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DESIGN ENGINEERS

WATER NEUTRALITY REPORT

FOR

ST MARK'S COURT
CHART WAY
HORSHAM
RH12 1XL

Suite 29 Level 6
New England House
New England Street
Brighton
BN1 4GH
Tel: 01273 626247
Email: mail@PJRServices.co.uk

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1.0 – EXECUTIVE SUMMARY

PJR Design Services has been appointed to produce a Water Neutrality Report for the proposed St Mark's Court, Horsham development. The planned development is the conversion of an existing occupied office building with a net internal floor area of 13,461.30 m^2 to create a residential development comprising of:

58 No. Studio Apartments

115 No. 1 Bed 2 Person Apartments

12 No. 2 Bed 3 Person Apartments

10 No. 2 Bed 4 Person Apartments

195 No. Residential Apartments in total.

With the current emphasis placed on water conservation, the Developer is keen to enhance the development's sustainability credentials.

Natural England defines water neutrality as 'the use of water in the supply area before the development being the same or lower after the development is in place', and also requests the following:

- Complete a water budget (based on occupancy)
- All new builds to demonstrate that they can achieve strict water targets

The current use of the building is office accommodation capable of accommodating 1077 people, which it has been assessed would provide a baseline for current water consumption of:

c. 48,465 L/day

c. 17,689.72 m^3/year

In order to achieve a significant improvement upon Part G performance targets, the Water Efficiency Calculator for New Dwellings for water efficiency by component type was used to estimate the expected flow rates of the sanitaryware fittings for the proposed development.

In accordance with these measures, the proposed development has an estimated expected occupancy of c. 422 and an estimated water consumption of:

c. 92.3 L/person/day

c. 38,950 L/day

c. 14,216.75 m^3/year

Therefore, in comparison with Part G Compliance performance targets for new dwellings of 125 litres/person/day, the proposed development provides an estimated annual water saving of:

c. 5,036.25 m^3/year

This equates to a c. 26% improvement when compared against the Part G water efficiency performance targets. This can be seen as a significant improvement upon the requirements stated in the Building Regulations Part G water efficiency of new dwellings.

In comparison to the assessed water usage of the existing building operating as providing office accommodation with a canteen, the proposed development provides an estimated annual water saving of:

c. 3,472.97 m^3/year

2.0 – INTRODUCTION

PJR Design Services have been appointed to produce a Water Neutrality Report for the proposed St Mark's Court, Horsham development. Natural England defines water neutrality as 'the use of water in the supply area before the development being the same or lower after the development is in place', and also requests the following:

- Complete a water budget (based on occupancy)
- All new builds to demonstrate that they can achieve strict water targets

The planned development is for a change of use for the existing office building to provide residential accommodation, comprising of:

58 No. Studio Apartments

115 No. 1 Bed 2 Person Apartments

12 No. 2 Bed 3 Person Apartments

10 No. 2 Bed 4 Person Apartments

195 No. Residential Apartments in total.

This high-level report has been compiled to appraise the estimated water consumption of the proposed St Mark's Court, Horsham development. The Water Efficiency Calculator for new dwellings has been used to assess the efficiency of the domestic water-consuming components against a baseline consumption performance level used in Part G Building Regulations.

To this end, the proposed design shall promote reduced water usage by maximising efficiency through best-practice measures.

3.0 – WATER USAGE

3.1 Assessment Methodology for Current Water Usage

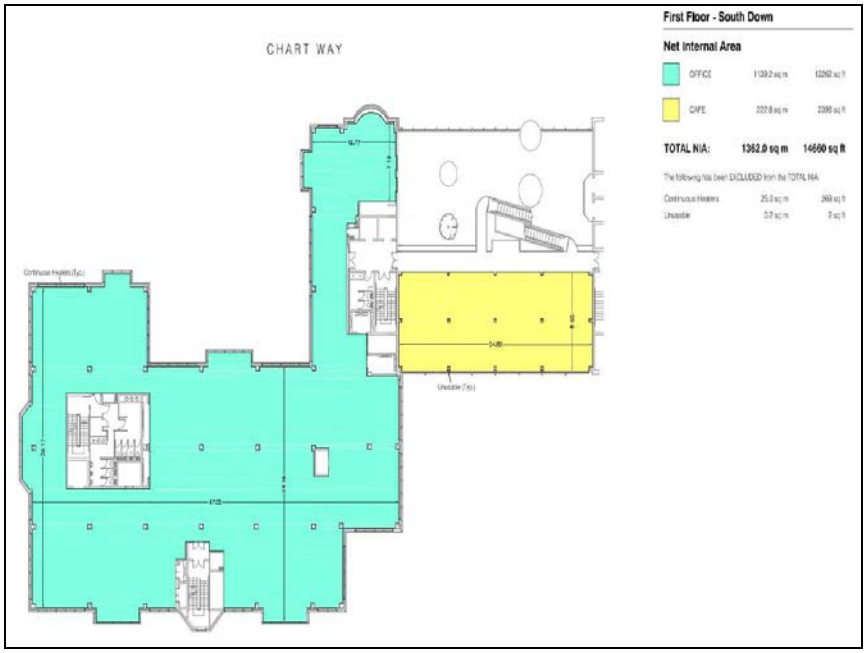
The site is currently occupied by an existing operational building of 13,461.30 m^2 providing office accommodation for up to 1077 occupants.

Fig 1. Existing Building



The measured survey drawing of the existing building identifies that it is provided with a Café for staff use.

Fig 2. Existing First Floor Plan



As the building is existing and occupied the potential water usage has been assessed on the basis of the Institute of Plumbing (IOP) publication Plumbing Engineering Services Design Guide, to determine current water consumption.

Table 2 of the Institute of Plumbing (IOP) publication Plumbing Engineering Services Design Guide identifies a daily water demand for offices with canteen of 45 litres.

Table 1. IOP Design Guide Table 2

***Table 2** Daily water demand*

Type of Building	Litres	Criteria/Unit
Dwellings		
- 1 bedroom	210	Bedroom
- 2 bedroom	130	Bedroom
- 3+ bedrooms	100	Bedroom
- Student en-suite	100	Bedroom
- Student, communal	90	Bed space
- Nurses Home	120	Bed space
- Children's Home	135	Bed space
- Elderly sheltered	120	Bedroom
- Elderly Care Home	135	Bed space
- Prison	150	Inmate
Hotels		
- Budget	135	Bedroom
- Travel Inn/Lodge	150av	Bedroom
- 4/5 Star Luxury	200	Bedroom
Offices & general work places		
- with canteen	45	Person (1)
- without canteen	40	Person (1)

Based on an occupancy of 1077 people this would result in water usage as shown below:

c. 48,465 L/day

c. 17,689.72 m^3/year

3.2 Assessment Methodology for Proposed Water Usage

The predicted building water consumption for the proposed St Mark's Court, Horsham development has been calculated using the anticipated building occupancy and the estimated type and quantity of sanitaryware fittings.

The developer has advised that the allocation of sanitary appliances based on the different apartment types will comprise of:

33 No. Studio apartments with bathrooms

26 No. Studio apartments with shower rooms

110 No. 1 Bed Apartments with bathrooms

16 No. 2 Bed Apartments with ensuites

6 No. 2 Bed Apartments with bathroom and ensuite

4 No. 2 Bed Apartments with 2 bathrooms

The base build for the apartments will include a for a washing machine to be provided and also a dishwasher to be provided within each dwelling, and these have been accounted for within the calculations.

Table 1. Proposed Development Sanitaryware Component data

Accommodation Type	Component Types				
	WHB	WC	SINK	SHWR	BATH
Studio (Bath)	33	33	33	0	33
Studio (Shower)	26	26	26	26	0
1 Bed Flat	110	110	110	0	110
2 Bed Flat (Ensuite)	32	32	16	16	16
2 Bed Flat	6	6	6	0	6
2 Bed Flat (2 Bathrooms)	8	8	4	0	8
Totals	215	215	185	42	173

In order to measure the efficiency of the anticipated domestic water-consuming components in the proposed development, the Water Efficiency Calculator for New Dwellings was used which is a Part G calculation methodology. This calculator uses the Government's methodology for assessing the whole house water efficiency of new dwellings. The calculation method is to be used to assess compliance against the water performance targets in Building Regulations Part G (Table 3).

Table 3. Building Regulations Part G performance target

Performance Target	Maximum Consumption (litres/person/day)
Part G Compliance	125

Based on an occupancy of the building with residential use of 422 people with the permissible water consumption of 125 litres/person/day this would equate to:

c. 52,750 L/day

c. 19,253 m^3/year

The calculation method requires the use of water consumption figures provided from manufacturers' product details. Before the assessment can be carried out, figures will need to be collected from manufacturers' product information to determine the consumption of each terminal fitting.

Given that the specifications of the sanitaryware fittings for the proposed development are yet to be confirmed, the following figures have been applied, and it has been confirmed by the Developer that these will be achieved through the specification of the sanitary fitments.

Type	Description	Flow rates, volumes etc.
Taps	Taps	6 litres/min
Baths	Baths	100 litres to overflow
Dishwashers	Dishwasher	1.25 litres/place
Washing Machines	Washing Machines	7 litres/kg
Showers	Showers	6 litres/min
WC's	Toilets	4.5/3 litres flush vols.
Kitchen/Utility taps	Taps	6 litres/min

External

Accounting for external maintenance and landscaping, a usage of 5 litres per person per day has been allowed for as per the recommendations of the Part G calculator tool, resulting in an additional 2110L per day. However, an external use allowance of 5 litres per person per day is likely to be a gross overestimation when considering the majority of the external areas are "hard" landscaped. The only "soft" external area is the grassed verge that will not require watering.

The Part G Compliance Reports produced using the Water Efficiency Calculator for New Dwellings methodology are contained within Appendix A.

4.0 – CONCLUSION

This high-level report has been compiled to appraise the water consumption efficiency of the proposed St Mark's Court, Horsham development using Part G Calculation Methodology.

The predicted water consumption efficiency for the proposed development using the Water Efficiency Calculator for New Dwellings (Building Regulation 17.K) is shown below:

c. 92.3 L/person/day

c. 38,950 L/day

c. 14,216.75 m^3/year

Therefore, in comparison with Part G Compliance performance targets for new dwellings, the proposed development provides an estimated annual water saving of:

c. 5,036.25 m^3/year

This equates to a c. 26% improvement when compared to the Part G Compliance target. This can be seen as a significant improvement upon the requirements stated in the Building Regulations Part G water efficiency of new dwellings.

In comparison to the assessed water usage of the existing building operating as providing office accommodation with a canteen, the proposed development provides an estimated annual water saving of:

c. 3,472.97 m^3/year

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Appendices

Part G Compliance Report A – 1 Bed Dwelling

Part G Compliance Report B – 2 Bed Dwelling

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PART G COMPLIANCE REPORT A

PROJECT DETAILS

Client:	WeBuild Sussex Ltd
Property:	1 Bedroom New Build Dwelling St Marks Court Chart Way Horsham RH12 1XL
Local Authority:	Horsham District Council
Date:	8th August 2024

RESULT SUMMARY

By following the Government's national calculation methodology for assessing water efficiency in new dwellings this 1-bed dwelling, as designed, achieves an internal water consumption of 92.3 litres per person per day.

Table 1: The Water Calculator for New Dwellings

Installation Type	Unit of measure	Value	Use factor	Fixed use	litres/person/day
WC(single flush)	Flush volume (litres)		4.42	0.00	0
WC(dual flush)	Full flush vol.	4.5	1.46	0.00	6.57
	Part flush vol.	3.0	2.96	0.00	8.88
WC(multiple fittings)	Average effective Flush vol. (litres)		4.42	0.00	0
Taps(excl. Kitchen)	Flow rate (litres/min)	6	1.58	1.58	11.06
Bath (shower also present)	Capacity to overflow (litres)	100	0.11	0.00	11
Shower (bath also present)	Flow rate (litres/min)	6	4.37	0.00	26.22
Bath only	Capacity to overflow (litres)	0	0.50	0.00	0
Shower only	Flow rate (litres/minute)	0	5.6	0.00	0
Kitchen sink taps	Flow rate (litres/minute)	6	0.44	10.36	13
Washing Machine	litres/kg dry load	7	2.1	0.0	14.7
Dishwasher	litres/place setting	1.25	3.6	0.0	4.5
Waste disposal	litres/use	0	3.08	0.00	0
Water softener	litres/person/day	0	1.0	0.00	0

Total calculated use (litres/person/day)	95.93
Contribution from greywater (litres/person/day)	-
Contribution from rainwater (litres/person/day)	-
Normalisation factor	0.91
Total Water Consumption. Code for Sustainable Homes (litres/person/day)	**87.3**
External water use	5.0
Total Water Consumption. (36(1)) (litres/person/day)	**92.3**

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Summary of fitting types "As Designed"			
Type	**Description**	**Flow rates, volumes etc.**	**Qty**
Taps	Taps	6 litres/min	1
Baths	Baths	100 litres to overflow	1
Dishwashers	Dishwasher	1.25 litres/place	1
Washing Machines	Washing Machines	7 litres/kg	1
Showers	Showers	6 litres/min	1
WC's	Toilets	4.5/3 litres flush vols.	1
Kitchen/Utility taps	Taps	6 litres/min	1

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PART G COMPLIANCE REPORT B

PROJECT DETAILS

Client:	WeBuild Sussex Ltd
Property:	2 Bedroom New Build Dwelling St Marks Court Chart Way Horsham RH12 1XL
Local Authority:	Horsham District Council
Date:	8th August 2024

RESULT SUMMARY

By following the Government's national calculation methodology for assessing water efficiency in new dwellings this 2-bed dwelling, as designed, achieves an internal water consumption of 92.3 litres per person per day.

Table 1: The Water Calculator for New Dwellings

Installation Type	Unit of measure	Value	Use factor	Fixed use	litres/person/day
WC(single flush)	Flush volume (litres)		4.42	0.00	0
WC(dual flush)	Full flush vol.	4.5	1.46	0.00	6.57
	Part flush vol.	3.0	2.96	0.00	8.88
WC(multiple fittings)	Average effective Flush vol. (litres)		4.42	0.00	0
Taps(excl. Kitchen)	Flow rate (litres/min)	6	1.58	1.58	11.06
Bath (shower also present)	Capacity to overflow (litres)	100	0.11	0.00	11
Shower (bath also present)	Flow rate (litres/min)	6	4.37	0.00	26.22
Bath only	Capacity to overflow (litres)	0	0.50	0.00	0
Shower only	Flow rate (litres/minute)	0	5.6	0.00	0
Kitchen sink taps	Flow rate (litres/minute)	6	0.44	10.36	13
Washing Machine	litres/kg dry load	7	2.1	0.0	14.7
Dishwasher	litres/place setting	1.25	3.6	0.0	4.5
Waste disposal	litres/use	0	3.08	0.00	0
Water softener	litres/person/day	0	1.0	0.00	0

Total calculated use (litres/person/day)	95.93
Contribution from greywater (litres/person/day)	-
Contribution from rainwater (litres/person/day)	-
Normalisation factor	0.91
Total Water Consumption. Code for Sustainable Homes (litres/person/day)	**87.3**
External water use	5.0
Total Water Consumption. (36(1)) (litres/person/day)	**92.3**

Summary of fitting types "As Designed"			
Type	**Description**	**Flow rates, volumes etc.**	**Qty**
Taps	Taps	6 litres/min	1
Baths	Baths	100 litres to overflow	1
Dishwashers	Dishwasher	1.25 litres/place	1
Washing Machines	Washing Machines	7 litres/kg	1
Showers	Showers	6 litres/min	1
WC's	Toilets	4.5/3 litres flush vols.	1
Kitchen/Utility taps	Taps	6 litres/min	1