Site: Land West of Backsettown, Furners Lane, Henfield, BN5 9HS
Prepared by: Ella Harrop
Approved by: Neil Jaques
Date: 26th September 2024

84 North Street
Guildford
GU1 4AU

Tel: 01483 531300
www.motion.co.uk

1.0 Introduction

1.1 This Water Neutrality Statement (WNS) has been prepared on behalf of our client, Elivia Homes, to demonstrate how the proposed development at Land West of Backsettown, Furners Lane, Henfield, BN5 9HS, will achieve water neutrality.

1.2 It is proposed to provide a total of 29 units, comprising a housing mix of two one-bed units, seven two-bed units, 11no. three-bed units and nine four-bed units.

1.3 Following the issue of Natural England's (NE's) Position Statement on Water Neutrality within the Sussex North Water Supply Zone (SNWSZ) and the Somerset Ruling, 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.

1.4 As the site falls within the SNWSZ boundary, 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.

1.5 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 and rainwater harvesting, will be used;
- Whether the proposed development will be water neutral, and;
- Whether any further offsetting measures to meet proposed water demand are required.

2.0 Background

2.1 The proposed development is located west of Backsettown, Furners Lane, Henfield, BN5 9HS. The site currently consists of a empty fields.

2.2 It is proposed to construct a total of 29 units, comprising a housing mix of two one-bed units, seven two-bed units, 11no. three-bed units and nine four-bed units, along with residential parking spaces. The proposed units must be offset and demonstrate water neutrality. A copy of the proposed plans can be found in Appendix C.

3.0 Existing Baseline Water Demand

3.1 As the site currently consists of empty fields, there are no existing water usage calculations.

3.2 Therefore, the existing water usage of the site will be taken as zero l/d (litres per day).

4.0 Proposed Water Demand

4.1 As previously defined, the proposed development will provide two one-bed units, seven two-bed units, 11no. three-bed units and nine four-bed units.

4.2 In terms of the mains water demand of the dwellings, they will need to comply with 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*". This water consumption can be used with the population of the proposed development to calculate what the future demand is likely to be.

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 previously discussed, the population of the proposed development is estimated to be 68.71 persons.

4.5 Using the Building Regulations water consumption figure of 125 l/p/d (litres per person per day) and proposed population size of 68.71, it is estimated that the total water usage per day for the proposed development would total to 8,588.75 l/d.

4.6 Therefore, following the construction of the proposed development, there would be a net increase in water demand of 8,588.75 l/d. 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, 8,588.75 l/d will need to be offset. The NE Position Statement states that offsetting can be carried out by fitting properties with grey water recycling systems, rainwater harvesting and/or water efficient fixtures and fittings.

5.2 To minimise the demand on the mains water, it is proposed that the new dwellings will achieve a water efficiency of less than 110 l/p/d of water, which will be in accordance with the optional water efficiency target set out in Building Regulations Part G. This will be achieved through the use of water efficient fixtures and fittings.

5.3 For the development of 29 units, it is proposed that the 19open market dwellings units will have a reduced water consumption figure of 104.41 l/p/d and the remaining 10affordable rented dwellings units to have a water consumption of 106.31 l/p/d.

Fittings and Fixtures Open Market Dwellings

5.4 The 19 open market dwellings will have a proposed population of 48.67 persons.

5.5 A water calculation in accordance with Buildings Regulations Part G has been carried out and confirms that 19 proposed dwellings can achieve a reduced main water consumption of 104.41 l/p/d, which includes an allowance of 5 l/p/d for external water usage. A copy of the water efficient Part G calculation can be found in Appendix D and is summarised in Table 5.1, on the next page.

Fixture/Fitting Type	Total Water Usage (l/p/d)
WC (full flush)	6.57
WC (part flush)	8.88
Taps (Excluding Kitchen)	9.64
Shower	34.96
Bath	17.16
Kitchen Taps	15.68
Washing Machine	13.20
Dishwasher	3.15
Total	109.24
Normalisation Factor	0.91
Total	99.41
External Water Use	5.00
Total	104.41

Table 5.1 – Proposed Water Usage (104.41 l/p/d)

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

5.7 Using the Part G water consumption figure of 104.41 l/p/d and the census-based development population of 48.67 it is estimated that the water usage per day for the 19 units can be reduced to 5,081.65 l/d.

Fittings and Fixtures Affordable Rented Dwellings

5.8 The 10 affordable rented dwellings will have a proposed population of 20.04 persons.

5.9 A water calculation in accordance with Buildings Regulations Part G has been carried out and confirms that 10no. proposed dwellings can achieve a reduced main water consumption of 106.31 l/p/d, which includes an allowance of 5 l/p/d for external water usage. A copy of the water efficient Part G calculation can be found in Appendix F and is summarised in Table 5.2, below.

Fixture/Fitting Type	Total Water Usage (l/p/day)
WC (full flush)	5.84
WC (part flush)	7.70
Taps (Excluding Kitchen)	9.84
Shower	34.96
Bath	18.70
Kitchen Taps	13.00
Washing Machine	17.16
Dishwasher	4.50
Total	111.33
Normalisation Factor	0.91
Total	101.31
External Water Use	5.00
Total	106.31

Table 5.2 – Proposed Water Usage (106.31 l/p/d)

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

5.11 Using the Part G water consumption figure of 106.31 l/p/d and the census-based development population of 20.04, it is estimated that the water usage per day for 10 units can be reduced to 2,130.51 l/d.

5.12 Therefore, following the development of the site there will be a total net increase in water demand of 7,212.16 l/d (5,081.65 l/d + 2,130.51 l/d). At this stage, the proposed development still cannot be considered water neutral.

5.13 Therefore, to achieve water neutrality, further water reduction measures are required.

Rainwater Harvesting Systems

5.14 To mitigate the increase in water demand, it is proposed to incorporate rainwater harvesting into the proposed development. Each dwelling will have a rainwater harvesting tank that will feed back into the individual property's water supply.

5.15 The water collected by the rainwater harvesting system will be utilised for flushing toilets and in the washing machines. All other uses will be mains water fed as these require a supply of 'wholesome water' and cannot use recycled rainwater.

5.16 For the proposed development of 29no. units, it is proposed that the open market dwellings will have a reduced water consumption figure of 73.34 l/p/d and the remaining affordable rented dwellings will have a reduced figure of 73.38 l/p/d.

5.17 Table 5.3, below, 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)	6.57		6.57
WC (part flush)	8.88		8.88
Taps (Excluding Kitchen)	9.64	9.64	
Shower	34.96	34.96	
Bath	17.16	17.16	
Kitchen Taps	15.68	15.68	
Washing Machine	13.20		13.20
Dishwasher	3.15	3.15	
Total	109.24	80.59	28.65
Normalisation Factor	0.91	0.91	0.91
Total	99.41	73.34	26.07
External Water Use	5.00		5.00
Total	104.41	73.34	31.07

Table 5.3 – Water Efficient Part G Calculation with Rainwater Harvesting (Open Market Dwellings)

5.18 The above table, found in full in Appendix D, confirms that 31.07 litres per person per day can be supplied by the rainwater harvesting system which equates to 1,512.25 litres per day, based on the previously defined population of 48.67 persons for 19no. units.

5.19 Table 5.4, on the next page, 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)	7.70		7.70
Taps (Excluding Kitchen)	9.48	9.48	
Shower	34.96	34.96	
Bath	18.70	18.70	
Kitchen Taps	13.00	13.00	
Washing Machine	17.16		17.16
Dishwasher	4.50	4.50	
Total	111.33	80.64	30.69
Normalisation Factor	0.91	0.91	0.91
Total	101.31	73.38	27.93
External Water Use	5.00		5.00
Total	106.31	73.38	32.93

Table 5.4 – Water Efficient Part G Calculation with Rainwater Harvesting (Affordable Rented Dwellings)

5.20 The above table, found in full in Appendix F, confirms that 32.93 litres per person per day can be supplied by the rainwater harvesting system which equates to 659.93 litres per day, based on the previously defined population of 20.04 persons for 10no. units.

5.21 The rainwater harvesting tank for each dwelling have 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 tanks will provide at least 35 days of storage for periods of drought, as required by HDC.

5.22 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 Shoreham Airport. The calculation is summarised in Table 5.5 on the next page and can be found in full in Appendix H, along with proposed examples of rainwater harvesting tank sizes.

Unit	Number of Persons	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
Apartment Block 1	3.2	87.90	4,572.59	3,692.45	4,400
Apartment Block 2	3.2	87.90	4,572.59	3,692.45	4,400
AFF Type 3	1.88	47.84	2,488.66	2,169.31	2,600
AFF Type 4	2.47	50.98	2,652.00	2,850.11	3,400
“Farleigh” 2-bed	1.88	109.69	6,419.38	2,046.84	2,600
“Birtley” 2-bed	1.88	108.46	6,357.40	2,046.84	2,600
“Priestwood” 3-bed	2.47	122.95	7,195.40	2,689.20	2,600
“Brambleton” 3-bed	2.47	115.69	6,770.52	2,689.20	3,400
“Ashcombe II” 4-bed	2.86	86.14	5,041.17	3,113.81	3,400
“Goring” 4-bed	2.86	116.58	6,822.61	3,113.81	3,400
“Barnham” 4-bed	2.86	97.00	5,676.73	3,113.81	3,400

Table 5.5 – Rainwater Harvesting Tank Sizing Calculation

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

5.24 The rainwater harvesting systems 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 J.

5.25 Following the incorporation of the rainwater harvesting system on the proposed dwellings, the mains water usage will be reduced to 5,039.98 litres per day

5.26 The development would still require 5,039.98 litres of mains water per day to supply the proposed water demand, therefore, further offsetting measures are required to achieve water neutrality.

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 5,039.98 litres per day will need to be offset.

6.2 It is proposed to offset the mains demand of the proposed development against an offsite dairy farm.

Offsite Dairy Farm

6.3 The offsite dairy farm is located within the South Downs National Park Authority and the Sussex North Water Supply Zone that relies entirely on mains water. A borehole has been installed to offset this usage in part, but is not yet in operation.

6.4 The available amount of water in this offsetting scheme is 15,068 litres per day and is within the limits set by the Environment Agency before an extraction permit is required.

6.5 Elivia Homes considers the offsite dairy farm able to provide a suitable offsetting solution in order to address the water neutrality requirements at Land West of Backsettown, as well as other Elivia Homes schemes within Horsham District and Chichester District.

6.6 Following the construction of the proposed development, a total of 10,028.02 l/d (15,068 l/d – 5,039.98 l/d) will be left from the offsetting scheme at the offsite dairy farm and will be set aside for use on future projects.

7.0 Summary and Conclusions

7.1 This Technical Note sets out the water usage strategy for the proposed development at Land West of Backsettown, Furners Lane, Henfield, BN5 9HS.

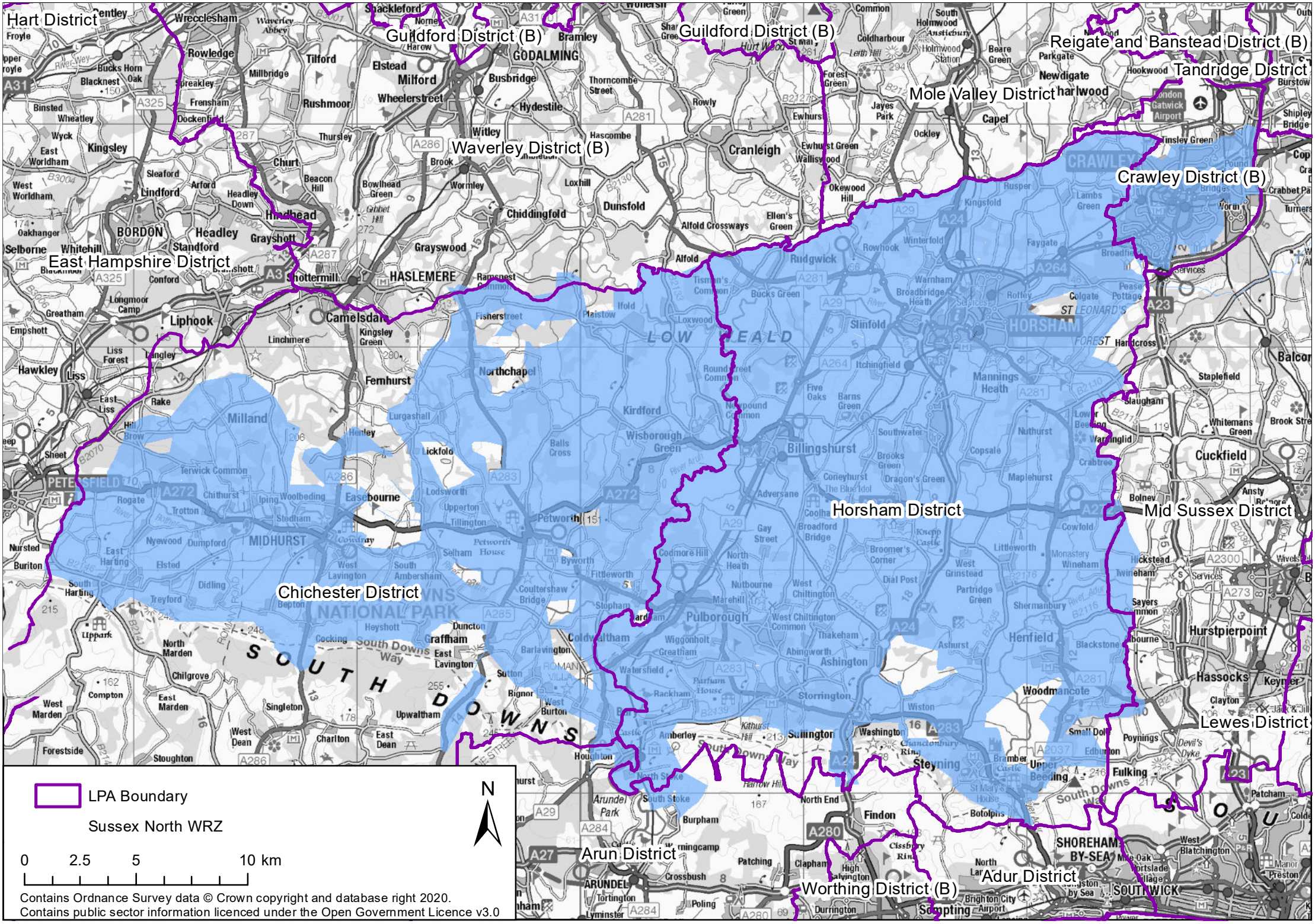
7.2 This proposal is to incorporate water efficient fixtures and fittings and rainwater harvesting systems to the 29no. dwellings to minimise the water demand of the proposed development.

7.3 The development represents a net increase in water demand of 5,039.98 l/d within the SNWSZ, and this increase in water demand will be offset against an offsetting scheme by an offsite dairy farm.

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


Hart District
Guildford District (B)
Guildford District (B)
Reigate and Banstead District (B)
Tandridge District
Mole Valley District
Waverley District (B)
Crawley District (B)
East Hampshire District
Horsham District
Mid Sussex District
Chichester District
Lewes District
Arun District
Adur District
Worthing District (B)
LPA Boundary
Sussex North WRZ
N
0
2.5
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10 km
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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

CDM 2015 Health & Safety Information

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.

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SITE PLAN

Accommodation Schedule

Affordable Rented Dwellings [10no. - 34.5%]

2no.	1-Bedroom M4(3) Flats	AFF Type 1	Block	607sqft
2no.	2-Bedroom Flats	AFF Type 2	Block	716sqft
2no.	2-Bedroom Houses	AFF Type 3	Terraced	874sqft
4no.	3-Bedroom Houses	AFF Type 4	Terraced	1003sqft

Open Market Dwellings [19no. - 65.5%]

3no.	2-Bedroom w/ Study Chalet Bungalows	Farleigh	Detached	1142sqft
5no.	3-Bedroom Chalet Bungalows	Birtley	Detached	1231sqft
2no.	4-Bedroom Houses	Ashcombe II	Detached	1428sqft
2no.	3-Bedroom w/ Study Chalet Bungalows	Priestwood	Detached	1517sqft
4no.	4-Bedroom Houses	Barnham	Detached	1628sqft
1no.	4-Bedroom Chalet Bungalow	Brambleton	Detached	1727sqft
2no.	4-Bedroom w/ Study Houses	Goring	Detached	1889sqft

Total; 29 Dwellings

Parking

Allocated Spaces:	59 spaces
Visitor Parking:	13 spaces
Total Parking Spaces:	**72 spaces**

Rev	Date	Revision Details	Dr	Ch
P11	19.09.24	Updated Red line boundary.	NK	TW
P10	17.09.24	Updated Site Layout	NK	TW
P9	05.09.24	Footpath on western boundary widened to 2m	TW	AK
P8	22.08.24	Indicative planting removed.	EW	TW
P7	14.08.24	Parking added to schedule - annotations added.	NK	KE
P6	12.08.24	Updated Site Layout - drainage info added.	NK	KE
P5	29.07.24	Updated Site Layout	TW	AK
P4	22.07.24	Updated Site Layout	JY	AK
P3	16.07.24	Updated Site Layout	AK	KE
P2	30.08.23	Updated Site Layout to Pre-App Comments	LD	AK
P1	05.07.23	Updated to Client Comments	LD	AK

London: 76 Great Suffolk Street, London, SE1 0BL
T 0207 928 2773 E london@ecearchitecture.com
Sussex: 64 - 68 Brighton Road, Worthing, West Sussex, BN11 2EN
T 01903 248777 E sussex@ecearchitecture.com
Bristol: Westworks, Beacon Tower, Colston Street, Bristol, BS1 4XE
T 0117 214 1101 E bristol@ecewestworks.com
ECE Architecture
www.ecearchitecture.com

Client's Name
Elivia Homes

Job Title
Land West of Backsettown, Furners Lane, Henfield

Drawing Title
Proposed Site Plan

Scale
1:500 @ A1 / 1:1000 @ A3

metres 10 20 30 40 50

Drawn	Checked	Date
AK	KE	02.03.23

Job No	Drawing No	Rev
7227	PL-10	P11

Status
PRELIMINARY

CAD Plot date: 19/09/2024 - 14:54:57 7227m henfield site plan - new scheme.dwg

Appendix D

Proposed - Part G Calculation (@ 104.91 l/p/d and @ 73.34 l/p/d)

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)	4.5	1.46		6.57
WC (Dual Flush) Part	3	2.96		8.88
Taps (excluding kitchen)	5.1	1.58	1.58	9.64
Bath (where shower present)	156	0.11		17.16
Shower (where bath present)	8	4.37		34.96
Bath Only		0.5		0.00
Shower Only		5.6		0.00
Kitchen Sink	12.1	0.44	10.36	15.68
Washing Machine	6.29	2.1		13.20
Dishwasher	0.875	3.6		3.15
Total calculated use (litres/person/day)				109.24
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				99.41
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				104.41

Rainwater Harvesting	31.07	litres/person/day
Mains Water	73.34	litres/person/day
Total	104.41	litres/person/day

	Number of units	Census	Population	Mains Water Usage	Rainwater Usage		
2-bed House	3	1.88	5.64	413.63	175.24		
3-bed House	7	2.47	17.29	1268.03	537.23		
4-bed House	9	2.86	25.74	1887.74	799.78		
Totals	19		48.67	3,569.40	1,512.25	5,081.65	litres/day

Appendix E

Proposed – Fixtures and Fittings (@ 104.91 l/p/d)

Fixtures and Fittings - Part G Specifications

Item	Capacity/Flow rate	Overview
Toilet (Dual Flush)	4.5/3 litres	Roca 'The Gap' Single floor standing Rimless WC (A347737000)
Basin Tap	5.1 litres/minute	Vado 'Zoo' Mono basin mixer with universal basin (ZOO-100F/CC-C/P)
Bath	156 litres	Roca 'The Gap' Rectangular acrylic bath; 1700mm (Z024717000)
Shower	8 litres/minute	Vado 'Zoo' Single function shower handset; Chrome (ZOO-DECKKIT-C/P)
Kitchen Sink	12.1 litres/minute	1810 Cascata Square

Appendix F

Proposed – Part G Calculation (@ 106.31 l/p/d and @ 73.38 l/p/d)

Proposed Water Usage - "Affordable", 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	2.6	2.96		7.70
Taps (excluding kitchen)	5	1.58	1.58	9.48
Bath (where shower present)	170	0.11		18.70
Shower (where bath present)	8	4.37		34.96
Bath Only		0.5		0.00
Shower Only		5.6		0.00
Kitchen Sink	6	0.44	10.36	13.00
Washing Machine	8.17	2.1		17.16
Dishwasher	1.25	3.6		4.50
Total calculated use (litres/person/day)				111.33
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				101.31
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				106.31

Rainwater Harvesting	32.93	litres/person/day
Mains Water	73.38	litres/person/day
Total	106.31	litres/person/day

	Number of units	Census	Population	Mains Water Usage	Rainwater Usage		
1-bed Flat	2	1.32	2.64	193.73	86.94		
2-bed Flat	2	1.88	3.76	275.92	123.82		
2-bed House	2	1.88	3.76	275.92	123.82		
3-bed House	4	2.47	9.88	725.02	325.35		
Totals	10		20.04	1,470.58	659.93	2,130.51	litres/day

Appendix G

Proposed – Fixtures and Fittings (@ 106.31 l/p/d)

Fixtures and Fittings - Part G Specifications

Item	Capacity/Flow rate	Overview
Toilet (Dual Flush)	4/2.6 litres	Roca Laura Close Coupled Pan w/ Roca Laura Cistern
Basin Tap	5 litres/minute	VADO Matrix Mono Basin Mixer Single Lever Deck Mounted Chrome. with Clic-Clac Waste MAT-100/CC-C/P
Bath	170 litres	Roca - SB Contessa 1700 Plain Steel Bath c/w ANTI SLIP
Shower	8 litres/minute	VADO Eris Slide Rail Shower Kit Chrome ERI-SFSRK-DB-C/P
Kitchen Sink	6 litres/minute	Double lever Mono Mixer Kitchen Tap Chrome

Appendix H

Proposed - Rainwater Harvesting Systems Tank Sizing Calculation

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

AAR	752.61	Average Annual Rainfall
e	0.9	Yield Coefficient
h	0.9	Hydraulic Filter Efficiency
P_d	31.07	Daily Requirement per Person

Unit	Type	No. Beds	No. Units	Census	Population	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Total Storage Volume at 9.6%	Minimum Tank Size (litres)
2-bed	Farleigh	2	1	1.88	1.88	109.69	6,419.38	2,046.84	2,046.84	2,600
2-bed	Farleigh	2	1	1.88	1.88	109.69	6,419.38	2,046.84	2,046.84	2,600
2-bed	Farleigh	2	1	1.88	1.88	109.69	6,419.38	2,046.84	2,046.84	2,600
3-bed	Birtley	3	1	2.47	2.47	108.46	6,347.40	2,689.20	2,689.20	3,400
3-bed	Birtley	3	1	2.47	2.47	108.46	6,347.40	2,689.20	2,689.20	3,400
3-bed	Birtley	3	1	2.47	2.47	108.46	6,347.40	2,689.20	2,689.20	3,400
3-bed	Birtley	3	1	2.47	2.47	108.46	6,347.40	2,689.20	2,689.20	3,400
3-bed	Birtley	3	1	2.47	2.47	108.46	6,347.40	2,689.20	2,689.20	3,400
3-bed	Priestwood	3	1	2.47	2.47	122.95	7,195.40	2,689.20	2,689.20	3,400
3-bed	Priestwood	3	1	2.47	2.47	122.95	7,195.40	2,689.20	2,689.20	3,400
4-bed	Brambleton	4	1	2.86	2.86	115.69	6,770.52	3,113.81	3,113.81	3,400
4-bed	Ashcombe II	4	1	2.86	2.86	86.14	5,041.17	3,113.81	3,113.81	3,400
4-bed	Ashcombe II	4	1	2.86	2.86	86.14	5,041.17	3,113.81	3,113.81	3,400
4-bed	Goring	4	1	2.86	2.86	116.58	6,822.61	3,113.81	3,113.81	3,400
4-bed	Goring	4	1	2.86	2.86	116.58	6,822.61	3,113.81	3,113.81	3,400
4-bed	Barnham	4	1	2.86	2.86	97.00	5,676.73	3,113.81	3,113.81	3,400
4-bed	Barnham	4	1	2.86	2.86	97.00	5,676.73	3,113.81	3,113.81	3,400
4-bed	Barnham	4	1	2.86	2.86	97.00	5,676.73	3,113.81	3,113.81	3,400
4-bed	Barnham	4	1	2.86	2.86	97.00	5,676.73	3,113.81	3,113.81	3,400
		Totals	19		48.67		118,590.91	52,989.24	52,989.24	

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

AAR	752.61	Average Annual Rainfall
e	0.8	Yield Coefficient
h	0.9	Hydraulic Filter Efficiency
P_d	32.93	Daily Requirement per Person

Unit	Type	No. Beds	No. Units	Census	Population	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Total Storage Volume at 9.6%	Minimum Tank Size (litres)
1-bed	Apartment Block	1	1	1.32	1.32					
2-bed	Apartment Block	2	1	1.88	1.88	87.90				
			2		3.2	87.90	4,572.59	3,692.45	3,692.45	4,400

Unit	Type	No. Beds	No. Units	Census	Population	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Total Storage Volume at 9.6%	Minimum Tank Size (litres)
1-bed	Apartment Block	1	1	1.32	1.32					
2-bed	Apartment Block	2	1	1.88	1.88	87.90				
			2		3.2	87.90	4,572.59	3,692.45	3,692.45	4,400

Per Dwelling										
2-bed	AFF Type 3	2	1	1.88	1.88	47.84	2,488.66	2,169.31	2,169.31	2,600
2-bed	AFF Type 3	2	1	1.88	1.88	47.39	2,465.14	2,169.31	2,169.31	2,600
3-bed	AFF Type 4	2	1	2.47	2.47	50.98	2,652.00	2,850.11	2,850.11	3,400
3-bed	AFF Type 4	2	1	2.47	2.47	50.98	2,652.00	2,850.11	2,850.11	3,400
3-bed	AFF Type 4	2	1	2.47	2.47	50.98	2,652.00	2,850.11	2,850.11	3,400
3-bed	AFF Type 4	2	1	2.47	2.47	50.98	2,652.00	2,850.11	2,850.11	3,400
		Totals	10		20.04		24,706.98	23,123.94	23,123.94	

Annual Rainfall Data – MET Office Climate Averages

Station: Shoreham Airport

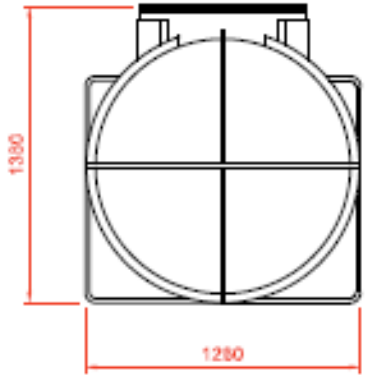
Average tables | Average graphs | Location comparison | Average maps

Climate period: 1991-2020

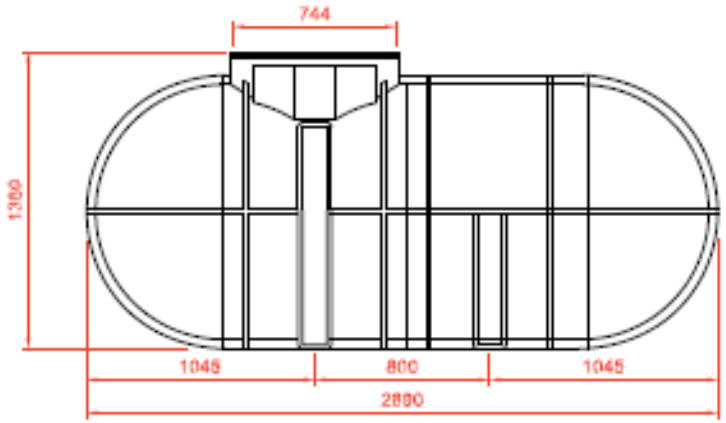
Station: Shoreham Airport

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	8.19	2.37	8.03	–	80.45	12.71	10.06
February	8.37	2.25	7.88	–	56.70	10.27	9.70
March	10.48	3.56	3.90	–	45.66	9.04	9.27
April	13.12	5.15	1.77	–	45.13	9.11	8.64
May	16.31	8.11	0.00	–	45.93	8.33	8.86
June	19.08	10.95	0.00	–	46.68	7.74	8.46
July	20.94	13.02	0.00	–	54.18	7.63	8.57
August	21.03	13.06	0.00	–	58.73	8.46	8.36
September	18.92	10.92	0.00	–	59.13	8.23	8.52
October	15.49	8.38	0.40	–	82.20	11.57	9.13
November	11.61	5.21	2.97	–	90.37	13.12	9.55
December	8.87	2.81	8.15	–	87.45	12.62	9.86
Annual	14.40	7.18	33.10	–	752.61	118.83	9.08

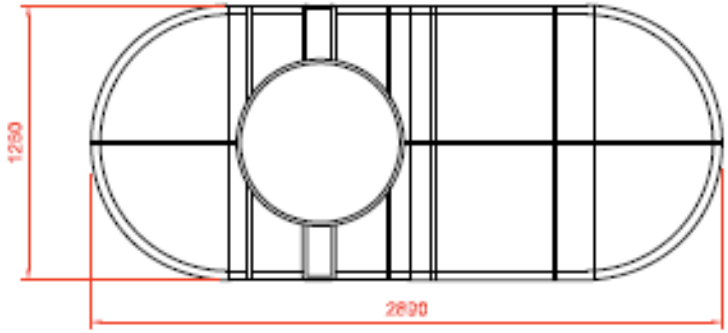
SDS 2,600 Litre Rainwater Harvesting Tank



END ELEVATION



SIDE ELEVATION



PLAN

Client	SDS	Details
Project Name	2,600 Litre Tank	
Type	Standard Detail	
Date	-	
Drawing no.	-	
Revision	A	

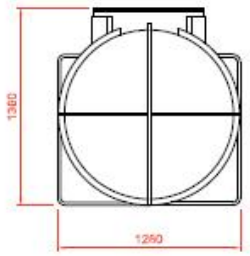
Notes:

This Drawing is to be read in conjunction with all relevant Architect, Engineers and Specialists drawings and specifications.

Do not scale from the drawing in either paper or digital form. Use written dimensions only.

SDS Water Infrastructure Systems

SDS 3,400 Litre Rainwater Harvesting Tank



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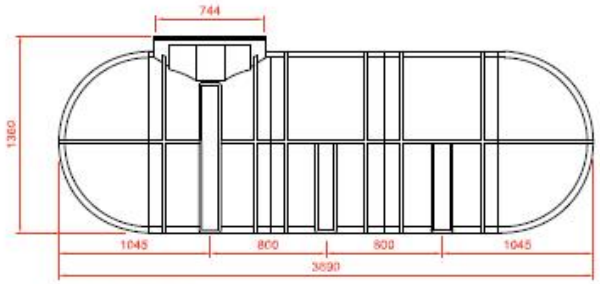
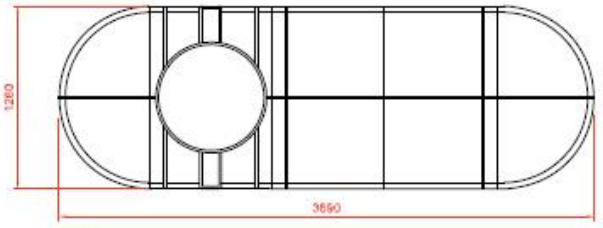


SIDE ELEVATION



PLAN

Client	SDS	Details
Project Name	3,400 Litre Tank	
Type	Standard Detail	
Date	-	
Drawing no.	-	
Revision	A	

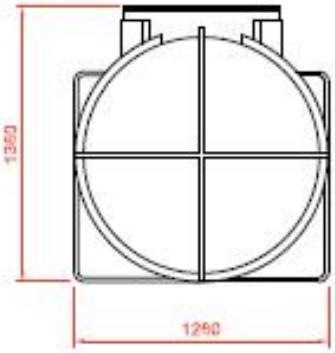
Notes:

This Drawing is to be read in conjunction with all relevant Architect, Engineers and Specialists drawings and specifications.

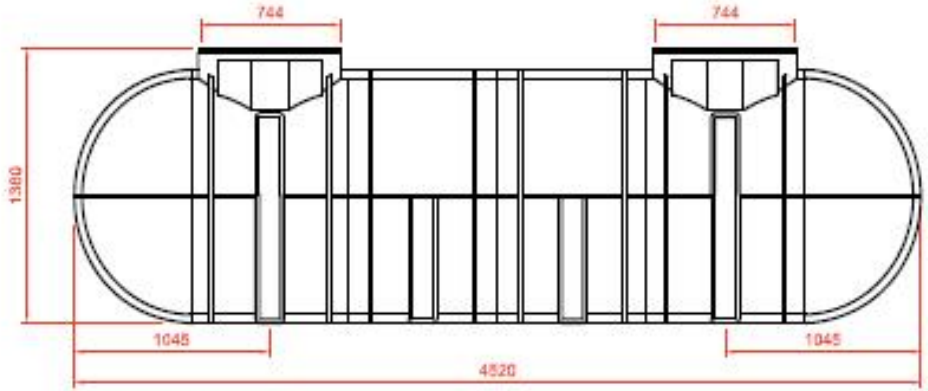
Do not scale from the drawing in either paper or digital form. Use written dimensions only.

SDS Water Infrastructure Systems

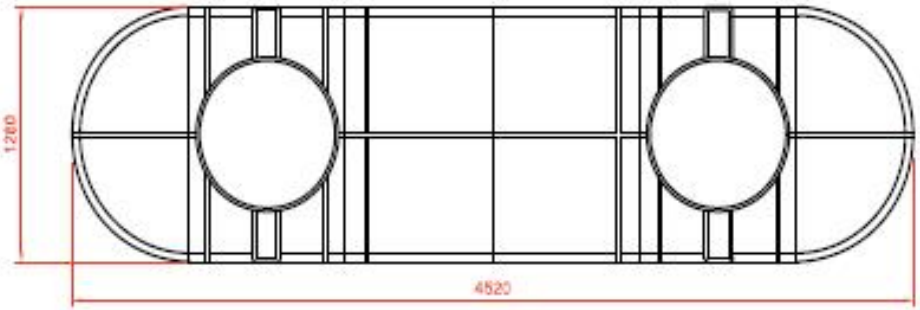
SDS 4,400 Litre Rainwater Harvesting Tank



END ELEVATION



SIDE ELEVATION



PLAN

Client	SDS	Details
Project Name	4,400 Litre Tank	
Type	Standard Detail	
Date	-	
Drawing no.	-	
Revision	A	

Notes:

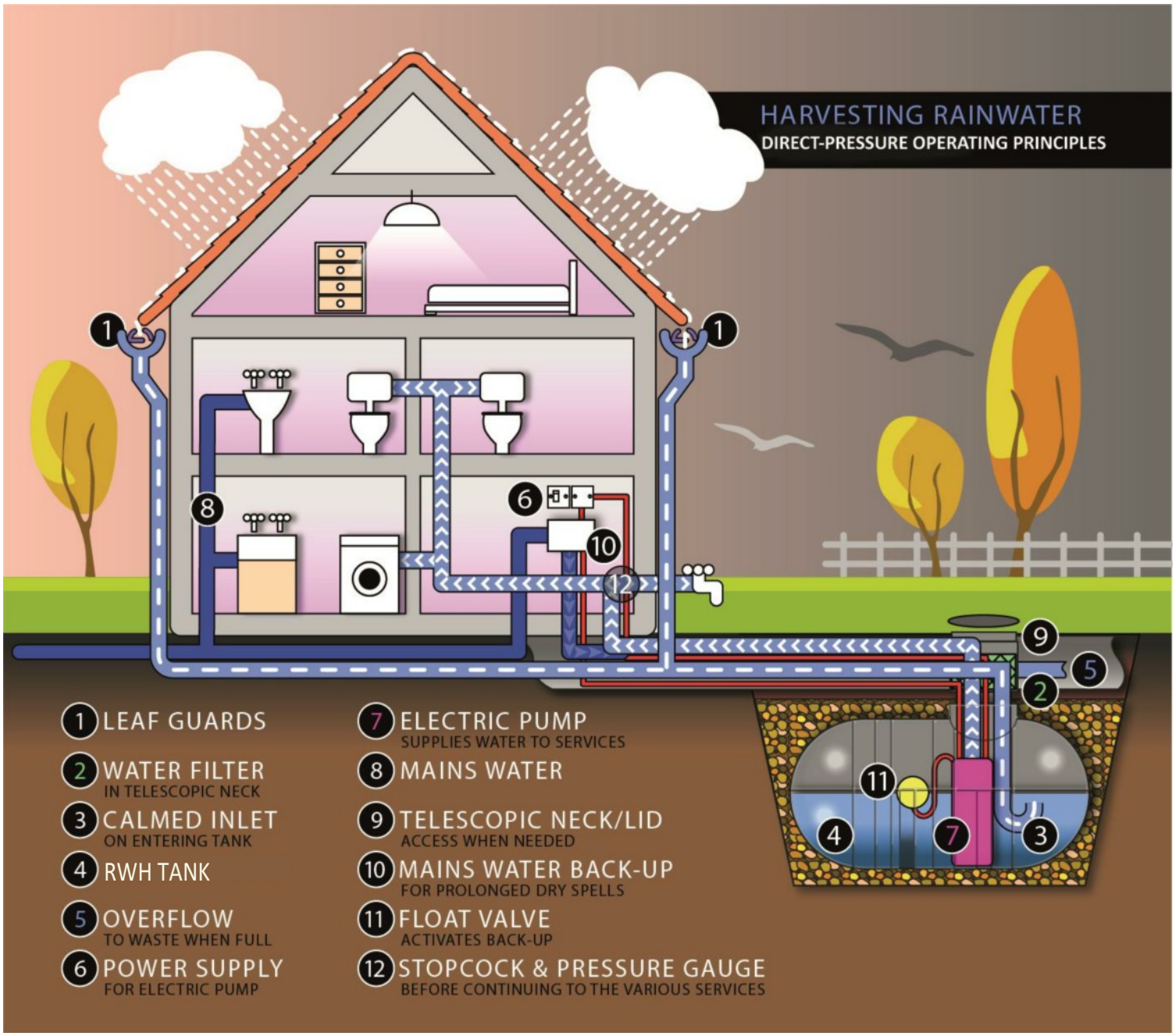
This Drawing is to be read in conjunction with all relevant Architect, Engineers and Specialists drawings and specifications.

Do not scale from the drawing in either paper or digital form. Use written dimensions only.

SDS Water Infrastructure Systems

Appendix I

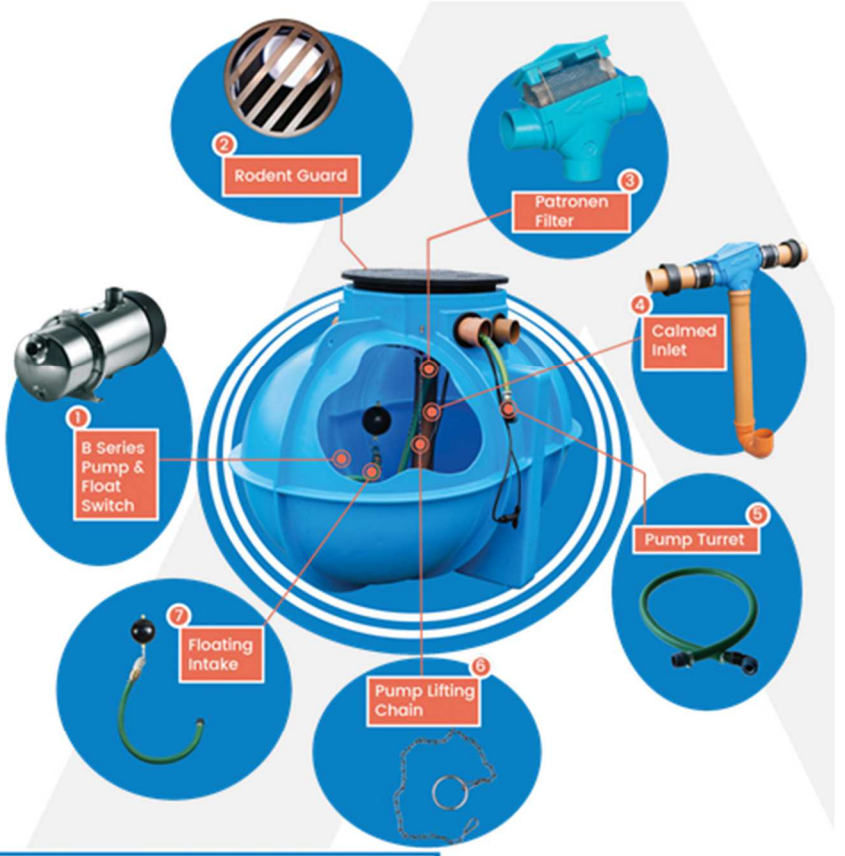
Proposed - Typical Layout of a Rainwater Harvesting System


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

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE
T: +44 (0)1934 751303
E: info@sdslimited.com

Appendix J

Proposed - Rainwater Harvesting System Management and Maintenance Plan

Land West of Backsettown
Furners Lane, Henfield, BN5 9HS

Rainwater Harvesting Management and Maintenance Plan

For

Elivia Homes

Document Control Sheet

Land West of Backsettown

Furners Lane, Henfield, BN5 9HS

Elivia Homes

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
18.09.2024	FINAL	EH	NJ

Motion
84 North Street
Guildford
GU1 4AU
T 01483 531300
F 01483 531333
E info@motion.co.uk
W www.motion.co.uk

Contents

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