

TN01: Water Neutrality Statement

Site: Land to the east of Tilletts Lane, Warnham
Prepared by: Laura Jagiela
Approved by: Neil Jaques
Date: 7th May 2025

motion
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 The Lucas Broadbridge Heath Trust to demonstrate how the proposed development at Land to the east of Tilletts Lane, Warnham, RH12 3SN, 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 boundary, Horsham District Council (HDC) as the Local Planning Authority (LPA) will want 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 and rainwater harvesting, will be used;
 - ▶ Whether any further offsetting measures to meet proposed water demand are required.

2.0 Background

- 2.1 The proposed development is located at Land to the east of Tilletts Lane, Warnham, RH12 3SN.
- 2.2 The site currently consists of open field.
- 2.3 The proposed development is to provide 59no. units, consisting of 11no. one-bed units, 23no. two-bed units, 19no. three-bed units and 6no. four-bed units. A copy of the proposed plans can be found in **Appendix C**.

3.0 Existing Water Usage

- 3.1 The existing site does not have any water use associated with it. Therefore, no baseline data will be taken forward in the water neutrality calculations.

4.0 Future Water Demand

- 4.1 As previously defined, the proposed development will construct a total of 59 units, consisting of 11 one-bed units, 23 two-bed units, 19 three-bed units and six four-bed units.
- 4.2 The occupancy levels for the 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-bed	2-bed	3-bed	4-bed
1.32	1.88	2.47	2.86

Table 4.1 – Average district occupancy levels per dwelling size

- 4.3 Using the above census data and the housing mix defined above, the population of the proposed development is estimated to be 121.85 persons.
- 4.4 It is proposed that the new dwellings will achieve a water efficiency of less than 110 litres per person per day 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.
- 4.5 A water calculation in accordance with Buildings Regulations Part G has been carried out and confirms that the proposed dwellings can achieve a mains water consumption of 84.45 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 D** and is summarised in Table 4.2, below.

	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	26.22	26.22	
Bath	14.30	14.30	
Kitchen Taps	12.12	12.12	
Washing Machine	13.50		13.50
Dishwasher	3.56	3.56	
Total	87.31	62.05	25.26
Normalisation Factor	0.91	0.91	0.91
Total	79.45	56.47	22.99
External Water Use	5.00		5.00
Total	84.45	56.47	27.99

Table 4.2 – Proposed Part G Calculation

- 4.6 A copy of the proposed fixtures and fittings required to achieve the above water consumption can be found in **Appendix E**.
- 4.7 Using the Part G water consumption figure of 84.45 litres per person per day and the proposed population of 121.85, it is estimated that the total water usage per day for the development is 10,290.82 litres per day. At this stage, the proposed development cannot be considered to be water neutral.
- 4.8 Therefore, to achieve water neutrality, it is necessary to reduce mains water consumption further through rainwater harvesting and recycling, which is discussed further in section 5 below.

5.0 Water Reduction Measures

- 5.1 To help mitigate the increase in water demand, it is proposed to incorporate rainwater harvesting systems to the proposed development.

- 5.2 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. Each dwelling will have their own rainwater harvesting tank.
- 5.3 Noting these water uses, Table 4.2 above confirms that 27.99 litres per person per day will be supplied by rainwater harvesting systems, which equates to 3,410.50 litres per day based on a population of 121.85.
- 5.4 The rainwater harvesting tanks for the proposed dwellings 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.
- 5.5 The roof material of the dwellings is unknown and therefore a conservative yield of 0.8 has been used in the calculations.
- 5.6 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. The calculation is summarised in Table 5.1 below and can be found in full in [Appendix F](#).

Housing Type	Population	Roof Area (m ²)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
Apt Type 1	8.48	213.46	12,301	8,317	8,400
Apt Type 2	11.28	200.53	11,556	11,063	11,500
House Type 2A	1.88	50.45	2,907	1,844	2,600
Cottage Type 2B	1.88	49.10	2,829	1,844	2,600
Cottage Type 2C/2D	1.88	49.06	2,827	1,844	2,600
Cottage Type 2E	1.88	50.69	2,921	1,844	2,600
Cottage Type 2F	1.88	52.83	3,044	1,844	2,600
Cottage Type 3A	2.47	58.13	3,350	2,422	2,600
Cottage Type 3B	2.47	56.44	3,253	2,422	2,600
Cottage Type 3C	2.47	57.98	3,341	2,422	2,600
House Type 3D	2.47	57.96	3,340	2,422	2,600
Cottage Type 3E	2.47	57.96	3,340	2,422	2,600
House Type 3F	2.47	55.76	3,213	2,422	2,600
Cottage Type 3G	2.47	57.96	3,340	2,422	2,600
House Type 3H	2.47	57.96	3,340	2,422	2,600
Cottage Type 4A	2.86	66.03	3,805	2,805	3,400
House Type 4B	2.86	74.06	4,267	2,805	3,400
House Type 4C	2.86	74.06	4,267	2,805	3,400
House Type 4D	2.86	75.06	4,325	2,805	3,400
House Type 4E	2.86	75.06	4,325	2,805	3,400

Table 5.1 – Rainwater Harvesting Calculation (per dwelling type)

- 5.7 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.
- 5.8 The dimensions of the proposed tanks can be found in [Appendix H](#).
- 5.9 The rainwater harvesting systems will be managed and maintained in accordance with the attached Management and Maintenance Plan, as shown in [Appendix I](#).

- 5.10 The rainwater harvesting system will contain the UV-DS55 filter manufactured by Silverline UK Limited. The specification of the UV filter can be found in **Appendix J**.
- 5.11 Once rainwater harvesting has been incorporated into the dwellings the mains water usage will be reduced to 56.47 litres per person per day, which equates to 6,880.32 litres per day, based on an occupancy of 121.85.
- 5.12 Following the incorporation of the above measures to the development there will be an increase in water demand of 6,880.32 litres per day and therefore further offsetting is required.

6.0 Offsetting Measures

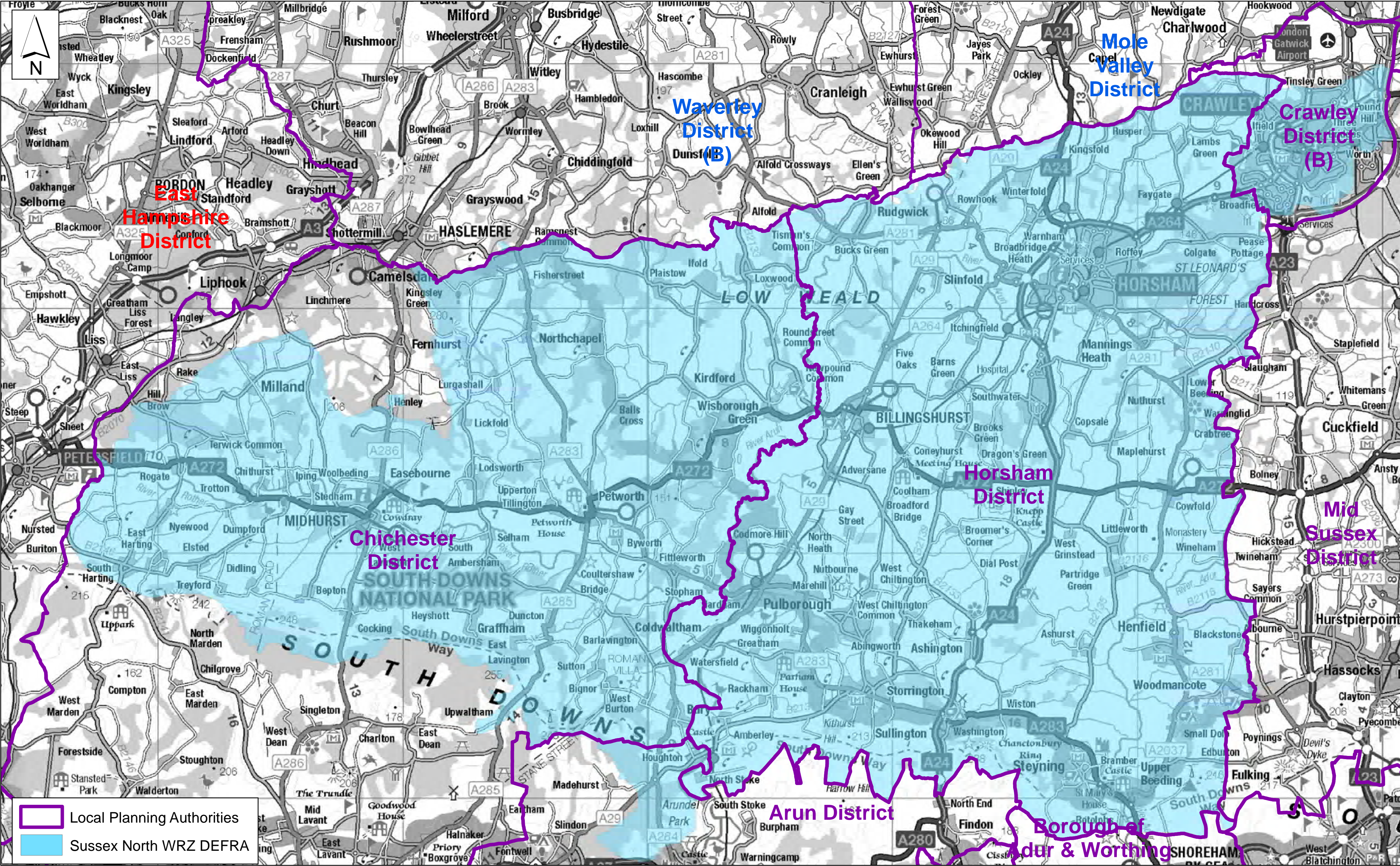
- 6.1 To ensure the development can demonstrate water neutrality in accordance with the NE Position Statement, a residual mains water demand of 6,880.32 litres per day will need to be offset.
- 6.2 The further offsetting measures will be delivered by purchasing credits in the Sussex North Offsetting Water Scheme (SNOWS), or through a suitable alternative bespoke offsetting scheme.

7.0 Summary and Conclusions

- 7.1 This Technical Note sets out the water usage strategy for the proposed development at Land to the east of Tilletts Lane, Warnham, RH12 3SN.
- 7.2 The proposal is to incorporate water efficient fixtures and fittings along with rainwater harvesting systems to the dwellings to minimise the water demand of the proposed development.
- 7.3 The proposed development at Land to the east of Tilletts Lane, Warnham, will be purchasing credits in the Sussex North Offsetting Water Scheme (SNOWS), or through a suitable alternative bespoke offsetting scheme. Therefore, the residual mains water requirement of the development of 6,880.32 litres per day has been fully offset and there is no additional mains water requirement within the SNWSZ as a result of the development at Land to the east of Tilletts Lane, Warnham.
- 7.4 This strategy will minimise the impact of the new development on the Sussex North Water Supply Zone. The Water Usage Strategy confirms proposal will be water neutral once complete and therefore satisfying Natural England's requirements.

Appendix A

Sussex North Water Supply Zone Map



Horsham District Council

Parkside, Chart Way, Horsham

West Sussex RH12 1RL

Barbara Childs : Director of Place

Reproduced by permission of Ordnance Survey map on behalf of HMSO. © Crown copyright and database rights (2021).

Ordnance Survey Licence.100023865

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



Eastern Access Excerpt



- All dimensions in millimetres unless otherwise indicated. All levels in metres relative to Ordnance Datum and are positive (AOD) unless otherwise indicated.
- Figure dimensions only to be taken from this drawing. Dimensions and levels to be checked on site.
- Do not re-scale this drawing.
- All civil/structural matters including existing and proposed services, sub-base construction, site structures and retaining walls are subject to design confirmation by an appropriately qualified Engineer. Refer to information by others.
- The original version of this drawing was produced in colour - monochrome copies should not be relied upon to accurately reflect all drawing elements.
- This drawing has been prepared for planning purposes only and should not be used for quantification, tender or construction.

- Site boundary
- Existing tree to be retained and protected in accordance with BS 5837:2012 - refer to arboricultural report MDJAC-240.25-TRCA-01 by MDJ Arboricultural consultancy limited dated June 2024
- Root Protection Area - refer to arboricultural report. To remain undisturbed and uncompacted (no material or equipment storage permitted)
- Veteran tree buffer
- Existing tree to be removed
- 10m ecological buffer zone
- Existing contours
- Proposed Contours (1m intervals)
- Existing scrub retained
- Proposed tree
- Proposed fruit tree
- Proposed espalier fruit trees to walls /trellis
- Proposed woodland planting
- Proposed native shrub planting
- Proposed hedge
- Proposed ornamental planting beds
- Proposed wildflower meadow
- Proposed amenity grass
- Proposed climbers to bulb succession & herb beds adjacent to walls and fences
- Play area with safety surfacing where required
- Rain gardens
- Bark mulch
- TF1 Jackson's Estate railing fencing (or equivalent), black finish, with gates
- TF2 Jackson's Timber Post and Rail fencing (or equivalent)
- TF3 Jackson's Timber knee rail (or equivalent)
- TF4 Jackson's Timber picket fence (or equivalent)
- Wattle fence - 1.5m ht and planted on both sides with native hedge
- Jackson's Closeboard Fence (or equivalent)
- 125mm raised kerb
- DK Dropped kerb
- Gapped kerb to rain gardens
- Shared surface: Sureset Permeable Resin bound gravel - Pearl Jam
- Vehicular Bitmac with Marshalls (or equivalent) Conservation Kerb throughout
- Permeable Block paved (Parking areas) Marshall Tegula Permeable Paving - Traditional
- Footpath: Sureset Permeable Resin bound gravel - Barley Butler (or equivalent)
- Slab paving Marshall Conservation x Paving (or equivalent) Cream, Size 600x600mm
- Silva cell system under trees in shortscapes

- Timber bollards - Broxap BX17 Domed-Square (or equivalent)
- Proposed ditch/suave
- Proposed attenuation basin
- Gravel Strip
- TigerMulch - for playground surface

- Note:
- Play equipment shown indicatively
- Lighting to be added at later date once known.

POS	30/04/25	NC	LF	Drainage layout added
POS	25/04/25	NC	LF	LAP & LEAP areas added
POS	08/04/25	NC	LF	Updated proposed contours
POS	03/03/25	NC	LF	Updated according to architect's plans
POS	25/02/25	EP/TF	LF	First issue
rev.	date	by	chk	notes
project	Tillets Lane, Warrham			
title	Landscape Masterplan			
status	Stage 3			scale @ A1 1:500
dwg no	2516-TFC-XX-00-DR-L-1001			

Appendix D

Proposed Part G Calculation

Part G - Proposed Water Usage

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)	130	0.11		14.30
Shower (where bath present)	6	4.37		26.22
Bath Only		0.5		0.00
Shower Only		5.6		0.00
Kitchen Sink	4	0.44	10.36	12.12
Washing Machine	6.43	2.1		13.50
Dishwasher	0.99	3.6		3.56
Total calculated use (litres/person/day)				87.31
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				79.45
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				84.45



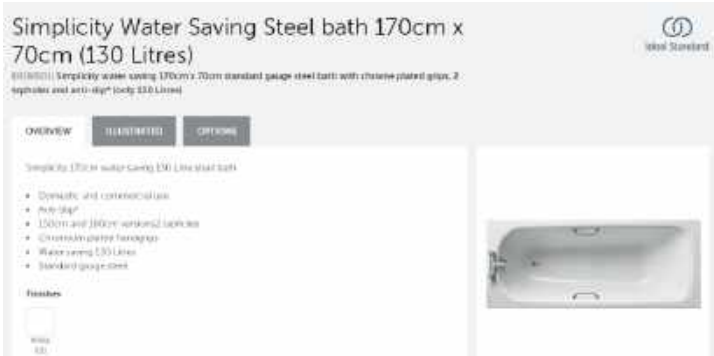



Rainwater Harvesting	27.99	litres/person/day
Mains Water	56.47	litres/person/day
Total	84.45	litres/person/day

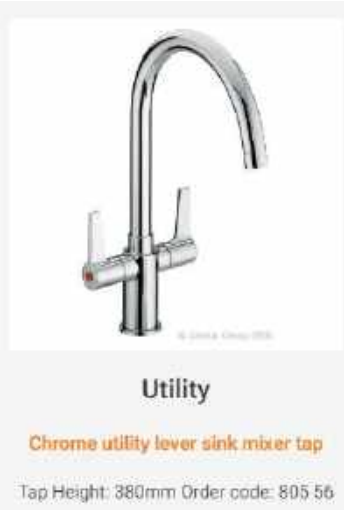

	Number of Units	Census	Population	Mains Water Usage	Rainwater Usage	Total Water Usage
One-bedroom	11	1.32	14.52	819.88	406.41	1,226.28
Two-bedroom	23	1.88	43.24	2,441.57	1,210.26	3,651.83
Three-bedroom	19	2.47	46.93	2,649.93	1,313.54	3,963.47
Four-bedroom	6	2.86	17.16	968.95	480.30	1,449.24
Totals	59		121.85	6,880.32	3,410.50	10,290.82

Appendix E

Example Specification of Fixtures and Fittings

Fixtures and Fittings - Part G Specifications

Item	Capacity/Flow rate	Overview
Toilet (Dual Flush)	4/2 litres	The Gap  <p>HOME / PRODUCTS / TOILETS / TOILET CISTERNS</p> <p>TWO GAP REF: A3AT710330</p> <p>Dual flush 4/2l WC cistern with bottom inlet for compact back to wall rimless toilet</p> <p>Dimensions: 355 x 142 x 425 mm CISTERN: RUSTIC HEAVY</p> <p>PRODUCT PHOTOGRAPH (PDF) VIEW ALL DIMENSIONS</p> <p>ES - WHITE</p> <p>WANT TO BUY £ 385.26</p>
Basin Tap	2.7 litres/minute	Joseph Miles  <p>Available versions: Mono mixer tap, Mixer tap Suitable for dark coloured installation Finish: High polished Faucet connection: 1/2 inch G1/2 Suitable for low water pressure systems Pressure maximum: 0.2 bar water pressure system Refer to the technical diagram for the complete technical dimensions Faucets or kitchen sink tap Height: 110mm Height: 115mm Info: Basin front Tap Pipe Center: 75 (H) 2mm</p> <ul style="list-style-type: none"> Sink & basin: 10cm Cover in pipe: 10 cm Flow rate: 2.7 l/min @ 0.2 bar Product of Basin Tap: Height: 110mm Height: 115mm Base to space: 10 cm Flow rate: 2.7 l/min @ 0.2 bar
Bath	130 litres	Ideal Standard  <h3>Simplicity Water Saving Steel bath 170cm x 70cm (130 Litres)</h3> <p>(11111111) Simplicity water saving 170cm x 70cm standard gauge steel bath: with chrome plated grips, 2 upholes and anti-slip* body (130 Litres)</p> <p>OVERVIEW QUANTITIES OPTIONS</p> <p>Simplicity 170cm water saving 130 Litre steel bath</p> <ul style="list-style-type: none"> Domestic and commercial use Anti-slip* 150cm and 170cm versions available Chrome plated handgrips Water saving 130 Litres Standard gauge steel <p>Features</p> <p>White 130</p> 
Shower	6 litres/minute	Triton  <h3>Overview</h3> <p>Triton T202 8.5kW Fast-Fit Eco Electric Shower - ECO0000299</p> <p>Triton is recognised for its exceptional performance in respect of a Triton shower but with a focus on water efficiency. With a maximum flow rate of 6 litres per minute, the T202 Fast Fit is the ultimate replacement shower, packed with robust features including stable and water entry options from all possible directions. The unit comes supplied with a matching adjustable shower rail and multifunction handset.</p> <p>Features</p> <ul style="list-style-type: none"> Fast-fit White Max Flow Rate: 6 litres Temperature Control: Stabilised Power Rating: 8.5 kW Swing Fit - Termination for left & right coding Swivel P.A. - a 200° fully reversible water outlet that accommodates water connections from either the left or right faced side Push Button Start/Stop Low Pressure Indicator Rather On indicator Rapid Shower Head - 5 safety settings Maximum Water Pressure: 1 Bar (10 bar) Maximum Water Pressure: 10 bar Approved: BS45, CE, ISO-Kitemark <p>2 Year Guarantee</p>  <p>Triton T202 8.5kW Fast-Fit Eco Electric Shower £201.34</p>

Kitchen Sink	4 litres/minute	<p>Tap with flow regulator - Affinity by Moores</p> <div data-bbox="644 264 989 772">  </div> <p>Flow Regulator:</p> <div data-bbox="644 880 1410 1314">  <ul style="list-style-type: none"> • Tap tail type flow limiters are suitable for most British basin, pillar taps, basin and sink mixers. • Operating pressure range – Min. 1.0 bar Max. 5.0 bar. • All flow limiters accurate +/- 10%. • Flow limiting flow straighteners aerates the water for a softer non-splashing flow. • Flow limiting flow straighteners can be easily retro fitted in tap spout (dependent on tap/mixer model). <table border="1"> <thead> <tr> <th>Colour</th><th>Flow Rate limited to:</th><th>Order Code</th></tr> </thead> <tbody> <tr> <td>Pink</td><td>1 litre per minute</td><td>805 57</td></tr> <tr> <td>Blue</td><td>2 litres per minute</td><td>805 58</td></tr> <tr> <td>Brown</td><td>3 litres per minute</td><td>805 59</td></tr> <tr> <td>Green</td><td>4 litres per minute</td><td>805 40</td></tr> <tr> <td>Yellow</td><td>5 litres per minute</td><td>805 41</td></tr> <tr> <td>Black</td><td>6 litres per minute</td><td>805 42</td></tr> </tbody> </table> </div>	Colour	Flow Rate limited to:	Order Code	Pink	1 litre per minute	805 57	Blue	2 litres per minute	805 58	Brown	3 litres per minute	805 59	Green	4 litres per minute	805 40	Yellow	5 litres per minute	805 41	Black	6 litres per minute	805 42
Colour	Flow Rate limited to:	Order Code																					
Pink	1 litre per minute	805 57																					
Blue	2 litres per minute	805 58																					
Brown	3 litres per minute	805 59																					
Green	4 litres per minute	805 40																					
Yellow	5 litres per minute	805 41																					
Black	6 litres per minute	805 42																					

Appendix F

Rainwater Harvesting Calculations

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	27.99	Daily Requirement per Person

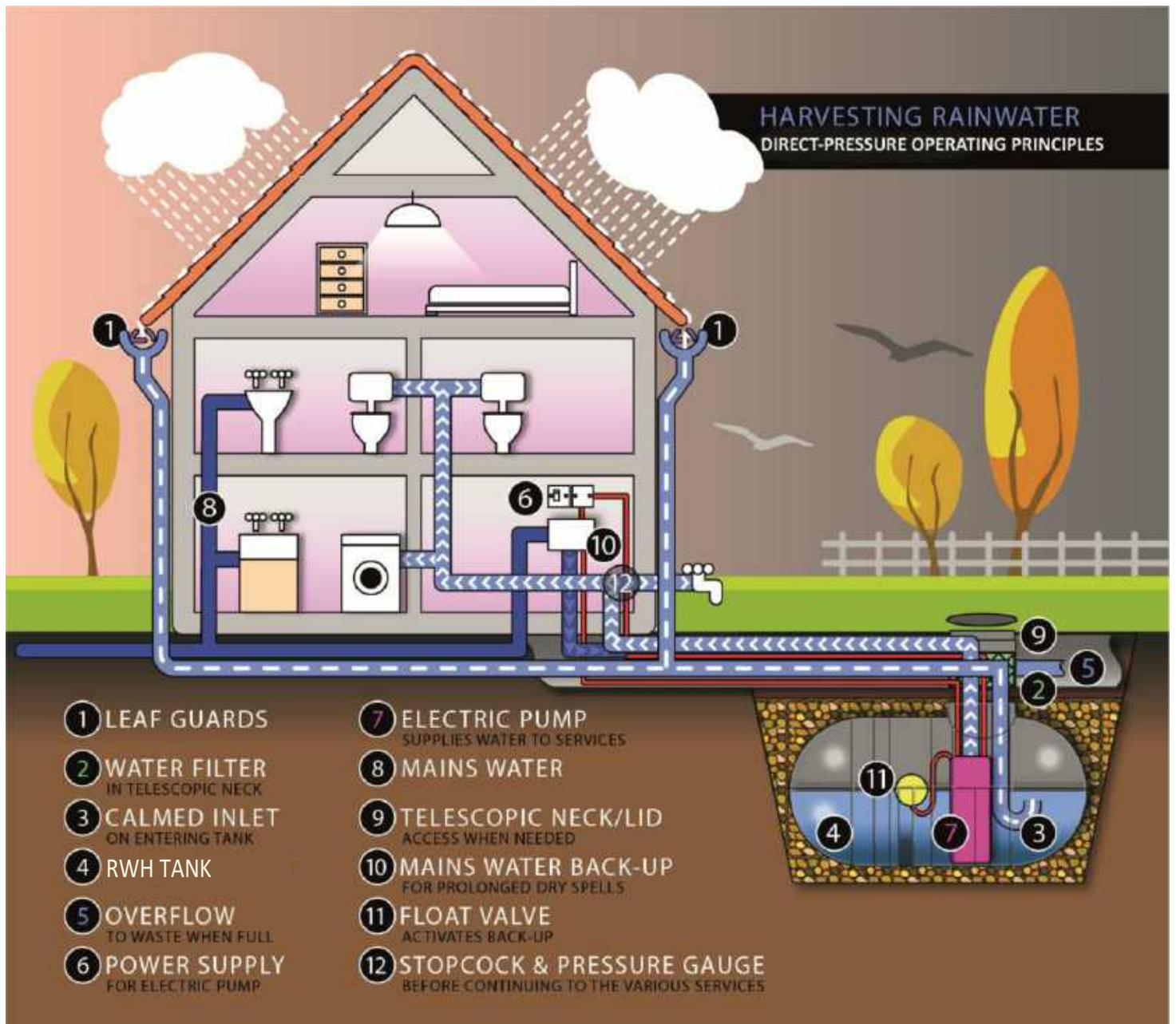
Unit	Type	No. Beds	No. Units	Population	Roof Area	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
Apt Type 1	Apartments	-	1	8.48	213.46	12,301	8,317	8,400
Apt Type 2	Apartments	-	1	11.28	200.53	11,556	11,063	11,500
House Type 2A	House	2	1	1.88	50.45	2,907	1,844	2,600
Cottage Type 2B	House	2	1	1.88	49.10	2,829	1,844	2,600
Cottage Type 2C/2D	House	2	1	1.88	49.06	2,827	1,844	2,600
Cottage Type 2E	House	2	1	1.88	50.69	2,921	1,844	2,600
Cottage Type 2F	House	2	1	1.88	52.83	3,044	1,844	2,600
Cottage Type 3A	House	3	1	2.47	58.13	3,350	2,422	2,600
Cottage Type 3B	House	3	1	2.47	56.44	3,253	2,422	2,600
Cottage Type 3C	House	3	1	2.47	57.98	3,341	2,422	2,600
House Type 3D	House	3	1	2.47	57.96	3,340	2,422	2,600
Cottage Type 3E	House	3	1	2.47	57.96	3,340	2,422	2,600
House Type 3F	House	3	1	2.47	55.76	3,213	2,422	2,600
Cottage Type 3G	House	3	1	2.47	57.96	3,340	2,422	2,600
House Type 3H	House	3	1	2.47	57.96	3,340	2,422	2,600
Cottage Type 4A	House	4	1	2.86	66.03	3,805	2,805	3,400
House Type 4B	House	4	1	2.86	74.06	4,267	2,805	3,400
House Type 4C	House	4	1	2.86	74.06	4,267	2,805	3,400
House Type 4D	House	4	1	2.86	75.06	4,325	2,805	3,400
House Type 4E	House	4	1	2.86	75.06	4,325	2,805	3,400

Total Tank Sizing (litres)	No. of Each Unit
8,400	6
11,500	6
15,600	6
10,400	4
15,600	6
7,800	3
7,800	3
2,600	1
5,200	2
10,400	4
2,600	1
10,400	4
2,600	1
10,400	4
5,200	2
2,600	1
6,800	2
3,400	1
3,400	1
3,400	1
3,400	1
146,900	59

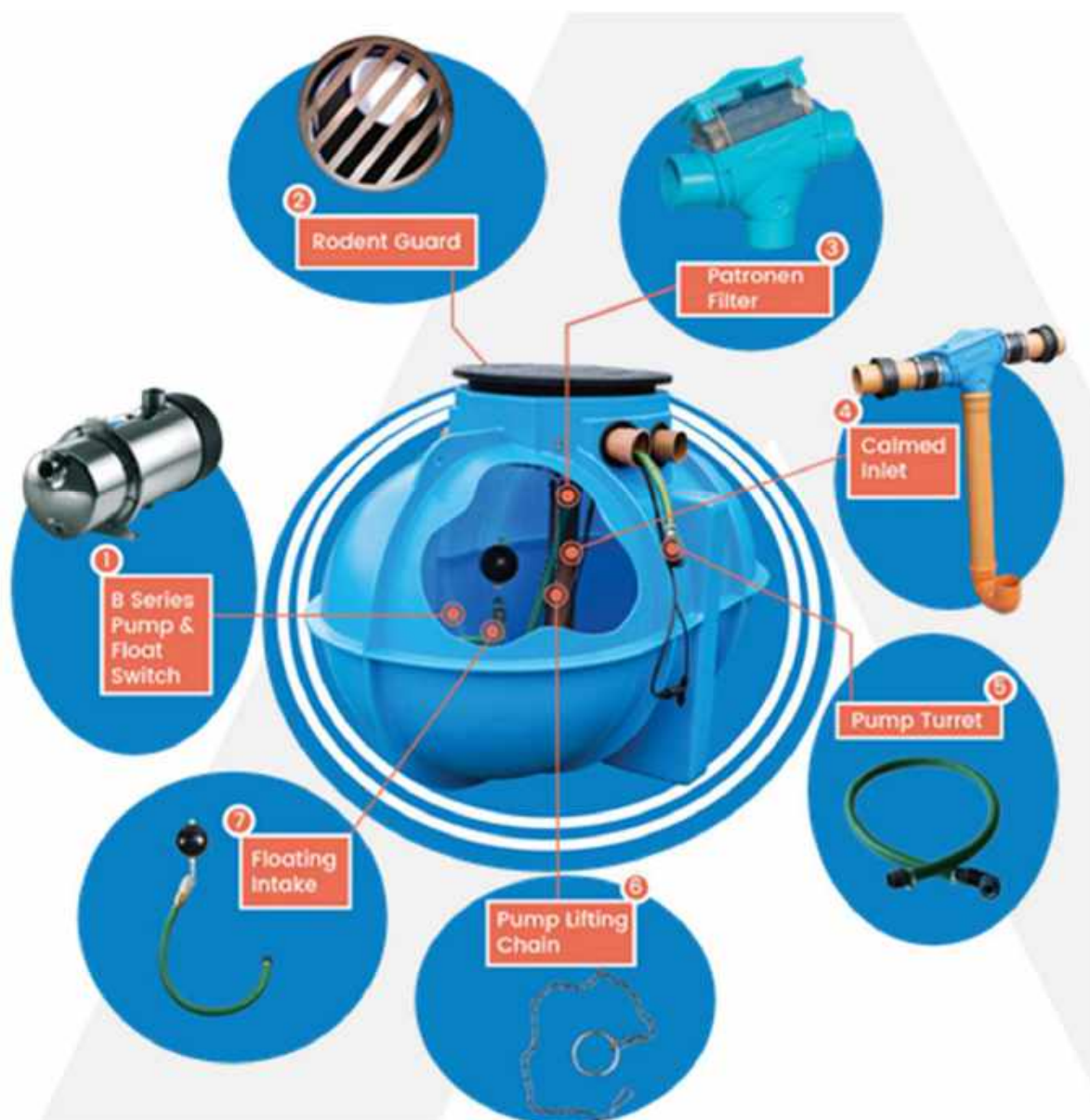
Appendix G

Typical Layout and Specification of Rainwater Harvesting System

HARVESTING RAINWATER DIRECT-PRESSURE OPERATING PRINCIPLES



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.



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:

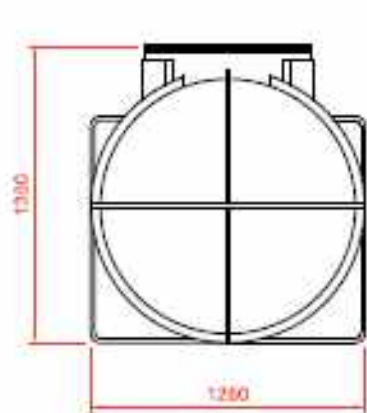
- Garden irrigation
- Cleaning the car
- Washing windows
- Power washing drive/patio
- Outside tap and hosepipe
- Flushing toilets
- Drinking water (if tank is potable)
- Washing machine



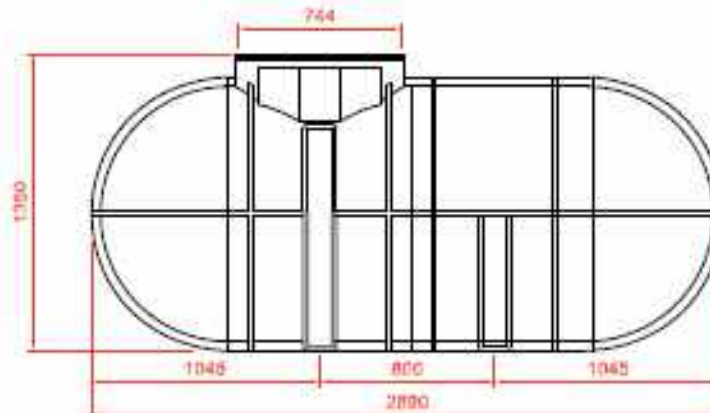
Appendix H

Rainwater Harvesting Tank Dimensions

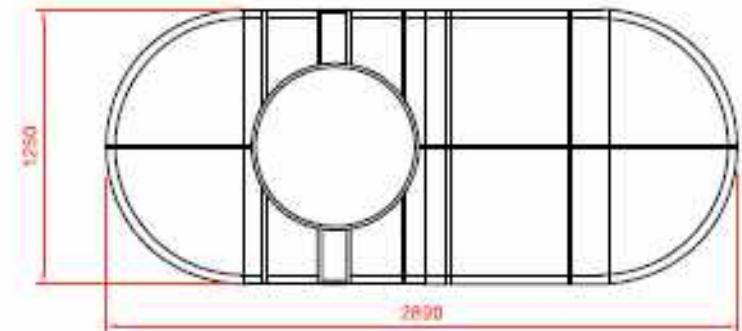
SDS 2,600 Litre Rainwater Harvesting Tank



END ELEVATION



SIDE ELEVATION



PLAN

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

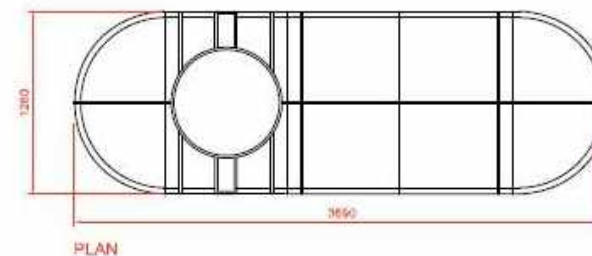
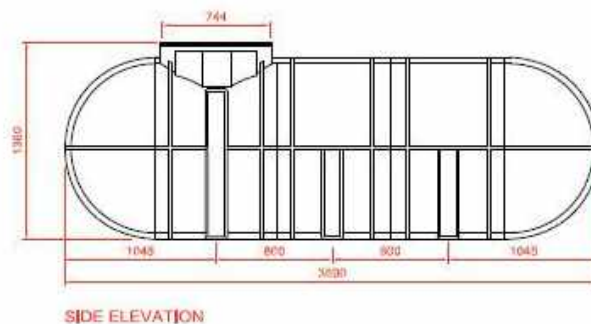
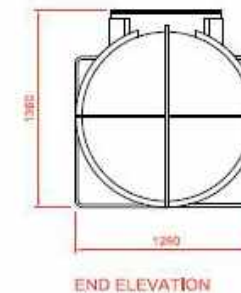
Notes:

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 3,400 Litre Rainwater Harvesting Tank



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

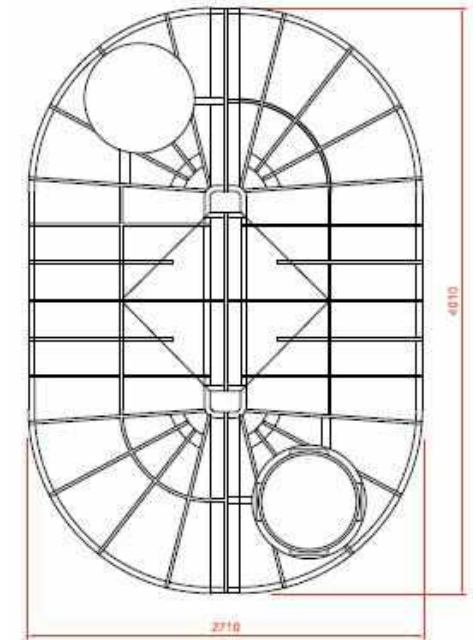
Notes:

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

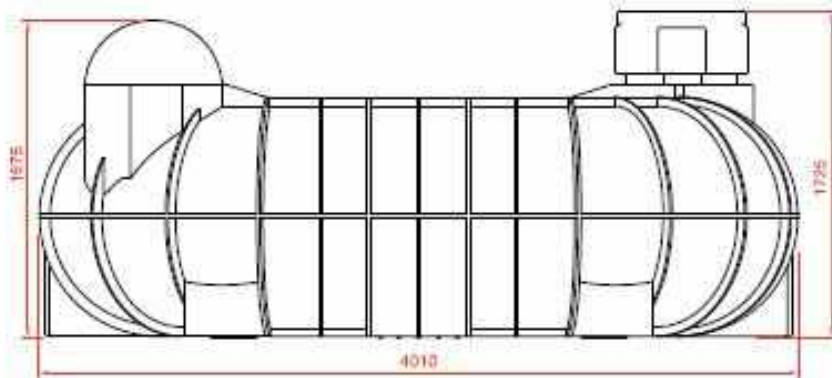
Do not scale from the drawing in either paper or digital form. Use written dimensions only.



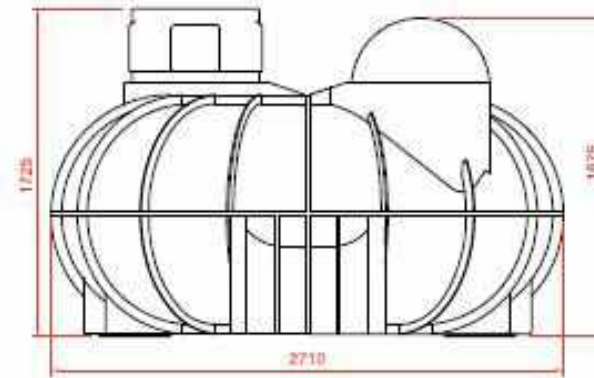
SDS 8,400 Litre Rainwater Harvesting Tank



PLAN



SIDE ELEVATION



END ELEVATION

Client	SDS	Details
Project Name	8,400 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.



Appendix I

Rainwater Harvesting Management and Maintenance Plan



Land to the East of Tilleys Lane
Warnham

**Rainwater Harvesting Management and
Maintenance Plan**

For

The Lucas Broadbridge Heath Trust

Document Control Sheet

Land to the East of Tilleys Lane

Warnham

The Lucas Broadbridge Heath Trust

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
7 th May 2025	FINAL	Ella Harrop	Laura Jagiela



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

2.0 Treatment..... 2

3.0 Water Quality Control 4

4.0 Continuity of Supply 5

5.0 Maintenance Categories 6

6.0 The Rainwater Harvesting System 7

7.0 General Maintenance Principles..... 8

8.0 Inspection and Maintenance Frequency of Components..... 9

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 shall follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments shall always be undertaken and made available, if requested.
- 1.4 Under Private Water Regulations 2016 the site is classed as a regulation 10 supply, as the water supply is $<10\text{m}^3$ per day to a single dwelling.
- 1.5 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.
- 1.6 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.
- 1.7 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 potential contaminants are listed below:
- ▶ pH
 - ▶ TOC
 - ▶ Colour
 - ▶ Turbidity
 - ▶ Suspended solids
 - ▶ Conductivity
 - ▶ Cl, No₃, SO₄
 - ▶ Na, Ca, Mg, Al
 - ▶ Ni, Cr, Cu, Pb
 - ▶ Total & Dissolved Fe
 - ▶ Mn
 - ▶ Ammonium/Ammonia
 - ▶ TVC, E.Coli, Coliforms, Pseudomonas aeruginosa, Enterococci, Clostridium Perfringens
- 2.3 The treatment, of the potential contaminants listed above, 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.
- 2.4 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.
- 2.5 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.
- 2.6 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.
- 2.7 Removal of floating particles will occur when the tank overflows, or when it is cleaned out in accordance with Table 5.1 below.
- 2.8 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.

- 2.9 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.
- 2.10 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.
- 2.11 All component used in the rainwater harvesting system shall be WRAS approved.

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.
- 3.2 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.
- 3.3 NA.1 in BS EN 16941-1:2018 states that frequent testing will not normally be required for rainwater harvesting systems of a single domestic dwelling to ensure the water quality. It states that observations for water quality will be made during maintenance visits and testing will be carried out where the system is not operating satisfactorily. When sampling is required a sample will 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.
- 3.4 The Drinking Water Inspectorates (DWI's) guidance and regulations on Private Water Supplies recommends that for all water supplies of <10m³ per day that supplies water to more than one domestic dwelling must be monitored for five specific parameters once every five years. These parameters include: conductivity; Enterococci; E. coli; pH; and turbidity. The local authority can increase the frequency of sampling, and monitor other parameters, if they deem it to be necessary.
- 3.5 The guidance states that the sampling must be undertaken by an accredited sampler. These samplers must be certified by companies that are accredited to ISO 17024. Analysis must be carried out at a laboratory that is accredited to the ISO 17025 Drinking Water Testing Specification.
- 3.6 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.
- 3.7 The British Standard and DWI guidance, does not require water quality testing for systems serving one domestic unit. However, HDC has requested that testing is carried out in accordance with the standards set in paragraphs 3.4 and 3.5 above.

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 shall be carried out frequently, nominally once a month, and will 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 shall 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 shall 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 shall 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 8.1 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 DWI'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 will 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
	Sampling of water supply	Every five years
Remedial Actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 8.1 – Maintenance tasks and frequencies

- 8.4 Upon completion of maintenance activities, a record will be kept of the work carried out. This will be retained and an annual maintenance report will be compiled, which shall 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 will be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this shall be a living document and regularly updated, as required and will 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 J

UV-DS55 Technical Specifications



model shown
UV-DS55 with ¾" BSP offset ports



Flow rate	36 lpm
Unit wattage	55 w
Lamps	1 x 55 w
Quartz sleeve	1
Inlet/outlet port size	¾" BSP
Length	36" (92cm)
Unit Width	3½" (9cm)
Height	5" (13cm)
Chamber diameter	3½" (9cm)
Shipping weight	8 kg
Casing stainless steel	316
Voltage	220/240 v
Max operating pressure	100 psi

- available with offset or parallel ports
- spray baked electrical control box
- available on polypropylene backboard

Silverline UK Limited
Whitemoor
Iddesleigh, Winkleigh
Devon EX19 8BN

Tel: +44 (0)1805 804202
enquiries@silverlineuk.co.uk
www.silverlineuk.co.uk