Water Neutrality Statement

For Horsham District Council

Land To Rear of No 8 Station Road Billingshurst RH14 9RE

Proposed Three Bedroom Two Storey Dwelling

On Behalf of The Applicant: GPR Building Contractors Ltd

1. Introduction

This report has been produced to justify the construction of a proposed new 3 bed residential dwelling that sits to the rear of No 8 Station Road, Billingshurst.

In the pages that follow, we will outline the proposed strategies and initiatives aimed at achieving water neutrality within the Horsham District, guided by the principles of holistic water management.

NB As a baseline water consumption values need to meet Building Regulation Part G amount of 125L/pp/day with view to meeting the optional requirement (imposed as part of the process of granting planning permission) of 110L/pp/day optional is for internal water consumption. However the applicant would be happy to accept the Local Plan target of 100L/pp/day as a condition of approval but would strive to future proof the property by improving the water consumption (hence the notional target for internal water usage of 85L/pp/day)

Read with dwg nos 18415_3_200001A, 2A and 3A

2. **Water Efficiency Measures**: Reducing the water usage to a baseline Internal Water Consumption 85 l/pp/day

Where the proposed water consumption across the plot is higher than a neutral consumption, we must first consider reducing water consumption in the proposed development through installing more water efficient fixtures and appliances. Using the principles of the Part G, or BREEAM water calculators, as a base has helped to demonstrate the savings being made. Where highly efficient appliances are to be installed, details of an appliance that meets that high standard of water consumption have been submitted to demonstrate the efficiencies are achievable. (*see Appendix A*)

Maximising the water efficiency of toilets, taps, showers, baths, washing machines & dishwashers. An indicative table of the new water consumption values that meet the requirements shows the basis of how this can be achieved.

Installation Type		**Water Capacity/Flow Rate**	
		To achieve 110 l/p/d	**To achieve 85 l/p/d**
WC	Full flush volume	6 litres/flush	6.0 litres/flush
	Part flush volume	4 litres/flush	4.0 litres/flush
Bath		150 litres	130 litres
Basin tap		5 litres/min	3 litres/min
Shower		8 litres/min	4/5 litres/min
Kitchen tap		6 litres/min	4 litres/min

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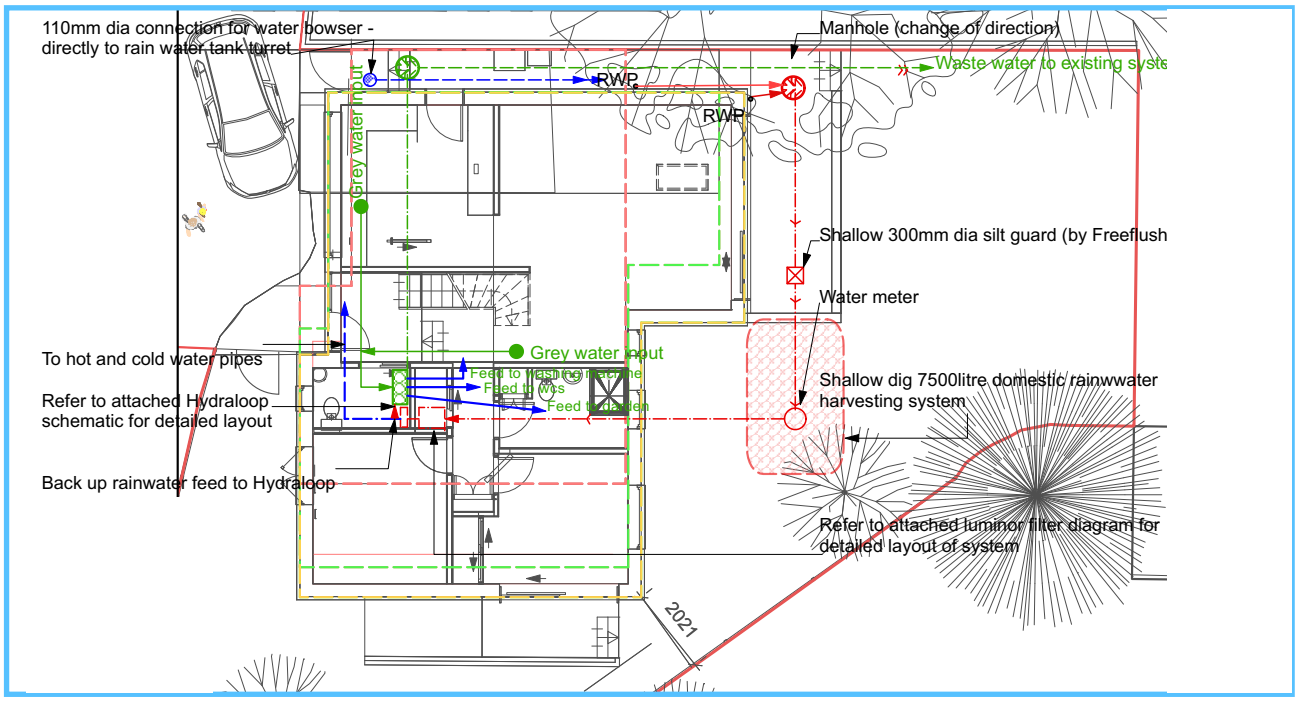
Dishwasher		1.25 litres/place setting	0.68 litres/place setting
Washing machine		8.17 litres/kg	8.17 litres/kg

With reference to the extract of proposed plan 3_200003A the following table shows the proposed layout of water fixtures and fittings;.



Installation Type		Nos of Fittings		Water Capacity/ Flow Rate	Sub totals	Totals
				To achieve 85 l/p/d		
Ground Floor						
Kitchen						
	Sink	1		4 litres/min		
	Dishwasher	1		0.68 litres/place setting		
Utility Cupboard						
	Washing machine/drier	1		8.17 litres/kg		
Bathroom						
	WC	1	Full flush volume	6 litres/flush		
			Part flush volume	4 litres/flush		
	Basin	1		3 litres/min		
	Shower	1		4.71 litres/min		
First Floor						
Ensuite (x 2)						
	WC	2	Full flush volume	6 litres/flush		
			Part flush volume	4 litres/flush		
	Basin	2		3 litres/min		
	Shower	2		4.71 litres/min		

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The Water Neutrality Calculator (in Section 5) shows that Internal Water consumption in the proposed new dwelling can be reduced to 85L/pp/day and this represents the applicant's target

Now all efficiency opportunities have been explored, water re-use through recycling grey water and rain water harvesting should be considered.

3 Reduction Management - Greywater

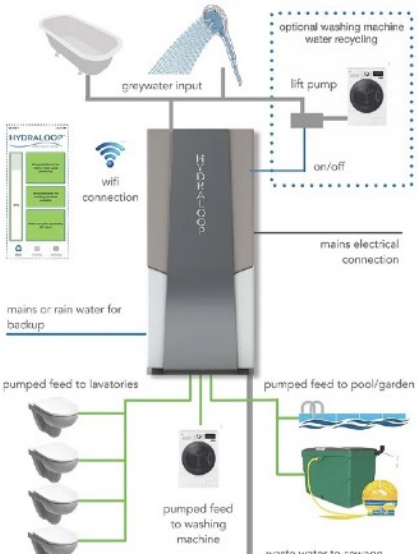
Historical offsets would comprise of the garage and romany caravan (permanently sited) to No 8 Station Road (see D and A Statement). These would drive the plot an offset of some 85L/pp/day (42.231m2 x 0.9 x 858.70 / 365/4 = **22.35L/pp/day** which would more than cover minimum External Water Consumption for example).

For the sake of clarity this calculation has not included any fallback evidence from planning permission refs: DC/18/2554 , DC/17/1767 , and DC/14/2408 and has started from a zero base.

Consideration of both grey water and rainwater recycling is necessary to produce a neutral use of water.

Sited to the rear of the Ground Floor Cloak Room a Hydroloop H300 UK Grey Water Recycling System is proposed with inlet diverter/washing machine option collects, cleans, and re-uses the water **FROM** showers, baths, washing machines, air conditioning units and hand basins.







The recycled water is clean, clear, safe, and disinfected. It can be re-used FOR toilet flushing, washing machines, garden irrigation, and topping up swimming pools. Recycled water is clean, clear, safe & certified, and complies with international standards and contribute towards sustainable and off-grid living.

NB DAB Genix VT 030 lift pump will be required as it is proposed to be sited on the Ground Floor adjacent to the Bathroom.

In the Part G calculations (see Section 5 below) the unit has only been used for wc's and the washing machine. The internal grey water contributes **37.76 L/pp/d*** and therefore reduces the baseline internal rain water contribution to **47.25 L/pp/d.**

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***NB A direct feed can be connected to the Hydraloop from the rain water harvesting system thus increasing its capacity**

4 Reduction Management - Rainwater Harvesting.

All the above loadings and those within this section have followed the guidelines for calculation from Building Regulations Approved Document G (see Section 5). The calculator has been supported with photographs of typical fixtures and fittings readily available (Appendix A) , and an explanation of the methodology used to calculate the flow rates. Actual performance data has been provided by Freeflush Water Management.

Based on extrapolated 2011 census data for Horsham District, average occupancy rates are as follows:

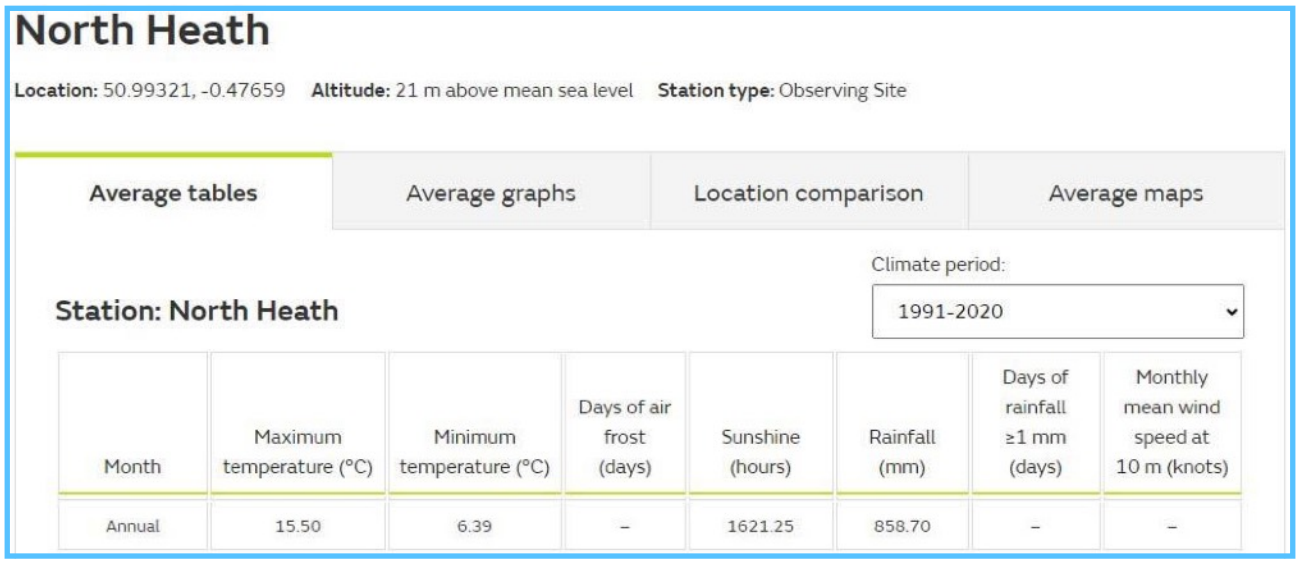
Two-bedroom dwellings: 1.88 occupants
Three-bedroom dwellings: **2.47 occupants**

Roof Collection of Rainfall

Rainfall will be collected from the new dwelling roofs, the catchment area of which amounts to 120.3 square metres.

Source: https://en.climate-data.org/europe/united-kingdom/england/horsham-6550/

Average annual rainfall in Horsham district for period 1991-2020 was **858.70mm**
On average the wettest month is 78mm and the driest is 48mm.



North Heath

Location: 50.99321, -0.47659 **Altitude:** 21 m above mean sea level **Station type:** Observing Site

Average tables | Average graphs | Location comparison | Average maps

Climate period: 1991-2020

Station: North Heath

Month	Maximum temperature (°C)	Minimum temperature (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)	Days of rainfall ≥1 mm (days)	Monthly mean wind speed at 10 m (knots)
Annual	15.50	6.39	–	1621.25	858.70	–	–

Calculated average annual rainfall (figures taken from Met Office Data 1991 to 2020 North Heath)

Collection area (m^2)	Yield coefficient & filter efficiency (0.95 x 0.95 as advised by Freeflush)	Rainfall average (mm/year)	Days	No of Occupants	Daily rainwater per person (litres)
120.3	0.9*	858.70	365	4	**63.68**
120.3	0.9*	858.70	365	2.47	**103.12**

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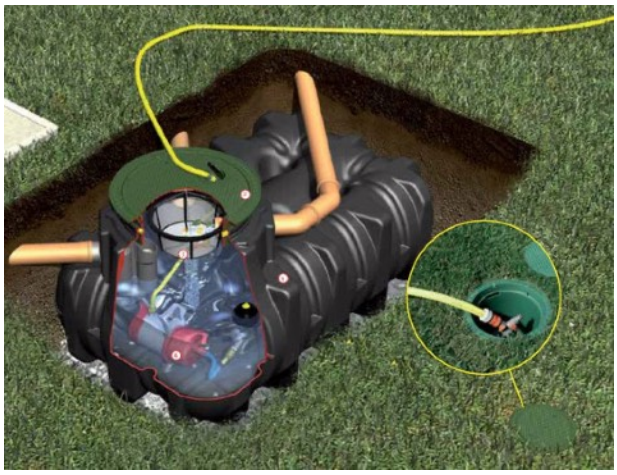
Rainwater collection (using Part G's (worst case of 4 persons) occupancy data 63.68 l/p/d would easily be able to satisfy the total make up for both internal and external demand (47.25lL/pp/d - taps(other),showers, taps(K) and dishwasher plus 5 L/pp/d - fixed external allowance) therefore the rainwater harvesting, and the Water Neutrality Calculator, are credible and deliverable)

Average area annual rainfall (mm) x roof surface area (m2) = 858.70mm x 120.3m2 = 103,301.61ml (103.302m3)/12 = average monthly rainfall capture = 8608.47 (8.608 m3) litres per month average.

Rainwater Storage and Drought

The water storage tank is to be sized to hold at least 18 days (5%) off the annual rainwater demand. Some tank manufacturers recommend using 21 days and Natural England request 35 days for extreme drought protection.

Tank size = 35days x 52.25 L/pp/d demand x 4.00 (taking the worst case) occupancy = 7315.00L





The 7500l Shallow Dig Domestic Rainwater Harvesting System by Freeflush Water Management. Is a larger tank so that it not only can service Natural Englands recommendations but the amount of available water for reuse remains higher for a longer period (outside the drought periods). Freeflush Eco Plus Package with a submersible pump and header tank system minimises the top up water required. Underground tank (choice of tanks available, sizes vary according to property type), Telescopic lid (choice of telescopic lid available, depending on tank location), Minimax filtered Mains water feeding console 15/4.

If this was supplemented with say 2 x 100litre The Original Prestige Wall Mounted Water Butts by Freeflush Water Management Ltd (see appendix A) to assist with the localised irrigation of the garden then this will provide a total of 7700 litres delivering well over 35 days of drought protection.

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Water Neutrality Calculator - Summary Sheet

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)	0.0	4.42	0.00	0.00
WC (dual flush)	Full flush Volume (litres)	6.0	1.46	0.00	8.76
	Part flush Volume (litres)	4.0	2.96	0.00	11.84
WC (multiple fittings)	Average effective flushing Volume (litres)	0.0	4.42	0.00	0.00
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	3.0	1.58	1.58	6.32
Bath (where shower also present)	Capacity to overflow(litres	0.0	0.11	0.00	0.00
Shower (where bath also present)	Flow Rate(litres / minute)	0.0	4.37	0.00	0.00
Bath Only	Capacity to overflow(litres)	0	0.50	0.00	0.00
Shower Only	Flow Rate (litres/minute)	4.71	5.60	0.00	26.36
Kitchen/Utility room sink taps	Flow rate (litres/minute)	4	0.44	10.36	12.12
Washing Machine	(Litres/kg dry load)	8.17	2.10	0.00	17.16
Dishwasher	(Litres/place setting)	0.68	**3.60**	0.00	2.45
Waste disposal unit	(Litres/use)	Nil Present	3.08	0.00	0.00
Water Softener	(Litres/person/day)	0.00	1.00	0.00	0.00
	(5)	Total Calculated use (litres/person/day). = SUM(column 4)			85.00
	(6)	Contribution from greywater ** (litres/person/day)			37.76
	(7)	Contribution from rainwater * (litres/person/day)			47.25
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			0.00
	(10)	External water use			5.00
	(11)	Provision from additional rainwater availability (63.78 l/p/d - 47.25)			16.53
* and ** product performance advised by Freeflush Management Ltd products - refer to sections 4 and 5	(12)	Total water consumption (Building Regulation 17.K) =(9)-(10) + (11) (litres/person/day)			11.53

Baseline water consumption using the Building Regulations Part G Calculator guidelines

Greywater contribution = wc's and washing machine only
Rainwater Contribution (appliances only) = taps, bath, showers, taps(others) and dishwasher

5. Behavioural Changes and Education:

Advice will be provided to:

- Promote awareness with the next owner (household members) about the significance of water conservation and the environmental implications of water usage, and
- Encourage responsible water behaviours such as shorter showers, fixing leaks promptly, and using appliances efficiently.

6. Sustainable Landscaping:

- The outdoor amenity spaces have been designed to minimise water consumption through drought-resistant plants, permeable surfaces, and xeriscaping principles, as well as
- Fostering biodiversity and ecosystem health by creating habitat for native species and minimising chemical inputs.

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7. Conclusion (Offsets):

A 3-bed house has an average occupancy of 2.47 (2011 census data for Horsham District)

At consumption of 100 L/pp/d to be water neutral 2.47 No occupants must not consume more than 247 litres per day in total.

Mitigation through improved water efficient fixtures and appliances to the proposed new dwelling will be supported by the use of grey water and rainwater harvesting tank(s). This self sufficient approach (where in reality the project is 'water positive') demonstrates the proposal can be seen as water neutral.

It can be concluded therefore that with mitigation the proposed development would result in no greater demand than existing, and Water Neutrality has been achieved.

Neutrality can be achieved within this development area, through the complete management of the water cycle. In addition to water demand being limited to a minimum, it has demonstrated this by :

A Treating ALL wastewater and re-using it for potable consumption rather than discharging to the environment;

B Maximisation of rainwater harvesting, which can include the complete capture of rainfall falling within the development, for use in the home; and

There is no clear or compelling evidence to suggest the nature and scale of the proposed development would result in a more intensive occupation of the residential plot necessitating an increased consumption of water that would result in a significant impact on the Arun Valley SAC, SPA and Ramsar sites. The grant of planning permission would not therefore adversely affect the integrity of the estate or conflict with policy 31 of the Horsham District Planning Framework 2015, National Planning Policy Framework 20 23 paragraph 180 and the Council's obligations under the Conservation of Habitats and Species Regulations 2017.

There are additional measures that can be considered over and above the proposal above.

1 *The capture of additional rainfall via 2 x 100litre The Original Prestige Wall Mounted Water Butts. This would provide for the External Water consumption*

2 *Should this justification not be acceptable for the External Water consumption element then a reservation can been made for purchasing sufficient water offsetting credits with The Water Bank (wateroffsets.co.uk) where Water Offsets Ltd would implement the water offsetting works to accord with Horsham policy. This can be conditionalised within the approval notice.*

The applicants would be willing to accept a suitably worded planning condition to ensure that all of the above water reduction measures are implemented prior to first occupation of the new build.

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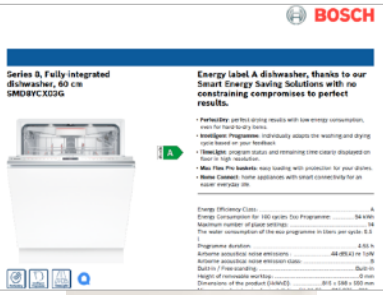
Appendix A Examples of fixtures and appliances that comply with the Part G calculator

Product Description	Product Image
Gerberit Concealed Gerberit Kappa Low Flush Cistern 15cm 6/3litres BREEAM Guidance confirms that effective flush volume for a dual flush WC is the aerage of 1 ffull flush plus 2 reduced flushed to deliver and average of litres volume.	
Britain Basin/Pillar Tap Flow Limiters 3 litres per minute (pair)	
Dishwasher 8 litres/kg dry load	
Pillar Tap	
Shower head and Wall Mount	
Washing Machine 60 cm Freestanding White Bosch Dishwasher (0.9 litres/place setting) – has a low water usage	

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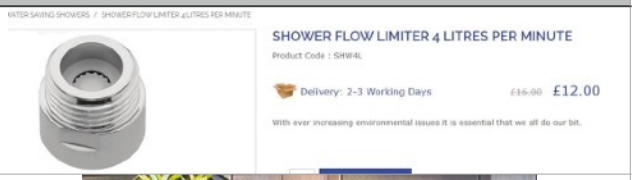
Product Description	Product Image
Shower Flow Limiter 4 litres per minute	
Freeflush 100l original external prestige wall mounted water butt	