

BUILDING
REGULATIONS PART G
ANALYSIS OF WATER
CONSUMPTION

PART G CONSUMPTION ANALYSIS

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BACKGROUND

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1. BACKGROUND

Part G of The Building Regulations (2000) covers sanitation, hot water safety and water efficiency. Several requirements were amended and captured in a new approved document published on 6th April 2010. Requirement G2 and Regulation 36 set out the new requirements on water efficiency in new dwellings. Requirement G2 states that reasonable provision must be made by the installation of fittings and fixed appliances. Building Regulation 36 requires that the potential consumption of wholesome water by persons occupying a dwelling must not exceed 125 litres per person per day when calculated in accordance with the methodology set out in the CLG's document 'The Water Efficiency Calculator for New Dwellings'.

In order to forecast the demand for water, Essex & Suffolk Water (ESW) and Northumbrian Water (NW) subgroup metered properties and apply specific per capita daily consumption figures to each group. The subgroups of metered properties are as follows; meter optant, selectively metered, existing metered and new properties. For the first three subgroups, it is possible to measure consumption accurately using meter read data. This provides the opportunity to estimate base year per capita daily consumption figures, from which it is possible to forecast into the future. Due to the very nature of new properties, the business does not have access to a series of meter reads of suitable length in time and therefore it is not possible to accurately measure consumption. In turn, the Part G figure of 125 litres per head per day is used to forecast demand as it is assumed the occupants of new dwellings will not exceed this level of consumption.



2. INTRODUCTION

Part G of The Buildings Regulations, which states that the potential water consumption by persons living in new dwellings should not exceed 125 litres per person per day, provides a useful tool to ensure that developers install fittings and fixed appliances that use water efficiently. It is assumed that the introduction of this regulation will assist in the delivery of the Government's aspiration that per capita consumption should reduce in the future.

However, there are widely recognised concerns that the regulations do not effectively account for the water-using behaviour and changing behaviour of the occupants dwelling in new homes. Whilst several studies have measured and assessed the consumption of occupants of new dwellings built to varying levels of the Code for Sustainable Homes, there is little understanding of the actual water consumption of occupants within new homes built to the amended Part G of The Building

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Regulations. Changes to Part G of the building regulations in 2010 required that the water use of a home (calculated using the Water Efficiency Calculator for New Dwellings) is no more than 125 litres per person per day. There is no legal obligation to install water efficiency fittings or devices when plumbing alterations are carried out in an existing property.

3. AIMS AND OBJECTIVES

This research aims to measure the actual water consumption of occupants dwelling in new buildings built to the amended Part G of The Building Regulations. Waterwise (2016) stated that there are still opportunities to reduce water use and a valuable need to understand actual vs reported water use figures. This research will contribute towards what is reported to actual figures.

Specifically, the objectives are to:

- Identify at housing developments built between 2010 and 2012 in order to provide a sample of a minimum total of 500 properties.
- Interrogate the ICIS billing system to collect meter read data for each property on the identified housing developments,
- Gain an understanding of occupancy levels in the identified properties through a simple questionnaire,
- Analyse consumption data in order to understand the actual per capita water consumption in homes built to the amended Part G of The Building Regulations.

METHODOLOGY

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4. METHODOLOGY

In July 2014, The Developer Services team at ESW provided a list of 17 developments built between 1st January 2011 and 31st December 2012. The ESW billing database was interrogated to gather the full addresses at each development, along with customer name and all historic meter reads. The dataset was then 'cleaned' to provide a list of 472 addresses with full customer details and a series of meter reads. This is referred to as Phase 1.

The second phase of the workings occurred in March 2017, 50,189 addresses were provided classed as new developments. The properties were selected from when the first account (empty or customer) was registered against a property between January 2011 and December 2014. From this list of properties, 1,500 properties were identified from the Northumbrian Water operating area and 750 from the Essex & Suffolk Water operating area. The properties were selected by eliminating those with empty status and non household properties. Historic reads and customer details were provided for the developments selected. The addresses were cleaned to be used for a mail out to the customers asking them a single occupancy question, '*How many people live in your home?*' (See Appendix A). This is referred to as Phase 2.

A data set was then compiled detailing the meter reads and occupancy from the returned questionnaires for each property. Analysis was undertaken to calculate the per capita consumption (PCC) for each property with occupancy data. The range of the reads 2011 – 2017 allow for averages without seasonal variability which would affect the value. To validate the findings from the survey regarding the PCC, meter exchanges from the properties were identified. This resulted in initial meter reads (post meter exchange) and the latest reads for the properties which responded to the letter from billing data.

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5. RESULTS

674 customers responded providing occupancy data in response to the mailing across both phases of mailing. Below is a breakdown of the analysis for both operating areas. These are combined in the final data report.

Table 1 : Occupancy data from the surveys returned and the number of participants from each operating area.

Occupancy	NWG	ESW	Northumbrian	Essex	Suffolk
1	165	62	103	40	22
2	249	94	155	48	46
3	138	46	92	35	11
4	89	35	54	25	10
5	29	14	15	10	4
6	1	1	0	1	0
7	1	0	1	0	0
8	2	0	2	0	0

Occupancy	NWG	ESW	Northumbrian	Essex	Suffolk
1	24%	25%	24%	25%	24%
2	37%	37%	37%	30%	49%
3	20%	18%	22%	22%	12%
4	13%	14%	13%	16%	11%
5	4%	6%	4%	6%	4%
6	0%	0%	0%	1%	0%
7	0%	0%	0%	0%	0%
8	0%	0%	0%	0%	0%

Table 2: A summary of findings from the Part G analysis survey.

Operating Area	Number of respondents	Average Occupancy	Average PCC (l)	% of survey respondents	Daily Average Litres
NWG	674	2.38	113.70	100%	249.38
Northumbrian Water	422	2.38	108.75	63%	235.25
Essex & Suffolk	252	2.40	121.08	37%	272.67
Essex	159	2.50	124.26	24%	290.18
Suffolk	93	2.23	118.08	14%	243.21

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Northumbrian Water Group

The total number of customers who responded was 674. The survey resulted in an average occupancy of 2.38 overall and an average PCC of 113.70 litres per day. The daily consumption per household averaged at 249.38 litres.

Breakdown of the operating areas

Northumbrian Water

- 63% of respondents to survey (422 participants) were from the Northumbrian Water operating area. Although, 4 properties were not included in the final PCC figures due to reads not being consistent with use, error and initial reads at 0 and latest reads also at 0.
- The average occupancy of survey results 2.38 and the average PCC is 108.75 litres per per day.
- The average daily household consumption from the respondents of the survey within the Northumbrian Water operating area is 235.25 litres, the lowest of the three operating areas.

Essex and Suffolk Water

- 37% of the total number of respondents to the survey were from the Essex and Suffolk operating areas (252 participants).
- The average occupancy of the Essex & Suffolk Water respondents is 2.4 and the average PCC is 121.08 litres per day.
- The average daily household consumption from the respondents of the survey within the Essex and Suffolk operation regions is 272.67 litres.

Essex and Suffolk Breakdown

Essex

- 159 of the total 252 respondents from the Essex and Suffolk operating area responded from Essex (63%).
- The average occupancy for the Essex region from the survey is 2.50 and the average PCC is 124.26 litres per day.
- The average daily household consumption from the respondents of the survey within the Essex area is 290.18 litres.

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Suffolk

- 93 of the total 252 respondents from the Essex and Suffolk operating area responded from Suffolk (37%).
- The average occupancy for the Suffolk area was 2.23 and the average PCC for the Suffolk region was 118.08 litres per day.
- The average daily household consumption for respondents of the survey within the Suffolk area is 243.21 litres per day.

6. CONCLUSION

Overall, 674 customers responded from both phases of the mail out. The average PCC in new properties built to the amended Part G of the Building Regulations is below target of 125 litres per person per day at 113.70 litres per person per day. The average daily household consumption was 249.38 litres per property per day and the average occupancy over both operating areas from the results was 2.38.

7. REFERENCES

Approved Document G - Sanitation, hot water safety and water efficiency (2015 edition with 2016 amendments)

Approved Document G – Frequently Asked Questions March 2016 Department for Communities and Local Government

APPENDICES

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8. APPENDICES

8.1 Appendix A - Part G letter mailed out to customers.

«Customer_Name»
«Address_Line_1_»
«Address_Line_2»
«Address_Line_3»

17th February 2017

Property Reference Number: «PRN»

Dear «Customer_Name»

Research into Water Consumption in New Homes

At Northumbrian Water, we forecast the demand for water 25 years into the future. In order to do so, we often undertake research to help us understand different areas of water demand. As all properties built since 2010 were fitted with water efficient appliances, we are currently undertaking research to help us understand water consumption in new homes.

We would like to offer you the opportunity to participate in our research. Your property has been chosen as it is part of one of that housing developments that were selected at random. If you would be happy to help with our study, please answer the question below and return this letter in the pre-paid envelope provided.

The information collected will be pooled together to establish the average consumption of occupants in new homes. We will not be using the information to assess water usage in individual homes and the information you provide will not be linked to your account or used for any other purposes. It will also be held in accordance with the Data Protection Act.

Question: *How many people live in your home?* _____ people

If you have any queries or would like further information, please get in contact by telephoning 01913015572 or by emailing me at ruth.scott@nwl.co.uk.

Yours sincerely,



Ruth Scott, Water Efficiency Analyst