



ENERGY AUDIT

OAKLAND GARDENS, BARNSELEY

JSP SUSTAINABILITY LTD
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CONTENTS

	Page
Executive Summary	2
1 Introduction	3
2 Energy Strategy	4
3 Evaluation	7

Report Completed By	JSP Sustainability Limited Innovation Centre, Innovation Way, York Science Park, Heslington, York, YO10 5DG	
Reviewed By	Gerard McGuigan BSc PGDipSurvey	
Signature		



EXECUTIVE SUMMARY

- The residential development off Willthorpe Road, Barnsley has delivered 326 new homes.
- The developer, Persimmon Homes, was required by condition 19 to include energy efficiency design measures and renewable technologies capable of reducing the site's emission rate by 15%.
- The fabric efficiency measures implemented by the developer have reduced the site's emission rate by 10.48%.
- Photovoltaic panels have been installed on the roofs of 19 no. homes and the apartment block. The installed arrays generate 45,799.50kWh/year of electricity.
- The site's emission rate betters Part L by 15.08%.



1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Persimmon Homes to prepare an Energy Audit in response to condition 19 of the planning permission for the now completed Oakland Gardens residential development off Wilthorpe Road, Barnsley. For completeness the condition is included below;

“Prior to commencement of development, details of a scheme to reduce the developments carbon dioxide emissions by at least 15% by using decentralised, renewable or low carbon energy sources or other appropriate design measures shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details and upon completion of the development a report shall be submitted to and approved by the Local Planning Authority demonstrating that at least a 15% reduction in carbon dioxide emissions has been achieved. In the event that the use of other decentralised, renewable or low carbon energy sources or other appropriate design measures are also required to achieve a 15% reduction in carbon dioxide emissions, full details of such proposals and a timetable for their implementation shall be submitted to and approved in writing by the Local Planning Authority prior to installation. The approved details shall be implemented in accordance with the approved timetable and all the approved measures shall be retained as operational thereafter.”

Condition 19, 2016/1228

This Statement seeks to review the energy efficiency and renewable energy measures that were incorporated into the build of the development and confirm they have achieved the necessary 15% reduction in CO₂ emissions.

A number of documents have been used to complete this report. These include;

National Planning Policy Framework (NPPF) includes a presumption in favour of sustainable development. The Framework expands upon the guiding principles and objectives of a successful planning system. These include the building of a strong and competitive economy, delivering high quality housing, requiring good design and meeting the challenges of climate change.

Approved Document L sets fabric efficiency standards and together with SAP, establishes a maximum CO₂ emission rate for new build residential properties. The Approved Document is the Government's sustainable design benchmark in England.

Barnsley Metropolitan Borough Council Core Strategy policy CSP 5 requires development of 10 or more dwellings to include renewable technologies to reduce CO₂ emissions by 15%.



2 ENERGY STRATEGY

2.1 Sustainable Development Design Proposals

JSP Sustainability completed an Energy Statement in April 2017 in response to condition 19. This confirmed that the energy efficiency standards incorporated into the Persimmon Homes National Specification together with photovoltaic arrays capable of generating 44,763.05kWh/year of electricity would deliver a 15% reduction in CO₂ emissions over the Building Regulations Part L. These measures were approved by the Local Planning Authority

2.2 Energy Efficiency Measures

Each of the homes at the development site was constructed in line with the Persimmon Homes national specification which incorporates robust standards of energy efficiency designed to deliver comfortable compliance with the Building Regulations Part L. The specification is summarised below;

- The construction specification includes high levels of insulation in the ground floor, external walls and roof spaces;
- The house type designs and Persimmon Homes construction details adhere to the guidance included in Accredited Details and Constructive Details;
- A high performance natural gas combination boiler has been installed in every home. The heating designs of every house and apartment incorporate user friendly time and thermostatic controls;
- Energy efficient lamps were installed in every light fitting; and
- Each home is naturally ventilated using system 1 extract fans and background trickle ventilation.

The table below provides a summary of the energy efficiency standards delivered at the development site;

**Table 1 – Specification Summary**

Element	Part L	Specification
Wall	0.30W/m ² K	0.28W/m ² K
Cold Roof	0.20W/m ² K	0.14W/m ² K
Floor	0.20W/m ² K	0.20W/m ² K
Glazing	2.00W/m ² K	1.40W/m ² K
Door	2.00W/m ² K	1.40W/m ² K
Air Permeability	10 m ³ /(h.m ²) @ 50 Pa	5.0 m ³ /(h.m ²) @ 50 Pa

2.3 Performance of the Energy Efficiency Measures

As part of our review, we have re-calculated the site's emission rate. The table below summarises the calculation.

Table 2 – Willthorpe Road Emission Rate

House Type	No	Target Emission Rate (kg/year)	Calculated Emission Rate (kg/year)
Kendal	22	44,881.94	39,492.29
Winstar	18	38,016.22	33,896.23
Roseberry	39	74,355.84	65,603.54
Chedworth	9	17,886.38	15,800.98
Hatfield	39	67,745.34	59,402.15
Clayton	15	26,498.16	24,008.40
Rufford	54	86,364.11	78,493.10
Souter	40	61,975.13	55,924.30
Moseley	2	2,655.63	2,400.78
Hanbury	34	45,540.14	40,409.85
Alnwick	9	10,344.83	9,309.83
Brampton	25	29,666.70	27,630.58
Willow	8	10,134.43	9,232.00
Flats	12	10,671.27	9,914.04
TOTAL	326	526,736.12	471,518.06

The site's calculated emission rate represents a 55,218.06kg/year or 10.48% saving over Part L.



2.4 Photovoltaic Panels

Persimmon Homes has provided us with a copy of the installed photovoltaic array schedule and copies of the accompanying Microgeneration Certification Scheme commissioning certificates for each installation. The renewable provision is summarised below.

Table 3 – Willthorpe Road PV Provision

Plot Number	PV (kWp)	Electricity Generation (kWh/year)
46	4	2,832.00
47	4	2,832.00
48	4	2,832.00
49	4	2,832.00
50	4	2,832.00
51	4	2,832.00
52	4	2,832.00
53	2	1,444.00
54	2	1,444.00
55	2	1,444.00
56	2	1,444.00
57	2	1,444.00
58	2	1,444.00
89	2	1,774.00
90	2	1,774.00
91	2	1,774.00
92	2	1,774.00
93	2	1,774.00
94	2	1,774.00
221-232	7.5	6,667.50
TOTAL	59.5	45,799.50

The installed arrays have the potential to generate 45,799.50kWh/year of electricity and offset 24,227.94kg/year of CO₂ emissions. The site's net emission rate is therefore calculated to be 447,290.12kg/year or a 15.08% saving over Part L.



3 EVALUATION

This Energy Audit has been prepared in response to condition 19 of the planning approval for the Oakland Gardens residential development. The condition required the constructed site to achieve a 15% reduction in CO₂ emissions and the completion of a review post construction to confirm a 15% reduction has been delivered. Following analysis and re-calculation we can confirm the following;

- Each home was constructed in line with the Persimmon Homes national specification;
- This specification, together with the constructed house types at Oakland Gardens, has achieved a 10.48% reduction in CO₂ emissions;
- PV arrays have been installed on the roof slopes of 19 no. homes and the apartment block. The installed arrays total 59.5kWp and generate 45,799.50Wh/year of electricity; and
- The site's net emission rate is calculated to be 447,290.12kg/year, representing a 15.08% saving over Part L.

We can conclude that the measures implemented by Persimmon Homes have delivered compliance with condition 19 of the planning approval.