -Supply Package

The reliable domestic solution with a submersible pump and header tank system

- Simple & quick to install
- Submersible pump supplies harvested rainwater on demand to the header tank where it is then gravity fed to the WCs & washing machine
- The header tank controls the operation of the system and the supply of harvested rainwater and backup mains water to the WCs
- Dual valve system within the header tank priorities rainwater supply over mains water, maximising the use of all available rainwater to save on mains water consumption
- Mains water switch over point is at a lower level in the header tank when rainwater is not available from the underground Carat tank
- Mains water backup supply is not reliant on power supply or pump pressure and therefore guarantees supply of water to WCs at all times

House Indirect scope of supply:

1. As per direct package
2. As per direct package
3. As per direct package
4. As per direct package
5. Float switch (connected from mains water backup unit to the underground tank)
6. 100mm diameter duct pipe to contain; float sensor cable, power cable for pump
7. 100mm diameter drainage pipe connected from downpipes to the inlet at the top of the tank (all downpipes brought into one pipe for connection to the filter)
8. 100mm diameter pipe for overflow from the tank to mains drainage network or soakaway
9. Header tank package

4. Freeflush Eco Plus Package

The reliable domestic solution with a submersible pump and header tank system

- Simple & quick to install
- Minimises the top up water required

Eco Plus scope of supply:

1. Underground tank (choice of tanks available, sizes vary according to property type)
2. Telescopic lid (choice of telescopic lid available, depending on tank location)
3. Minimax filter
4. Mains water feeding console 15/4

Capacity (l)	Length (mm)	Width (mm)	Height (mm)	Inner Ø dome shaft (mm)	Weight (kg)
8,500	3500	2040	2695	650	380
10,000	3520	2240	2895	650	456
16,000	4660	2500	3160	650	805
22,000	6145	2500	3160	650	1015
26,000	7045	2500	3160	650	1150

Operating and installing a rainwater harvesting system

RELATED PRODUCTS



Homestream Domestic Rainwater Harvesting System 1000 to 5000l (/collections/rainwater-harvesting-systems/products/homestream-

SOLD OUT



RAINMASTER Eco 10 rainwater harvesting system pump console (/collections/rainwater-harvesting-systems/products/rainmaster-eco-10-rainwater-harvesting-



Rainwater Harvesting Package 800l butt and garden steel pressure pump (/collections/rainwater-harvesting-systems/products/rainwater-



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CONTACT INFORMATION

Please feel free to contact us regarding design or supply of one of our products.

email: info@freeflush.co.uk (mailto:info@freeflush.co.uk)

Tel: 0161 872 7308 (tel:0161%20872%207308)

Mon - Fri I 9am - 4.30pm

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WATER NEUTRALITY

"Ransoms", Station Road, Pulborough



Purple Pepper Partnership Ltd

6 June 2023

V6June23

Version Control:

This version replaces v30Sep22 as the offsetting site had to be changed. Any changes to the document is in ***purple*** *to ease tracking. Any pages entirely unchanged also contains the phrase "No Changes to this page" at the bottom right hand.*

Executive Summary:

The proposed new development is made water neutral by using **water efficient devices** on site as well as installing on-site **greywater recycling** and **rainwater harvesting** systems. The small remainder of new water use is then **offset at nearby Knepp Estate Wildlife Centre**, which even when applying the lowest rainfall figures of the last 20 year still provides an excess saving of more than 170,000 litres per year, resulting in a robust water neutral proposal.

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INTRODUCTION WATER NEUTRALITY

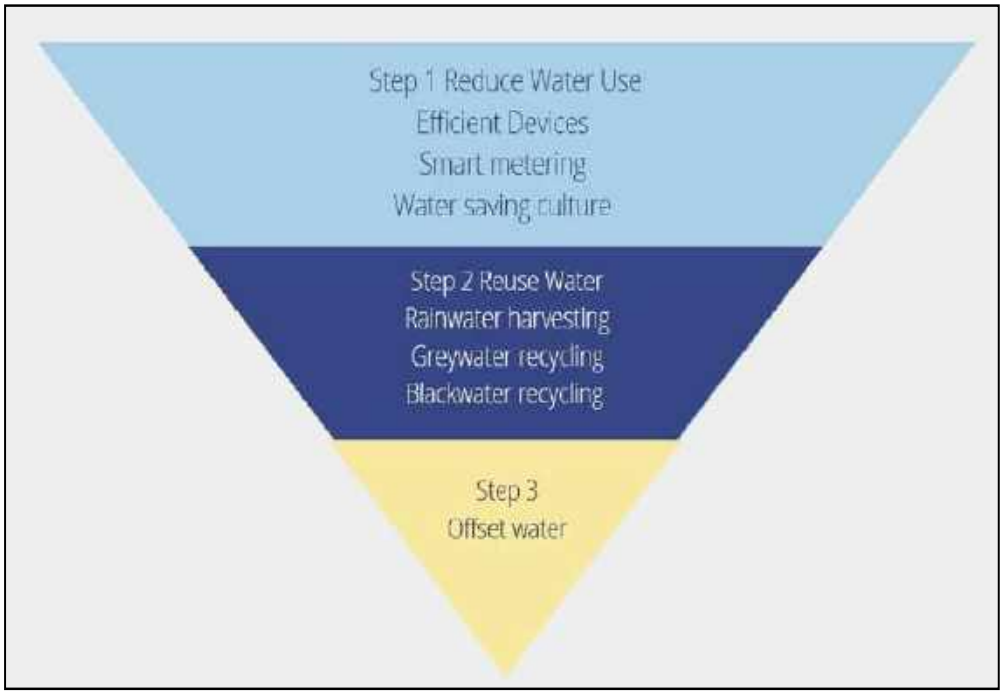
INTRODUCTION

Overview

Water neutrality is defined as

"For every new development, total water use in the region after the development must be equal to or less than the total water-use in the region before the new development."

This is usually achieved by applying the hierarchy to the right to any new development (for detailed explanation see elsewhere in the document)



Strategy

Following the specification of water efficient devices, smart metering and water saving information to new owners, the main strategy for the development to achieve water neutrality is by harvesting and reusing water on site. This is specifically achieved by:

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1. *Installing a grey water recycling system into the development that allows all grey water (bath, washing machine and showers) to be UV filtered, sediment filtered and reintroduced into the property's non-potable system.*
2. *Installing a rainwater harvesting system that will utilise a UV filter and sediment filter and then being introduced into the property's non-potable water supply.*

Calculations have shown that a small proportion of offsetting is still required, and this is proposed at a nearby car wash and restaurant, which agreed in writing to have their water system upgraded to include a rainwater harvesting system.

SCHEME SUMMARY

The application is for the construction of 8no new 1 / 2 bedroom apartments with associated landscaping, parking and bin storage.



EXISTING USE

The existing property comprises 1no 1 bed flat, 1no 2 bed flat, and 2no retail units. Most of the building fell in disrepair many years ago, however a part of the ground floor has been in use as office and informal storage space since April 2021. Please see the VOA demand notice in appendix.

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REUSE SYSTEM EXPLAINED

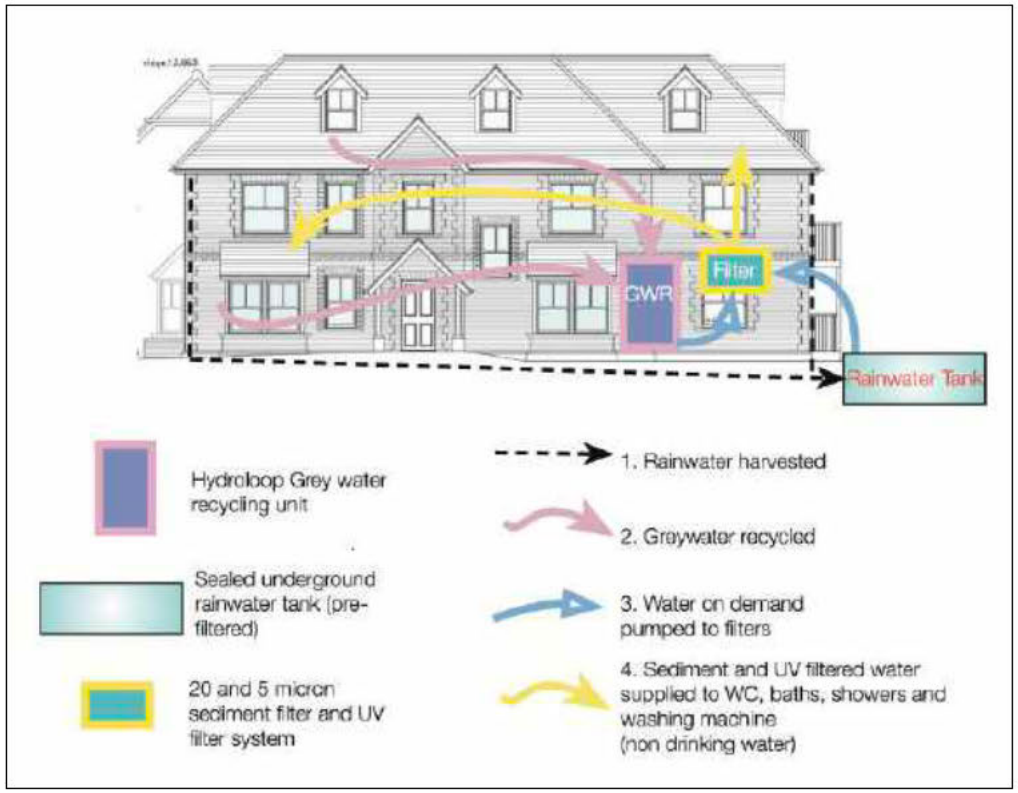

Figure 1 Water Reuse system at Ransoms

The figure on the left illustrates the proposed system. Rainwater is harvested from the roof and greywater is recycled from the dwelling showers, baths and washing machines. The recycled water is filtered, stored, and on demand is pumped via another filter system (sediment filters to remove particles to a smaller standard than mains drinking water) and UV filters to kill all microbes and odours) to all connection points excluding drinking water (kitchen taps).

Although the water is safe to drink, a mains water supply is still of critical importance for safe drinking water.

The proposed system is already water neutral if average rainfall figures (rather than drought year rainfall) and standard occupancy rates are used. Instead to ensure the system will be as robust as possible, the 2005 rainfall figures of 610mm (the lowest of the past 20 years) are used. This results in a small amount of water still having to be offset at a nearby commercial premises, ensuring robust water neutrality.

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CALCULATIONS PROPOSED WATER USE

INTRODUCTORY ASSUMPTIONS

Variables / Basis of calculation

Table 1: Variables / Basis of calculation

Item	Basis / Number	Notes
Occupancy/Dwelling proposed by HDC	1.67 across the scheme	This figure is used to ensure consistency across the local authority
Habitat Regulations Max Daily use	100 litres pppd	Horsham Local Plan Habitats Regulations Assessment (July 2021) Technical Note Appendix E
Rainfall per year: Average	817mm	The Met Office (Note: This is a 20 year average and therefore already provides for the effects of droughts. See table below)
Drought year rainfall	610mm	In order to provide a robust solution, the lowest rainfall over the last 20 years has been used

Steps in achieving neutrality

Step 1: Calculate Part G Water use for site

Step 2: Calculate offsetting demand (net of rainwater harvesting)

Step 3: Calculate offsetting contribution

Step 4: Conclusion: Water Neutrality Achieved?

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STEP 1: CALCULATE PART G WATER USE FOR SITE

Step 1a) Table 2: Calculate Part G Water use for site ("How much water will each person consume daily?")

Installation Type	Unit of Measure	Capacity/Flow rate (1)	Use Factor (2)	Fixed use (litres/person/day) (3)	Litres/person/day = [(1)x(2)] + (3) (4)
WC (single flush)	Flush Volume (litres)		4.42	-	-
WC (dual flush)	Full flush Volume (litres)	6	1.46	-	8.76
	Part flush Volume (litres)	4	2.96	-	11.84
WC (multiple fittings)	Average effective flushing Volume (litres)	4.66	4.42	-	-
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	5.70	1.58	1.58	10.59
Bath (where shower also present)	Capacity to overflow(litres)	173.00	0.11	-	19.03
Shower (where bath also present)	Flow Rate(litres / minute)	8.00	4.37	-	34.96
Bath Only	Capacity to overflow(litres)		0.50	-	-
Shower Only	Flow Rate (litres/minute)		5.60	-	-
Kitchen/Utility room sink taps	Flow rate (litres/minute)	12.00	0.44	10.36	15.64
Washing Machine	(Litres/kg dry load)	7.17	2.1	-	15.06
Dishwasher	(Litres/place setting)	0.90	3.6	-	3.42
Waste disposal unit	(Litres/use)	Present	3.08	-	-
Water Softener	(Litres/person/day)		1.00	-	-

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	(5)	Total Calculated use (litres/person/day) =SUM(column 4)	119.29
	(6)	Contribution from greywater (litres/person/day) (See 1d below)	69.05
	(7)	Contribution from rainwater (litres/person/day) (See 1c below)	23.56
	(8)	Normalisation factor	0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)	24.29
	(10)	External water use	5.00
	(11)	**Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)**	**29.29**

The LPA Habitats Regulations require "Best case re-use – New homes would include both greywater recycling and rainwater harvesting reducing water use to a minimum of 62 l/h/d". Conclusion: this proposal performs better than the Habitats Regulations minimum requirement.

Step 1b) Table 3: Installation specification ("How much water does each installation in Part G require?")

Installation Type	Make/Model (mandatory)	Litres/Person/Day
WC (dual flush)	Metro Close Coupled Modern Toilet	20.6
Taps	EUROSMART COSMOPOLITAN Monobloc	10.59
Baths (shower(s) present)	Monza 1700 x 700 Single Ended Rectangular Bath	19.03
Showers (bath(s) present)	Triton EXE Lever Inclusive Bar Mixer Shower	34.96
Kitchen Taps	Hansgrohe Logis Single lever kitchen mixer 260	15.64
Washing Machines	Beko WTK62051W 7155243000	2.18
Dishwasher	Bosch 45cm slimline integrated	3.42

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Table 4: Filtered water demand (from rainwater harvesting "RWH" and greywater recycling "GR")		
Installation	**Unit (litres)**	
Toilet Flushing	20.60	
Washing Machine	15.06	
Garden	5.00	
Shower	34.96	* Note: With use of UV and 5-micron sediment filters
Bath	19.03	
Total non-potable demand per person per day (h)	94.65	litres per person per day

Note that Rainwater Harvesting (RWH) + Greywater Recycling (GR) must be < Filtered water demand (FWD)

Contribution	Recycled Greywater Contribution	69.05	* See below
	Harvested Rainwater Contribution	23.56	
	Total		92.61
Demand	WC (multiple fittings)	20.60	
	Bath (where shower also present)	19.03	
	Shower (where bath also present)	34.96	
	Washing Machine	15.06	
	External water use	5.00	
	Total		94.65
Conclusion: Use lowest of demand or contribution =		92.61	lpd

Total Occupancy ("**f**" below)**: 13.92 (as per HDC instruction)**

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1c) Contribution from Rainwater ("How much rainwater, as a minimum, can be harvested?")



The rainwater harvesting system will comprise the following or equivalent:





- *Rainwater Harvesting System*
- *Hydra-Rainmaster Trio Rainwater Filter × 1*
- *UV Filter 27 litre per second*

A rainwater harvesting system will be installed which collects rainwater from the roof with 90% efficiency, and filter before storing it in an underground tank. When needed the stored water **will be pumped through an ultraviolet and sediment filter,** and supplied to a holding tank in each flat. From there it will supply the baths, showers, washing machines and external taps. Dishwashers and drinking water will be supplied by mains water. **Luminor Blackcomb UV Steriliser 11lpm to 79lpm × 1 and Hydra-Rainmaster Trio Rainwater Filter × 1 will be used:**



Using the roof size agreed with the LPA to be 280sqm and occupancy of 13.92 persons, the following rainwater harvesting yield per person is calculated:

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Table 5: Annual Rainwater Yield

Collection area (sqm) (a)	**280**		***See above***
Yield Coefficient (allowing for pitched and flat roof combination) (b)	70%		
	Average 20 years	**Min last 20 years**	*Drought Stress Testing: Lowest Annual Rainfall in last 20 years applied*
Rainfall Average / Year (c)	817.77	610.60	mm (*See table below)*
Average Daily Rainwater Collection (litres) (a x b x c = d)	439.21	327.94	litres
Annual Maximum Rainwater yield (d x 365 = e)	**160,312**	**119,699**	litres
Occupancy / dwelling (f)	**13.92**	**13.92**	Persons (HDC Standard)
Yield per person per day (e / f / 365 = g)	31.55	23.56	litres per person per day

Conclusion: 31.55 litres per person per day can be harvested but even in times of drought 23.56 litres can be harvested.

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1d) Contribution from greywater recycling (taken from Part G above) ("How much non-potable water will the occupants demand per year?")

Table 6: (ii) Yield from greywater recycling system

Using the Hydraloop system, 90% of all greywater can be recycled, filtered and reused	
Bath (where shower also present)	19.03
Shower (where bath also present)	34.96
Washing Machine	15.06
Total supply of potential recycling	69.05



Because of the specified use of UV filter and 5 micron sediment filters (see below), the full greywater recycling yield is available for use.

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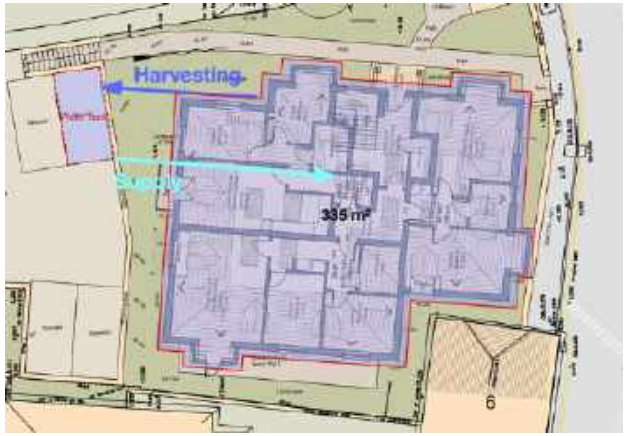
1e) Tank Size and location ("What size tank will cover drought and rainy times?")

Table 7: Tank Size Calculation

Tank Size Calculation		BS8515:2009 "... storage capacity should be the lesser of 5% of the annual rainwater yield or 5% of the annual non-potable water demand." Horsham District Council has a higher threshold than BS8515:2009, being 35 days' storage: 35 x 29.05 litres x 17,26 occupancy = 17,549 litres
*Total occupancy (**f**)*	17.26	
*Daily non-potable demand per dwelling (**f x g = i**)*	1,633.61	
Annual non-potable demand (i x 365 days)	**596,267**	
Tank Size: Minimum of		
5% of annual non-potable water demand OR	**29,813**	
5% of annual rainwater yield	9,205	
Size needed	**17,549 litres**	

Table 8: Rainfall in the area the last 20 years (Source: Met Office, Station: Charlwood)

2000	1,109.00	mm	2010	689.30	mm
2001	861.60	mm	2011	630.50	mm
2002	1,008.00	mm	2012	1,005.00	mm
2003	639.70	mm	2013	805.70	mm
2004	757.10	mm	2014	1,039.00	mm
2005	610.60	mm	2015	737.20	mm
2006	788.10	mm	2016	729.80	mm
2007	844.40	mm	2017	726.00	mm
2008	852.00	mm	2018	758.80	mm
2009	822.50	mm	2019	858.70	mm
			2020	900.20	mm
Min	**610.60**	mm			
Average	**817.77**	mm			



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Conclusion: By utilizing on site water saving strategies including rainwater harvesting and filtered grey water recycling, the off site offsetting demand can be limited to 29.29 litres per person per day (see section 1a above).

STEP 2: CALCULATE OFFSETTING DEMAND (NET OF RAINWATER HARVESTING AND GREYWATER RECYCLING)

Table 9: Offsetting demand

		Litres
Total water consumption (Building Regulation 17.K) (litres/person/day)	*See Step 1a above*	**29.29**
Total occupancy (f)	*See Step 1c, Section f above*	13.92
Total daily demand		**407.65**
Offsetting Demand (Daily demand x 365)	Daily demand x 365 = Annual	148,792 litres

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STEP 3: CALCULATE OFFSETTING CONTRIBUTION

Offsetting Business Details

KNEPP CASTLE HOME FARM SWALLOWS LANE, DIAL POST, HORSHAM RH13 8NN

https://knepp.co.uk/knepp-estate/

The Knepp Estate is a very large estate in West Sussex (just south of Horsham) involved in agriculture, equestrian estate, gardens, renewable energy, camping, rewilding, walking and various other year round activities.

Knepp Estate has the following number of people on site:

Campers: 5,500 / year (April-Oct)

Daily visitors: 10,000 / year

Staff: 60 full time, 60 contractors (10 permanently only at the rewilding / camping area).



The specific part of the site where the rainwater harvesting system is proposed, is based at the rewilding estate just north of Dial Post.

The roof proposed is larger than the one previously proposed at the previously proposed offsetting site (670sqm rather than 402sqm), therefore the harvesting potential, and therefore the offsetting is greater.

The site will use the water for around 10 toilets, a shower block, a new laundry facility, watering the garden and general cleaning.

It is using more than 2,000,000 litres of water per year at present (see water bill in relevant section below) therefore the offsetting demand is vastly greater than the harvesting potential.



The site contains several buildings useful for harvested rainwater, in particular:

- *A total of 15 toilets for use by public and staff*
- *A shower block for campers*
- *A proposed launderette, should the rainwater system be installed*
- *Extensive landscaping*

- *Total of at least 1,684sqm of roof area suitable for rainwater harvesting, of which 670sqm for this offsetting scheme (balance for Coppice Hanger)*


- Standard 115mm Rainwater Gutters feeding
- 68mm downpipes feeding the water tanks
- Firstflush filter system and leaf catcher
- Enduramax 15,000 litres above ground tanks
- Sediment filter prior to supply pump
- Pressure pump to feed various outlets
670 m²
WC, non-potable taps and animal troughs supplied
ENDURAMAXX 15,000 LITRE RAINWATER TANK
2.4m x 2.4m x 3.55m
Viewing angle
Viewing angle
Viewing angle
Viewing angle
Viewing angle
Viewing angle
Sub Sta

Water Offsetting Demand (Development Site)

The development site at Ransoms has been demonstrated to use a net 29.29 litres per person per day, with a total occupancy of 13.92 persons a daily offsetting demand of 407.65 litres (**148,792 litres per year**) has been calculated.

Knepp Castle Home Farm uses at least 2,861,000 litres of mains water per year, of which only 258,060 is for potable use.

Knepp Estate Water Bills analysis (see appendix for copies)			
Reading date	Reading	Usage	Days
20-Dec-21	1135		
07-Mar-22	1692	557	77
02-Jun-22	2155	463	87
02-Sep-22	3406	1,251	92
30-Dec-22	4015	609	119
13-Mar-23	4553	538	73
		3,418	448
Usage 7 Mar 22 - 13 Mar 23		**2,861**	
	=	2,861,000	litres

Analysis of potable vs greywater usage (to prove harvested rainwater will reduce actual usage)

Note: The site acts as offsetting for two schemes under control of the developer: Ransoms and Coppice Hanger. The below calculation is provided to evidence that there is a large enough demand for harvested rainwater on site to offset more than the Ransoms development site requirement.

Knepp Estate (Home Farm) Water Use			Litres/Person/Day (Part G Equivalent) - can be replaced by rainwater					
	Visitors	Average Days on site	WC	Cleaning Tap	Shower	Annual Usage POTENTIALLY Replaced by rainwater	Coppice Hanger Use (Large roof)	Ransoms Use (Smaller Roof)
Campers (April-Oct)	5,500	3	20.6	10.59	34.96	1,091,475	1,091,475	
Daily Visitors (per year)	10,000	0.5	20.6	10.59	0	155,950	77,975	77,975
On site permanent staff	10	220	20.6	10.59	0	68,618	17,155	51,464
Roaming Staff on site 25% of their time	110	55	20.6	10.59	0	188,700	47,175	141,525
		Total Human Mains use to be replaced by Rainwater				1,504,743		
		Potable Water Use (not replaceable by rainwater)				258,060		
		(Kitchen use by campers for the whole year, 15.64 litres / person / day)						
			Annual Use across the whole site			2,861,000		
	Balance used for irrigation, commercial and equestrian activity					1,098,198		
	Horse drinking water (min 25 litres / horse / day), 20 horses					182,500		182,500
	https://www.bluecross.org.uk/advice/horse/food-and-weight/horse-feeding-and-watering							
6 non-potable taps for commercial and equestrian use. 2 supplied by large roof, 4 by small roof						748,980	249,660	499,320
(constant daily use, 5.7 litres/min flow rate, minimum 60 mins daily use per tap)								
			Balance of water for unspecified use			166,718		
	Total water demand that can potentially be replaced by rainwater						1,483,439	952,783

CONCLUSION: 952,783 litres of non-potable demand per year can be supplied by rainwater harvesting.

Offsetting site Harvesting Capacity (Offsetting Site)

	Average rainfall last 20 years	Lowest rainfall last 20 years	
Collection area available (i)	610	610	sqm
Yield Coefficient (ii)	70%	70%	
Rainfall Average / Year (iii)	817.77	610.60	mm
Daily Rainwater Collection (litres)	955.57	713.32	litres (i x ii x iii = iv)
Annual Rainwater yield	**348,859**	**260,470**	**litres (iv x 365)**
Rainwater offsetting demand	148,792	148,792	
Excess rainwater harvested	200,067	111,678	**Yield less demand**

Furthermore the 348,859 litres of water harvested per year is less than the potential 952,783 litres annual demand for non-potable water, rending the scheme viable.

Tank Size:

Tank Size: Minimum of		
5% of annual annual non-potable water demand OR	8,591	Horsham District Council has a threshold different to BS8515:2009, being 35 days' storage: 22,066 litres
5% of annual rainwater yield	17,400	
Size needed	8,591	

Legal Agreement Heads of terms

The following Heads of Terms will for the basis of a S106 agreement between the landowner, the developer and Horsham District Council:

- Owner and Third Party Landowner to submit a water neutrality offsetting strategy to the LPA for its approval in writing prior to commencement of development
- Owner and Third Party Landowner to submit evidence to the LPA for its approval in writing prior to first occupation of the development that the offsetting measures have been implemented in full
- Third Party Landowner to retain the offsetting measures in full in perpetuity.
- Definition: Water Neutrality Offsetting Strategy- a strategy detailing the precise measures to be undertaken on the Third Party Land to achieve the water reduction targets secured in the water neutrality strategy submitted and approved in the planning permission.

Conclusion: There is sufficient roof area available to harvest rainwater that will exceed the offsetting demand of 148,792 **litres by at least** 111,678 **litres in severe drought years and significantly more during normal rainfall at least by** 200,067 **litres (60%).**

Deduction of current use

The principles of water neutrality established by Natural England and the LPA's Habitats Regulations allow for a deduction of existing use, provided a building has been in lawful use.

Despite being in a poor state of repair the existing building is has been in use by the applicant as a site office and storage of materials to support a nearby construction project. Office use of retail space is a lawful use of the premises, and existing use therefore should be deductible.

The current water supply is unmetered, and for a number of months the applicant has been trying to have a meter installed on the premises to evidence use, however to date Southern Water has not responded.

Due to the difficulties it will present to evidence volume of existing use (staff toilet for 3 staff members + subcontractors, kitchen and general water supply), the benefit of deducting existing use has not been incorporated into the calculation.

It will be reasonable to expect the LPA to consider this contribution in addition to the already robust calculation provided: **not only has the applicant used the driest year in the last 20, and significantly increased occupancy of the building, but has also not deducted existing use.**

STEP 4: CONCLUSION: WATER NEUTRALITY ACHIEVED?

Total Offsetting Demand	148,792	Step 2
Total Water Savings being offset	**200,067**	Step 3
Net Saving / Contribution	(51,275)	Must be negative

Conclusion: The scheme is water neutral even if rainfall is less than the driest year in the last 20 years.

BACKGROUND
WATER NEUTRALITY

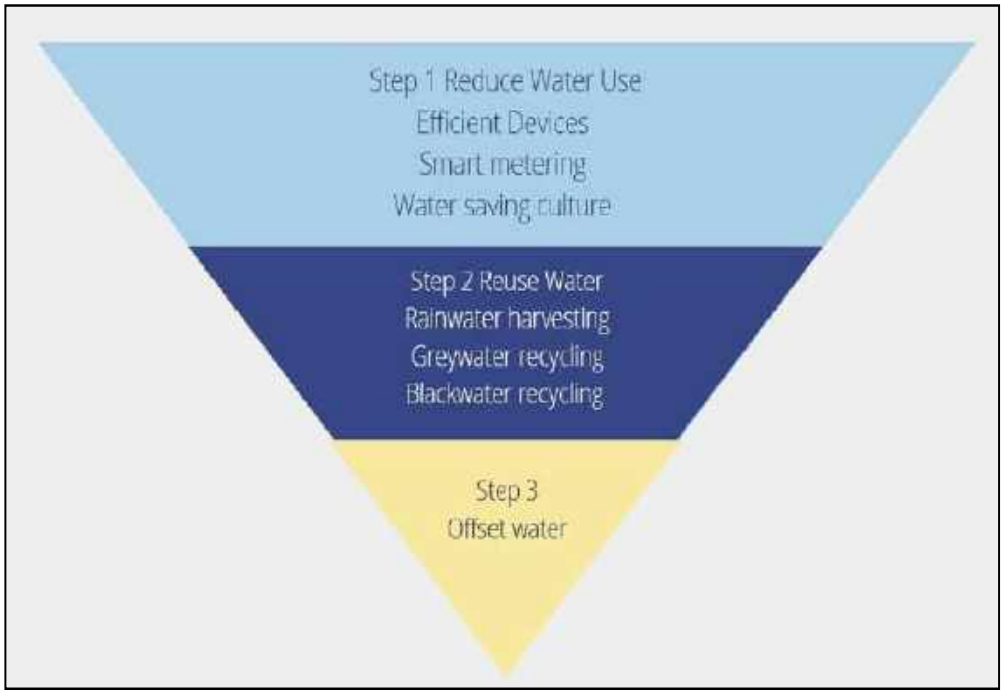
This document has been written in response to Natural England's position statement for all applications which fall within Sussex North's Water Supply Zone.

The position statement notes that developments within the Sussex North Water Supply Zone may have an impact on the Arun Valley water supply and advises that developments within this zone must not add to this impact.

To ensure new developments do not impose an unsustainable burden on the water resources within this area, a Water Neutrality assessment should be carried out to demonstrate that the net consumption of the site post-development will be less than or equal to the existing water demand.

NATURAL ENGLAND

In September 2021 Natural England released substantive advice for all developments that fall within the Sussex North's water supply zone. To alleviate stresses imposed on the water network, all new developments must demonstrate the water consumption after the development is complete will be no greater than the consumption of the site as existing. Where possible, water efficiency measure and on- site water recycling should be adopted. Any remaining water consumption after these measures have been instigated may then be offset.



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HORSHAM DISTRICT COUNCIL (POSITION STATEMENT & HABITATS REGULATIONS)

The Horsham Local Plan Habitats Regulations Assessment (July 2021) sets several stringent tests to be passed for new development to be approved.

Water neutrality is a concept whereby the total demand for potable mains water supply within a planning area after development has taken place is the same (or less) than it was before development took place. If this can be achieved, the overall balance for water demand is 'neutral', and there is considered to be no net increase in demand as a result of development. In order to achieve this, new development needs to be subject to planning policy which aims to ensure that where possible, houses and businesses are built to high standards of water efficiency through the use of water efficient fixtures and fittings and in some cases rainwater harvesting and greywater recycling.

It is theoretically possible that neutrality can be achieved within a new development area, through the complete management of the water cycle within that development area. In addition to water demand being limited to a minimum, it requires:

☐ all wastewater to be treated and re-used for potable consumption rather than discharged to the environment;

☐ maximisation of rainwater harvesting (in some cases complete capture of rainfall falling within the development) for use in the home; and

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☐ abstraction of local groundwater or river flow storage for treatment and potable supply.

Achieving 'total' water neutrality within a development remains an aspirational concept due to the requirement for specific catchment conditions to supply raw water for treatment and significant capital expenditure. It also requires specialist operational input to maintain the systems such as blackwater re-use on a community scale.

For the majority of new developments, in order for the water neutrality concept to work, the additional demand created by new development needs to be offset in part by reducing the demand from existing population and employment. Therefore, a 'planning area' needs to be considered where measures are taken to reduce existing or current water demand from the current housing and employment stock. The planning area in this case is the Horsham District Council administrative area as a whole.

Likely increases in demand in the study area have been calculated using three different water demand projections based on different rates of water use for new homes that could be implemented through proposed and potential future policy.

The projections were derived as follows:

- Average metered consumption – New homes in the district would use 133.24 l/h/d;
- Local plan requirements – New homes would conform to (and not use more than) the proposed Local Plan requirement where *"New residential development to limit water use to achieve a water efficiency of 100 litres/person/day, all strategic development is to achieve 80 litres/person/day; and all to incorporate measures which promote the conservation of water and / or grey water recycling*";

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- Best case re-use – New homes would include both greywater recycling and rainwater harvesting reducing water use to a minimum of 62 l/h/d.

New housing development to adhere to the requirements of the proposed Horsham Local Plan Policy 38, being designed to limit water use to 80 l/h/d on strategic development sites or 100 l/h/d on non-strategic development sites (more stringent than the optional Building Regulations requirements). It is recommended that the Council consider ways to support developer implementation of this policy via information sources on their website. Measures can include (but not necessarily limited to) garden water butts, low flush toilets, low volume baths, aerated taps, water efficient appliances and water recycling (greywater and/or rainwater).

WATER NEUTRALITY STUDY: PART B – IN-COMBINATION

A water neutrality study was done by JBA Consulting, with the final report issued in April 2022 (See Appendix). The executive summary are as follows:

Significant concerns regarding the current Southern Water abstraction at Pulborough (and any within licence increase in abstraction required to serve planned development), have been raised by the Environment Agency and Natural England. The latter has advised that it cannot conclude with certainty that this process is not having an adverse impact on site integrity through a reduction in water levels and potential water quality impacts that are leading to deterioration of habitat at designations including Amberley Wild Brooks SSSI, Pulborough Brooks SSSI that are part of Arun Valley SPA, Arun Valley SAC and Arun Valley Ramsar site. Natural England has advised the Councils within the water resource zone, that development in the Sussex North part of the Gatwick sub-region

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must not add to this adverse effect. Water Neutrality is required to allow development to proceed without increasing abstraction from Pulborough during the interim period whilst an alternative water supply is sought.

Water neutrality is defined in this study as:
"For every new development, total water use in the region after the development must be equal to or less than the total water-use in the region before the new development."

The Pulborough groundwater abstraction supplies water to the Sussex North Water Resource Zone (WRZ). This zone covers the majority of Crawley (excluding Gatwick Airport and Maidenbower), Horsham District, part of Chichester local authority area and part of the South Downs National Park. Part A of this work introduced the concept of water neutrality and addressed growth in just Crawley and Chichester individually. Part B builds on this work, combining the growth forecasts of all LPAs in the water resource zone into an overall water demand. The theoretical contribution that may be achieved from each of the mitigation measures identified in Part A is then presented, alongside the latest information provided by Southern Water on their emerging plans.

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APPENDICES

1. *Water Bills*
2. *Part G Calculations LABC approved*
3. *Rainwater Harvesting System details*
4. *Greywater Recycling System Details*
5. *Installation Specifications*

PI44499

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BSW-NEW | 000747 | Page 1 of 2 | BILLS | 000747

[redacted]

Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

Customer reference / invoice no [redacted]

Nominal Code	Description
3001	MAP20
	Analysis
Q2	Agent / Rating
£	Cr/Pay Ref
30/3/22	Amt Paid [redacted]

Your reference: Map 20
Invoice / tax point date: 9 March 2022
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
VAT number: 945 8508 85

Page 1 of 4

RECEIVED
14 MAR 2022

Your water services invoice

20 December 2021 - 7 March 2022 (77 days, average £11.52 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	

YOUR CHARGES THIS PERIOD (see page 2 for deta

Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment of [redacted]

For ways to pay see page 3

2022/23 charges

You can find more information on our charges and ways to save water and money on our website.

Visit business-stream.co.uk

How much water are you using?

If you'd like to reduce the volume of water you're using, check out our water saving tips on our website. You can also use our website to find advice on our website **business-stream.co.uk**

Actual meter read

This invoice is based on an actual read. To ensure the accuracy of future bills, you can submit your own readings, as long as it's safe to access your meter, on **business-stream.co.uk/meter-reading**. If your water is not provided by us, we will receive reads from your other supplier.

The water experts

Unless otherwise agreed, Scottish Water Business Stream Ltd provides services to you in accordance with our standard terms and conditions, a copy of which is available here: www.business-stream.co.uk/EnglandWalesTerms. Copies are also available on request. Through your continued receipt and acceptance of our services, you are deemed to have accepted our standard terms and conditions.

Based on this period your annual carbon consumption is 476.05 kgCO2e/yr, based on National Government statistics

Your charges in detail

Meter number / meter size: 4A260191 KENT 20mm

Water charges			Units	Rate	VAT	Charge
Fixed water charge						
Yearly fee £193.34	20 Dec 21 - 6 Mar 22		77 days	0.529699		
Volumetric water charge						
Actual reading	7 Mar 22	1692				
Actual reading	20 Dec 21	1135				
=Volume used this period			557.00 m³			
Charges	20 Dec 21 - 7 Mar 22		557.00 m³	1.519500		
Total water charges						
Subtotal						
VAT						
Total charges this period						

A yearly fee for the upkeep of external pipes and pumps that supply water to your property.

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
Most of our services are zero-rated (Z) but some are standard rate (S) or outside scope (O).
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- 9 JUN 2022

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

Customer reference / Invoice no
[redacted]

Your reference: Map 20
Invoice / tax point date: 3 June 2022
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85
Page 1 of 4

Your water services invoice

7 March - 2 June 2022 (87 days, average £8.90 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	
YOUR CHARGES THIS PERIOD (see page 2 for details	
Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment of [redacted]

For ways to pay see page 3

2022/23 charges

You can find more information on our charges and ways to save water and money on our website.

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Property Code: 3601	Description: MAB 20
Enterprise:	Analysis:
Astin Staff: LC	Visits: Pacing:
Bank ac: C	Dir.Pay Ref:
Date Paid: 14/7/22	Amt Paid: [redacted]

How much water are you using?

If you'd like to reduce the volume of water you're using, check out our water saving tips on our website. You'll also be able to find advice on our website **business-stream.co.uk**

Estimated invoice

This invoice is based on an estimated read. If we receive an actual read, we will use it to calculate your next bill. You can submit your own readings, as long as it's safe to access your meter, on **business-stream.co.uk/meter-reading**. If your water is not provided by us, we will receive reads from your other supplier.

The water experts

Unless otherwise agreed, Scottish Water Business Stream Ltd provides services to you in accordance with our standard terms and conditions, a copy of which is available here: www.business-stream.co.uk/EnglandWalesTerms. Copies are also available on request. Through your continued receipt and acceptance of our services, you are deemed to have accepted our standard terms and conditions.

Based on this period your annual carbon consumption is 350.23 kgCO2e/yr, based on National Government statistics

Your charges in detail

Meter number / meter size: 4A260191 KENT 20mm

Water charges			Units	Rate	VAT	Charge
Fixed water charge						
Yearly fee £193.34	7 Mar 22 - 31 Mar 22		25 days	0.529699		
Yearly fee £203.03	1 Apr 22 - 1 Jun 22		62 days	0.556247		
Volumetric water charge						
Estimated reading	2 Jun 22	2155				
Actual reading	7 Mar 22	1692				
=Volume used this period			463.00 m³			
Charges	7 Mar 22 - 31 Mar 22		133.00 m³	1.519500		
Charges	1 Apr 22 - 2 Jun 22		330.00 m³	1.590400		
Total water charges						[redacted]
Subtotal						
VAT						
Total charges this period						

A yearly fee for the upkeep of external pipes and pumps that supply water to your property.

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
Most of our services are zero-rated (Z) but some are standard rate (S) or outside scope (O).
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[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

RECEIVED
12 SEP 2022

Customer reference / invoice no [redacted]

Your reference: Map 20
Invoice / tax point date: 6 September 2022
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85
Page 1 of 4

Your water services invoice

2 June - 2 September 2022 (92 days, average £22.18 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	
YOUR CHARGES THIS PERIOD (see page 2 for deta	
Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment of [redacted]

For ways to pay see page 3→

2022/23 charges

You can find more information on our charges and ways to save water and money on our website.

Visit business-stream.co.uk

Property Code 3601 Description MAP 20
Area Code LE Agent Rec'd
Start on CrPay Ref
Read Date 30/9/22 Amt Paid [redacted]

How much water are you using?

If you'd like to reduce the volume of water you're using, check out our water saving tips on our website. You'll be able to find advice on our website **business-stream.co.uk**

A Actual meter read

This invoice is based on an actual read. To ensure the accuracy of future bills, you can submit your own readings, as long as it's safe to access your meter, on **business-stream.co.uk/meter-reading**. If your water is not provided by us, we will receive reads from your other supplier.

The water experts

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Based on this period your annual carbon consumption is **894.87 kgCO2e/yr.** Based on National Government statistics.

Your charges in detail

Meter number / meter size: 4A260191 KENT 20mm

Water charges			Units	Rate	VAT	Charge
Fixed water charge						
Yearly fee £203.03	2 Jun 22 - 1 Sep 22		92 days	0.5562		[redacted]
Volumetric water charge						
Actual reading	2 Sep 22	3406				
Estimated reading	2 Jun 22	2155				
=Volume used this period			1,251.00 m³			
Charges	2 Jun 22 - 2 Sep 22		1,251.00 m³	1.5904		
Total water charges						

A yearly fee for the upkeep of external pipes and pumps that supply water to your property.

The charge for the recorded amount of water you've used, measured by your meter.

Subtotal

VAT

Total charges this period

VAT on our charges
Most of our services are zero-rated (Z) but some are standard rate (S) or outside scope (O).
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P1491190

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Customer reference / invoice no [redacted]

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

RECEIVED
09 OCT 2022

Your reference: Map 20
Invoice / tax point date: 28 September 2022
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85

Your water services invoice

2 September – 28 September 2022 (26 days, average £14.56 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	
YOUR CHARGES THIS PERIOD (see page 2 for details)	
Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment o[redacted]

A Actual meter read

This invoice is based on an actual read. To ensure the accuracy of future bills, you can submit your own readings, as long as it's safe to access your meter, on **business-stream.co.uk/meter-reading**. If your water is not provided by us, we will receive reads from your other supplier.

Property Code 3661	Description MAP 20
Enterprise	Analysis
Auth Staff LC / Mgmt	Posting
Bank ac	CrPay Ref
Date Paid	Amt Paid

£ Ways to pay

Direct debit and eBilling
The simplest way to pay is by direct debit. It'll ensure you stay on top of bills and minimise paperwork. Visit **business-stream.co.uk/direct-debit** to sign up.

Call and Pay
Our automated system lets you call us 24/7 to make a payment over the phone by credit or debit card. Call us on 0330 123 2000.

Internet banking and BACS
Reference number: 2701510
Sort code: 30-00-02
Account number: 03029919
Account name: Business Stream
Please send your remittance advice to cashiers@business-stream.co.uk

Pay online
You can pay by credit or debit card instantly and securely online with my business stream or via our WorldPay site. Visit **business-stream.co.uk/online-payment** You can also pay by post or at any bank. Visit **business-stream.co.uk** to find out how

The water experts

Unless otherwise agreed, Scottish Water Business Stream Ltd provides services to you in accordance with our standard terms and conditions, a copy of which is available here: www.business-stream.co.uk/EnglandWatersTerms. Copies are also available on request. Through your continued receipt and acceptance of our services, you are deemed to have accepted our standard terms and conditions.
Scottish Water Business Stream Limited, 7 Lochside View, Edinburgh, EH12 9DH. Registered in Scotland SC289904.
Ofwat (the Water Services Regulation Authority) is the regulator of the water sector in England and Wales. For more information visit www.ofwat.co.uk

Your charges in detail

Meter number / meter size: 4A260191 KENT / 20mm

Water charges		Units	Rate	VAT	Charge
Fixed water charge					
Yearly fee £203.03	2 Sep 22 – 27 Sep 22	26 days	0.556247		[redacted]
Volumetric water charge					
Customer reading	28 Sep 22	3635			
Actual reading	2 Sep 22	3406			
= Volume used this period		229.00 m³			
Charges	2 Sep 22 – 28 Sep 22	229.00 m³	1.590400		
Total water charges					
Subtotal					
VAT					
Total charges this period					

A yearly fee for the upkeep of external pipes and pumps that supply water to your property

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
Most of our services are zero rated (Z) but some are standard rate (S) or outside scope (O). See **business-stream.co.uk/vat** for more information.

Need help?

Complaints
If for any reason you feel your query hasn't been resolved as expected, you can make a complaint and escalate your concerns to our customer relations team:
Post: Customer relations team, Business Stream, 7 Lochside View, Edinburgh EH12 9DH.
Online: Via our website business-stream.co.uk

The Consumer Council for Water
If you have followed our complaints process but are still unhappy, the Consumer Council for Water offers free independent advice. You can visit their website ccwater.org.uk, call them on 0300 034 2222, or write to them at Consumer Council for Water, c/o 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ

PI49376

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A SCOTTISH WATER COMPANY

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RECEIVED
12 OCT 2022

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

Customer reference / invoice no [redacted]

Your reference: Map 20
Invoice / tax point date: 8 October 2022
Supply address: HOME FARM, SWALLOWS LANE HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85

3601 MAP 20
Analysis
Auth Staff LC Input Report
Exception E
Entry Paid 02/11/22 Amt Paid [redacted]

Your water services invoice

28 September – 3 October 2022 (5 days, average £0.56 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	

YOUR CHARGES THIS PERIOD (see page 2 for details)

Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment

A Actual meter read

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£ Ways to pay

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BACS Internet banking and BACS

Reference number: 2701510
Sort code: 30-00-02
Account number: 03029919
Account name: Business Stream
Please send your remittance advice to cashiers@business-stream.co.uk

Pay online

You can pay by credit or debit card instantly and securely online with my business stream or via our WorldPay site. Visit **business-stream.co.uk/online-payment**. You can also pay by post or at any bank. Visit **business-stream.co.uk** to find out how

The water experts

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Scottish Water Business Stream Limited, 7 Lochside View, Edinburgh, EH12 9DH. Registered in Scotland SC299132.
Ofwat (the Water Services Regulation Authority) is the regulator of the water sector in England and Wales. For more information visit www.ofwat.gov.uk

Your charges in detail

Meter number / meter size: 4A260190 KENT / 20mm

Water charges			Units	Rate	VAT	Charge
Fixed water charge						
Yearly fee £203.03	28 Sep 22 – 2 Oct 22		5 days	0.556247		[redacted]
Volumetric water charge						
Customer reading	3 Oct 22	3635				
Customer reading	28 Sep 22	3635				
= Volume used this period			0.00 m³			
Charges	28 Sep 22 – 3 Oct 22		0.00 m³	1.590400		
Total water charges						
Subtotal						
VAT						
Total charges this period						

A yearly fee for the upkeep of external pipes and pumps that supply water to your property.

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
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Need help?

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P1S052c

business stream
A SCOTTISH WATER COMPANY

business-stream.co.uk

Customer reference / invoice no [redacted]

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

REC'T 13 DEC

Your reference: Map 20
Invoice / tax point date: 3 December 2022
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85

Your water services invoice

3 October – 2 December 2022 (60 days, average £15.27 per day)

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	

YOUR CHARGES THIS PERIOD (see page 2 for details)

Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment of [redacted]

Estimated invoice

This invoice is based on an estimated read. If we receive an actual read, we will use it to calculate your next bill. You can submit your own readings, as long as it's safe to access your meter, on **business-stream.co.uk/meter-reading**. If your water is not provided by us, we will receive reads from your other supplier.

Property/Coda	3601	Description	MAP 20
Enterprise		Analysis	
Auth Staff	LC	Mgmt	Recha
Bank ac	F	Cr/Pay Ref	
Date Paid	15/12/22	Amt Pai	[redacted]

✓ RATES UPDATED SPREADSHEET

Ways to pay

Direct debit and eBilling
The simplest way to pay is by direct debit. It'll ensure you stay on top of bills and minimise paperwork. Visit **business-stream.co.uk/direct-debit** to sign up.

Call and Pay
Our automated system lets you call us 24/7 to make a payment over the phone by credit or debit card. Call us on 0330 123 2000.

Internet banking and BACS
Reference number: 2701510
Sort code: 30-00-02
Account number: 03029919
Account name: Business Stream
Please send your remittance advice to cashiers@business-stream.co.uk

Pay online
You can pay by credit or debit card instantly and securely online with my business stream or via our WorldPay site.
Visit **business-stream.co.uk/online-payment**. You can also pay by post or at any bank. Visit **business-stream.co.uk** to find out how.

The water experts

Unless otherwise agreed, Scottish Water Business Stream Ltd provides services to you in accordance with our standard terms and conditions, a copy of which is available here: www.business-stream.co.uk/EnglandWalesTerms. Copies are also available on request. Through your continued receipt and acceptance of our services, you are deemed to have accepted our standard terms and conditions.
Scottish Water Business Stream Limited, 7 Lochside View, Edinburgh, EH12 9DH. Registered in Scotland SC294924.
Ofwat (the Water Services Regulation Authority) is the regulator of the water sector in England and Wales. For more information, see: www.ofwat.co.uk

Your charges in detail

Meter number / meter size: 4A260191 KENT / 20mm

Water charges		Units	Rate	VAT	Charge
Fixed water charge					
Yearly fee £203.03	3 Oct 22 – 1 Dec 22	60 days	0.556247		[redacted]
Volumetric water charge					
Estimated reading	2 Dec 22	4190			
Customer reading	3 Oct 22	3635			
= Volume used this period		555.00 m³			
Charges	3 Oct 22 – 2 Dec 22	555.00 m³	1.590400		
Total water charges					
Subtotal					
VAT					
Total charges this period					

A yearly fee for the upkeep of external pipes and pumps that supply water to your property.

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
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A SCOTTISH WATER COMPANY

business-stream.co.uk

Customer reference / Invoice no [redacted]

RECEIVED
11 JAN 2023

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD
RH13 8LJ

Your reference: Map 20
Invoice / tax point date: 9 January 2023
Supply address: HOME FARM, SWALLOWS LANE, HORSHAM, RH13 8NN
Supply point ID: 3019481716W14
Our VAT number: 945 8508 85

Your water services invoice

2 December – 30 December 2022

YOUR ACCOUNT SUMMARY

Your previous balance	[redacted]
Payments received	
Your balance brought forward	
YOUR CHARGES THIS PERIOD (see page 2 for det	
Water services charges	
VAT	
Total charges this period	
Your new account balance	

A Actual meter read

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Not posted on Key as still in credit

Property/Code	Description
3661	MAP 20
Enterprise	Analysis
Auth Staff LC	Mgmt / Recng
Bank ac	Cr/Pay Ref
Date Paid	Amt Paid

£ Ways to pay

DD Direct debit and eBilling

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BACS Internet banking and BACS

Reference number: 2701510
Sort code: 30-00-02
Account number: 03029929
Account name: Business Stream
Please send your remittance advice to cashiers@business-stream.co.uk

Pay online

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Scottish Water Business Stream Limited, 7 Lochside View, Edinburgh, EH12 9DH. Registered in Scotland SC290312.
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Your charges in detail

Meter number / meter size: 4A260191 KENT / 20mm

Water charges		Units	Rate	VAT	Charge
Fixed water charge					
Yearly fee £203.03	2 Dec 22 – 29 Dec 22	28 days	0.55624		[redacted]
Volumetric water charge					
Customer reading	30 Dec 22	4015			
Estimated reading	2 Dec 22	4190			
= Volume used this period		-175.00 m³			
Charges	2 Dec 22 – 30 Dec 22	-175.00 m³	1.590604		
Total water charges					
Subtotal					
VAT					
Total charges this period					

A yearly fee for the upkeep of external pipes and pumps that supply water to your property

The charge for the recorded amount of water you've used, measured by your meter.

VAT on our charges
Most of our services are zero rated (Z) but some are standard rate (S) or outside scope (O). See **business-stream.co.uk/vat** for more information.

Need help?

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Online: Via our website business-stream.co.uk

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8 APR 2023

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0330 123 2000

For emergencies, please contact your:
Water wholesaler: Southern Water
Visit business-stream.co.uk/emergencies

[redacted]
Knepp Castle Est. & Home Farm
Estate Office
Knepp Castle
WEST GRINSTEAD RH13 8LJ

Property/Code	Description
Ent [redacted] 99900/000052	Analysis
Auth Staff	Mgmt / Rechg
Bank ac	Cs/Pay Ref
Date Paid	Amt Paid

Customer reference / invoice no [redacted]

Your reference: MAP 20

Invoice / tax point date: 30 March 2023

Supply address: KNEPP CASTLE HOME FARM HOME FARM SWALLOWS LANE, DIAL POST HORSHAM, RH13 8HN

Water supply point ID: 3019481716W14

Our VAT number: 945 8508 83

Your water services invoice

30 December 2022 - 29 March 2023 (90 days, average £12.94 per day)

Your account summary

Your previous balance	[redacted]
Payments received	
Your balance brought forward	

Your charges this period (see page 2 for details)

Water services charges	
VAT	
Total charges this period	

We look forward to receiving your payment o[redacted]

Pay this

Changes to your 2023/24 charges

Like all water retailers, we review our charges every year. As a result, you'll see some changes to the charges included in your bill from 1 April 2023. Find out more information at business-stream.co.uk/charges

Carbon consumption

Based on this period your annual carbon consumption is 977.97kgCO2e/yr, based on National Government statistics.

$1$1$$42/0$$$$$$$$/$$$$$$$$/$$$$$$$$/

Your charges in detail

Meter number / meter size: 4A260191 / 20mm

Water charges			Units	Rate	VAT	Charge
Fixed water charge						
Yearly fee £203.03	30 Dec 22 - 29 Mar 23		90 days	0.556247		
Volumetric water charge						
Actual reading	13 Mar 23	4553				
Actual reading	30 Dec 22	4015				
= volume used this period			538 m³			
Estimated reading	30 Mar 23	4716				
Actual reading	13 Mar 23	4553				
= volume used this period			163 m³			
Charges	30 Dec 22 - 12 Mar 23		538 m³	1.5904		
Charges	13 Mar 23 - 29 Mar 23		163 m³	1.5904		
Total water charges						
Subtotal						
VAT						
Total charges this period						

[redacted]

This is a fixed fee to cover the costs of providing you with a water supply and sewerage services to your property.

This is a charge for the amount of water you've used, as recorded by your water meter. The rate you are charged per m³ is set by your local water company. Find out more at www.ofwat.gov.uk/consumer-advice-landing-page/understanding-your-water-and-wastewater-bill/

Most of our services are exempt from VAT. [illegible]

4017 14/3/23

B 007852 2 / GA8/WS91 / PHU / 001 / 043492 / 259602 / 003960 / 18 / 000360 / 1 of 2 / 1



British Standard 8515:2009 Explained

BS 8515:2009 Rainwater Harvesting Systems - Code of Practice

This code of practice protects the public by ensuring consistency of quality, installation, testing and maintenance of Rainwater Harvesting systems for non-potable (non-drinkable) water applications in the UK.

The introduction of BS 8515:2009 means there is for the first time, clear guidance on what are the minimum acceptable standards Rainwater Harvesting companies and the people specifying their systems have to meet. By ensuring conformity across the industry, the standard will further strengthen the industry's reputation for producing high quality, reliable and efficient systems.

What does the British Standard cover?

BS 8515:2009 covers the design, installation, water quality, maintenance, and risk management of Rainwater Harvesting systems. The use of water butts and the design of system components are not covered but it does apply equally to new build and retrofit projects.

Why harvest rainwater?

Rising utility bills, reduction of running costs and environmental implications are just three reasons for investing in a Rainwater Harvesting system. 50% of domestic and up to 85% of non-domestic mains water can be replaced in this way. Rainwater Harvesting is a key component to reach compliance within the Code for Sustainable Homes to reduce overall water consumption. Additionally, rainwater re-use scores high accreditation in the Water Efficiency sector of the BREEAM schemes and can help with gaining planning permission by meeting site drainage requirements (ref Building Regulations Part H) as part of a sustainable drainage (SuDS) scheme.

What types of system are there?

Rainwater Harvesting systems fall into three main categories:

• Non-pressurised: where rainwater is gravity fed, via a header tank, to its point of use.

• Pressurised: where the water is pumped directly from the storage tank to the point of use.

• Combination: which combines elements of both direct pressure and gravity fed systems by using an internal control unit to supply boosted water on demand to points of use. The unit integrates a WRAS compliant means of safely topping up with mains water.

What design aspects need to be considered in order to comply?

The amount and intensity of rainfall; the size and type of roof or collection surface; and the

number and type of intended applications, both present and future, will all be considered as part of adhering to BS 8515:2009.

The size of the storage tank, which can be located underground or above ground, will also be calculated based on the formula in BS 8515:2009. The system designer should also take into consideration the client's requirements and site restrictions, such as shallow drainage, giving a more ‘detailed approach'. The collection surface has a significant impact.
For example, a green roof absorbs water, resulting in less run off and more discolouration than other roof types. The use of syphonic drainage can be an effective method of collecting the maximum amount of available rainwater, but will affect the system design due to the high flow rates. Care needs to be taken to ensure the water cannot stagnate, so the system, including the roof, guttering and pipework should be free draining and prevent contaminated water entering the system.

To comply with the British Standard the system has to feature filtration before the rainwater enters the "main body of stored water".
The filter system needs to meet strict criteria: covering its weather resistance, accessibility and efficiency. Water should also enter via a calmed inlet.

UV Disinfection

Most non-potable water use, such as flushing WCs and laundry, will not require the use of ultraviolet disinfection. The standard advises that when there is the potential for greater human exposure or in ‘high-care' environments, UV treatment may be beneficial. Systems with a third stage of fine filtration are key to ensuring that the UV disinfection system remains clean and therefore most effective.

Is the storage tank covered by BS 8515:2009?

Storage tanks, whether below or above ground, are covered by the standard. They need to be watertight, discourage microbial growth, avoid stagnation and be sited so not to allow conditions suitable for Legionella to develop. Underground tanks should be designed to suit traffic loadings and resist flotation. Above ground tanks should be sufficiently insulated to prevent the water from either freezing or warming.

How do I stop the recovered rainfall entering the public mains water supply?

BS 8515:2009 stipulates, that backflow prevention, providing category 5 protection, should be fitted upstream of or at the point where the two systems meet. This should be in the form of a Type AA or AB Airgap conforming to BS EN 13076 and BS EN 13077 respectively.

Do Rainwater Harvesting tanks need an overflow?

Yes, so that in time of really heavy rain, the excess water can drain away. The overflow should be designed to prevent backflow and stop vermin entering the system. The flow capacity of the outlet pipe on the overflow should be equal or larger than the inlet pipe's capacity.
A good design will allow the main storage tank to overflow at least twice a year to remove build up of floating sediment on the top of the stored water and maintain good water quality.

Why is a control unit necessary?

Basically, the control unit makes the user aware if the system is functioning effectively or not. The unit controls the pump(s), automatically activates the back-up water supply and provides a volt free outlet for linking to a building management system (BMS), where necessary.

Is the pipework for rainwater different to mains water?

All pipework used in the Rainwater Harvesting system should be in a contrasting colour, or material, to mains pipework and labelled in accordance with Annex C of BS 8515:2009. Pipework should not be blue, but green or black and green, and robust enough to withstand the pressure of the system and sized to provide the specified flow rates.

Who can install a Rainwater Harvesting system?

Installation of the system should be in accordance with the manufacturer's instructions and carried out by qualified personnel with regard to location and access to components for future maintenance and/or replacement.

Who can commission a Rainwater Harvesting system?

Only qualified people, authorised by the manufacturer, should commission a system. The system needs to be flushed and tested prior to handover. There should be no cross-connections in accordance with BS 6700 and all pipework and fittings need to meet BS 6700:2006, 6.1.12.3. Electrical wiring needs to comply with BS 7671.

Does the system require regular maintenance?

Routine and ongoing maintenance, in line with manufacturer's recommendations is the best way to ensure a system is reliable and effective.

FACT SHEET | Have your building Recycle Ready

With Hydraloop, you can recycle up to 95% of shower and bath water, as well as condensation water from air conditioning and optionally 50% of washing machine water. This enables you to reuse up to 85% of the total in-house water.
In order to install a Hydraloop system, make sure to be well prepared for plug-and-play installation. In this document, you'll find guidelines and plumbing information to make any building Recycle Ready and future proof for sustainable water supply.

INPUT & OUTPUT

Input sources	Grey water from showers, baths, air conditioning and optionally washing machines. **At any time: avoid grey water from hand basins, dishwashers, floor drain and kitchen sink.**
Output options	Toilets, garden, pool, washing machine, optional faucets for cleaning purposes. **At any time: label grey water faucets with a 'non potable water' sign.**

POSITIONING

Hydraloop vs input sources	If input sources are located on a higher floor than the Hydraloop system, you can make use of gravity for the input water. In other circumstances you'll need a lift pump. For Hydraloop Qualified lift pumps, see page 3.
Washing machine	If you want to use the washing machine recycle option for your laundry, we advise to install the Hydraloop system near the washing machine. You can only connect one machine.

CONDITIONS

Room specifications	Minimum height of the ceiling: 210 cm, 6.10" – Room temperature between 14-35° C | 57-95° F. **At any time: avoid direct sunlight on the Hydraloop system.**
Access to back up water	Tap water or rainwater
Electricity	100-230 Volt
Online access	Stable internet with working Wi-Fi connection
Washing machine water input	Only possible with Hydraloop washing machine add-on (sanitary lift pump included)

PIPING

Isolation	Isolate all pipes.
Input connection	Tie all incoming drains into a single pipe (75/50/40 mm | 3"/2"/1 ½") into the inlet (40 mm | 1 ½") on top of the Hydraloop system. Use riser pipes out of the system and branch them out to the output options.
Ventilation	Don't forget proper ventilation of the inlet pipe (75/50/40 mm | 3"/2"/1 ½") to support grey water flowing into the Hydraloop system without airlocks. Also provide sewer venting to ensure proper functioning of the Hydraloop system.
Bypass	Install appropriate bypass connections for maintenance
Grey water Identification	Label everything. Use color coding or large warning labels to designate that the pipes are running grey water.

INPUT CONNECTIONS

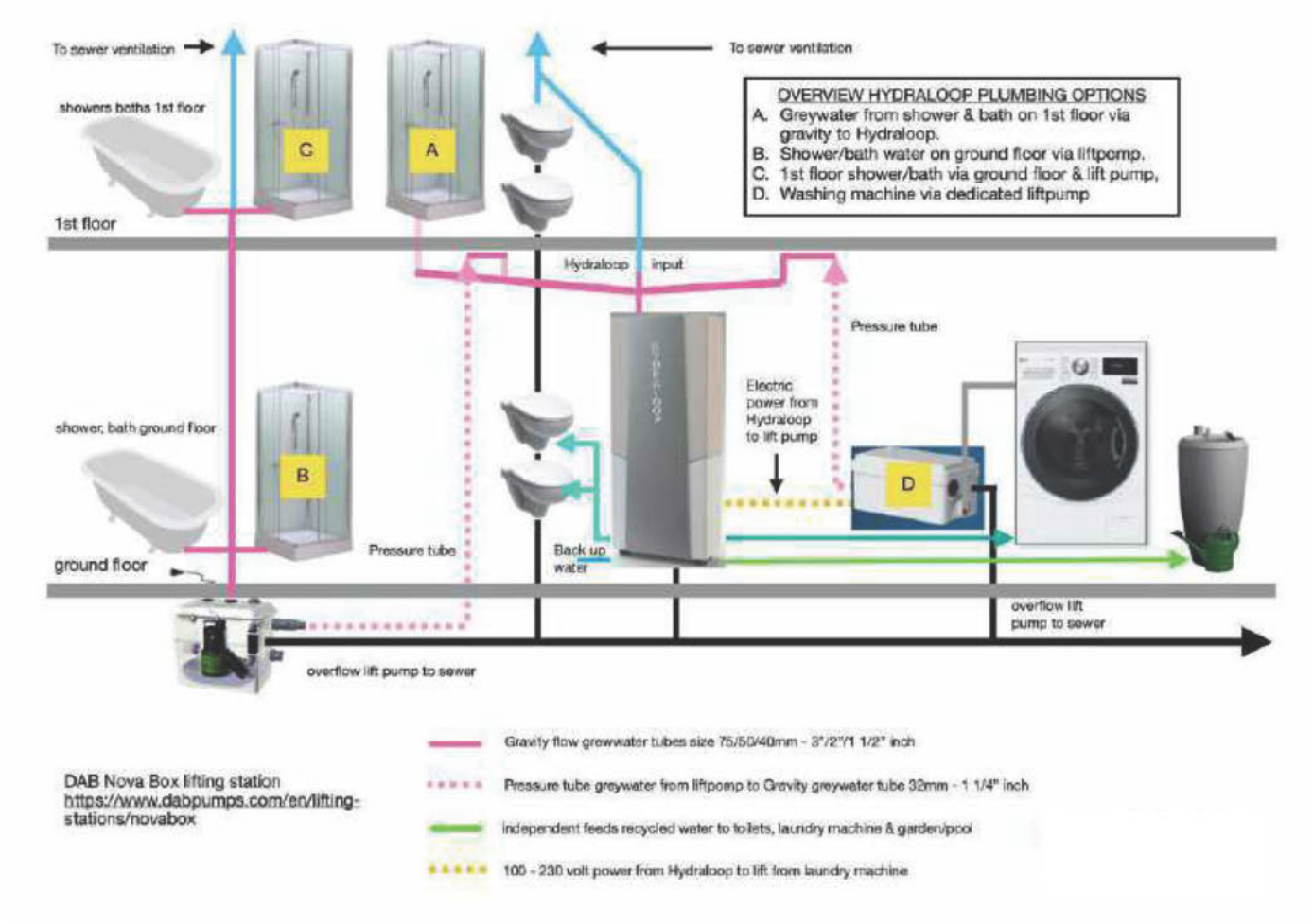
Grey water into Hydraloop	40 mm | 1 ½" connections
Backup water	½" male thread, minimum water flow of 20 liters | 5.3 gallons p/m, 29 psi / 2.2 bar. If pressure is higher (max. 55 psi / 4 bar), install expansion vessel and 50Mu mash filter.

OUTPUT CONNECTIONS

Wastewater to sewer	40 mm | 1 ½" connection to sewer – Sewer connection (75 to 50 mm| 3" to 2") with rubber manchet underneath or behind the Hydraloop system into floor or wall.
Recycled water to toilet	½" male thread – Prepare plumbing underneath or behind Hydraloop system. Connect with flexible hose.
Recycled water to washing machine	½" male thread – Prepare plumbing underneath or behind Hydraloop system. Connect with flexible hose.
Recycled water to garden/pool	½" male thread – Prepare plumbing underneath or behind Hydraloop system. Connect with flexible hose.

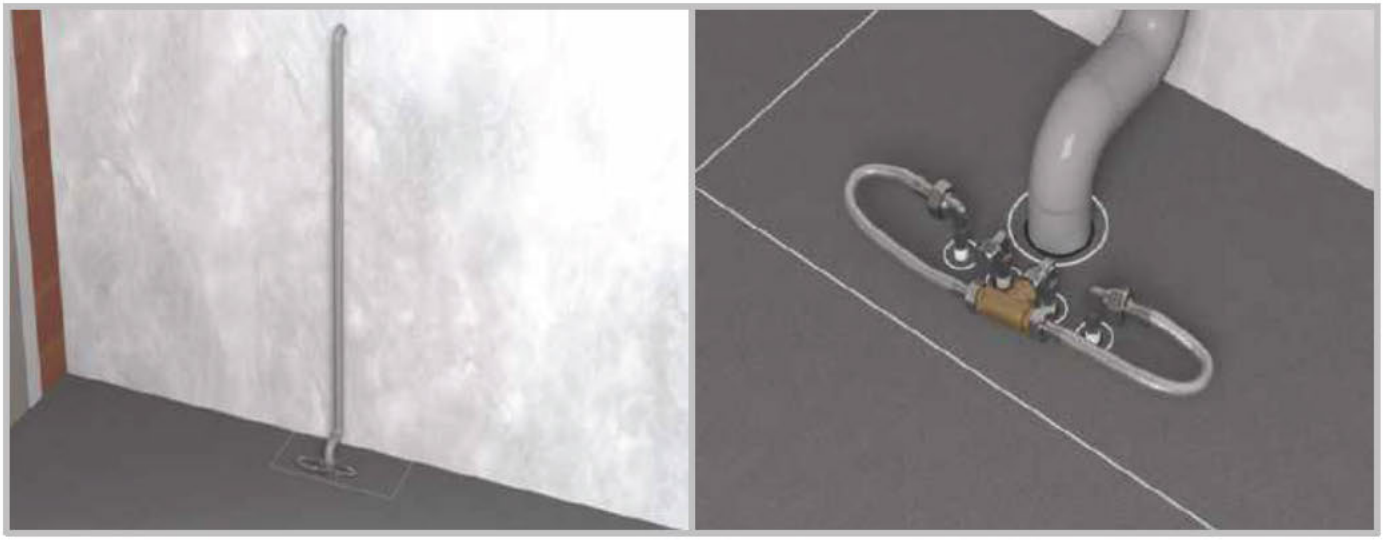
20201208 | This datasheet contains typical information specific to products manufactured at the time of its publication.
© Hydraloop Systems BV | Contents herein do not constitute a warranty.

SCHEMATIC OVERVIEW



WATER SUPPLY UNTIL INSTALLATION OF HYDRALOOP

OPERATION BEFORE INSTALLATION OF A WATER RECYCLING SYSTEM	When your building is Recycle Ready, you can install a (temporary) bridge connection from the input pipes to the sewer. This enables you to use showers and baths as usual, until a water recycling system like Hydraloop is installed.



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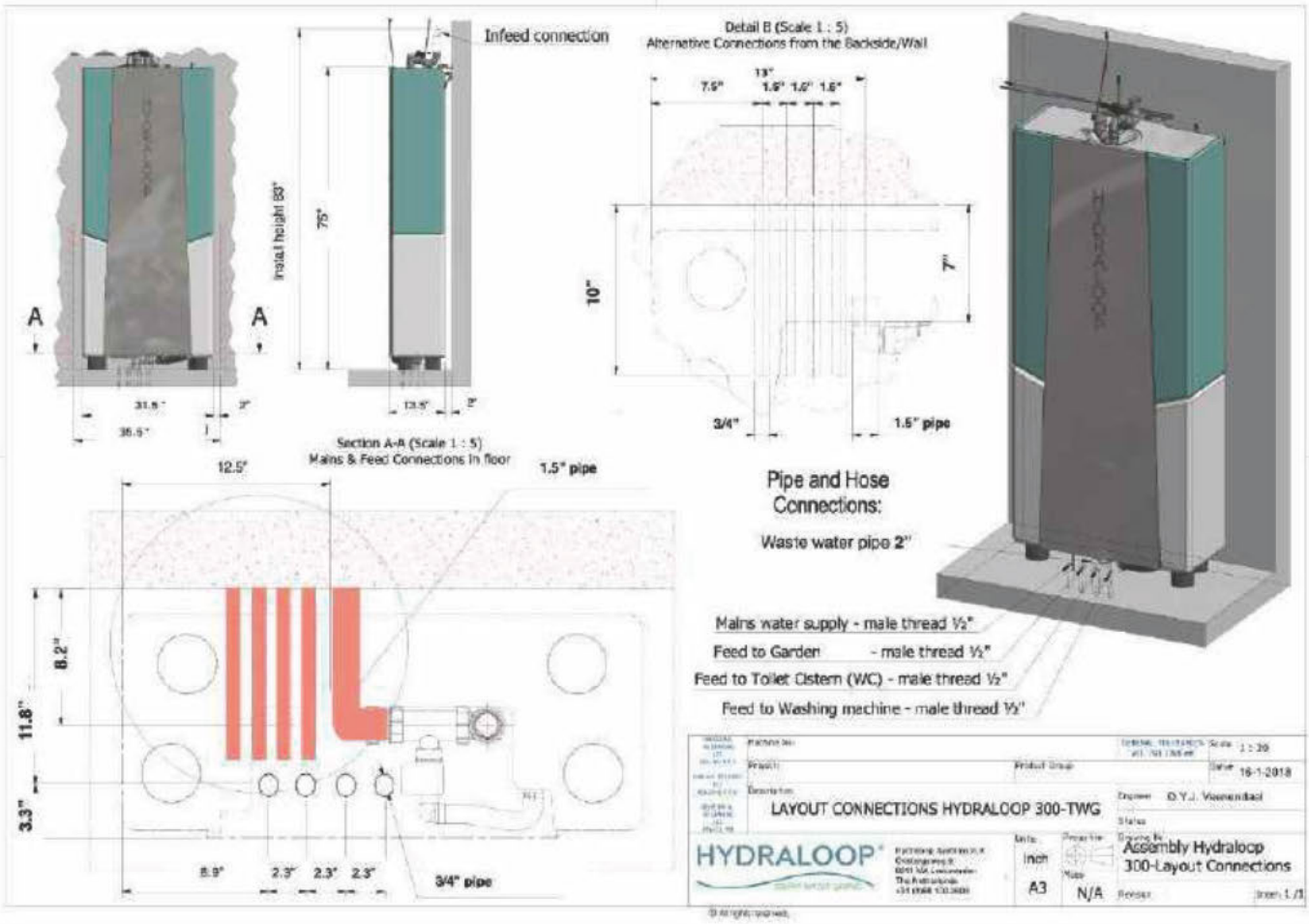
DIMENSIONS



HYDRALOOP 300 SPECIFICATIONS

Capacity	300 liters | 80 gallons
Family home	Up to 5 persons
Treatment capacity	530 liters | 140 gallons per day
Dimensions	80 cm wide, 34 cm deep, 187 cm high | 31 ½" wide, 13'4" deep, 74" high
Voltage	100/230 Volt, 24 Volt internal
Power consumption	20 watts during treatment. On average: 200 kWh/year per system
Average recycled water quality	non-potable water CBOD5 (mg/L) < 10 TSS (mg/L) <10 Turbidity (NTU < 5) E. coli (MPN/100ml.) < 14 PH (SU) 6.0 – 9.0
Noise Level	± 44 dB

HYDRALOOP QUALIFIED LIFT PUMPS

DAB Novabox 30/300	This lift pump is for installation in the crawl space underneath the floor 60.7 cm wide, 30.9 cm deep, 36 cm high | 23.9" wide, 12.2" deep, 14.1" high
DAB Genix VT030	This lift pump is placed on or partly in the floor. 45.6 cm wide, 17.8 deep, 34.6 cm high | 18" wide, 7" deep, 13.6" high
Connection pipes	Make sure the pressure tube from the lift pump is 32 mm | 1.26" to avoid excessive flow of water entering the Hydraloop system.

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VIDEO SUPPORT

Click any blue field to watch an instructional video that suits your individual situation.



ADDITIONAL INFORMATION

Please visit our website at www.hydraloop.com/technical, or mail your questions and/or technical drawings to recycleready@hydraloop.com. Our support team will be pleased to guide you through the process.

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(//cdn.shopify.com/s/files/1/0829/4323/products/platinindirectoverv
v=1585941658)









1500l Shallow Dig Domestic Rainwate Harvesting System 3000l, 5000l and 7500l

Capacity

~~7500l~~

System Type

~~Indirect (header tank)~~

Access Cover

~~Pedestrian~~

1 £2,849.00 **Add to Cart**

DESCRIPTION | **DOCUMENTATION** | **DELIVERY** | **REVIEWS**

This system is available for inspection at the Centre for Water Saving Technology. (https //www.freeflush.co.uk/pages/centre-for-water-saving-technology) We highly recommend inspecting this product, particularly the pump, as the main components are significantly higher quality than anything else on the market.

If you need assistance with tank sizing use our rainwater harvesting calculator here (https://www.freeflush.co.uk/pages/rainwater-harvesting-calculator) or our garden rainwater tank sizing blog here (https://www.freeflush.co.uk/blogs/freeflush-rainwater-harvesting-blog/how-much-wate do-i-need-to-water-my-garden-and-other-useful-watering-tips).

Four main rainwater harvesting packages are offered in four tank sizes and two lid options:

1. Garden Comfort Package for irrigation only

2. Direct Rainwater Harvesting System - the most cost effective solution. A submersible pump maintains pressure and delivers rainwater where i is required. A mains top up unit, tops up the tank if it runs low on rainwater.

3. Indirect Rainwater Harvesting System - the submersible pump tops up a header tank which drains by gravity to feed rainwater to where it is required. The header tank has a mains top up valve if rainwater runs low.

4. Eco Plus Rainwater Harvesting Package - An external pump ans console draws rainwater from the tank and deliver it to where it is required. If the tank is low on rainwater a small amount of mains water is delivered to the console and the pump continues to deliver this water.

1. Freeflush Garden Comfort Package

Garden Comfort scope of supply:

1. Platin® flat tank incl. 4 prefitted DN 100(110) lip seals
2. Tank cover suitable for pedestrian or vehicle loading depending on the version
3. Tank filter package for the garden consisting of:
    - Internal filter basket incl. suspension
    - Overflow siphon with integrated rodent guard
4. Garden-Comfort technical package consisting of:

- Integra INOX stainless steel submersible and suction pump incl. floating extraction setup
- 10m pressure hose 1"
- Internal water connection box
- External water connection box

2. Freeflush House Direct -Supply Package

- Simple & quick to install
- Submersible pump supplies harvested rainwater on demand to WCs, washing machine & external tap
- Mains-on-Tap unit tops up the water level in the Platin tank when rainwater levels are low to guarantee continued water supply
- The quiet & conveniently sized Mains-on-Tap unit will fit in a kitchen or utility cupboard for very low visual impact
- Innovative float sensor detection on Mains-on-Tap unit ensures that the underground tank is kept supplied with mains water but only the amount necessary to maintain supply to toilets and washing machine, leaving as much volume as possible in the tank to collect rainwater when available

House Direct scope of supply:

1. Underground tank (choice of tanks available, sizes vary according to property type)
2. Telescopic lid (choice of telescopic lid available, depending on tank location)
3. Filter (Minimax filter supplied in accordance with type of tank)
4. Submersible pump with floating water intake
5. Mains-on-Tap unit
6. Float sensor (connected from Mains-on-Tap unit to the underground tank)

- 100(110)mm diameter duct pipe (not supplied) to contain; float sensor cable, power cable for pump, also bringing mains water to undergroun tank as and when required

3. Freeflush House Indirect -Supply Package

The reliable domestic solution with a submersible pump and header tank system

- Simple & quick to install
- Submersible pump supplies harvested rainwater on demand to the header tank where it is then gravity fed to the WCs & washing machine
- The header tank controls the operation of the system and the supply of harvested rainwater and backup mains water to the WCs
- Dual valve system within the header tank prioritises rainwater supply over mains water, maximising the use of all available rainwater to save on mains water consumption
- Mains water switch over point is at a lower level in the header tank when rainwater is not available from the underground Platin tank
- Mains water backup supply is not reliant on power supply or pump pressure and therefore guarantees supply of water to WCs at all times

House Indirect scope of supply:

1. As per direct package
2. As per direct package
3. As per direct package
4. As per direct package
5. Header tank package
6. Float switch (connected from mains water backup unit to the underground tank)

- 100(110)mm diameter duct pipe (not supplied) to contain; float sensor cable, power cable for pump
- 100 (110) mm diameter drainage pipe (not supplied) connected from downpipes to the inlet at the top of the tank (all downpipes brought into one pipe for connection to the filter)
- 100mm (110) diameter pipe for overflow from the tank to mains drainage network or soakaway

4. Freeflush Eco Plus Package

The reliable domestic solution with a submersible pump and header tank system

- Simple & quick to install

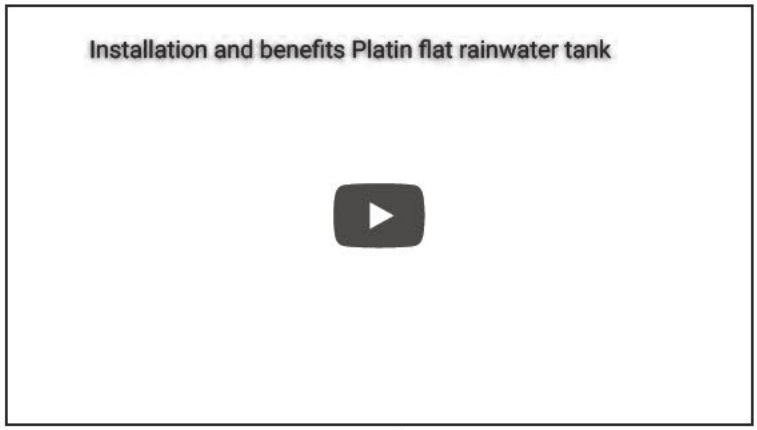
- Minimises the top up water required

Eco Plus scope of supply:

1. Underground tank (choice of tanks available, sizes vary according to property type)
2. Telescopic lid (choice of telescopic lid available, depending on tank location)
3. Minimax filter
4. Mains water feeding console 15/4

Optional accessories

- Non rertun valve if the overflow is connected to a sewer. These are available in in-line (https://www.freeflush.co.uk/products/back-flow-prevention-non-return-valve-110mm-160mm-200mm?_pos=1&_sid=682583625&_ss=r) or outlet versions (https://www.freeflush.co.uk/products/flap-valve-anti-flood-non-return-valve?_pos=3&_sid=7ba7aa601&_ss=r)
- Surface garden draw off points (https://www.freeflush.co.uk/products/external-surface-mounted-hose-connection-box?_pos=1&_sid=5f6182723&_ss=r)





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Platin House In-Direct Package - Data Sheet (https://cdn.shopify.com/s/files/1/0829/4323/files/Platin_House_In-Direct_Package.pdf?v=161495605
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Platin Silentio Package - Data sheet (https://cdn.shopify.com/s/files/1/0829/4323/files/Platin_Silentio_Package.pdf?v=1614956059)

RELATED PRODUCTS

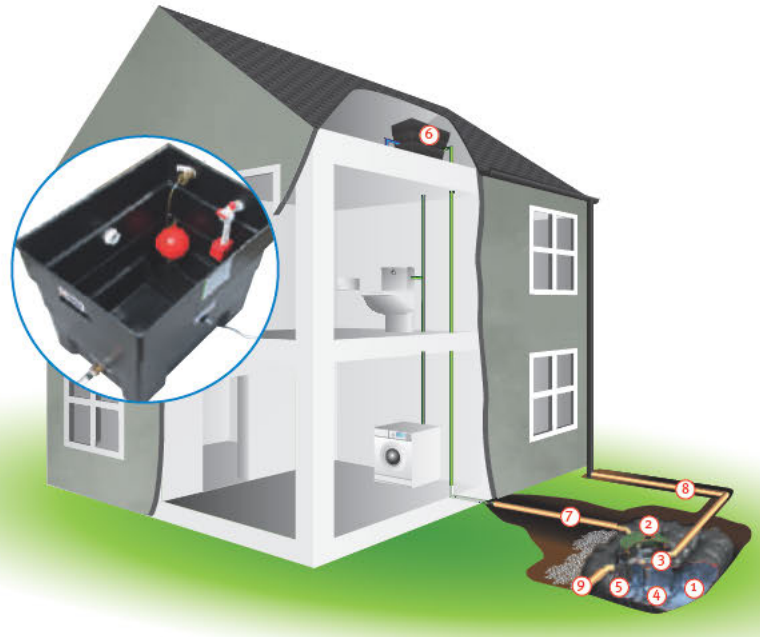








Platin House In-Direct Package



Platin House In-Direct package

- Simple & quick to install
- Submersible pump supplies harvested rainwater on demand to the header tank where it is then gravity-fed to the WCs & washing machine
- The header tank controls the operation of the system, supply of harvested rainwater and backup mains water to the WCs
- Dual valve system within the header tank prioritises rainwater supply over mains water, maximising the use of all available rainwater to save on mains water consumption
- Mains water switchover point is at a lower level in the header tank and becomes operational when rainwater is not available from the underground Platin tank
- Mains water backup supply is not reliant on power supply or pump pressure and therefore guarantees supply of water to WCs at all times

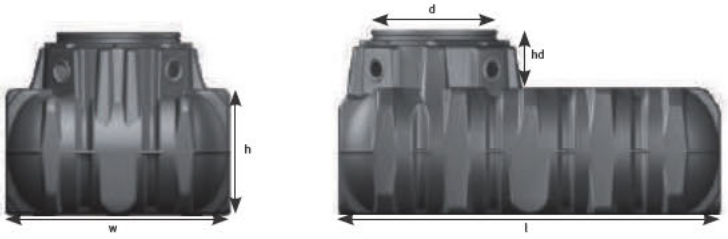
Scope of supply

1. Underground tank (choice of tanks available, sizes vary according to property type)
2. Telescopic lid (choice of telescopic lid available, depending on tank location)
3. Minimax filter supplied in accordance with type of tank
4. Submersible pump with floating water intake
5. Float switch (connected from mains water backup unit to the underground tank)
6. Header tank package

Supplied by others

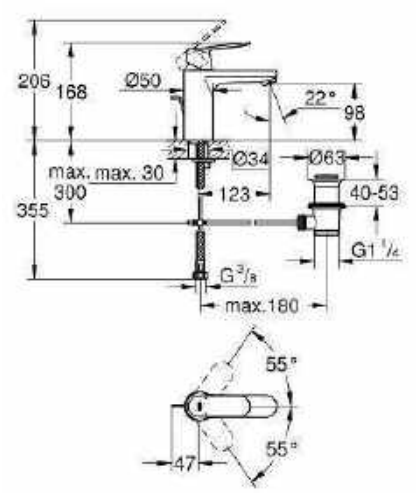
7. 100mm diameter duct pipe to contain; float sensor cable, power cable for pump
8. 100mm diameter drainage pipe connected from downpipes to the inlet at the top of the tank (all downpipes brought into one pipe for connection to the filter)
9. 100mm diameter pipe for overflow from the tank to mains drainage network or soakaway

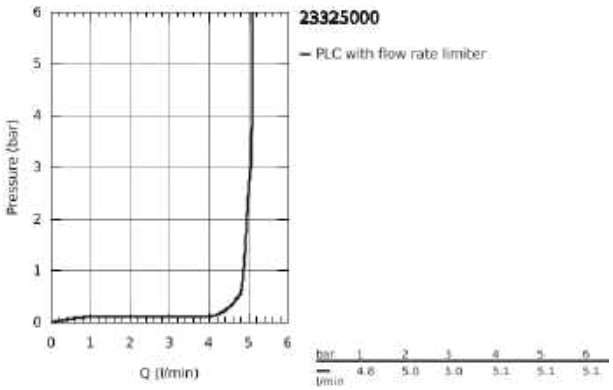
Dimensions/weight	1,500 litres (400 US gallons)	3,000 litres (800 US gallons)	5,000 litres (1,350 US gallons)	7,500 litres (1,980 US gallons)
Length (l)	2,100mm (82.6")	2,450mm (96.5")	2,890 (113.8")	3,600 (141.7")
Width (w)	1,250mm (49.2")	2,100mm (82.7")	2,300mm (90.6")	2,250mm (88.6")
Height of tank shoulder (h)	700mm (27.5")	735mm (28.9")	950mm (37.4")	1250mm (49.2")
Height of dome collar (hd)	315mm (12.4")	315mm (12.4")	315mm (12.4")	315mm (12.4")
Ø tank dome (d)	800mm (31.5")	800mm (31.5")	800mm (31.5")	800mm (31.5")
Weight	80kg	170kg	240kg	360kg



23 325 000 **EUROSMART COSMOPOLITAN EUROSMART COSMOPOLITAN BASIN MIXER 1/2" M-SIZE**







PRODUCT DESCRIPTION

- monobloc installation
- metal lever
- **GROHE SilkMove** 35 mm ceramic cartridge
- adjustable flow rate limiter
- **GROHE StarLight** chrome finish
- **GROHE EcoJoy** mousseur 5.7 l/min
- **GROHE FastFixation** installation system
- pop-up waste set 1 1/4"
- flexible connection hoses
- optional temperature limiter (46 375 000)

hansgrohe

Logis
Single lever kitchen mixer 260
Surfaces: **chrome** Art. no. : **71835000**



Description

product features

- ComfortZone 260
- swivel spout can be adjusted in 3 steps 110°, 150° or 360°
- handle can be positioned on the right or left
- normal spray
- flow rate 12 l/min
- operating pressure: min. 1 bar / max. 10 bar
- ceramic cartridge
- ⅜" connections

Article Details

Price excl. VAT	£ 118.33

Technology

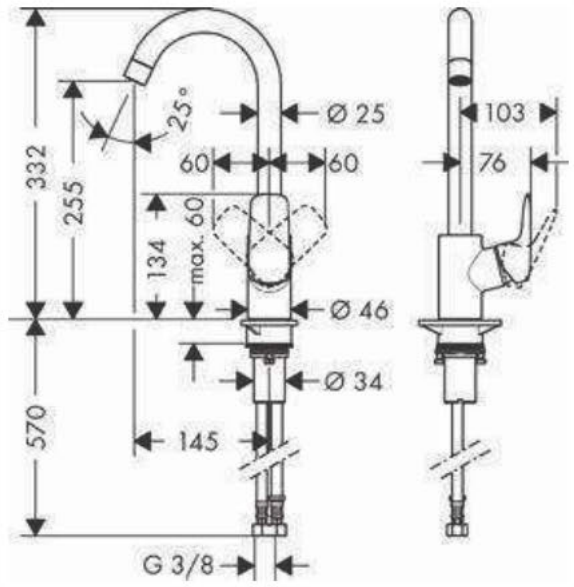




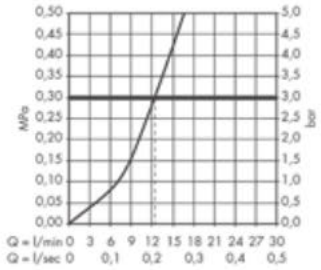
Product image



Scale drawing



Flowchart



Web www.savemoneycutcarbon.com
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Metro Close Coupled Modern Toilet + Soft Close Seat

Part No.: METCC

15 Reviews | Write a Review

£179.95

IN STOCK

Choose Quantity: 1 ADD TO BASKET

Estimated Delivery Cost

Standard Pallet Delivery (5-10 working days) - £29.94

Next Day Pallet Service (1 Working Day) - £44.94

Orders over £499 - **FREE STANDARD DELIVERY**

For delivery on Tuesday

Order in next

0day(s) | 0hrs | 43mins

EMAIL ME / SHARE

SPARE PARTS

Images Dimensions





Bundle Deals | Product Info | Product Dimensions | Delivery Costs | Customer Questions | Returns Info | Finance Options

Description

Metro Close Coupled Modern Toilet + Soft Close Seat

5 Years

To give your bathroom an up-to-the-minute look opt for this Modern Toilet from Metro. It's a close coupled toilet, meaning the cistern is attached to the bowl as a single unit. With a projection of 650mm, this neat and compact piece won't hog space in smaller bathrooms. It's supplied with a wrap-over seat that has soft-close hinges – great for preserving your peaceful bathroom ambience.

Product Details

Height: 820mm
Width: 375mm
Projection: 650mm
Colour/Finish: Gloss white
Material: Ceramic construction
Type: Close Coupled
Internal Overflow
Central, Dual push-button flush (4/6ltr Flush)
Supplied with soft close seat

You may also like



£59.95



£119.95

Semi flush-to-wall pan option is easier to install and conceals unsightly pipework
Compliance / Approvals
BS 3402: 1969: Specification for quality of vitreous china sanitary appliances
BS EN 33 WC pans with close coupled cistern, connecting dimensions
BS EN 997 WC pans with integral trap.
Water supply regulations 1999
Right hand water inlet on the cistern

All measurements are approximate

Images are for illustrative purposes only

Guarantee: 5 Year (seat guaranteed for 1 year)

Comprises

(1) Cistern & Fittings
(1) Close Coupled Pan
(1) Soft-Close Wrap Over Seat



£239.95

Victorian Plumbing Bundles





IN STOCK £179.95 + IN STOCK £219.95 + IN STOCK £44.95
~~Was £54.95~~

Total Price if Purchased Separately: £444.85
Bundle Saving: £4.45

Total Price: £440.40

View Bundle Details

ADD BUNDLE TO BASKET






IN STOCK £179.95 + IN STOCK £79.95 + IN STOCK £44.94 + IN STOCK £39.95

Total Price if Purchased Separately: £344.79
Bundle Saving: £3.45

Total Price: £341.34

View Bundle Details

ADD BUNDLE TO BASKET




IN STOCK £179.95 + IN STOCK £19.95

Total Price if Purchased Separately: £199.90
Bundle Saving: £2.00

Total Price: £197.90

View Bundle Details

ADD BUNDLE TO BASKET

Spare Parts | Customer Also Purchased | View More Modern Toilets | View Bathroom Accessories

Monza 1700 x 700 Single Ended Rectangular Bath

Part No.: MZSE177

| Be the first to Write a review

£199.95

IN STOCK

Choose Quantity: 1 ADD TO BASKET

Estimated Delivery Cost

Standard Pallet Delivery (5-10 working days) - £29.94

Next Day Pallet Service (1 Working Day) - £44.94

Orders over £499 - **FREE STANDARD DELIVERY**

Large Item - (What is this?)

For delivery on Tuesday
Order in next
0day(s) | 0hrs | 34mins

EMAIL ME / SHARE

Images Dimensions

Product Info | Product Dimensions | Delivery Costs | Customer Questions | Returns Info | Finance Options

Description

Monza Thin Edged 1700 x 700 Single Ended Rectangular Bath

5 Years

Add a modern touch to your bathroom with the Monza Single Ended Rectangular Bath in sleek gloss white. This 1700mm long single ended bath features an elegant narrow rim and a deep slope at the end for maximum comfort when reclining in the tub. The quality acrylic is extremely durable for use in even the busiest households. This Monza bath is easy to install and suitable for both built in and panel installation. Why not pair with a classic white or chic grey bath panel for a Scandinavian inspired look? This product does not come supplied with a waste.

This product does not come supplied with a waste or bath panels.

Product Details
Size: 1700 x 700mm
Product Type: Single Ended Bath
Material: Acrylic
Material Thickness: 3.2mm

1 £159.95

2 £129.95

Finish: Gloss White
Tap Holes: 0
Water Capacity (L): 173
Fully encapsulated base board for added strength
Deep slope at end offers comfort when reclining in bath
Bathtub features an elegant fine edge/rim
Finished in durable white acrylic to the highest standard, making it ideal for any bathroom.
Supplied with leg set
Choose from our range of bath panels to create the perfect look
Product pictures for illustrative purposes only.
All measurements are approximate

Guarantee: 5 Year

Please be aware that any tap holes have to be drilled by the customer.

3



£216.07

4



£149.95

5



£189.95

Customer Also Purchased | Recently Viewed | View More Standard Baths | View Bath Taps







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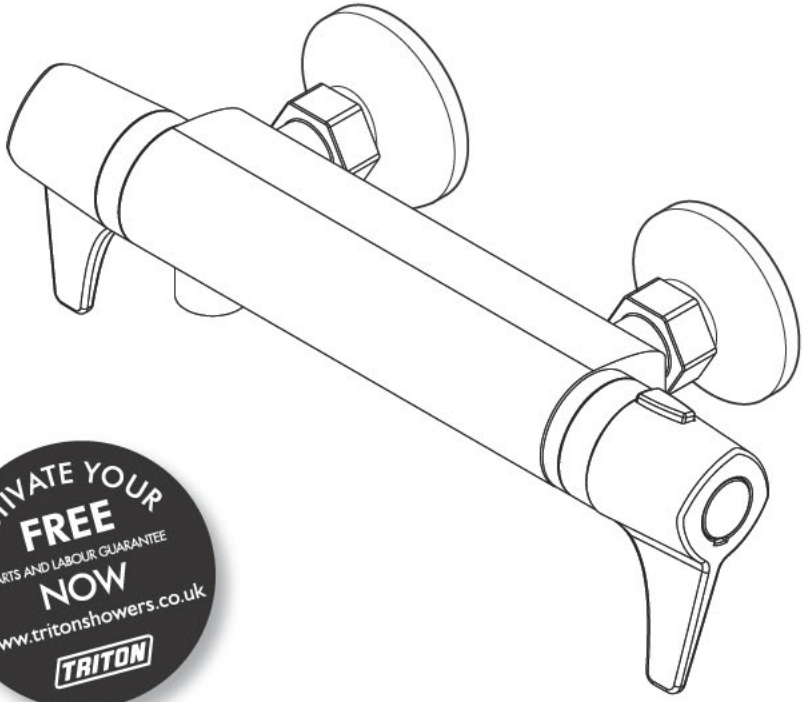
Inclusive Bar Mixer Shower



Installation and operating instructions

INSTALLERS PLEASE NOTE THESE INSTRUCTIONS ARE TO BE LEFT WITH THE USER

2180924A - March 2014

INTRODUCTION

This book contains all the necessary fitting and operating instructions for your mixer shower. Please read them carefully and read through the whole of this book before beginning your installation.

The shower installation must be carried out by a suitably competent person and in sequence of this instruction book.

Care taken during the installation will give a long and trouble free life from your mixer shower.

SITE REQUIREMENTS

The installation must be in accordance with water supply (water fittings) regulation 1999 and/or local Bylaws.

Water pressure requirements

Running water pressure:

Low presure*	-	0.1 bar min.
		1.0 bar max.
High pressure	-	0.5 bar min.
		5.0 bar max.

Maximum static water pressure:

Low & High pressure	-	10 bar

*This mixer shower is designed for high pressure systems found in the UK, but can be installed with low pressure gravity water systems with reduced flow rates.

For effective operation of the internal seals, the maximum static pressure must not be exceeded.

Pressure reducing valve

On sites where the running pressure is above 5 bar, the use of a suitably sized pressure reducing valve fitted in the cold mains supply pipe work can provide nominally equal pressures at the mixer shower.

Water minimum flow rate

For best performance within the specified running pressure range a minimum flow of 8 litres per minute should be available to both inlets.

Water temperature requirements

Recommended maximum:	= 65°C
Minimum hot water temperature:	= 55°C
Maximum cold water temperature:	= 25°C

NOTE: Valves operating outside these conditions cannot be guaranteed by the Scheme to operate as Type 2 valves.

A stored water temperature of 60°C is considered sufficient to meet all normal requirements and will minimise the effects of scale in hard water areas.

Water temperature adjustment and thermal safety

The mixed water temperature can be adjusted from cold through to a top limit which must be preset during installation with full anti-scald protection throughout the range (35°C to 40°C) providing the hot water temperature at the inlet remains 10°C above the outlet temperature.

Should there be a loss of flow to either incoming supply then- water from the shower will stop or be reduced until both supplies are restored.

SAFETY WARNINGS

a. **DO NOT** choose a position where the shower could become frozen.

b. **DO NOT** connect this mixer shower to any form of tap or fitting not recommended by the manufacturer.

c. **DO NOT** allow the inlet pressure or flow rates to operate outside the guidelines laid out in 'site requirements'.

d. **DO NOT** connect the mixer shower to a gravity hot supply and a mains cold supply (or vice versa).

PLUMBING REQUIREMENTS

DO NOT use jointing compounds on any pipe fittings for the installation,

DO NOT solder fittings near the mixer unit as heat can transfer along the pipework and damage the mixer valve.

DO NOT subject the unit to a water temperature above 80°C during installation, use, maintenance or disinfection.

IMPORTANT:

- The layout and sizing of pipework **MUST** be such that nominally equal inlet supply pressures are achieved and the effects of other draw-offs are minimised.
- The pipe-work should be installed such that other taps and appliances being operated elsewhere on the premises do not significantly affect the flow
- When connecting pipe-work avoid using tight 90° elbows; swept or formed bends will give the best performance.
- The hot water pipe entry **MUST** be made to the left-hand side inlet, marked HOT, 'H' or with a red/orange label.
- Suitable isolating valves (complying with Water Regulations and Bylaws) **MUST** be fitted on the hot and cold water supplies to the shower as an independent means of isolating the water supplies should maintenance or servicing be necessary.
- It is preferable to flush the pipe-work to clear the system of debris and check for leaks before connecting to the mixer.
- The mixer inlets contain removable filters that may become blocked if debris is not flushed through before fitting.

(Commercial applications)

- It is recommended that for all commercial applications, easily accessible, in-line filters are used to aid maintenance.

Hard water areas

a. If it is intended to operate the shower in areas of hard water (above 200-ppm temporary hardness), a scale inhibitor may have to be fitted. For advice on the scale inhibitor, please contact Customer Service.

b. For best performance the showerhead **MUST** be regularly cleaned to remove scale and debris.

WATER SYSTEM REQUIREMENTS

This mixer shower is suitable for:

- Gravity water systems
- Pumped gravity systems.
- Fully modulating type combination boilers
- Multi-point hot water heaters.
- Thermal storage,
- Unvented systems

When installing this mixer with a Combination or multi-point boiler, it may be necessary to install flow regulation.

Check that the appliance is capable of delivering hot water at a minimum switch-on flow rate of 3 litres per minute. At flow rates between 3 and 8 litres per minute, the appliance **MUST** be capable of raising the water temperature to 52°C (minimum).

Water temperature at the inlet of the mixer valve **MUST** remain relatively constant when flow rate adjustments are made (refer to the appliance-operating manual to confirm compatibility with this mixer shower).

Where thermal store systems and instantaneous gas water heaters are used, if excessive draw-off take place the appliance may not be able to maintain an adequate output temperature. This could result in the shower temperature becoming noticeably cooler.

Flow regulators can be fitted with high-pressure water systems to reduce flow rate and assist economy.

The hot supply temperature **MUST** remain a minimum of 10°C hotter than the required blend temperature for optimum performance.

APPROVALS

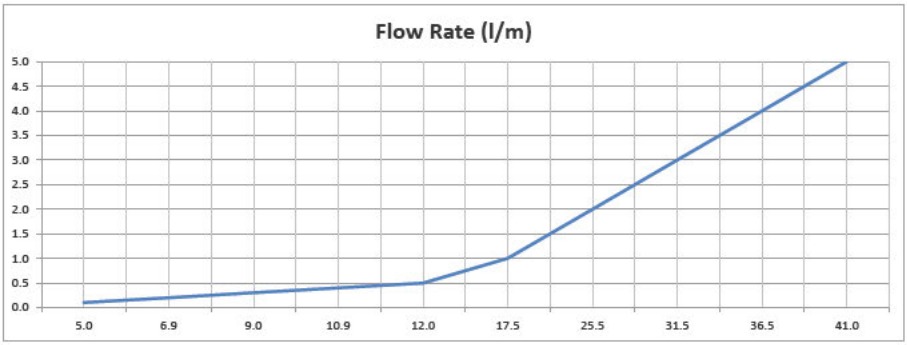
This mixer valve is designed to comply with: ***BS EN 1111**
On pressures above 0.5 bar.* ***WRAS

FLOW CHART

86004420 BAR VALVE XDL 5015 (NO KNOBS)

Flow Rate (l/m)	5.0	6.9	9.0	10.9	12.0	17.5	25.5	31.5	36.5	41.0
Pressure (bar)	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0

Conditions for test
Inlet temperatures comply with EN1111 requirements
Outlet temperature 38°C
Flow Control Fully Open
Open Outlet - No hose or showerhead connected



Supplier's name or trade mark:			**Beko**		
Supplier's address :			**Arctic S.A Gaesti, Dambovita, 13 Decembrie Street, No 210, Romania**		
Model identifier:			**WTK62051W 7155243000**		
General product parameters:					
Parameter	Value		Parameter	Value	
Rated capacity (kg)	6,0		Dimensions in cm	Height	84
				Width	60
				Depth	44
EEI_W	90,5		Energy efficiency class	E	
Washing efficiency index	1,04		Rinsing effectiveness (g/kg)	4,9	
Energy consumption in kWh per cycle, based on the eco 40-60 programme. Actual energy consumption will depend on how the appliance is used.	0,733		Water consumption in litre per cycle, based on the eco 40-60 programme. Actual water consumption will depend on how the appliance is used and on the hardness of the water.	43	
Maximum temperature inside the treated textile (°C)	Rated capacity	42	Remaining moisture content (%)	Rated capacity	53
	Half	31		Half	53
	Quarter	27		Quarter	53
Spin speed (rpm)	Rated capacity	1200	Spin-drying efficiency class	B	
	Half	1200			
	Quarter	1200			
Programme duration (h:min)	Rated capacity	3:17	Type	Free-Standing	
	Half	2:35			
	Quarter	2:35			
Airborne acoustical noise emissions in the spinning phase (dB(A) re 1 pW)	76		Airborne acoustical noise emission class (spinning phase)	B	
Off-mode (W)	0,50		Standby mode (W)	1,00	
Delay start (W) (if applicable)	4,00		Networked standby (W) (if applicable)	NA	
Minimum duration of the guarantee offered by the supplier :			**12 months**		
This product has been designed to release silver ions during the washing cycle			**NO**		
Additional information:					
Weblink to the supplier's website, where the information in point 9 of Annex II to Commission Regulation (EU) 2019/2023 is found: **http://support.beko.com**					

Installation Type	Unit of Measure	Capacity/Flow rate (1)	Use Factor (2)	Fixed use (litres/person/day) (3)	Litres/person/day = [(1)x(2)] + (3) (4)
WC (single flush)	Flush Volume (litres)		4.42	0.00	0
WC (dual flush)	Full flush Volume (litres)		1.46	0.00	0
	Part flush Volume (litres)		2.96	0.00	0
WC (multiple fittings)	Average effective flushing Volume (litres)	4.66	4.42	0.00	20.60
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	5.70	1.58	1.58	10.59
Bath (where shower also present)	Capacity to overflow(litres)	173.00	0.11	0.00	19.03
Shower (where bath also present)	Flow Rate(litres / minute)	8.00	4.37	0.00	34.96
Bath Only	Capacity to overflow(litres)		0.50	0.00	0
Shower Only	Flow Rate (litres/minute)		5.60	0.00	0
Kitchen/Utility room sink taps	Flow rate (litres/minute)	12.00	0.44	10.36	15.64
Washing Machine	(Litres/kg dry load)	7.17	2.1	0.00	15.06
Dishwasher	(Litres/place setting)	0.90	3.6	0.00	3.24
Waste disposal unit	(Litres/use)	☐Present	3.08	0.00	0
Water Softener	(Litres/person/day)		1.00	0.00	0
	(5)	Total Calculated use (litres/person/day) =SUM(column 4)			119.12
	(6)	Contribution from greywater (litres/person/day)			35.66
	(7)	Contribution from rainwater (litres/person/day)			75.28
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			7.44
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			12.4

Installation Type	Make/Model (mandatory)	Litres/Person/Day
WC (multiple fittings)	Metro Close Coupled Modern Toilet	20.60
Taps	EUROSMART COSMOPOLITAN Monobloc	10.59
Baths (shower(s) present)	Monza 1700 x 700 Single Ended Rectangular Bath	19.03
Showers (bath(s) present)	Triton EXE Lever Inclusive Bar Mixer Shower	34.96
Kitchen Taps	Hansgrohe Logis Single lever kitchen mixer 260	15.64
Washing Machines	Beko WTK62051W 7155243000	15.06
Dishwasher	Bosch 45cm slimline integrated	3.24
Contribution from greywater (litres/person/day)		35.66
Contribution from rainwater (litres/person/day)	75.28	75.28

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Terms and Conditions

System Requirements

Bath Fitting Type	Capacity to overflow(litres) (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
Are there any showers present?	☑		
1	173	1	173.00
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		1	
Total (Sum of all totals per fitting type) (e)			173.00
Average capacity to overflow(litres) = [(e)/(d)]			173.00
Maximum Capacity to overflow (litres) (f)			173.00
Weighted Average capacity to overflow(litres) = [(f)x0.7]			121.10
Calculate			

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Terms and Conditions
System Requirements

Type of Dishwasher	Litres per place setting (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
1	0.9	1	0.90
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		1	
Total (Sum of all totals per fitting type) (e)			0.90
Average litres per place setting = [(e)/(d)]			0.90
Maximum litres per place setting (f)			0.90
Weighted Average litres per place setting = [(f)x0.7]			0.63
Calculate			

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Terms and Conditions
System Requirements

Tap Fitting Type	Flow rate (litres/min) (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
1	12	1	12.00
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		1	
Total (Sum of all totals per fitting type) (e)			12.00
Average flow rate (litres/min) = [(e)/(d)]			12.00
Maximum flow rate (litres/min) (f)			12.00
Weighted Average flow rate (litres/min) = [(f)x0.7]			8.40

Calculate

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System Requirements

Tap Fitting Type	Flow rate (litres/min) (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
1	5.7	6	34.20
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		6	
Total (Sum of all totals per fitting type) (e)			34.20
Average flow rate (litres/min) = [(e)/(d)]			5.70
Maximum flow rate (litres/min) (f)			5.70
Weighted Average flow rate (litres/min) = [(f)x0.7]			3.99

Calculate

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Terms and Conditions
System Requirements

The rainwater collection calculation for New Dwellings		
Rainwater Collected	(a)	75.28
Rainwater demand	(b)	75.28
Rainwater savings* (c)=(a)/(b)*(b)=	(c)	0

Calculate

Rainwater collection

The water efficiency calculator for new dwellings methodology document available in Appendix A of The Building Regulations 2010 Part G (**here**) allows calculation of rainwater collection volume according to two methodologies, both of which are based upon BS8515:2009. These are outlined in Section A21 of the methodology document. The daily rainwater per person (litres) figure calculated by either method should be entered into row (a).

Rainwater demand

For any appliance (WC, or washing machine) where rainwater is to be used for supply to all of the appliances of that type within the property, the volume of water for rainwater demand can be taken directly from the relevant appliance row in Column (4). For any appliance (WC, or washing machine) where rainwater is to be supplied to only a proportion of the appliances of that type within a property, the volume of water for rainwater demand should be calculated according to an alternative methodology. This can be found in Section A26 of the water efficiency calculator for new dwellings methodology document (**available here**) and allows calculation of the water demand from only the appliances where rainwater is to be used. The total volume of rainwater demand calculated in accordance with either of the above methodologies (as appropriate) should be summed for WCs and/or washing machines and entered into Row (b).

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Shower fitting Type	Flow rate (litres/min) (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
Are there any Baths Present?	☑		
1	8	2	16.00
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		2	
Total (Sum of all totals per fitting type) (e)			16.00
Average flow rate (litres/min) = [(e)/(d)]			8.00
Maximum flow rate (litres/min) (f)			8.00
Weighted Average flow rate (litres/min) = [(f)x0.7]			5.60
Calculate			

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System Requirements

Type of washing machine	Litres per kilogram of dry load (a)	Quantity (No.) (b)	Total per Fitting Type =(a)x(b) (c)
1	7.17	1	7.17
2			
3			
4			
5			
6			
Total (Sum of all Quantities) (d)		1	
Total (Sum of all totals per fitting type) (e)			7.17
Average litres per kilogram of dry load = [(e)/(d)]			7.17
Maximum litres per kilogram of dry load (f)			7.17
Weighted Average litres per kilogram of dry load = [(f)x0.7]			5.02
Calculate			

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System Requirements

WC Type	Effective Flushing volume* (litres) (a)			Quantity (No.) (b)	Total per Fitting Type = (a)x(b) (c)
Multiple Fittings?	☑				
Dual Flush?	☑				
	Full Flushing volume x 0.33	Part Flushing volume x 0.67	**(a)**		
1	6	4	4.66	3	13.98
2	0	0	0	0	0.00
3	0	0	0	0	0.00
4	0	0	0	0	0.00
5	0	0	0	0	0.00
6	0	0	0	0	0.00
Total (Sum of all Quantities) (d)				3	
Total (Sum of all totals per fitting type) (e)					13.98
Average effective flushing volume (litres)=(e)/(d)					4.66
Calculate					

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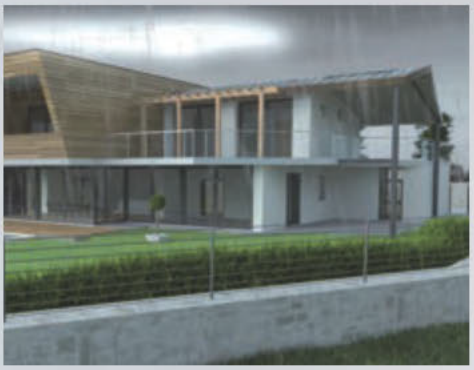
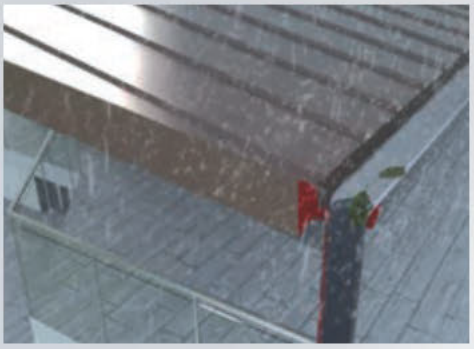
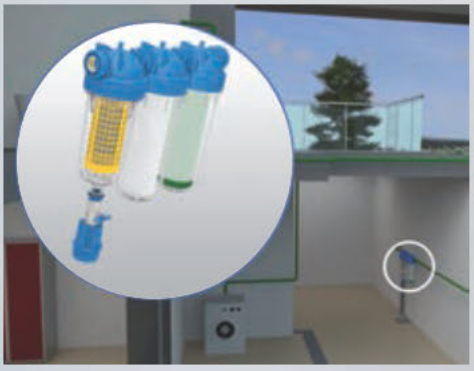
Terms and Conditions
System Requirements











HYDRA RAINMASTER

multi-stage self-cleaning filters

Range of multi-stage self-cleaning filters
especially designed for the filtration and treatment of rainwater,
in re-cycling applications

HYDRA RAINMASTER

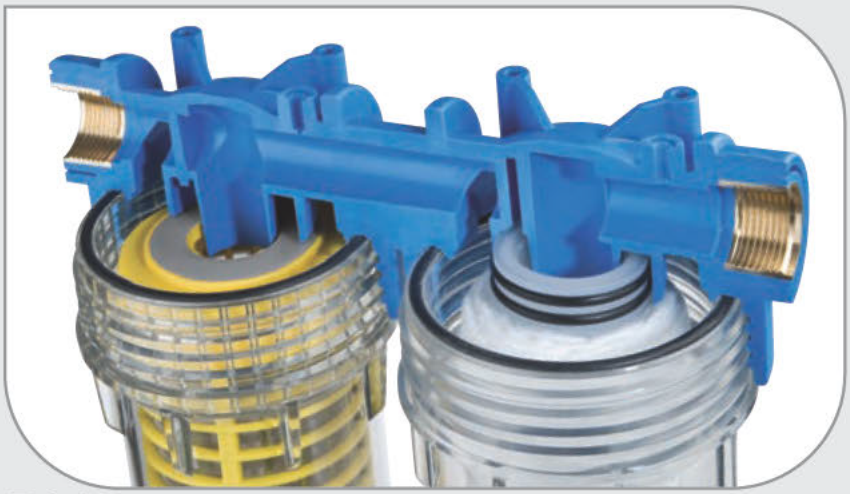
FOR CARTRIDGES SX and BX

Second and third stages housings fit to both standard SX (DOE) cartridges and to exclusive BX cartridges.

The full range of Atlas Filtri® SX and BX cartridges is suitable to Hydra multi-stage housings and provides the widest range of water filtration and treatment units.



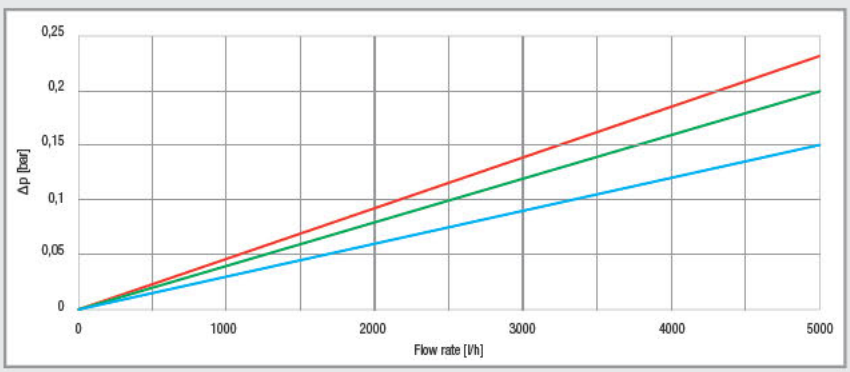
SX cartridges with antimicrobial flat seals. Standard seals for CB EC cartridge.



BX cartridges with 45 mm double o-ring collar.
Quick-fit connection for a perfect tightening.

FLOW RATE vs PRESSURE DROP Δp

Testing mode: 20°C, 3 BAR



ACCESSORIES INCLUDED



-X- spanner -DUO- wall bracket



-TRIO- wall bracket

DISCHARGE KIT



brass discharge ball-valve with gasket — plastic hose-holder



drain funnel

In compliance with the European Standard UNI EN 1717/2002: designed to prevent back-flow contamination by making all elements downstream the discharge vent to atmosphere (protection unit symbol: DC)



Filterfit - cartridge centering device

ACCESSORIES ON DEMAND



3/4" plastic nipple with o-ring
CODE LB7404012



3/4"/ 1" brass nipples with o-ring (pair)
CODE RB7404001 / CODE RB7404002



-KIT AUTO- CODE RE7120024
automatic discharge kit (see pages 186-187)



-UV 1200- CODE EA3500003 (see page 321)
-UV 2800- CODE EA3500004 (see page 321)

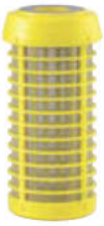


DUO TRIO

HYDRA RAINMASTER | DUO | 3/4" | RAH | CB EC | OT

FILTER MODEL	VERSION	IN / OUT	PREFILTER CARTRIDGE	POSTFILTER CARTRIDGE	THREADS TYPE
HYDRA RAINMASTER	DUO	1/2"	RAH	CB EC - CARBON BLOCK	OT - BRASS BSP *
		3/4"		LA - GRANULAR ACTIVATED CARBON	IN - PLASTIC BSP *
		1"			NPT IN - PLASTIC NPT **

Exclusive
HYDRA RAINMASTER filter cartridge with antimicrobial flat seal
for the self-cleaning stage.



RAH
stainless steel net cartridge, filtration at 90 micron.
CODE RA5000020



With dedicated **stainless steel AISI 302 cartridge spring.**
CODE RE7120040



-LUBRIKIT- single-dose lubricant for housing o-ring
CODE RE9020650

CERTIFICATIONS

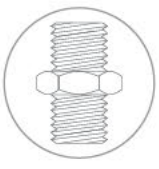
Housings are tested and certified under the most stringent procedures worldwide, **in compliance with DM 25 (Italy), with the sanitary certification ACS (France), EAC/Ghostreghistrazia (Russia) and WaterMark (Australia).**

SYMBOLS LEGEND

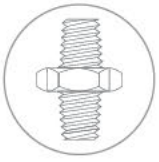
For domestic use

For technical and industrial use

Filter housings made in PET, a highly recyclable plastic, are manufactured with a proprietary procedure saving up to 60% of energy in injection molding compared with standard plastics. That is one of Atlas Filtri commitments to comply with Kyoto Treaty for the reduction of green house gas (CO_2) emissions in the atmosphere.



*** BSP**
parallel (cylindrical)
ISO 228

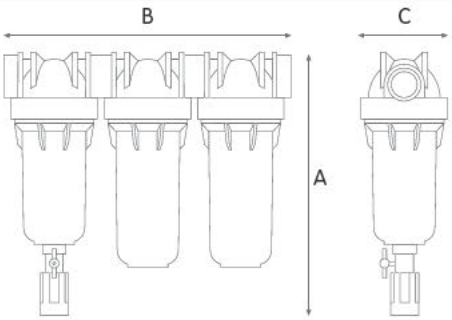


**** NPT**
tapered (conical)
ANSI/ASME B1.20.1

HYDRA RAINMASTER TRIO

WORKING CONDITIONS

Max working pressure:
BSP versions _____ 8 bar (116 psi)
NPT versions _____ 8,6 bar (125 psi)
Min working pressure _____ 1,8 bar (26 psi)
Max working temperature _____ 45°C (113°F)
Min working temperature _____ 4°C (39,2°F)





DRAIN FUNNEL
Back-flow preventing device
UNI EN 1717-11/2002

SPECIFICATIONS

Non-toxic materials, suitable for drinking water.
Head: reinforced polypropylene.
Bowl: PET.
O-rings: EPDM.
Breather-valve: body stainless steel, o-ring EPDM.
IN/OUT brass threads: CW 617 N brass.
Discharge ball-valve: CW 617 N brass nickel plated.
Drain funnel: reinforced polypropylene.





HYDRA RAINMASTER TRIO RAH with carbon block cartridge

HOUSINGS WITH BRASS BSP THREADS

CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095114	HYDRA RAINMASTER TRIO RAH CB/EC 1/2" OT	90	25	10	1/2"	3500	390	336	107
RA6095124	HYDRA RAINMASTER TRIO RAH CB/EC 3/4" OT	90	25	10	3/4"	4800	390	336	107
RA6095134	HYDRA RAINMASTER TRIO RAH CB/EC 1" OT	90	25	10	1"	5500	390	336	107

HOUSINGS WITH PLASTIC BSP THREADS

CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095115	HYDRA RAINMASTER TRIO RAH CB/EC 1/2" IN	90	25	10	1/2"	3500	390	336	107
RA6095120	HYDRA RAINMASTER TRIO RAH CB/EC 3/4" IN	90	25	10	3/4"	4800	390	336	107
RA6095135	HYDRA RAINMASTER TRIO RAH CB/EC 1" IN	90	25	10	1"	5500	390	336	107

HOUSINGS WITH PLASTIC NPT THREADS

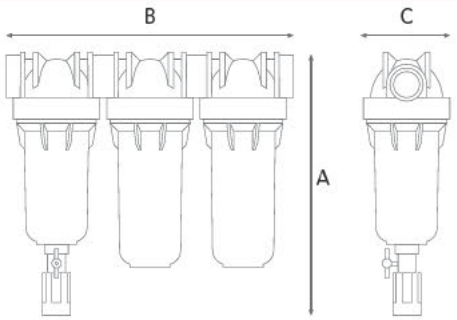
CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095126	HYDRA RAINMASTER TRIO RAH CB/EC 3/4" NPT IN	90	25	10	3/4"	4800	390	336	107
RA6095136	HYDRA RAINMASTER TRIO RAH CB/EC 1" NPT IN	90	25	10	1"	5500	390	336	107

For wound thread cartridge specifications see FA at page 215
For carbon block cartridge specifications see CB EC CTO at page 261

VARIANTS AVAILABLE ON MINIMUM QUANTITY:

- HYDRA RAINMASTER TRIO with RLH or RSH prefilter cartridges.

Some items in the list are subject to minimum order quantities and/or to longer delivery term.



WORKING CONDITIONS

Max working pressure:
BSP versions _____ 8 bar (116 psi)
NPT versions _____ 8,6 bar (125 psi)
Min working pressure _____ 1,8 bar (26 psi)
Max working temperature _____ 45°C (113°F)
Min working temperature _____ 4°C (39,2°F)



DRAIN FUNNEL
Back-flow preventing device UNI EN 1717-11/2002

SPECIFICATIONS

Non-toxic materials, suitable for drinking water.
Head: reinforced polypropylene.
Bowl: PET.
O-rings: EPDM.
Breather-valve: body stainless steel, o-ring EPDM.
IN/OUT brass threads: CW 617 N brass.
Discharge ball-valve: CW 617 N brass nickel plated.
Drain funnel: reinforced polypropylene.





HYDRA RAINMASTER TRIO RAH with GAC cartridge

HOUSINGS WITH BRASS BSP THREADS

CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095214	HYDRA RAINMASTER TRIO RAH LA 1/2" OT	90	25	-	1/2"	1800	390	336	107
RA6095224	HYDRA RAINMASTER TRIO RAH LA 3/4" OT	90	25	-	3/4"	2500	390	336	107
RA6095234	HYDRA RAINMASTER TRIO RAH LA 1" OT	90	25	-	1"	2800	390	336	107

HOUSINGS WITH PLASTIC BSP THREADS

CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095215	HYDRA RAINMASTER TRIO RAH LA 1/2" IN	90	25	-	1/2"	1800	390	336	107
RA6095225	HYDRA RAINMASTER TRIO RAH LA 3/4" IN	90	25	-	3/4"	2500	390	336	107
RA6095235	HYDRA RAINMASTER TRIO RAH LA 1" IN	90	25	-	1"	2800	390	336	107

HOUSINGS WITH PLASTIC NPT THREADS

CODE	MODEL	SELF CLEANING NOMINAL FILTRATION MICRON	SEDIMENT NOMINAL FILTRATION MICRON	POST CARTRIDGE NOMINAL FILTRATION MICRON	IN/OUT	FLOW RATE l/h	DIMENSIONS mm A	B	C
RA6095226	HYDRA RAINMASTER TRIO RAH LA 3/4" NPT IN	90	25	-	3/4"	2500	390	336	107
RA6095236	HYDRA RAINMASTER TRIO RAH LA 1" NPT IN	90	25	-	1"	2800	390	336	107

For wound thread cartridge specifications see FA at page 215
For GAC cartridge specifications see LA at page 253

VARIANTS AVAILABLE ON MINIMUM QUANTITY:

- HYDRA RAINMASTER TRIO with RLH or RSH prefilter cartridges.

Some items in the list are subject to minimum order quantities and/or to longer delivery term.

Subject: Quote #D3298
Date: Wednesday, 19 January 2022 at 10:54:37 Greenwich Mean Time
From: Freeflush Water Management Ltd.
To: peirre@purplepepper.uk

Freeflush Water Management Ltd. QUOTE #D3298

Check your quote

Complete your purchase or Visit our store

Order summary



Hydra-Rainmaster Trio Rainwater Filter × 1 — £219.00



1500l Shallow Dig Domestic Rainwater Harvesting System 3000l, 5000l and 7500l × 1 — £2,849.00
7500l / Indirect (header tank) / Pedestrian



Flow Regulator (restrictor) Insert 15mm compression fit × 1 — £2.49
2 / 15mm



Flow Regulator (restrictor) Insert 15mm compression fit × 1 — £2.49
4 / 15mm



Flow Regulator (restrictor) Insert 15mm compression fit × 1 — £2.49
6 / 15mm



Shower and tap tail water saving flow regulator × 1 — £6.99
8

	Shower and tap tail water saving flow regulator × 1 9	£6.99
	Shower and tap tail water saving flow regulator × 1 10	£6.99
	Hydraloop UK Grey Water Recycling System × 1 Chili	£3,999.00
	Complete Home Water Quality Test Kit × 1	£29.99
	Water Bacteria Test with E.coli detection × 1	£11.99
	Ecosoft P'ure Balance Drinking Water Filter × 1 Not Required	£199.00

Subtotal	£7,336.42
Shipping	£0.00
GB VAT	£1,222.77
Taxes	£1,222.77
Total	£7,336.42 GBP

Customer information

Shipping address

Billing address

Pierre Lombaard
RH20 1AB
United Kingdom

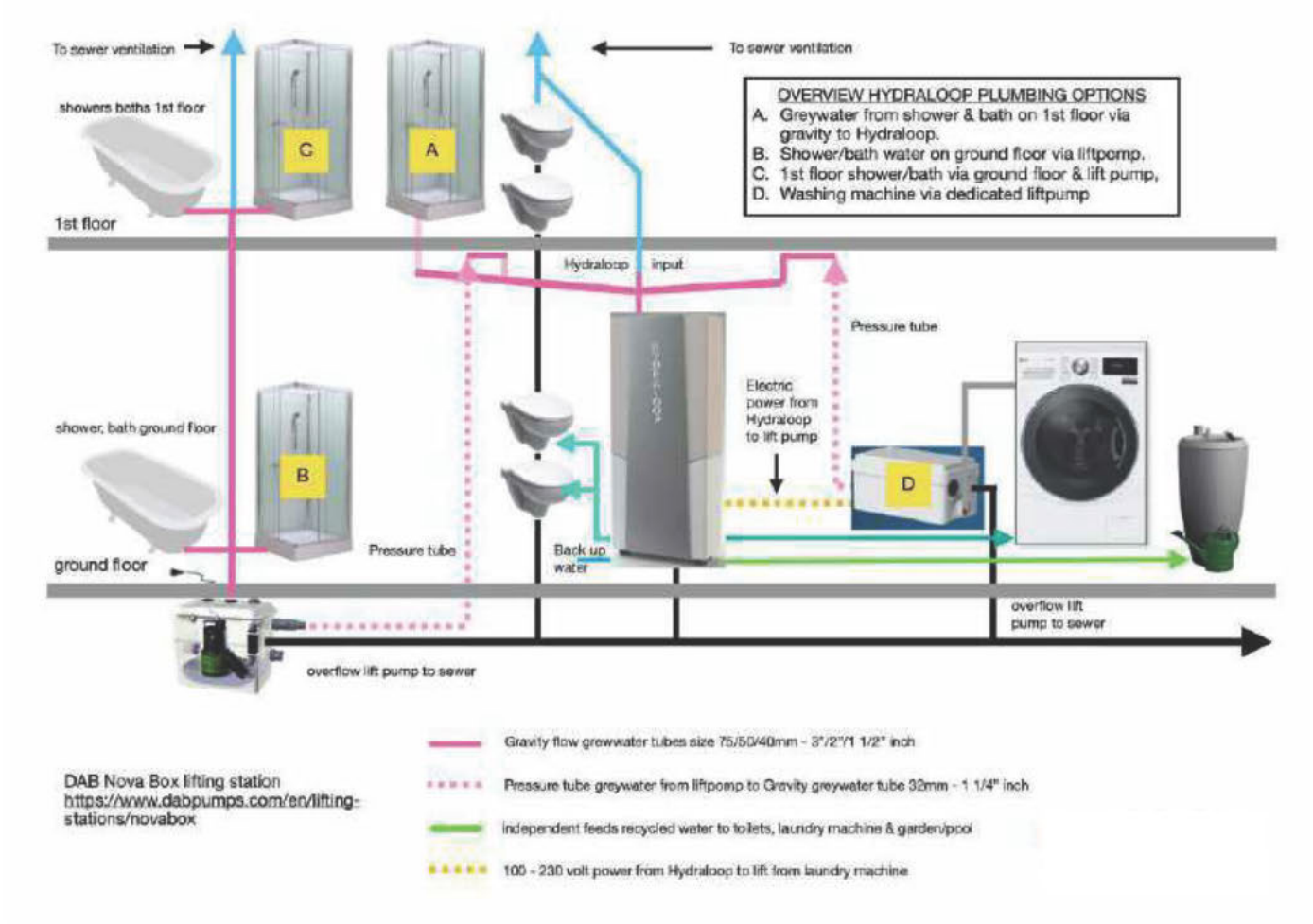
Pierre Lombaard
RH20 1AB
United Kingdom

Shipping method

TBA
£0.00

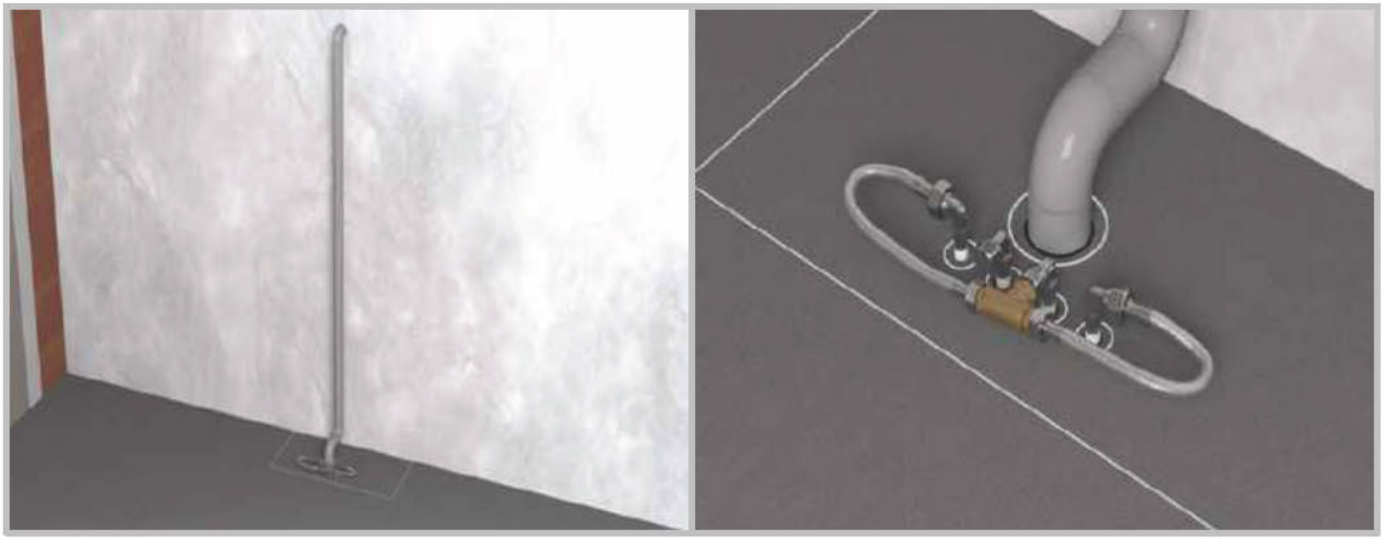
If you have any questions, reply to this email or contact us at sales@freeflush.co.uk

SCHEMATIC OVERVIEW



WATER SUPPLY UNTIL INSTALLATION OF HYDRALOOP

OPERATION BEFORE INSTALLATION OF A WATER RECYCLING SYSTEM	When your building is Recycle Ready, you can install a (temporary) bridge connection from the input pipes to the sewer. This enables you to use showers and baths as usual, until a water recycling system like Hydraloop is installed.



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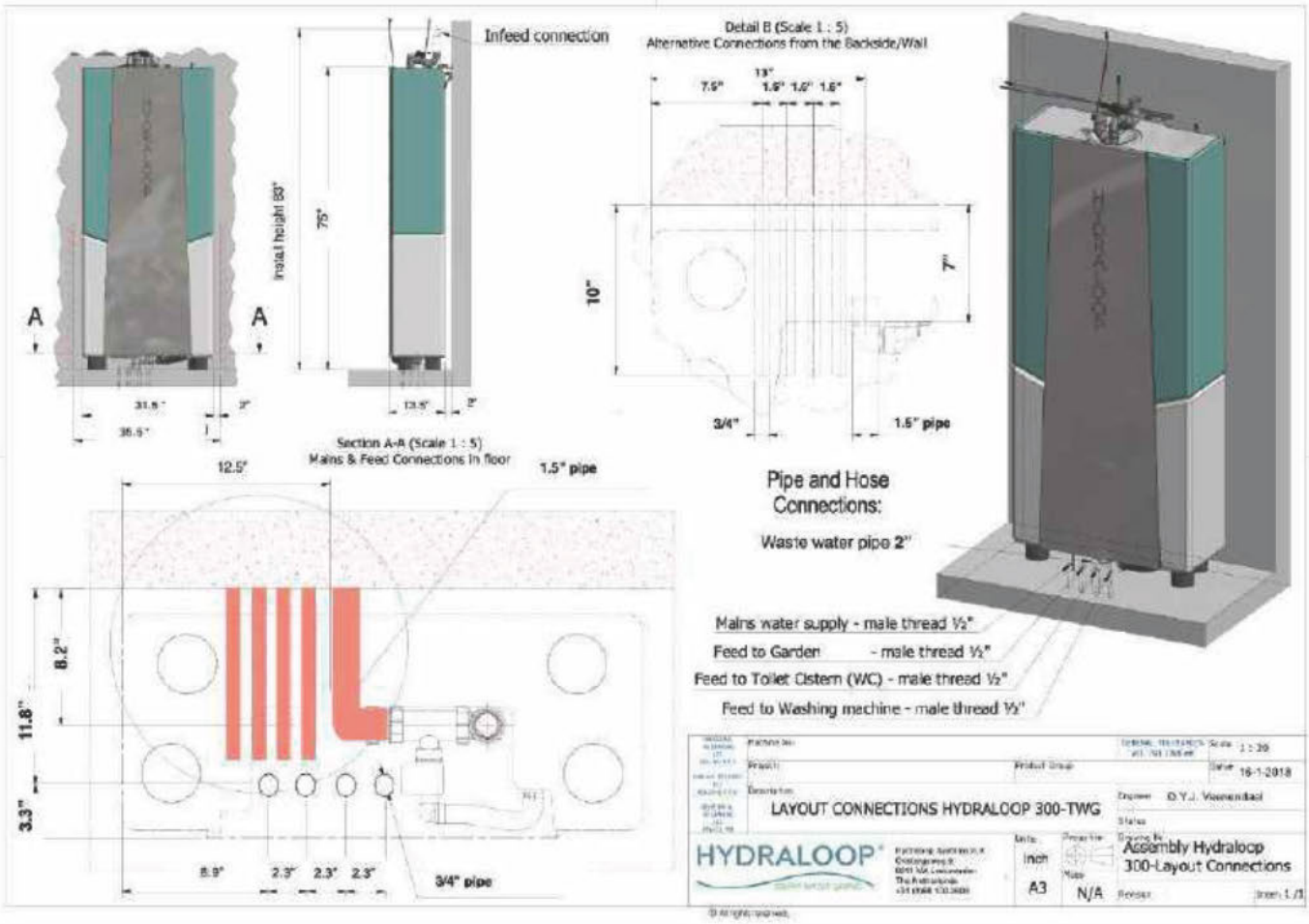
DIMENSIONS



HYDRALOOP 300 SPECIFICATIONS

Capacity	300 liters | 80 gallons
Family home	Up to 5 persons
Treatment capacity	530 liters | 140 gallons per day
Dimensions	80 cm wide, 34 cm deep, 187 cm high | 31 ½" wide, 13'4" deep, 74" high
Voltage	100/230 Volt, 24 Volt internal
Power consumption	20 watts during treatment. On average: 200 kWh/year per system
Average recycled water quality	non-potable water CBOD5 (mg/L) < 10 TSS (mg/L) <10 Turbidity (NTU < 5) E. coli (MPN/100ml.) < 14 PH (SU) 6.0 – 9.0
Noise Level	± 44 dB

HYDRALOOP QUALIFIED LIFT PUMPS

DAB Novabox 30/300	This lift pump is for installation in the crawl space underneath the floor 60.7 cm wide, 30.9 cm deep, 36 cm high | 23.9" wide, 12.2" deep, 14.1" high
DAB Genix VT030	This lift pump is placed on or partly in the floor. 45.6 cm wide, 17.8 deep, 34.6 cm high | 18" wide, 7" deep, 13.6" high
Connection pipes	Make sure the pressure tube from the lift pump is 32 mm | 1.26" to avoid excessive flow of water entering the Hydraloop system.

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VIDEO SUPPORT

Click any blue field to watch an instructional video that suits your individual situation.



ADDITIONAL INFORMATION

Please visit our website at www.hydraloop.com/technical, or mail your questions and/or technical drawings to recycleready@hydraloop.com. Our support team will be pleased to guide you through the process.

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Heads of Term
(Subject to Contract)

Agreement in respect of arrangements for
Water Neutrality requirements

Developer:	Coppice Hanger Ltd
Third Party Owner:	Ronald Phillip Naldrett and Jennifer Naldrett
Development Land:	Land at Coppice Hanger, Church Hill, Pulborough RH20 1AB being all that freehold land registered at the Land Registry under title number WSX428999 Also at Ransoms, Church Hill, Pulborough RH20 1AB being all that freehold land registered at the Land Registry under title number WSX116728
Third Party Land:	Land on the North East Side of Hole Street, Ashington forming part of the freehold land registered at the Land Registry under title WSX115085 and known more commonly as Big Plant Nursery, Hole Street, Ashington West Sussex, RH20 3DE
Operating Company:	Big Plant Nursery Limited (company registration number 04662307)
Nursery Business:	The nursery business being run by the Operating Company from the Third Party Land.
Water Harvesting System:	A water harvesting system with a minimum capacity of 20,000 litres including pumps and filters to supply water for irrigation purposes
Developer's Obligation:	At the Developer's sole cost the Developer shall install the Water Harvesting System on the Third Party Land. All works shall be carried out by the Developer in a good and workmanlike manner, using good quality materials, in accordance with any requisite statutory consents and to the reasonable satisfaction of the Third Party Owner and the Operating Company. The exact location of the main Water Harvesting System apparatus shall be as per agreement between the Developer, Third Party Owner and Operating Company (each acting reasonably).
Operating Company Obligations:	The Operating Company shall allow the Developer access to the Third Party Land for the purposes of installing the Water Harvesting System;

	The Operating Company shall covenant with the Developer, for the benefit of the Development Land, that following the installation of the Water Harvesting System the Operating Company shall utilize fully the Water Harvesting System for the benefit of the Nursery Business. If required by the Developer the Operating Company shall agree to enter into a section 106 planning agreement confirming the terms of the aforesaid obligations.
Third Party Owner's Obligations:	The Third Party Owner shall allow the Developer access to the Third Party Land for the purposes of installing the Water Harvesting System. The Third Party Owner shall covenant with the Developer, for the benefit of the Development Land, that following the installation of the Water Harvesting System they will procure that they are or any occupier of the Third Party Land utilities the Water Harvesting System in perpetuity. If required by the Developer the Third Party Owner shall agree to enter into a section 106 planning agreement confirming the terms of the aforesaid obligations. The Third Party Owner shall also assist, at the Developer's costs, the Developer preparing and submitting to the Local Authority a "water neutrality offsetting strategy" in support of the Developer's proposed development of the Development land.

Signed: ……
For and on behalf of the Developer

Date:

Signed: ……
For and on behalf of the Third Party Owner

Date:

Signed: ……
For and on behalf of the Operating Company

Date: