



# **24 Ducks Hill Road**

## **Energy and Water Statement**

*Design Stage Report*

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## EXECUTIVE SUMMARY

This statement will show that the proposed dwellings at 24 Ducks Hill Road, Northwood will exceed the 10% improvement beyond Building Regulations and achieve the water efficacy requirements of a maximum of a 110 litres per person per day.

To undertake the energy statement SAP calculations using the SAP 10.2 Software and construction information provided by the client have been utilised.

For this statement we have used the 2021 regulations not the 2013 regulations as these are a 31% uplift and the current regulations.

The findings will show that the proposed 4 dwellings will have a combined improvement of 52% in carbon emissions over the current building regulations which well exceeds the 10% improvement required by planning. It will also demonstrate that the water efficiency requirements are met.

## INTRODUCTION

The proposed development is for 4 new semi-detached dwellings with an area circa 722m<sup>2</sup>. These are set forward of the existing building line with an access road to the rear along the southern boundary.

Planning requirements were set out in response letter sent to jsa architects Ltd and this statement addresses the energy and sustainability requirements.

The following extract is taken from the Hillingdon Pre Application response.

### ENERGY AND SUSTAINABILITY:

Policy SI 2 of the London Plan (2021) states residential development should achieve at least a 10% improvement beyond Building Regulations 2013. Policy DME1 2 of the Hillingdon Local Plan: Part 2 (2020) requires all developments to make the fullest contribution to minimising carbon dioxide emissions in accordance with the London Plan targets.

A Sustainability Energy Statement should be prepared to demonstrate that the proposed dwellings would achieve at least a 10% improvement beyond Building Regulations 2013. Also, water efficiency measures to show how the development would achieve a minimum of 110 litres per person per day with regards to maximum water consumption should be considered as part of any forthcoming planning application.

*Figure 1 – Energy and Sustainability Hillingdon Pre Application response*

We note that the planners response refers to the 2013 Building Regulations, these regulations have been superseded by the current regulations (2021). Elmhurst suggest that the 2021 regulations are an uplift of 31% compared to the 2013 Regulations (noted in link below). In line with the response “the fullest contribution to minimise carbon dioxide emissions....” we have used the more stringent regulations to optimise the improvement.

<https://www.elmhurstenergy.co.uk/blog/2023/06/15/a-new-dawn-for-new-build-homes-in-england/#:~:text=Part%20L%202021%20follows%209,saving%20technology%20and%20fabric%20improvements.>

## APPROACH

The carbon emissions have been predicted using the SAP 10 calculation methodology, and referenced in the current version of the Building Regulations (Part L1 2021). A compliant case for each dwelling was modelled, using the typical orientation and a level of insulation and building services equipment performance consistent with the development achieving compliance with Approved Document L1: 2021. The overall carbon emissions were then extracted.

All parameters should be reviewed and signed-off. Should any amendments be required then these can be included within a revision exercise.

## SITE IMAGES



Figure 2 – Proposed Site Plan

## PROPOSED DWELLINGS SAP INPUTS

The total energy demand has been calculated taking full account of energy demands for space heating, hot water, electricity for pumps, fans, lights and appliances. The "compliant case" was determined by using the typical orientation for each dwelling and the use of building elements (walls, windows etc.) with U-values consistent with achieving compliance with Approved Document Part LA: 2021.

### EXTERNAL ELEMENTS

Element	U-value W/m <sup>2</sup> K
External walls	0.17
Roof	0.10-0.14
Floor	0.1
Door	0.80
Windows	1.0
Glazed doors	1.2

Table 1 – U-values elements

### AIR PERMEABILITY

Air Permeability	m <sup>3</sup> / m <sup>2</sup> hr @ 50Pa
AP target	4

Table 2 - Air Permeability

### SYSTEM DESCRIPTIONS

System	Description
Heating	Mitsubishi Ecodan 8.5 kW air source heat pump with time and temperature zone controls.
Ventilation	Vent Axia Lo Carbon NBR dMEV 125HT
DHW	Hot water cylinder 300 l Megaflo

Table 3 – System Descriptions

## RESULTS

### DER TER COMPARISON RESULTS

The following results table details the findings of the SAP 10 calculation undertaken. The calculation utilises the SAP 10 methodology and carbon factors (the current building regulations) which are deemed to be most representative.

Dwelling Identifier	Area m <sup>2</sup>	DER KgCO <sub>2</sub> /m <sup>2</sup> annum	TER KgCO <sub>2</sub> /m <sup>2</sup> annum	Improvement %
1	224.2	3.64	7.65	52.4%
2	224.2	3.64	7.65	52.4%
3	137	4.69	9.57	51.0%
4	137	4.69	9.57	51.0%

Table 4 – DER TER Comparison Results

The area weighted average improvement over the 4 dwellings is 51.9%

### ENERGY BREAKDOWN TARGET ENERGY

Energy Breakdown targets of each dwelling is shown below, key loads are heating and hot water.

Dwelling Identifier	Area m <sup>2</sup>	Heating kWh/m <sup>2</sup>	Cooling kWh/m <sup>2</sup>	DHW kWh/m <sup>2</sup>	Fans and Pumps kWh/m <sup>2</sup>	Lighting kWh/m <sup>2</sup>	Total kWh
1	224.2	33.57	0	14.33	0.38	1.59	11,181
2	224.2	33.57	0	14.33	0.38	1.59	11,181
3	137	32.7	0	23.17	0.63	1.89	7,999
4	137	32.7	0	23.17	0.63	1.89	7,999

Table 5 – TER Energy Breakdown

### ENERGY BREAKDOWN DWELLING ENERGY

Energy Breakdown of each dwelling is shown below, there is a significant improvement in the heating and hot water with the inclusion of the specified heat pumps.

Dwelling Identifier	Area m <sup>2</sup>	Heating kWh/m <sup>2</sup>	Cooling kWh/m <sup>2</sup>	DHW kWh/m <sup>2</sup>	Fans and Pumps kWh/m <sup>2</sup>	Lighting kWh/m <sup>2</sup>	Total kWh
1	224.2	10.44	0	12.41	0.44	1.47	5,551
2	224.2	10.44	0	12.41	0.44	1.47	5,551
3	137	10.17	0	19.86	0.45	1.71	4,410
4	137	10.17	0	19.86	0.45	1.71	4,410

Table 6 – DER Energy Breakdown

## WATER EFFICIENCY

The London Borough of Haringey requires that new residential developments are designed so that mains water consumption would meet a target of 110 litres or less per head per day, including an allowance of 5 litres or less per head per day for external water consumption.

The calculation methodology is contained within Approved Document G of the Building Regulations, and the proposed specification to achieve the 110 litres per person per day is listed in the table below.

### PLOT 1 AND 2 WATER CONSUMPTION

Product	Specification	Parameter
W/C	5/2.5 Dual Flush	Litres Per Flush
Basin Taps	4	Litres per Minute
Kitchen Taps	6	Litres per Minute
Shower	9	Litres per Minute
Bath	170	Litres per Minute
<hr/>		
Washing Machine	8.17	Litres per Kilo dry load
Dishwasher	1.25	Litres per Place Setting
<hr/>		
<b>Total Consumption (Litres / Person / Day)</b>	<b>109.9</b>	

*Table 7 – Plot 1 and 2 Water Efficiency Table*

### PLOT 3 AND 4 WATER CONSUMPTION

Product	Specification	Parameter
W/C	5/2.5 Dual Flush	Litres Per Flush
Basin Taps	4	Litres per Minute
Kitchen Taps	6	Litres per Minute
Shower	9	Litres per Minute
Bath	-	Litres per Minute
<hr/>		
Washing Machine	8.17	Litres per Kilo dry load
Dishwasher	1.25	Litres per Place Setting
<hr/>		
<b>Total Consumption (Litres / Person / Day)</b>	<b>92.9</b>	

*Table 8 – Plot 3 and 4 Water Efficiency Table*

## CONCLUSION

The findings show significant improvements from the TER to DER of the 4 dwellings averaging 52% well in excess of the required 10%.

Water efficiency has been demonstrated to achieve the required maximum usage of 110 litres per person per day.

**APPENDIX A: ENERGY SPECIALIST STATEMENT**

The author of this report has acquired substantial expertise and a recognised qualification for undertaking assessments, designs and installations of low and zero carbon solutions in the commercial buildings sector; and is not professionally connected to a single low or zero carbon technology or manufacturer. He is an accredited Low Carbon Energy Assessor with the Chartered Institute of Building Services Engineers (see certificate below).

