Technical Note 1: Water Neutrality Statement

Site: Guildford Road, Rudgwick, Horsham, RH12 3BH
Prepared by: Ella Harrop
Approved by: Neil Jaques
Date: 7th October 2024

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1.0 Introduction

1.1 This Water Neutrality Statement (WNS) has been prepared on behalf of Mitchell Evans LLP to demonstrate how the proposed development at Guildford Road, Rudgwick will achieve water neutrality.

1.2 Following the issue of Natural England's (NE's) Position Statement on Water Neutrality within the Sussex North Water Supply Zone (SNWSZ) all new, reserved matters, conditions discharge and Section 73 planning applications within the SNWSZ must demonstrate that the development can be water neutral. The SNWSZ covers part of Horsham District, as well as parts of the neighbouring Chichester, Arun and Crawley Districts. A plan showing the supply area can be found in Appendix A and NE's Position Statement can be found in full within Appendix B.

1.3 As the site falls within the SNWSZ, Horsham District Council (HDC) as the Local Planning Authority (LPA) wish to know whether the proposed development represents a change in water consumption and, if so, that the proposed development can be water neutral.

1.4 Therefore, to satisfy NE's and HDC's requirements on water neutrality, this WNS will set out the following:

- The baseline, existing water demand for the development site;
- Whether there will be a change in water demand as a result of the proposed development;
- What water demand reduction measures, such as the fitting of water efficient fixtures and fittings, will be used;
- Whether the proposed development will be water neutral, and;
- Whether any rainwater recycling or offsetting measures are required.

2.0 Background

2.1 The proposed development is located at the stables of Guildford Road, Rudgwick, Horsham, RH12 3BH.

2.2 The existing site currently comprises of a stable block.

2.3 The housing mix of the proposed development will convert the existing stables on the site into one one-bed annexe. A copy of the floor plan of the proposed development can be found in Appendix C.

3.0 Existing Baseline Water Demand

3.1 There is currently no water usage on site, therefore, the baseline water usage will be taken forward in the calculations as zero litres per day.

4.0 Proposed Water Demand

4.1 As previously defined, the proposed redevelopment will provide one one-bed annexe.

4.2 In terms of the mains water demand of the dwelling, all new developments must comply with Building Regulations Part G. Paragraph 2 of Schedule F1 of Building Regulations 2010, which states that "*the potential consumption of wholesome water by persons occupying a new dwelling must not exceed 125 litres per person per day*".

4.3 The occupancy levels for the proposed development have been drawn from local census data (as recommended by HDC in their water neutrality methodology guidance) and this is summarised in Table 4.1, below.

1-bedroom	2-bedroom	3-bedroom	4-bedroom
1.32	1.88	2.47	2.86

Table 4.1 – Average district occupancy levels per dwelling size

4.4 Using the census data and the housing mix defined above, the population of the proposed development is estimated to be 1.32 persons.

4.5 Using the Building Regulations water consumption figure of 125 litres per person per day and population size of 1.32, it is estimated that the total water usage per day for the proposed development would be 165 litres per day.

4.6 Therefore, following the construction of the proposed development there will be a net increase in water demand of 165 litres per day. At this stage, the proposed development cannot be considered to be water neutral.

5.0 Water Consumption Reduction Measures

5.1 To ensure the development can demonstrate water neutrality in accordance with the NE Position Statement, 165 litres per day will need to be offset.

5.2 To further minimise the demand on the mains water, it is proposed that the new dwelling will achieve the Building Regulations Part G optional water efficiency requirement of less than 110 litres per person per day of water. This will be achieved through the use of water efficient fixtures and fittings.

5.3 A water calculation in accordance with Buildings Regulations Part G has been carried out and confirms that the proposed dwellings can achieve a reduced main water consumption of 64.46 litres per person per day, sharing the kitchen sink, washing machine and dishwasher with the existing site which does not include external water usage as it is an annexe, so the external water usage will be shared with the existing house. A copy of the Part G calculation can be found in Appendix D and is summarised in Table 5.1, below.

	Total Water Usage (l/p/day)
WC (full flush)	5.84
WC (part flush)	5.92
Taps (Excluding Kitchen)	5.85
Shower	33.60
Kitchen Sink	4.40
Washing Machine	12.60
Dishwasher	2.63
Total	70.84
Normalisation Factor	0.91
Total	64.46

Table 5.1 – Water Efficient Part G Calculation

5.4 A copy of the proposed fixtures and fittings required to achieve the above water consumption can be found in Appendix E.

5.5 Using the Part G water consumption figure of 64.46 litres per person per day and the census-based development population of 1.88 it is estimated that the water usage per day for the proposed development can be reduced to 85.09 litres per day.

Rainwater Harvesting Systems

5.6 The NE Position Statement states that offsetting can be carried out by fitting properties with grey water recycling systems, rainwater harvesting and/or water reduction fittings.

5.7 To help mitigate the increase in water demand it is proposed to incorporate rainwater harvesting to the proposed development.

5.8 The water collected by the rainwater harvesting system will be utilised for flushing toilets and the washing machine, while all other uses will be mains water fed.

5.9 The following table sets out the water uses, as detailed in the Part G calculation and shows the split between the mains water usage and water supplied by the rainwater harvesting system:

	Total Water Usage (l/p/day)	Mains Water Usage (l/p/day)	RWH System Usage (l/p/day)
WC (full flush)	5.84		5.84
WC (part flush)	5.92		5.92
Taps (Excluding Kitchen)	5.85	5.85	
Shower	33.60	33.60	
Kitchen Sink	4.40	4.40	
Washing Machine	6	6	
Dishwasher	0.73	0.73	
Total	70.84	59.08	11.76
Normalisation Factor	0.91	0.91	0.91
Total	64.46	53.76	10.70

Table 5.2: Water Usage

5.10 The above table confirms that 10.70 litres per person per day will be supplied by rainwater harvesting systems, which equates to 14.13 litres per day, based on a population of 1.32 persons.

5.11 The rainwater harvesting tank for the proposed dwelling has been sized using the calculation set out in BS EN 16941-1:2018 and will be large enough to store 9.6% of the Annual Water Demand. This will ensure that the tank will provide at least 35 days of storage for periods of drought, as required by HDC.

5.12 The calculations confirm that the yields are sufficient enough to meet demands for each dwelling type. Calculations used the annual rainfall data from the nearest MET Office climate station to the proposed site, which is Charlwood Station. The calculation is summarised in Table 5.5 on the next page and can be found in full in Appendix F.

Unit	Population	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
1-bed	1.32	173	9,969.06	494.98	750

Table 5.3 – Rainwater Harvesting Sizing Calculation

5.13 A typical layout and specification for a rainwater harvesting system is shown in Appendix G. The illustration shows how the rainwater will be collected, filtered and then returned to the property for re-use.

5.14 The rainwater harvesting system will be managed and maintained by a management company and this will be secured in the S106 agreement. A Management and Maintenance Plan is included in Appendix H.

5.15 Following the incorporation of rainwater harvesting systems, the mains water demand for the proposed dwellings will be reduced to 70.96 litres per day.

5.16 Therefore, following the development of the site, there will be a net increase in water demand of 70.96 litres per day. At this stage, the proposed development cannot be considered to be water neutral.

5.17 Therefore, to achieve water neutrality, further offsetting is required.

6.0 Offsetting Measures

6.1 To ensure the development can demonstrate water neutrality in accordance with the NE Position Statement, a residual mains water demand after the other water saving measures on site of 70.96 litres per day will need to be offset.

6.2 A total of 71 credits will be required to be purchased, to offset the proposed development, where one credit is equal to one litre per day of water.

6.3 The client is proposing to offset their development against a water offsetting scheme in Crawley, Sussex Water Neutrality through the purchase of 80 credits, providing an additional buffer of 9 credits to the required 71 credits. A summary of the offsetting scheme can be seen in Appendix I. The property used to offset the proposed development will be 13 Scott Road.

13 Scott Road

6.4 13 Scott Road is a six-bed property with a current population of six people located in Crawley, RH10 5DA. Within the HMO the kitchen is a communal space, used by all six occupants. The bathrooms are split between the bedrooms. This means that first bathroom (Bathroom One) will be used by two of the occupants and the second bathroom (Bathroom Two) will be used by four occupants.

Flow Survey

6.5 A flow survey was undertaken in April 2024 to determine the existing water usage of 13 Scott Road. A copy of the flow survey can be found in Appendix J.

6.6 Noting how the bathrooms are used, the Part G calculation has been split into two. The part G calculation for the water use by the first two occupants and a Part G calculation for the remaining four occupants. They all use the communal washing machine, therefore this will remain the same across the calculations.

6.7 A Part G calculation following the flow survey on Bathroom One gives a water consumption of 149.69 litres per person per day, which includes an allowance of 5 litres per person per day for external water usage. This equates to 299.39 litres per day with a population of two.

6.8 A Part G calculation following the flow survey on Bathroom Two gives a water consumption of 154.79 litres per person per day, which includes an allowance of 5 litres per person per day for external water usage. This equates to 619.15 litres per day with a population of four. A copy of the Part G calculations for each bathroom can be found in Appendix K.

6.9 Following the flow survey, the total water consumption at 13 Scott Road is 918.54 litres per day.

Water Reduction Measures

6.10 Flow restricting valves will be fitted to the basin taps and kitchen taps within the property, as well the showers in all the Bathrooms will be fitted with flow restricting valves, as to reduce the water consumption.

6.11 A water calculation in accordance with Building Regulations Part G has been carried out and this confirms that the water use of all the Bathrooms can be reduced to 89.52 litres per person per day, which includes an

allowance of 5 litres per person per day for external water usage. A copy of the Part G calculation can be found in Appendix L and is summarised in Table 6.1, on the next page:

Fixture	Capacity/Flow Rate	Water Usage (l/p/day)
WC (Dual Flush)	6.0	8.76
WC (Dual Flush) Part	3.0	8.88
Taps (excluding kitchen)	3.5	7.11
Shower (where bath present)	8.0	44.80
Kitchen Sink	5.0	12.56
Washing Machine	5.13	10.77
	Total Calculated Use	92.88
	Normalisation Factor	0.91
	Total Water Consumption	84.52
	External Water Use	5.00
	Total Water Consumption (Part G)	89.52

Table 6.1 – Offsetting Water Usage

6.12 Using the Part G water consumption figure of 89.52 litres per person per day and a population of six, it is estimated that the water usage of 13 Scott Road will reduce to 537.14 litres per day.

6.13 A copy of the flow restricting valves to achieve the above water consumption can be found in Appendix M.

6.14 Following the installation of the flow restricting valves at 13 Scott Road, the total water consumption can be reduced from 918.54 litres per day to 537.14 litres per day. Therefore, there will be a reduction of 381.40 litres per day within the SNWSZ.

Summary of Offsetting

6.15 13 Scott Road's baseline water usage was 918.54 litres per day, following the incorporation of the above measures, the water usage will be reduced to 537.14 litres per day. This will provide a water saving of 381.40 litres per day within the SNWSZ and this is available through a system of credits, in which one credit is equal to one litre. Therefore, 380 credits are available from 13 Scott Road.

6.16 As stated in Section 5 of this WNS, the proposed development will have a total water demand of 70.96 litres per day and therefore the client will purchase a total of 80 credits from the offsetting at 13 Scott Road for the development to be water neutral.

7.0 Summary and Conclusions

7.1 This Technical Note sets out the water usage strategy for the proposed development at Guildford Road, Rudgwick, Horsham, RH12 3BH.

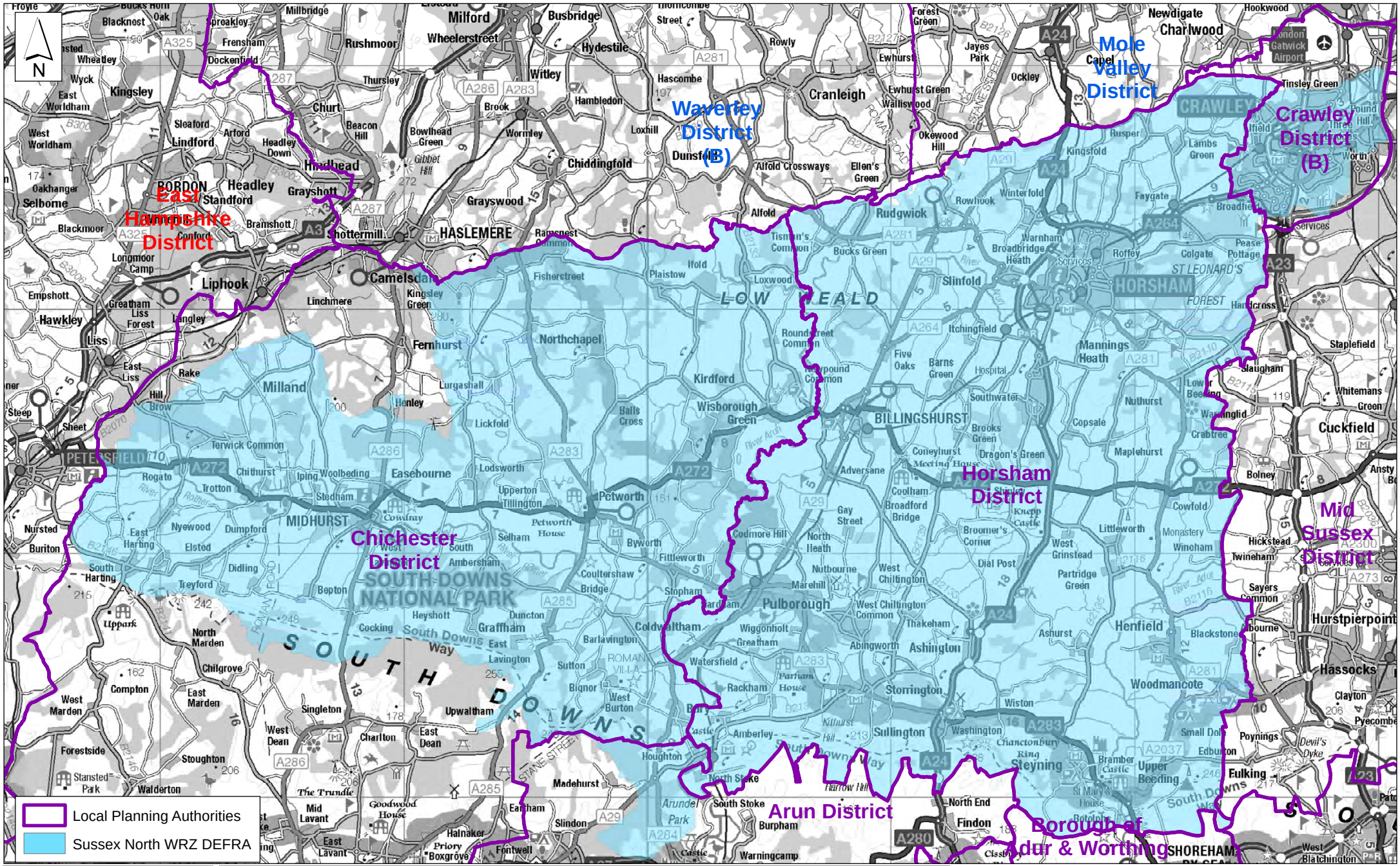
7.2 The proposal is to incorporate water efficient fixtures and fittings to the proposed dwelling along with rainwater harvesting systems, to minimise the water demand of the proposed development to 70.96 litres per day.

7.3 The proposed development at Guildford Road will purchase a total of 80 credits as part of an offsetting scheme. Therefore, the residual mains water requirement of the development of 70.96 litres per day has been fully offset with a buffer of 9 litres per day and there is no additional mains water requirements within the SNWSZ as a result of the development.

7.4 This strategy will minimise the impact of the new development on the SNWSZ. This WNS confirms the proposal will be water neutral once complete and therefore satisfying NE's requirements.

Appendix A

Sussex North Water Supply Zone



Horsham District Council

Parkside, Chart Way, Horsham
West Sussex RH12 1RL.
Barbara Childs : Director of Place

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Sussex North Water Resource Zone

Chichester Horsham Crawley

Reference No :		Date : 23 November 2021	Scale : 1:3,000 at A2
Drawing No:	Drawn :	Checked :	Revisions :

Appendix B

Natural England's Position Statement

Natural England's Position Statement for Applications within the Sussex North Water Supply Zone

September 2021 – Interim Approach

Please take the following as Natural England's substantive advice for all applications which fall within Sussex North's Water Supply Zone.

Sussex North Water Supply Zone

Arun Valley SPA, SAC and Ramsar Site- Sussex North Water Supply Zone

The Sussex North Water Supply Zone includes supplies from a groundwater abstraction which cannot, with certainty, conclude no adverse effect on the integrity of;

- Arun Valley Special Area Conservation (SAC)
- Arun Valley Special Protection Area (SPA)
- Arun Valley Ramsar Site.

As it cannot be concluded that the existing abstraction within Sussex North Water Supply Zone is not having an impact on the Arun Valley site, we advise that developments within this zone must not add to this impact. This is required by recent caselaw, Case C-323/17 People over wind and Sweetman. Ruling of CJEU (often referred to as sweetman II) and Coöperatie Mobilisation for the Environment and Vereniging Leefmilieu Case C-293/17 (often referred to as the Dutch Nitrogen cases).

Between them these cases require Plans and Projects affecting sites where an existing adverse effect is known (i.e. the site is failing its conservation objectives), to demonstrate certainty that they will not contribute further to the existing adverse effect or go through to the latter stages of the Regulations (no alternatives IROPI etc).

Developments within Sussex North must therefore must not add to this impact and one way of achieving this is to demonstrate water neutrality.

In addition, the Gatwick Sub regional Water Cycle Study concluded that water neutrality is required for Sussex North to enable sufficient water to be available to the region.

The definition of water neutrality is the use of water in the supply area before the development is the same or lower after the development is in place.

Strategic approach

Natural England has advised that this matter should be resolved in partnership through Local Plans across the affected authorities, where policy and assessment can be agreed and secured to ensure water use is offset for all new developments within Sussex North. To achieve this Natural England is working in partnership with all the relevant authorities to secure water neutrality collectively through a water neutrality strategy.

Whilst the strategy is evolving, Natural England advises that decisions on planning applications should await its completion. However, if there are applications which a planning authority deems critical to proceed in the absence of the strategy, then Natural England advises that any application needs to demonstrate water neutrality. We have provided the following agreed interim approach for demonstrating water neutrality;

Minimising water use of new builds.

- Complete a water budget (based on occupancy)
- All new builds to demonstrate that they can achieve strict water targets (e.g., 85L/pp/day*)

  This can be achieved by measures such as:

- Grey water recycling (advantage of being reliable in hot dry weather);
- Rainwater harvesting;
- Water efficient fixings (such as shower aerators) to demonstrably reduce demand-this would need to be suitably certain.

In addition, water offsetting is required

- One way to achieve this is retrofitting of council owned properties/commercial buildings-located within Sussex North. Examples include:

- Grey water recycling- (for example there are clear opportunities for commercial properties).
- Rainwater harvesting of commercial settings;
- Installation of water reduction fittings in Council-owned buildings.

These measures need to be implemented until such time as a more sustainable water supply has been secured.

It will also need to be ensured that measures are not already proposed (for example in Southern Water's Management Plan) to avoid double-counting.

Any mitigation must be suitably certain in order to comply with the Habitats Regulations and Caselaw.

If the application cannot demonstrate, through an appropriate assessment, the required water neutrality, we advise that it is either revised to achieve this in line with the above or awaits completion of the strategic approach.

The securing of water neutrality is a matter which needs to be resolved at a strategic level and Natural England is working with the relevant authorities and the water company to achieve this. In light of this, Natural England will not be engaging with individual planning applications whilst the strategy is evolving.

***This this is the reasonably achievable figure with the above measures based on the early data from the strategic solution and may be subject to change as the strategic solution evolves.**

Appendix C

Proposed – Development Plans


Concrete
Grass
Flowerbed
Ramp Up
Gravel
Paving
Ditch
Trellis fence 1.8Ht
Swimming Pool
Hedge 3.5Ht
Slide
Kitchen 3.04/3.36
BED 3.51/3.36
BATH 1.91/2.36
SHOWER
SHOWER
STAIRS 3.51/3.36
STORE 3.51/3.36
STORE 1 4.76/5.08
STORE 2 4.76/5.08
STORE 3 4.76/5.08
PLANT 2.51/2.36
PLANT 2.51/2.36
CHANGING 2.51/2.36
POOL PLANT 2.51/2.36
LIV 4.76/5.08
BAR COUNTER/ WINDOW CILL
BI-FOLD CAFE STYLE WINDOWS
NEW INVERTED PORCH WITH BI-FOLD DOORS
NEW LEVEL PAVING
STEP UP
NEW PAVING
HIGH LEVEL WINDOW
NEW OPENING FOR NEW DOOR
NEW FULL HEIGHT WINDOW
NEW HINGED SHUTTER
NEW OPENING FOR NEW DOOR & HIGH LEVEL WINDOW
NEW OPENING FOR NEW DOOR
NEW OPENING FOR NEW DOOR
NEW OPENING FOR NEW DOOR

Appendix D

Proposed – Part G Calculations

Proposed Water Usage - Part G Calculation

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person/day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	4	1.46		5.84
WC (Dual Flush) Part	2	2.96		5.92
Taps (excluding kitchen)	2.7	1.58	1.58	5.85
Bath (where shower present)		0.11		0.00
Shower (where bath present)		4.37		0.00
Bath Only		0.5		0.00
Shower Only	6	5.6		33.60
Kitchen Sink	10	0.44		4.40
Washing Machine	6	2.1		12.60
Dishwasher	0.73	3.6		2.63
	Total calculated use (litres/person/day)			70.84
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				64.46
External Water Use				0.00
Total Water Consumption (Part G) (litres/person/day)				64.46

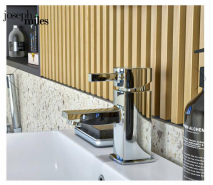
Rainwater Harvesting	10.70	litres/person/day
Mains Water	53.76	litres/person/day
Total	64.46	litres/person/day

	Number of units	Census	Population	Mains Water Usage	Rainwater Usage		
Proposed 1-bed	1	1.32	1.32	70.96	14.13		
Totals	1		1.32	70.96	14.13	85.09	litres/day

Appendix E

Proposed – Examples of Fixtures and Fittings

Examples of Fixtures and Fittings - Part G Specifications

Item	Capacity/Flow rate	Overview
Toilet (Dual Flush)	4/2 litres	The Gap  HOME / PRODUCTS / TOILETS / TOILET CISTERNS THE GAP REF: A34173C000 Dual flush 4/2L WC cistern with bottom inlet for compact back to wall Rimless toilet DIMENSIONS: 365 x 140 x 405 mm (LENGTH, WIDTH, HEIGHT) PRODUCT FACTSHEET (PDF) VIEW ALL DIMENSIONS 00 - WHITE WHERE TO BUY RRP (VAT included) £ 385.76
Basin Tap	2.7 litres/minute	Joseph Miles  - Available variations: Mini mono tap, Mono tap. - Suitable for deck-mounted installation. - Flexible tails included. - Inlet connection: 1/2 Inch M10. - Suitable for low water pressure system. - Requires a minimum 0.2 bar water pressure system. - Refer to the technical diagram for the complete technical dimension. - Features of Mini Mono Tap:. - Weight: 1.100kg. - Height: 115.5mm. - Spout reach: 78mm. - Base to spout: 56.7mm. - Flow rate: 2.7 Litre/Minute @ 0.2 bar. Features of Mono Tap:. - Weight: 1.28kg. - Height: 146mm. - Spout reach: 96.3. - Base to spout: 62.1mm. - Flow rate: 3.6 litre/minute @ 0.2 bar. Info / Size (mm) Taps Pipe Center: 78 / 96.3 mm
Shower	6 litres/minute	Triton Overview Triton T80Z 8.5kW Fast-Fit Eco Electric Shower - ECO8008ZFF Triton Eco range offers the exceptional performance you expect of a Triton shower but with a focus on water efficiency. With a maximum flow rate of 6 litres per minute, the T80Z Fast-Fit is the ultimate replacement shower, packed with installation friendly features including cable and water entry options from all possible directions. The unit comes supplied with a matching adjustable riser rail and multifunction handset. Features • Finish: White • Max Flow Rate: 6 l/min • Temperature Control: Stabilised • Power Ratings: 8.5 kW • Swing-Fit - Terminal for left & right cabling • Swivel-Fit - A 180° fully reversible swivel water inlet that accommodates water connections from either the left or right hand side • Push Button Start/Stop • Low Pressure indicator • Power On Indicator • Rub Clean Shower Head - 5 spray patterns • Minimum Running Pressure / Flow: 1 Bar @ 8 l/min • Maximum Static Pressure: 10 Bar • Approvals: BEAB, CE, BSI Kitemark 2 Year Guarantee Current Item  Triton T80Z 8.5kW Fast-Fit Eco Electric Shower £201.34

Appendix F

Proposed – Rainwater Harvesting Tank Calculation & MET Data

Rainwater Harvesting System (BS EN 16941-1:2018 - Intermediate Approach)

AAR	833.69	Average Annual Rainfall
e	0.8	Yield Coefficient
h	0.9	Hydraulic Filter Efficiency
P_d	10.70	Daily Requirement per Person

Unit	Type	No. Beds	No. Units	Census	Population	Roof Area (m^2)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Minimum Tank Size (litres)
Proposed 1-bed	Annexe	1	1	1.32	1.32	173	9,969.06	494.98	500
		Totals	1		1.32	173	9,969.06	494.98	500

Annual Rainfall Data – MET Office Climate Averages

Station: Charlwood

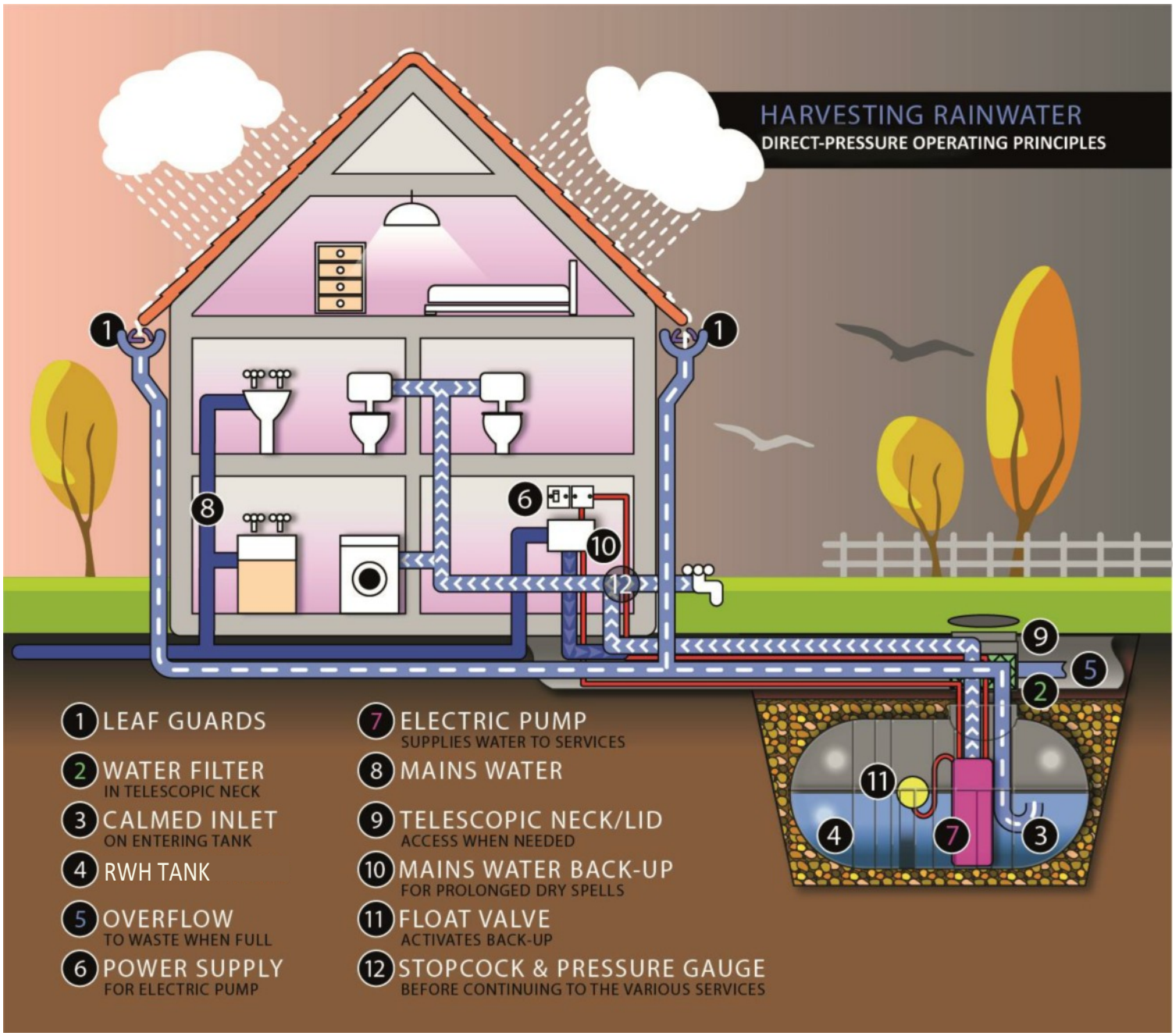
Climate period: 1991-2020

Station: Charlwood

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)
January	7.83	1.52	10.89	53.42	90.34	13.10	6.56
February	8.49	1.44	10.47	75.42	64.46	10.86	6.56
March	11.20	2.79	7.35	119.36	53.65	9.44	6.60
April	14.50	4.24	3.87	171.48	52.49	9.73	5.80
May	17.74	7.11	0.60	206.31	54.83	8.90	5.44
June	20.80	9.92	0.03	209.70	50.67	8.79	5.12
July	23.14	11.99	0.00	215.95	54.73	8.45	4.82
August	22.70	11.86	0.00	199.09	60.42	9.29	4.64
September	19.55	9.51	0.07	156.01	64.71	9.15	4.68
October	15.35	7.10	1.66	110.62	94.33	12.51	5.18
November	11.11	3.91	6.09	65.21	97.11	13.17	5.20
December	8.25	1.74	11.89	45.87	95.95	12.82	5.94
Annual	15.09	6.12	52.92	1628.44	833.69	126.21	5.54

Appendix G

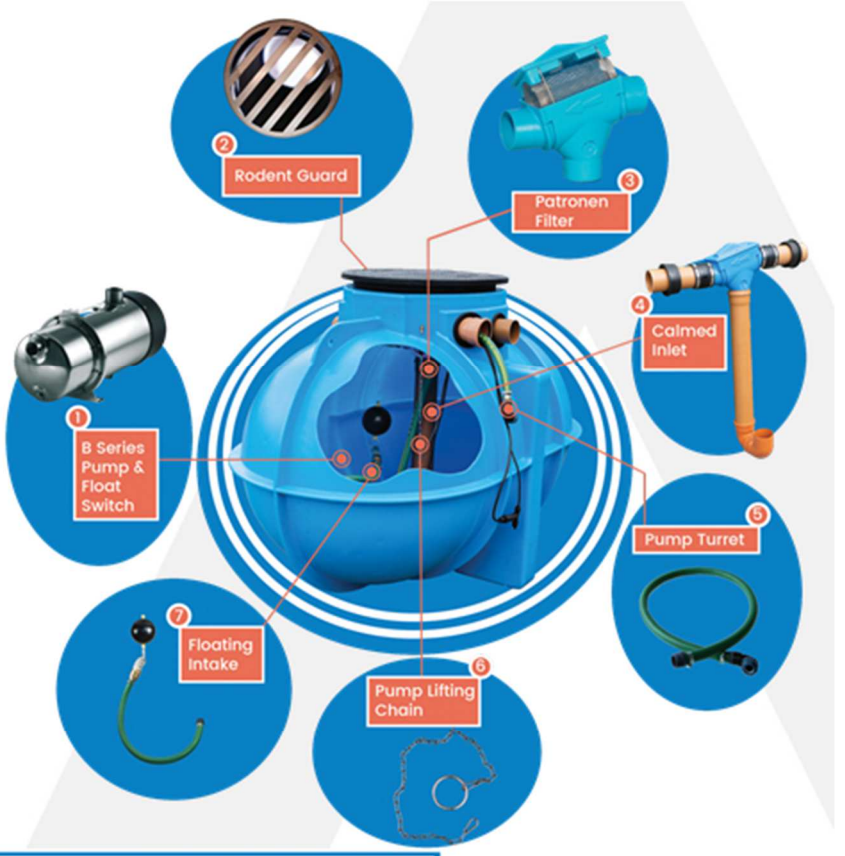
Proposed – Typical Layout of Rainwater Harvesting System


HARVESTING RAINWATER
DIRECT-PRESSURE OPERATING PRINCIPLES
1 LEAF GUARDS
2 WATER FILTER
IN TELESCOPIC NECK
3 CALMED INLET
ON ENTERING TANK
4 RWH TANK
5 OVERFLOW
TO WASTE WHEN FULL
6 POWER SUPPLY
FOR ELECTRIC PUMP
7 ELECTRIC PUMP
SUPPLIES WATER TO SERVICES
8 MAINS WATER
9 TELESCOPIC NECK/LID
ACCESS WHEN NEEDED
10 MAINS WATER BACK-UP
FOR PROLONGED DRY SPELLS
11 FLOAT VALVE
ACTIVATES BACK-UP
12 STOPCOCK & PRESSURE GAUGE
BEFORE CONTINUING TO THE VARIOUS SERVICES

SDS

Water Infrastructure Systems

DIRECT PRESSURE SYSTEM HOME & GARDEN





Inside the Household

Top Up Controller

Automatic mains water top-up Controller kit for rainwater tanks with pump isolation and alarm. The system detects when the tank contents level is running low and initiates a mains top up procedure to ensure the tank never runs out of water supply.

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE

T: +44 (0)1934 751303
E: info@sdslimited.com

SYSTEM:

A Direct Pressure System is the most popular, cost effective and risk-free option for rainwater harvesting. It can be used for both garden and household applications, for example, it can be used in buildings with a small block of toilets, and for garden irrigation and machine washdowns. The system sends pressurised water straight from the external tank directly to the application. If the water level in the tank gets too low, the top up controller will activate a mains top up so the tank doesn't empty.

COMPONENTS

P Series pumps are stainless steel pumps with plastic coverings and are suitable for domestic water systems, rainwater harvesting, tanks, surface irrigation and tank transfer.

The rodent guard protects the internal water from rodents and large debris which could contaminate the water entering via the overflow.

The PF filter is designed with a level drop, this along with its very smooth surface structure allows excess dirt to be rinsed straight through to the overflow. The filter cartridge mesh is stainless steel within plastic housing and is self-cleaning, though regular inspection is recommended.

The calmed inlet removes the kinetic energy from the water as it enters the tank. This means that as the water enters it doesn't stir up the contents of the tank.

The turret set provides the connection between the pump and the pipework leading to the various external applications. They are made from a flexible plastic so can easily deal with the pressurised water coming from the pump.

The pump lifting chain aids in servicing the pump as it allows the pump to be easily pulled up towards the top of the tank.

A floating intake ensures that no water from either the bottom or the surface of the tank is taken in. Meaning only clean water passes through the system and is pumped into the household.

ADDITIONAL SPECIFICATIONS

- Service duct
- Delivery hose (Options available)
- Top up controller
- Tanks sold separately
- Extra overflow on tanks 5600 – 10000

POPULAR USE:

- Garden irrigation
- Cleaning the car
- Washing windows
- Power washing drive/patio
- Outside tap and hosepipe
- Flushing toilets
- Drinking water (if tank is potable)
- Washing machine





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Appendix H

Proposed – Rainwater Harvesting Systems Management and Maintenance Plan

Guildford Road
Rudgwick, Horsham, RH12 3BH

Rainwater Harvesting Management and Maintenance Plan

For

Mitchell Evans LLP

motion

Document Control Sheet

Guildford Road

Rudgwick, Horsham, RH12 3BH

Mitchell Evans LLP

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
19.09.2024	FINAL	EH	NJ

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ISO 9001 Certified
ISO 14001 Certified

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1.0 Introduction

1.1 The report sets out the principles for the long-term management and maintenance of the rainwater harvesting systems at the proposed development.

1.2 The purpose of this report is to ensure that the client has a robust inspection and maintenance plan for the lifetime of the development. This will ensure the optimum operation of the rainwater harvesting systems and that they will be continually maintained. This will ensure that the proposed development will remain water neutral.

1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.

1.4 This report has been produced by Motion to describe the typical management and maintenance tasks that are known at the design stage (such as maintenance frequencies and typical tasks). These have been drawn from industry guidance such as BS EN 16941-1:2018, The SuDS Manual (CIRIA 753) and the manufacturer's own guidance.

1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.

1.6 In recognition of the requirements of the CDM Regulations 2015, this rainwater harvesting management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the rainwater harvesting systems onsite.

2.0 Treatment

2.1 The rainwater harvesting system shall incorporate suitable treatment in accordance with BS EN 16941-1:2018, to ensure that the water quality is suitable for its intended end use.

2.2 The treatment will cover the following:

- Removal of coarse particles, upstream of the storage;
- Retention of fine particles by sedimentation and flotation in the storage tank; and
- Filtration following the storage device, depending on the intended use.

2.3 Preliminary treatment will be provided in the form of filters and separators prior to the storage tank. This will include leaf guards on gutters and a leaf filter. A first flush diverter will be included to divert particles contained in rainwater away from the tank and to a suitable drain. These measures will prevent coarse solids and organic matter from entering the storage tank.

2.4 Any fine particles will then be separated either by sedimentation by settling out to the bottom of the tank, or flotation to the water surface.

2.5 A calmed inlet will be incorporated in the tank to prevent turbation of the sediment at the bottom of the tank by the inflow of water. Removal of the sediment will be carried out in accordance with Table 5.1 below.

2.6 Removal of floating particles will occur when the tank overflows, or when it is cleaned out in accordance with Table 5.1 below.

2.7 Water will be extracted from the tank via a floating pump, which will extract water from level that is above any sediment collected at the bottom of the tank and below any floating particles. This will help maintain the quality of harvested rainwater that is to be used in the property.

2.8 Where the water is being used for laundry, it is understood that the Council require an additional level of treatment. Therefore, it is proposed that a UV filter will be incorporated in advance of the washing machine and this will kill any microorganisms, prior to it being used in the washing machine.

2.9 A schematic showing the layout of the equipment used in a rainwater harvesting system is shown in Figure B.2 of BS EN 16941-1:2018.

3.0 Water Quality Control

3.1 It is understood that the system will be considered as a private water supply and, therefore, will be governed by the Private Water Supply Regulations 2016. These are regulated by the local council's Environmental Health Officer or Pollution Control Officer. However, the regulations in England and Wales do not require monitoring to be undertaken where the water supply is to a single domestic dwelling, unless the local authority is requested to do so by the owner or occupier of the dwelling, or if they are concerned that the supply presents a potential danger to human health.

3.2 NA.1 in BS EN 16941-1:2018 states that frequent testing should not normally be required for rainwater harvesting systems to ensure the water quality. It states that observations for water quality should be made during maintenance visits and testing should be carried out where the system is not operating satisfactorily. When sampling is required a sample should be taken and carried out in accordance with the guidance set out in NA.1 and Table NA.1 sets out the guideline values for bacteriological monitoring and Table NA.2 for non-bacteriological monitoring.

3.3 The water quality will need to be maintained at a suitable level commensurate with the end use and the treated water quality will have to meet those set out in the Private Water Supply Regulations.

4.0 Continuity of Supply

4.1 To ensure that sufficient water is available for re-use, the storage tank will be sized so that it can provide 35 days of storage, which will provide sufficient supply during periods of drought.

4.2 Where drought periods extend beyond 35 days, the rainwater harvesting system will include an automatic mains backup. This will ensure that water is available at all times, even during extended periods of drought.

5.0 Maintenance Categories

5.1 There are three categories of maintenance activities referred to in this report. These are:

Inspection and Monitoring

- Inspection and monitoring tasks should be carried out frequently, nominally once a month, and should include a visual inspection of all components including all inlets and outlets.

Regular Maintenance (Monthly)

- Regular maintenance consists of basic tasks done on a frequent and predictable schedule.

Seasonal Maintenance (Quarterly)

- Seasonal maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks.

Remedial Maintenance

- Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system that have been identified through visual inspections. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance.

6.0 The Rainwater Harvesting System

6.1 The proposed rainwater harvesting system will receive rainwater passing through and over several structures and will store rainwater within several items of infrastructure. These include:

- Roofs
- Gutters
- Filters;
- Pumps;
- Overflows; and
- Storage tanks.

6.2 All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangements as defined on the designer's drawings.

6.3 This report should be read in conjunction with the rainwater harvesting design, so that the location and type of each item of infrastructure can be recognised and understood.

6.4 Manufacturer's instructions are to be added to this document once specific products have been selected and installed as part of the detailed design. This document will subsequently form the basis for a maintenance regime for the rainwater harvesting system.

7.0 General Maintenance Principles

7.1 All rainwater harvesting systems require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the rainwater harvesting systems should be carried out alongside other regular maintenance tasks within the property.

7.2 Timely and adequate maintenance will increase the lifespan of the rainwater harvesting system. Inadequate maintenance will do the reverse.

7.3 The property owners are responsible for the monitoring and maintenance of the rainwater harvesting system for the lifetime of the development.

8.0 Inspection and Maintenance Frequency of Components

8.1 Table 5.1 below lists each of the components used within the development's rainwater harvesting systems. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.

8.2 In accordance with the Drinking Water Inspectorate's Private Water Supply regulations, it is the responsibility of the homeowner to ensure that all necessary maintenance activities are carried out in a timely manner and that the design performance of each drainage component is preserved. The homeowner may appoint a competent contractor to assist with the maintenance of their rainwater harvesting system. Additionally, the Council has a role to ensure the regulations are upheld by the homeowner.

8.3 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspection of the tank for debris and sediment build-up	Annually
	Inspection of inlets/outlets and withdrawal devices	Annually
	Inspection of filters	Annually
	Inspection of Pumps	Annually
	Inspection of overflow areas	Annually
	Inspection of gutters	Annually
	Cleaning of tank	Annually
	Cleaning of inlets and outlets and withdrawal devices	Annually
	Cleaning of gutters and roof drain filters	Annually
	Check pump operation	Annually
Occasional Maintenance	Cleaning and/or replacement of any filters	Quarterly
Remedial Actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 5.1 – Maintenance tasks and frequencies

8.4 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained and an annual maintenance report should be compiled, which should include the following:

- Observations resulting from inspections;
- Maintenance and operation activities undertaken during the year; and

- Recommendations for inspections and maintenance programmes for the following year.

8.5 On the next page is a table with suggested information that should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required and should be kept for the lifetime of the development.

Date	Component requiring maintenance	Issues prompting maintenance	Scheduled maintenance (Y/N)	Maintenance carried out	Additional works required (Y/N). If yes, please detail	Next scheduled date of inspection and maintenance

Appendix I

Offsetting – Summary of Offsetting Scheme

Sussex Water Neutrality Offsetting Scheme

Developer and Water Credit Allocation

Property	Total Number of Credits	Developer	Number of Credits Used	Remaining Credits
13 Scott Road	381	Mr Kevin Shaw	80	301
		Total Allocated Credits	80	
		Total Remaining Credits		301

Appendix J

Offsetting – 13 Scott Road, Flow Survey Data

Residential Flow Survey

25 Apr 2024 / Kevin Shaw @ 13 Scott Road

Complete

Score	15 / 15 (100%)	Flagged items	0	Actions	0

Site conducted	13 Scott Road, Crawley, RH10 5DA
Conducted on	25.04.2024 16:29 BST
Prepared by	Kevin Shaw @ 13 Scott Road
Location	13 Scott Road Crawley England RH10 5DA United Kingdom (51.10345660365816, -0.176875432466763)
Water Meter Reading	
Type of Property	Semi-detached
Number of bedrooms	6

Untitled Page	14 / 14 (100%)
Kitchen 1	1 / 1 (100%)
- Sink Taps - litres/minute VIDEO REQUIRED	Mixer 12Lpm
AF3500F5-DC71-47EF-815B-64561CFFEFE5-video.mov	
- Washing Machine Make & Model - litres/kg dry load PHOTO REQUIRED	Yes
- Dishwasher Make & Model - litres/place setting PHOTO REQUIRED	No
Utility Room/Kitchen 2	1 / 1 (100%)
Is there a utility room/second kitchen?	No
WC	1 / 1 (100%)
Is there a WC?	Yes
- Basin Taps - litres/minute VIDEO REQUIRED	Mixer 10Lpm
A2A0C771-8F5D-4141-B586-E39BFD7C1742-video.mov	
- WC - litres PHOTO REQUIRED	Dual Flush



Photo 1

Bathroom 1	2 / 2 (100%)
- Shower Make/Model - litres/minute VIDEO REQUIRED	Thermostatic Mixer 17Lpm
2 tenants share this bathroom	
714036B8-53E5-4BCF-AC2B-7F314192B7EA-video.mov	
- Basin Taps - litres/minute VIDEO REQUIRED	Mixer 11.5Lpm
753C551F-F918-4CC4-BEED-88BA1F5DEDA0-video.mov	
- WC - litres PHOTO REQUIRED	Dual Flush


Photo 2

Is there a bath?	No
- Bathroom 2	2 / 2 (100%)
Is there an additional bathroom?	Yes

4 tenants share this bathroom

- Basin Taps - litres/minute VIDEO REQUIRED	Mixer 11.5Lpm

A584CE74-E104-4F66-B649-EB24909EA724-video.mov

- Shower - litres/minute VIDEO REQUIRED	Thermostatic mixer 18Lpm

85616CA5-9A58-485D-BD2D-E32C752FDE92-video.mov

- WC - litres PHOTO REQUIRED	Dual Flush


Photo 3

Is there a bath?	No
Bathroom 3	2 / 2 (100%)
Is there an additional bathroom?	No
Is there a bath?	No
Bathroom 4	2 / 2 (100%)
Is there an additional bathroom?	No
Is there a bath?	No
Bathroom 5	2 / 2 (100%)
Is there an additional bathroom?	No
Is there a bath?	No

- Bath and Taps - Measure Bath and litres/minute VIDEO

REQUIRED

Other Water uses	1 / 1 (100%)
Are there any other water uses?	No

Media summary



Photo 1



Photo 2



Photo 3

File summary

AF3500F5-DC71-47EF-815B-64561CFFEFE5-video.mov
A2A0C771-8F5D-4141-B586-E39BFD7C1742-video.mov
714036B8-53E5-4BCF-AC2B-7F314192B7EA-video.mov
753C551F-F918-4CC4-BEED-88BA1F5DEDA0-video.mov

A584CE74-E104-4F66-B649-EB24909EA724-video.mov
85616CA5-9A58-485D-BD2D-E32C752FDE92-video.mov

Appendix K

Offsetting – 13 Scott Road, Flow Survey Part G Calculation

Part G Calculation - 13 Scott Road Water Usage (Flow Survey)
Bathroom 1

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person/ day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	6	1.46		8.76
WC (Dual Flush) Part	3	2.96		8.88
Taps (excluding kitchen)	11.5	1.58	1.58	19.75
Bath (where shower present)		0.11		0.00
Shower (where bath present)		4.37		0.00
Bath Only		0.5		0.00
Shower Only	17	5.6		95.20
Kitchen Sink	12	0.44	10.36	15.64
Washing Machine	5.13	2.1		10.77
Dishwasher		3.6		0.00
	Total calculated use (litres/person/day)			159.00
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				144.69
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				149.69

	Number of Units	Census	Population	Mains Water Usage
6-bedroom	1	2	2	299.39
Totals	1		2	299.39

Part G Calculation - 13 Scott Road Water Usage (Flow Survey)

Bathroom 2

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person/ day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	6	1.46		8.76
WC (Dual Flush) Part	3	2.96		8.88
Taps (excluding kitchen)	11.5	1.58	1.58	19.75
Bath (where shower present)		0.11		0.00
Shower (where bath present)		4.37		0.00
Bath Only		0.5		0.00
Shower Only	18	5.6		100.80
Kitchen Sink	12	0.44	10.36	15.64
Washing Machine	5.13	2.1		10.77
Dishwasher		3.6		0.00
	Total calculated use (litres/person/day)			164.60
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				149.79
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				154.79

	Number of Units	Census	Population	Mains Water Usage
6-bedroom	1	4	4	619.15
Totals	1		4	619.15

Appendix L

Offsetting – 13 Scott Road, Proposed Part G

Part G Calculation - 13 Scott Road Water Usage (Flow Restricting Valves)
Bathroom 1

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person /day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	6	1.46		8.76
WC (Dual Flush) Part	3	2.96		8.88
Taps (excluding kitchen)	3.5	1.58	1.58	7.11
Bath (where shower present)		0.11		0.00
Shower (where bath present)		4.37		0.00
Bath Only		0.5		0.00
Shower Only	8	5.6		44.80
Kitchen Sink	5	0.44	10.36	12.56
Washing Machine	5.13	2.1		10.77
Dishwasher		3.6		0.00
	Total calculated use (litres/person/day)			92.88
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				84.52
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				89.52

	Number of Units	Census	Population	Mains Water Usage
6-bedroom	1	2	2	179.05
Totals	1		2	179.05

Part G Calculation - 13 Scott Road Water Usage (Flow Restricting Valves)

Bathroom 2

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person /day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	6	1.46		8.76
WC (Dual Flush) Part	3	2.96		8.88
Taps (excluding kitchen)	3.5	1.58	1.58	7.11
Bath (where shower present)		0.11		0.00
Shower (where bath present)		4.37		0.00
Bath Only		0.5		0.00
Shower Only	8	5.6		44.80
Kitchen Sink	5	0.44	10.36	12.56
Washing Machine	5.13	2.1		10.77
Dishwasher		3.6		0.00
	Total calculated use (litres/person/day)			92.88
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				84.52
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				89.52

	Number of Units	Census	Population	Mains Water Usage
6-bedroom	1	4	4	358.09
Totals	1		4	358.09

Appendix M

Offsetting – Proposed Flow Restricting Valves

Fixtures and Fittings – Part G Specifications

Item	Capacity / Flow Rate	Overview
Basin Tap	3.5 litres/minute	Flow Restricting Valve
Shower	8 litres/minute	Flow Restricting Valve
Kitchen Sink	5 litres/minute	Flow Restricting Valve