



Water Use Report

Deerwater Park, Southwater

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Revision History

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About Environmental Economics

Our team of experienced consultants specialise in construction and building energy. We have qualifications in sustainability, energy, engineering, building physics and construction as well as environmental, quality management and auditing.

We develop flexible, practical, cost-effective specifications for our clients through identifying solutions and delivering design advice. This includes the following disciplines:

- *Energy Reports*
- *Sustainability Statements*
- *Compliance assessments and advice covering*
 - *Part L (SAP) & Future Homes Standard*
 - *Part F (ventilation)*
 - *Part G (water)*
 - *Part O (overheating)*
- *Overheating - TM59 dynamic modelling*
- *Overheating – simple method*
- *Life cycle carbon assessments*
- *Net zero carbon assessments*
- *BREEAM*
- *SBEM (existing and new build)*
- *Minimum Energy Efficiency Standards (MEES)*
- *Thermal Bridging (Psi value calculations)*

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1. Executive Summary

- 1.1.1. Environmental Economics Ltd has been commissioned by Barratt Redrow Southern Counties to prepare a water use report for the residential site Deerwater Park, Southwater. This document sets out how the development proposal presents a positive sustainable development.
- 1.1.2. As part of the sustainable development strategy, the proposed development has been designed to consider sustainability in accordance with the National Planning Policy Framework (NPPF) and the Horsham District Planning Framework.
- 1.1.3. This report has been completed to address the following condition from the Planning Approval:
*"No development above ground floor slab level of any part of the development hereby permitted shall take place until confirmation has been submitted, in writing, to the local planning authority that the relevant Building Control body shall be requiring the optional standard for water usage across the development. The dwellings hereby permitted shall meet the optional requirement of **building regulation G2 to limit the water usage of each dwelling to 110 litres per person**. The subsequently approved water limiting measures shall thereafter be retained."*
- 1.1.4. Water efficiency has been reviewed as part of the design process and a Part G compliant specification will be adopted, resulting in a water use improving upon the higher standard (lower water use) of 110 litres/person/day. This level of water use is in line with Horsham District Planning Framework and the relevant planning condition.
- 1.1.5. At the current stage of the design process, it is considered that the proposal meets or exceeds the required level of sustainability across all given criteria.

2. Project Overview

2.1. Description of Site

2.1.1. The site proposal consists of the construction of 96 residential dwellings.

2.1.2. The proposed site plan is shown in Appendix A.

2.2. Brief

2.2.1. The planning authority for this site is Horsham District Council. The local plan containing the relevant planning policy is the Horsham District Planning Framework.

2.2.2. This report has been completed to address the following condition from the Planning Approval:

*"No development above ground floor slab level of any part of the development hereby permitted shall take place until confirmation has been submitted, in writing, to the local planning authority that the relevant Building Control body shall be requiring the optional standard for water usage across the development. The dwellings hereby permitted shall meet the optional requirement of **building regulation G2 to limit the water usage of each dwelling to 110 litres per person**. The subsequently approved water limiting measures shall thereafter be retained."*

2.2.3. This report seeks to address the above condition and present a sustainable strategy.

2.2.4. This report should be read in conjunction with other reports prepared for this development.

3. Water Use

3.1. Specified Fittings and Products

3.1.1. Barratt Redrow have a standard approach toward water fittings and products which allow for a standardised approach to achieving Part G compliance.

3.1.2. Standard products are specified for washing machines and dishwashers where installed:

- *Washing machine: Electrolux E772F402BI*
- *Dishwasher: Electrolux KEAF7200L*

3.1.3. The following flow rates of these fittings and products are to be employed on this development:

- *Dual toilet flush volumes: Full flush 4 litres, part flush 2.6 litres*
- *Kitchen tap flow rates: 8 litres/minute*
- *Non-kitchen tap flow rates: 5 litres/minute*
- *Shower flow rates: 8 litres/minute*
- *Bath capacity: 140 litres*
- *Washing machine water use per kg washing: 5.86 litres*
- *Dishwasher water use per place setting: 0.77 litres*

3.1.4. Washing machines and dishwashers are not provided to every plot on this development. Where they are not provided, space will be available for the easy installation of products by the occupier.

3.1.5. Owing to the differing provision of these white goods, four separate Part G calculations have been completed to show waster use compliance for all combinations of white good provision as follows:

- *Both washing machine and dishwasher provided*
- *Washing machine only provided*
- *Dishwasher only provided*
- *Neith washing machine or dishwasher provided*

3.1.6. These waster use calculations can be seen in the following section showing compliance with the planning condition across the development.

3.2. Water Use Calculations

3.2.1. The design team will implement a specification which complies with the optional requirement of 110 litres/person/day as set out in Approved Document G 2015 with 2016 amendments (AD-G).

3.2.2. Whilst an optional requirement under Part G, this target is a requirement under Policy 37 of the Horsham District Planning Framework and the planning condition.

3.2.3. The Part G calculation for plots which are to be provided with both a washing machine and dishwasher is shown in Figure 1 below:

Table 1: The water calculator for new dwellings

All White Goods Provided

Installation Type	Unit of measure	Capacity / flowrate (1)	Use factor (2)	Fixed use (l/person/day) (3)	Litres/person/day = [(1)*(2)]+(3) (4)
WC (single flush)	Flush volume (litres)		4.42	0	
WC (dual flush)	Full flush volume (litres)		1.46	0	
	Part flush volume (litres)		2.96	0	
WCs (multiple fittings)	Average effective flushing volume (litres)	3.06	4.42	0	13.53404
Taps (exc kitchen taps)	Flow rate (l/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (l)	140	0.11	0	15.4
Shower (where bath also present)	Flow rate (l/min)	8	4.37	0	34.96
Bath only	Capacity to overflow (l)		0.5	0	
Shower only	Flow rate (l/min)		5.6	0	
Kitchen sink taps	Flow rate (l/min)	8.00	0.44	10.36	13.88
Washing machine	l/kg dry load	5.86	2.1	0	12.306
Dishwasher	l/place setting	0.77	3.6	0	2.772
Waste disposal unit	l/use	If present = 1 If absent = 0	3.08	0	
Water softener	l/person/day	0	1	0	0
(5)	Total calculated use (l/person/day) = Σ (column (4))				102.33
(6)	Contribution from greywater (l/person/day) from Table 4.6				0
(7)	Contribution from rainwater (l/person/day) from Table 5.5				0
(8)	Normalisation factor				0.91
(9)	Total water consumption (CSH) = $[(5)-(6)-(7)]*(8)$ (l/person/day)				93.12
(10)	External water use				5
(11)	Total water consumption (Part G) = $(9)+(10)$ (l/person/day)				98.12

Figure 1 - Part G calculation with all white goods provided

3.2.4. Figure 1 shows that internal water use is limited to 93.12 litres/person/day. With the addition of the 5 litres/person/day external water use the total water use is limited to 98.12 litres/person/day. The build specification therefore complies with the requirement of 110 litres/person/day when both washing machines and dishwashers are provided.

3.2.5. The Part G calculation for plots which are to be provided with a washing machine only is shown in Figure 2 below:

Table 1: The water calculator for new dwellings

Washing Machine Only

Installation Type	Unit of measure	Capacity / flowrate (1)	Use factor (2)	Fixed use (l/person/day) (3)	Litres/person/day =[(1)*(2)]+(3) (4)
WC (single flush)	Flush volume (litres)		4.42	0	
WC (dual flush)	Full flush volume (litres)		1.46	0	
	Part flush volume (litres)		2.96	0	
WCs (multiple fittings)	Average effective flushing volume (litres)	3.06	4.42	0	13.53404
Taps (exc kitchen taps)	Flow rate (l/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (l)	140	0.11	0	15.4
Shower (where bath also present)	Flow rate (l/min)	8	4.37	0	34.96
Bath only	Capacity to overflow (l)		0.5	0	
Shower only	Flow rate (l/min)		5.6	0	
Kitchen sink taps	Flow rate (l/min)	8.00	0.44	10.36	13.88
Washing machine	l/kg dry load	5.86	2.1	0	12.306
Dishwasher	l/place setting	0.00	3.6	0	0
Waste disposal unit	l/use	If present = 1 If absent = 0	3.08	0	
Water softener	l/person/day	0	1	0	0
	(5)	Total calculated use (l/person/day) = Σ [column (4)]			99.56
	(6)	Contribution from greywater (l/person/day) from Table 4.6			0
	(7)	Contribution from rainwater (l/person/day) from Table 5.5			0
	(8)	Normalisation factor			0.91
	(9)	Total water consumption (CSH) = $[(5)-(6)-(7)]*(8)$ (l/person/day)			90.60
	(10)	External water use			5
	(11)	Total water consumption (Part G) = (9)+(10) (l/person/day)			95.60

Figure 2 - Part G calculation with washing machines only provided

3.2.6. Figure 2 shows that internal water use is limited to 90.60 litres/person/day. With the addition of the 5 litres/person/day external water use the total water use is limited to 95.60 litres/person/day. The build specification therefore complies with the requirement of 110 litres/person/day when washing machines are provided.

3.2.7. The Part G calculation for plots which are to be provided with a dishwasher only is shown in Figure 3 below:

Table 1: The water calculator for new dwellings

Dishwasher Only

Installation Type	Unit of measure	Capacity / flowrate	Use factor	Fixed use (l/person/day)	Litres/person/day = [(1)*(2)] + (3) (4)
		(1)	(2)	(3)	
WC (single flush)	Flush volume (litres)		4.42	0	
WC (dual flush)	Full flush volume (litres)		1.46	0	
	Part flush volume (litres)		2.96	0	
WCs (multiple fittings)	Average effective flushing volume (litres)	3.06	4.42	0	13.53404
Taps (exc kitchen taps)	Flow rate (l/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (l)	140	0.11	0	15.4
Shower (where bath also present)	Flow rate (l/min)	8	4.37	0	34.96
Bath only	Capacity to overflow (l)		0.5	0	
Shower only	Flow rate (l/min)		5.6	0	
Kitchen sink taps	Flow rate (l/min)	8.00	0.44	10.36	13.88
Washing machine	l/kg dry load	0.00	2.1	0	0
Dishwasher	l/place setting	0.77	3.6	0	2.772
Waste disposal unit	l/use	If present = 1 If absent = 0	3.08	0	
Water softner	l/person/day	0	1	0	0
(5)	Total calculated use (l/person/day) = Σ [column (4)]				90.03
(6)	Contribution from greywater (l/person/day) from Table 4.6				0
(7)	Contribution from rainwater (l/person/day) from Table 5.5				0
(8)	Normalisation factor				0.91
(9)	Total water consumption (CSH) = $[(5)-(6)-(7)] * (8)$ (l/person/day)				81.92
(10)	External water use				5
(11)	Total water consumption (Part G) = $(9)+(10)$ (l/person/day)				86.92

Figure 3 - Part G calculation with dishwashers only provided

3.2.8. Figure 3 shows that internal water use is limited to 81.92 litres/person/day. With the addition of the 5 litres/person/day external water use the total water use is limited to 86.92 litres/person/day. The build specification therefore complies with the requirement of 110 litres/person/day when dishwashers are provided.

3.2.9. Part G calculation for plots which are to be provided with no white goods is shown in Figure 4 below:

Table 1: The water calculator for new dwellings

No White Goods

Installation Type	Unit of measure	Capacity / flowrate (1)	Use factor (2)	Fixed use (l/person/day) (3)	Litres/person/day = [(1)*(2)]+(3) (4)
WC (single flush)	Flush volume (litres)		4.42	0	
WC (dual flush)	Full flush volume (litres)		1.46	0	
	Part flush volume (litres)		2.96	0	
WCs (multiple fittings)	Average effective flushing volume (litres)	3.06	4.42	0	13.53404
Taps (exc kitchen taps)	Flow rate (l/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (l)	140	0.11	0	15.4
Shower (where bath also present)	Flow rate (l/min)	8	4.37	0	34.96
Bath only	Capacity to overflow (l)		0.5	0	
Shower only	Flow rate (l/min)		5.6	0	
Kitchen sink taps	Flow rate (l/min)	8.00	0.44	10.36	13.88
Washing machine	l/kg dry load	0.00	2.1	0	0
Dishwasher	l/place setting	0.00	3.6	0	0
Waste disposal unit	l/use	If present = 1 If absent = 0	3.08	0	
Water softener	l/person/day	0	1	0	0
(5)	Total calculated use (l/person/day) = Σ [column (4)]				87.25
(6)	Contribution from greywater (l/person/day) from Table 4.6				0
(7)	Contribution from rainwater (l/person/day) from Table 5.5				0
(8)	Normalisation factor				0.91
(9)	Total water consumption (CSH) = [(5)-(6)-(7)]*(8) (l/person/day)				79.40
(10)	External water use				5
(11)	Total water consumption (Part G) = (9)+(10) (l/person/day)				84.40

Figure 4 - Part G calculation with no white goods provided

3.2.10. Figure 4 shows that internal water use is limited to 79.40 litres/person/day. With the addition of the 5 litres/person/day external water use the total water use is limited to 84.40 litres/person/day. The build specification therefore complies with the requirement of 110 litres/person/day when no white goods are provided.

3.2.11. The calculated results show that utilisation of the representative component's water consumption can achieve below the maximum limit of 105 litres per person per day internally, and additional external water use of 5 litres per person per day.

3.2.12. The development therefore complies with Policy 37 of the Horsham District Planning Framework and the planning condition.

4. Conclusion

- 4.1.1. This water use report has been produced for the residential site Deerwater Park, Southwater.
- 4.1.2. The development strategy sets a high standard of overall sustainability with a water use figure of 98.12 litres/person/day when all white goods are provided, which is comfortably within the limit of 110 litres/person/day set by Policy 37 of the Horsham District Planning Framework along with the planning condition.
- 4.1.3. This report therefore shows that the development complies with the following planning condition:
- "No development above ground floor slab level of any part of the development hereby permitted shall take place until confirmation has been submitted, in writing, to the local planning authority that the relevant Building Control body shall be requiring the optional standard for water usage across the development. The dwellings hereby permitted shall meet the optional requirement of **building regulation G2 to limit the water usage of each dwelling to 110 litres per person**. The subsequently approved water limiting measures shall thereafter be retained."*
- 4.1.4. It should be noted that future policies and building regulations may require an update to the sustainability measures within this report.
- 4.1.5. The proposed site is found to present a positive sustainable development based on the assessed sustainability criteria.

RASCALS FARM, SOUTH WALES

REF	DESCRIPTION	HEIGHT
MARKET		
T1A	2-BEDROOM HOUSE	2.0
T1B	2-BEDROOM HOUSE	2.0
T1C	2-BEDROOM HOUSE	2.0
T1D	2-BEDROOM HOUSE	2.0
T1E	2-BEDROOM HOUSE	2.0
T1F	2-BEDROOM HOUSE	2.0
T1G	2-BEDROOM HOUSE	2.0
T1H	2-BEDROOM HOUSE	2.0
T1I	2-BEDROOM HOUSE	2.0
FLR TOTAL		
AFFORDABLE RENT		
A1A	2-BEDROOM HOUSE (1)	2.0
A1B	2-BEDROOM HOUSE (2)	2.0
A1C	2-BEDROOM HOUSE (3)	2.0
A1D	2-BEDROOM HOUSE (4)	2.0
A1E	2-BEDROOM HOUSE (5)	2.0
A1F	2-BEDROOM HOUSE (6)	2.0
A1G	2-BEDROOM HOUSE (7)	2.0
A1H	2-BEDROOM HOUSE (8)	2.0
A1I	2-BEDROOM HOUSE (9)	2.0
A1J	2-BEDROOM HOUSE (10)	2.0
A1K	2-BEDROOM HOUSE (11)	2.0
A1L	2-BEDROOM HOUSE (12)	2.0
FLR TOTAL		
LOW COST OWNERSHIP		
O1A	2-BEDROOM FLAT	2.0
O1B	2-BEDROOM FLAT	2.0
O1C	2-BEDROOM FLAT	2.0
O1D	2-BEDROOM FLAT	2.0
O1E	2-BEDROOM FLAT	2.0
O1F	2-BEDROOM FLAT	2.0
O1G	2-BEDROOM FLAT	2.0
O1H	2-BEDROOM FLAT	2.0
O1I	2-BEDROOM FLAT	2.0
O1J	2-BEDROOM FLAT	2.0
O1K	2-BEDROOM FLAT	2.0
O1L	2-BEDROOM FLAT	2.0
FLR TOTAL		
GRAND TOTAL		

[illegible]