



## Water Efficiency Calculation

**Proposed two Storey extension and creation of a new end of terrace dwelling  
at  
10 Holmes Road  
Reading  
RG6 7BH**

**Client:**

Arcadia Design Consultants  
12 Stanton Close  
Reading  
RG6 7DX

**Consultant:**

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| Revision | Designed | Date       |
|----------|----------|------------|
| A        | ZA       | 02.11.2020 |
|          |          |            |
|          |          |            |

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## 1 Introduction

This report outlines the calculations for **proposed two storey extension and creation of new end of terrace dwelling at 10 Holmes Road, Reading, RG6 7BH** with regards to the following:

- Water Efficiency Calculation

The purpose of the calculations is to justify the planning condition 4 that the internal water consumption of the development will not exceed **110 liters/person/day** to achieve in accordance with planning condition below:

*4. No development shall commence on site until written verification has been submitted to and approved in writing by the Local Planning Authority demonstrating that the dwellings hereby permitted will achieve a minimum of a 19% improvement in the dwelling emission rate over the target emission rate as defined in The Building Date: Head of Planning, Development & Regulatory Services Regulations for England Approved Document L1a: Conservation of Fuel and Power in New Dwellings (2013 edition), and built to the higher water efficiency standard under Regulation 36(3). Such evidence shall be in the form of a 'design stage' Standard Assessment Procedure (SAP), produced by an accredited energy assessor.*

*REASON: To ensure that the development is carried out in accordance with sustainable building standards in accordance with Policy CC2 and H5 of the Reading Borough Local Plan 2019.*

## 2 Calculation Input

Architectural drawings were used to establish number of fittings in dwelling.

### 2.1 Related Documents

#### 2.1.1 Drawings

- 10 Holmes Rd\_Reading – Proposed Floor Plans B
- 10 Holmes Rd\_Reading – Proposed Elevations B
- 

### 2.2 Assumptions/Targets:

The following assumptions and targets were made in order to demonstrate the compliance to achieve internal water consumption of no more than 105 Liters/person/Day.

| Assumption               | Yes/No | Targets             | No of Fittings |
|--------------------------|--------|---------------------|----------------|
| Rain Water / Grey Water  | NO     | -                   | -              |
| Shower                   | YES    | 10 Litres/min       | 1              |
| Bath                     | Yes    | 150 Litres          | 1              |
| Washing Machine          | YES    | 4.00 L/KG. Dry Load | 1              |
| Dish Washer              | NO     | -                   | -              |
| TAPS - Excluding Kitchen | YES    | 4 Litres/min        | 1              |
| Kitchen Tap              | YES    | 8 Litres/min        | 1              |
| WC- Cistern              | YES    | 3 Litres / 6 Litres | 1              |

## 8 Appendix A: Water Efficiency Calculation

Part G Water Efficiency Calculator

|          |                                  |
|----------|----------------------------------|
| Dwelling | 10 Holmes Road, Reading, RG6 7BH |
|----------|----------------------------------|

|         |    |            |
|---------|----|------------|
| Prep By | ZA | 02.11.2020 |
|---------|----|------------|



|                                     |   |
|-------------------------------------|---|
| Number of Bedrooms:                 | 2 |
| Occupancy for Calculation Purposes: | 3 |

Appliance/Usage Details  
Taps (Excluding Kitchen Taps)

| Tap Fitting Type              | Flow Rate (l/min) | Quantity | Total per Fitting Type |
|-------------------------------|-------------------|----------|------------------------|
| Taps (Excluding Kitchen Taps) | 4                 | 1        | 4                      |
|                               |                   |          | 0                      |
|                               |                   |          | 0                      |
|                               |                   |          | 0                      |
|                               |                   |          | 0                      |
|                               |                   |          | 0                      |
| Total No. of Fittings (No.)   | 1.0               |          |                        |
| Total Flow (l/s)              | 4.0               |          |                        |
| Maximum Flow (l/s)            | 4.0               |          |                        |
| Average Flow (l/s)            | 4.0               |          |                        |
| Weighted Average Flow (l/s)   | 2.8               |          |                        |
| Flow for Calculation (l/s)    | 4.0               |          |                        |

Baths

| Bath Type                     | Capacity to Overflow (l) | Quantity | Total per Fitting type |
|-------------------------------|--------------------------|----------|------------------------|
| Bath                          | 150                      | 1        | 150                    |
|                               |                          |          | 0                      |
|                               |                          |          | 0                      |
|                               |                          |          | 0                      |
| Total Number of Fittings      |                          |          |                        |
| Total Capacity (l)            | 150                      |          |                        |
| Maximum Capacity (l)          | 150                      |          |                        |
| Average Capacity (l)          | 150                      |          |                        |
| Weighted Average Capacity (l) | 105                      |          |                        |
| Capacity for Calculation (l)  | 150                      |          |                        |

Dishwashers

| Dishwasher Type                   | L per Place Setting | Quantity | Total per Fitting type |
|-----------------------------------|---------------------|----------|------------------------|
| Dishwasher                        | 1.25                | 1        | 1.25                   |
|                                   |                     |          | 0                      |
| Total No. of Fittings (No.)       | 1                   |          |                        |
| Total Consumption (l)             | 1.25                |          |                        |
| Maximum Consumption (l)           | 1.25                |          |                        |
| Average Consumption (l/s)         | 1.25                |          |                        |
| Weighted Average Consumption (l)  | 0.875               |          |                        |
| Consumption for Calculation (l/s) | 1.25                |          |                        |

Kitchen Taps

| Tap Fitting Type            | Flow Rate (l/min) | Quantity | Total per Fitting Type |
|-----------------------------|-------------------|----------|------------------------|
| Kitchen Tap                 | 8                 | 1        | 8                      |
|                             |                   |          | 0                      |
|                             |                   |          | 0                      |
| Total No. of Fittings (No.) | 1                 |          |                        |
| Total Flow (l/s)            | 8                 |          |                        |
| Maximum Flow (l/s)          | 8                 |          |                        |
| Average Flow (l/s)          | 8                 |          |                        |
| Weighted Average Flow (l/s) | 5.6               |          |                        |
| Flow for Calculation (l/s)  | 8                 |          |                        |

Showers

| Shower fitting Type         | Flow Rate (l/min) | Quantity | Total per Fitting Type |
|-----------------------------|-------------------|----------|------------------------|
| Shower                      | 10                | 1        | 10                     |
|                             |                   |          | 0                      |
|                             |                   |          | 0                      |
|                             |                   |          | 0                      |
|                             |                   |          | 0                      |
|                             |                   |          | 0                      |
| Total No. of Fittings (No.) | 1.0               |          |                        |
| Total Flow (l/s)            | 10.0              |          |                        |
| Maximum Flow (l/s)          | 10.0              |          |                        |
| Average Flow (l/s)          | 10.0              |          |                        |
| Weighted Average Flow (l/s) | 7.0               |          |                        |
| Flow for Calculation (l/s)  | 10.0              |          |                        |

WCs

| WC Type                            | Full Flush Volume | Part Flush Volume | Quantity (No) |
|------------------------------------|-------------------|-------------------|---------------|
| Cistern                            | 6                 | 3                 | 1             |
|                                    |                   |                   |               |
|                                    |                   |                   |               |
|                                    |                   |                   |               |
| Total Number of Fittings           | 1.0               |                   |               |
| Average Effective Flush Volume (l) | 0.0               |                   |               |

Washing Machines

| Washing Machine                   | L per Kg Dry Load | Quantity | Total per Fitting type |
|-----------------------------------|-------------------|----------|------------------------|
| Washing Machine                   | 4                 | 1        | 4                      |
|                                   |                   |          | 0                      |
| Total No. of Fittings (No.)       | 1                 |          |                        |
| Total Consumption (l)             | 4                 |          |                        |
| Maximum Consumption (l)           | 4                 |          |                        |
| Average Consumption (l/s)         | 4                 |          |                        |
| Weighted Average Cons. (l)        | 2.8               |          |                        |
| Consumption for Calculation (l/s) | 4                 |          |                        |

Other Fittings

|                                             |   |
|---------------------------------------------|---|
| Water softner Consumption beyond 4% (l/p/d) | 0 |
| Waste Disposal Y/N                          | N |

Grey Water & Harvested Rainwater

|                                       |     |
|---------------------------------------|-----|
| Total Grey water from WHB taps (l)    | 55  |
| Total Available Grey Water Supply (l) | 236 |
| Possible Demand (l)                   | 78  |
| Grey/Rain Installed Capacity (l)      |     |
| Figure for Calculation l/person/day   | 0   |

Assessment Summary

| Installation Type                       | Capacity/ Flow Rate | Use Factor | Fixed use (l/p/day) | Total Use (l/p/day) |
|-----------------------------------------|---------------------|------------|---------------------|---------------------|
| WC Single Flush Volume (l)              | 0.0                 | 4.4        | 0.0                 | 0.0                 |
| WC Dual Flush - Full Flush Volume (l)   | 6.0                 | 1.5        | 0.0                 | 8.8                 |
| WC Dual Flush - Part Flush Volume (l)   | 3.0                 | 3.0        | 0.0                 | 8.9                 |
| WC's (Multiple) Volume (l)              | 0.0                 | 4.4        | 0.0                 | 0.0                 |
| Taps Exc. Kitchen Flow Rate (l/s)       | 4.0                 | 1.6        | 1.6                 | 7.9                 |
| Bath (shower present) (l/s)             | 150.0               | 0.1        | 0.0                 | 16.5                |
| Shower (bath present) (l/s)             | 10.0                | 4.4        | 0.0                 | 43.7                |
| Bath Only (l)                           | 0.0                 | 0.5        | 0.0                 | 0.0                 |
| Shower Only (l/s)                       | 0.0                 | 5.6        | 0.0                 | 0.0                 |
| Kitchen Taps (l/s)                      | 8.0                 | 0.4        | 10.4                | 13.9                |
| Washing Machines (l/kg <sub>dry</sub> ) | 4.0                 | 2.1        | 0.0                 | 8.4                 |
| Dishwashers (l/place)                   | 1.3                 | 3.6        | 0.0                 | 4.5                 |
| Waste Disposal (l/s)                    | 0.0                 | 3.1        | 0.0                 | 0.0                 |
| Water Softner (l/s)                     | 0.0                 | 1.0        | 0.0                 | 0.0                 |

|                                      |       |
|--------------------------------------|-------|
| Total Calculated Water Use (l/p/day) | 112.5 |
| Grey/RainWater Reused (l)            | 0.0   |
| Normalisation Factor                 | 0.91  |
| Total Consumption CSH (l/p/day)      | 102.4 |
| External Water Use Allowance (l)     | 5.0   |
| Total Consumption Part G (l/p/day)   | 107.4 |

|                   |      |
|-------------------|------|
| Assessment Result | Pass |
|-------------------|------|