

APRIL 24, 2026

LAND WEST OF MARLBOROUGH ROAD,
ROYAL WOOTTON BASSETT
Sustainability and Energy Statement

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ON BEHALF OF MILLER HOMES

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TABLE OF CONTENTS

1.0 Introduction	3
1.1. Context	3
1.2. Description of Development.....	3
1.3. Project Brief	4
Condition 7	4
Condition 18	4
2.0 Methodology.....	5
2.1 Assessment Methodology	5
3.0 Baseline Carbon Emissions and Energy Use.....	6
3.1 The Development Baseline	6
4.0 CO ₂ Reduction Strategy - Fabric Approach	7
4.1 Energy Hierarchy.....	7
4.2 Development Design and Efficiency Measures.....	8
4.3 Proposed Fabric First Specification.....	8
5.0 Low and Zero Carbon (LZC) Technologies.....	9
5.1 Technologies	9
5.2 Air Source Heat Pump (ASHP).....	10
5.3 Ground Source Heat Pump (GSHP)	11
5.4 Wind Power	12
5.5 Biomass Technology	13
5.6 Solar Hot Water (SHW) Technology.....	14
5.7 Photovoltaic (PV) Technology.....	15
5.8 Conclusion	16
5.9 Proposed Fabric & LZC Results.....	17
6.0 Water Conservation	18
6.1 Water Calculator.....	18
7.0 EV Charging	19
7.1 Part S Electric Vehicle Charging	19
8.0 Overheating and Climate change.....	20
8.1 Part O Overheating Assessments.....	20
9.0 Resource Efficiency	21
9.1 Household Waste.....	21
9.2 Construction Waste	21
9.3 Materials and Embodied Carbon	21
10.0 Summary	22

10.1 Renewables and LZC technologies.....	22
10.2 Water Consumption	22
10.3 Electric Vehicle Charging	22
10.4 Overheating and Climate Change	22
10.5 Carbon Reduction	22
10.6 Energy Reduction	22
10.7 Part L Compliance	22
Appendix A – Site Layout	23
Appendix B – Results.....	24
Appendix C – Draft BREL report.....	25



1.0 INTRODUCTION

1.1. CONTEXT

This Statement was prepared by Energy & Design Ltd. on behalf of Miller Homes to support a planning application for the proposed 95-dwelling development at land west of Marlborough Road, Royal Wootton Bassett

1.2. DESCRIPTION OF DEVELOPMENT

Land west of Marlborough Road, Royal Wootton Bassett, includes 95 plots. These plots feature various types of housing: detached houses, semi-detached houses, terraced houses, and maisonettes.

The current site is shown below.



1.3. PROJECT BRIEF

The development is designed to achieve a reduction from the Target Emission Rate (TER) set out in Part L of the Building Regulations (2021) and to comply with the following Condition.

CONDITION 7

A revised Sustainable Energy Strategy shall be submitted with each reserved matters application to provide details of operational energy, embodied carbon, climate change adaptation measures, low-carbon and renewable energy technologies, electric vehicle charging points, cycle parking, and sustainable transport for the written approval of the Local Planning Authority. The development shall be carried out in accordance with the approved detail.

REASON: In order that the development is undertaken in accordance with Core Policy 41 of the Wiltshire Core Strategy an acceptable manner and in response to climate change.

CONDITION 18

No development approved by this permission shall commence until a scheme for water efficiency has been submitted to and approved in writing by the Local Planning Authority. The scheme will demonstrate a standard of a maximum of 110 litres per person per day is applied for all residential development. The scheme shall be implemented in accordance with the agreed details.

Reason: This condition contributes to sustainable development and meeting the demands of climate change. Increased water efficiency for all new developments also enables more growth with the same water resources.

2.0 METHODOLOGY

2.1 ASSESSMENT METHODOLOGY

Energy & Design Ltd. has modelled sample types using L12021 (SAP 10) methodology to calculate the dwellings' emissions.

This will allow us to show compliance in following steps.

- 1) Baseline carbon emissions – These are calculated and reported as total CO₂ emissions (kgCO₂/year). SAP uses the Target Emission Rate (TER), expressed as kilograms of CO₂ per square metre of total floor area per year, to establish the baseline for compliance with Approved Document Part L 2021. The TER is multiplied by the total floor area to determine the target CO₂ emissions for each dwelling type. This figure is then multiplied by the number of dwellings of each type to calculate the overall site CO₂ emissions per year.
- 2) Improvements to building fabric and the incorporation of Low and Zero Carbon (LZC) technologies will be assessed to determine the reduction in CO₂ emissions (kgCO₂/year). The resulting emissions figure is taken from the Dwelling Emission Rate (DER) of the Part L 2021 calculation. The DER is multiplied by the total floor area to determine the designed CO₂ emissions for each dwelling type. This figure is then multiplied by the number of dwellings of each type to calculate the designed overall site CO₂ emissions per year.
- 3) A percentage reduction will be calculated for the design vs the target.

We have also modelled sample types using L12021 (SAP 10) methodology to calculate the dwellings' energy use.

This will allow us to show compliance in the following steps.

- 1) Baseline energy use – These are calculated and reported as Total delivered energy for all uses (kWh/year) as given in the Target SAP worksheet box 238, to establish the baseline for compliance with Approved Document Part L 2021. This figure is then multiplied by the number of dwellings of each type to calculate the target overall site kWh per year.
- 2) Improvements to building fabric and the incorporation of Low and Zero Carbon (LZC) technologies will be assessed to determine the reduction in energy (kWh/year). The resulting figure is taken from the Design SAP worksheet box 238 of the Part L 2021 calculation. This figure is then multiplied by the number of dwellings of each type to calculate the designed overall site kWh per year.
- 3) A percentage reduction will be calculated for the design vs the target.

3.0 BASELINE CARBON EMISSIONS AND ENERGY USE

3.1 THE DEVELOPMENT BASELINE

To evaluate the proposed energy strategy, it is essential to determine the baseline first. In this case, it is the Target Emission Rate for CO₂ emissions per year, and the Target total delivered energy for all uses.

The proposed dwellings have been modelled in SAP L12021; the maximum CO₂ emissions permitted and Baseline emissions to comply with L12021 are shown below.

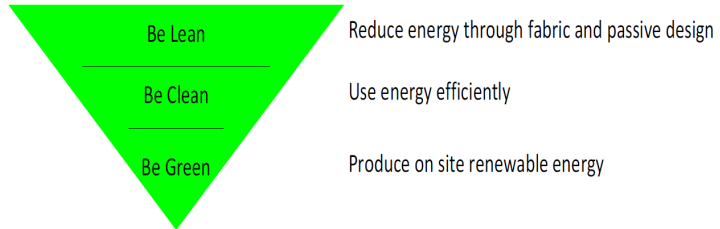
Target Emission Rate: Compliant with AD L 2021	
Total CO ₂ emissions – kgCO ₂ /year	92,810

The proposed dwellings have been modelled in SAP L12021; the maximum energy permitted to comply with L12021 is shown below.

Target Total delivered energy for all uses: Compliant with AD L 2021	
Total energy – kWh/year	371,641

4.0 CO₂ REDUCTION STRATEGY - FABRIC APPROACH

4.1 ENERGY HIERARCHY



The 'energy hierarchy' aims to reduce energy demand through passive design measures and a fabric-first approach before utilising low-carbon energy and the production of on-site renewable energy.

The developer has followed the above energy hierarchy approach for this site by improving the fabric.

4.2 DEVELOPMENT DESIGN AND EFFICIENCY MEASURES

The proposed design will reduce thermal energy demand by targeting improved insulation levels, air leakage, and fabric u-values, in accordance with current Building Regulations requirements.

The following measures to reduce energy use and carbon emissions have been included in the design of the new dwellings:

- Design new homes to optimise natural daylight in all the habitable spaces with suitable window sizes relative to living rooms and bedrooms.
- Design and layout to promote passive solar gains and maximise natural daylight, sunlight, and ventilation.
- Development which balances minimising the direct adverse impact of shading from other buildings and landscape features and improving access to passive solar gains.
- High-performance glazing with appropriate window u-values and g-values to reduce heat loss and optimise positive solar gain while reducing the potential for overheating.
- 100% low energy lighting.
- Smart meters
- Bespoke individual PSI values - these have been calculated and used; this assists in Fabric Energy Efficiency by designing out the cold bridges, which may occur if using the Approved details.
- TMP—The TMP (Thermal Mass Perimeter) has been calculated rather than using default figures as required by L12021; this now gives a more accurate reflection of the actual as-built dwelling, closing the gap between design and as-built performance.

4.3 PROPOSED FABRIC FIRST SPECIFICATION

The following are the U-values of the proposed fabric.

Element	Limiting Average Values - Part L12021	Proposed Average Values
Ground Floor U-Value (W/m ² K)	0.18	0.14
External Wall U-Value (W/m ² K)	0.26	0.21
Party Wall U-Value (W/m ² K)	0.20	0.00 (fully filled & sealed)
Roof - Insulated at ceiling U-Value (W/m ² K)	0.16	0.07
Window U-Value (W/m ² K)	1.60	1.30
Door U-Value (W/m ² K)	1.60	1.50
Design Air Permeability m ³ /h.m ² at 50 Pa	8.00	4.5

5.0 LOW AND ZERO CARBON (LZC) TECHNOLOGIES

5.1 TECHNOLOGIES

The following technologies will be assessed for appropriateness in the development.

- Air Source Heat Pumps (ASHP)
- Ground Source Heat Pumps (GSHP)
- Wind Power
- Biomass Technology
- Solar Hot Water (SHW) Technology
- Photovoltaic (PV) Technology

5.2 AIR SOURCE HEAT PUMP (ASHP)

ASHP technology extracts heat from the external air and condenses this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature, which can be used for space heating and domestic hot water.

Advantages

- Mature technology
- Can assist in cooling.
- Approx. 250% efficient using electricity.

Disadvantages

- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

Conclusion

ASHP has been deemed suitable for this development.

5.3 GROUND SOURCE HEAT PUMP (GSHP)

GSHP technology exploits seasonal temperature differences between the ground and air. Fluid is pumped through pipes laid in the ground, taking up heat extracted by the heat pump and released at a higher temperature to drive a space heating system. The pipework is placed either horizontally or vertically in the ground.

Advantages

- More efficient than ASHP
- Mature technology
- Can assist in cooling.
- Approx. 320% efficient using electricity.

Disadvantages

- Costly to install.
- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

Conclusion

Due to the cost, GSHP has been deemed unsuitable for this development.

5.4 WIND POWER

Wind turbines are available in various sizes, from large rotors able to supply whole communities, small roof or wall-mounted units for individual dwellings.

Advantages

- Generation of clean energy

Disadvantages

- Costly to install.
- Maintenance costs
- Can be noisy (hum of the generator)

Conclusion

The <http://www.solarinsiders.co.uk/cWindspeed/lookup> predictor suggests the wind speed is 4.9m/s at 10 meters above the ground. This is below the minimum of 5.0m/s for technical viability.

Results for postcode "GU9":

Windspeeds at your chosen location

10m Elevation: 4.9 mph

30m Elevation: 5.7 mph

45m Elevation: 6.2 mph

Due to the windspeed being below 5.0, Wind power has been deemed **unsuitable for this development.**

5.5 BIOMASS TECHNOLOGY

Biomass boilers work on the principle that the combustion of wood chips or pellets can create heat for space heating and hot water.

Advantages

- Considerable reduction in CO₂ emissions

Disadvantages

- Can be costly to run compared to a gas boiler.
- Space for a plant room to store fuel and plant.
- Regular maintenance may be required.
- A local source of fuel (reduce transport emissions)

Conclusion

Due to the cost and the requirement of space for plant and fuel storage, Biomass has been deemed **unsuitable** for this development.

5.6 SOLAR HOT WATER (SHW) TECHNOLOGY

Solar thermal technology harnesses solar energy to generate heated water.

Advantages

- Mature Technology
- Approx. 50% of hot water demand can be met.
- Low maintenance

Disadvantages

- Not always aesthetically pleasing.
- The benefit of installation is limited to the water heating demand.
- A Large hot water cylinder is required.
- If the system is oversized, it can contribute to overheating
- Access for maintenance
- Not as many installers as previously
- Benefits not as good as similar technologies.

Conclusion

Due to the number of disadvantages, SHW has been deemed unsuitable for this development.

5.7 PHOTOVOLTAIC (PV) TECHNOLOGY

Photovoltaic (PV) technology involves converting the sun's energy into electricity.

Advantages

- Mature Technology
- Low maintenance
- Easily integrated.

Disadvantages

- Not always aesthetically pleasing.
- Poor design can lead to lower-than-expected yields.
- Access for maintenance

Conclusion

Due to the benefits of this technology, PV has been deemed suitable for this development.

5.8 CONCLUSION

The following technologies have been deemed suitable for this development.

- Air Source Heat Pump (ASHP)
- Photovoltaic (PV) Technology

5.9 PROPOSED FABRIC & LZC RESULTS

Air Source Heat Pumps (ASHPs) have been selected as the preferred low-carbon technology for this development in order to reduce emissions in line with the requirements of Part L 2021.

- Houses: ASHPs will be provided for both space heating and domestic hot water.
- Maisonettes: Electric panel heaters will be used for space heating, with ASHP cylinders providing domestic hot water. Photovoltaics (PV) may be incorporated where required to achieve an EPC rating of B.

PV has not been proposed for the houses, as modern ASHP systems serving both heating and hot water can achieve operational efficiencies and running costs sufficient to meet an EPC B rating, comparable to those of gas boiler systems.

However, within the maisonettes, the use of electric panel heaters combined with ASHP hot water cylinders results in slightly higher predicted running costs. As a result, the inclusion of PV may be necessary to offset these costs, reduce energy demand, and ensure an EPC rating of B.

After incorporating the above technologies, the total site demand is expected to be as follows.

Target & Design Emission Rate: Compliant with AD L 2021		
Target Total CO ₂ emissions – kgCO ₂ /year	92,810	
Design Total CO ₂ emissions – kgCO ₂ /year	31,830	
Total achieved reduction - kgCO₂/year	60,981	65.70%

Target & Design Total delivered energy for all uses: Compliant with AD L 2021		
Target Total energy – kWh/year	371,641	
Design Total energy – kWh/year	214,945	
Total achieved reduction - kWh/year	156,696	42.16%

6.0 WATER CONSERVATION

6.1 WATER CALCULATOR

All new developments must be designed to use water efficiently in line with the policies.

Using low-water-use fixtures and water restrictors, water consumption will be under 100 litres per person per day, compared to the Part G building regulations, which are 125 litres per person per day. An example of how this can be done is below.

DYNAMIC WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS							
Installation type	Product Selection	Product Code	Unit of measure	(1) Capacity/ flow rate	(2) Use factor	(3) Fixed use (litres/ person/ day)	(4) Litres/ person/day = [(1) x (2)] + (3)
WC (single flush)	N/A		Flush volume (litres)	N/A	4.42	0.00	N/A
WC (dual flush)	*Standard flow rates*		Full flush volume (litres)	4	1.46	0.00	5.84
			Part flush volume (litres)	2.6	2.96	0.00	7.70
WCs (multiple fittings)	N/A		Average effective flushing volume (litres)	N/A	4.42	0.00	N/A
Taps (excluding kitchen/utility room taps)	*Flow restrictor fitted*		Flow rate (litres/minute)	5	1.58	1.58	9.48
Bath (where shower also present)	Tempo Arc Single Ended Bath	E256301	Capacity to overflow (litres)	181	0.11	0.00	19.91
Shower (where bath also present)	*Flow restrictor fitted*		Flow rate (litres/minute)	6	4.37	0.00	26.22
Bath only	N/A		Capacity to overflow (litres)	0	0.50	0.00	N/A
Shower only	N/A		Flow rate (litres/minute)	N/A	5.60	0.00	N/A
Kitchen/utility room sink taps	*Flow restrictor fitted*		Flow rate (litres/minute)	6	0.44	10.36	13.00
Washing machine	Unknown		Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Unknown		Litres/place setting	1.25	3.6	0.00	4.50
Waste disposal unit			Litres/use	If present = 1 If absent = 0	3.08	0.00	N/A
Water softener			Litres/person/day	N/A	1.00	0.00	N/A
			(5)	Total calculated use = (Sum column 4)			103.80
			(6)	Contribution from greywater (litres/person/day) from Table 4.6			N/A
			(7)	Contribution from rainwater (litres/person/day) from Table 5.5			N/A
			(8)	Normalisation factor			0.91
			(9)	Total water consumption = [(5) - (6) - (7)] = (8)			94.46
			(10)	External water use			5.00
			(11)	Total water consumption = (9) + (10) (litres/person/day)			99.46

7.0 EV CHARGING

7.1 PART 5 ELECTRIC VEHICLE CHARGING

Electric Vehicle Chargers will be installed as required in the approved document S2021.

The requirement is shown below.

Requirement	
The erection of new residential buildings	
S1.	(1) A new residential building with associated parking must have access to electric vehicle charge points as provided for in paragraph (2). (2) The number of associated parking spaces which have access to electric vehicle charge points must be— (a) the total number of associated parking spaces, where there are fewer associated parking spaces than there are dwellings contained in the residential building; or (b) the number of associated parking spaces that is equal to the total number of dwellings contained in the residential building, where there are the same number of associated parking spaces as, or more associated parking spaces than, there are dwellings. (3) Cable routes for electric vehicle charge points must be installed in any associated parking spaces which do not, in accordance with paragraph (2), have an electric vehicle charge point where— (a) a new residential building has more than 10 associated parking spaces; and (b) there are more associated parking spaces than there are dwellings contained in the residential building.

The Technical requirements are.

Technical requirements for electric vehicle charge points

6.2 Each electric vehicle charge point should meet all the following.

- Be designed and installed as described in **BS EN 61851**.
- Have a minimum nominal rated output of 7kW.
- Be fitted with a universal socket (also known as an untethered electric vehicle charge point). Alternatively, in exceptional circumstances, such as for a self-build property, if the vehicle requirements are already known, a tethered electric vehicle charge point may be acceptable.
- Be fitted with an indicator to show the equipment's charging status that uses lights, or a visual display.
- Be a minimum of a Mode 3 specialised system for electric vehicle charging running from a dedicated circuit, or equivalent, as defined in **BS EN IEC 61851-1**.
- The requirements of **BS 7671**.
- The requirements in the IET's *Code of Practice: Electric Vehicle Charging Equipment Installation*.

NOTE: Other legislation may also apply to the installation of electric vehicle charge points. For example, the Alternative Fuels Infrastructure Regulations 2017.

8.0 OVERHEATING AND CLIMATE CHANGE

8.1 PART O OVERHEATING ASSESSMENTS

In line with the policies, all dwellings will be assessed for overheating via the following methods.

- Simplified method as per guidance O1 section 1; if the simplified method fails, then.
- The Dynamic thermal modelling methodology will be used, which is based on the CIBSE's TM59 as per O1 Section 2

9.0 RESOURCE EFFICIENCY

This has been designed in accordance with policies that encourage all new developments to be resource-efficient both during construction and in operation.

9.1 HOUSEHOLD WASTE

Wiltshire Council currently operates a household collection service that includes general waste, garden waste, and recyclable materials, such as metal foil, tins, paper, plastic bottles, glass, and cardboard. Residents will receive an information pack detailing the Council's current collection arrangements for waste and recycling and advising of the nearest recycling centre.

9.2 CONSTRUCTION WASTE

Site Waste will have best practice target benchmarks for resource efficiency. Where possible, materials will be diverted from landfills using various methods.

9.3 MATERIALS AND EMBODIED CARBON

Material choices will be made to mitigate impacts on the environment, including but not limited to the following:

- Have a Global Warming Potential (GWP) of < 5 in manufacture and installation.
- Obtain certification where possible to confirm it is responsibly sourced.
- Materials will be preferred with a low environmental impact as per the BRE Green Guide
- Design Buildings where possible to use less energy and reduce resources.
- Materials with low embodied carbon will be sought in line with building regulations.
- Use of local sustainable materials

10.0 SUMMARY

10.1 RENEWABLES AND LZC TECHNOLOGIES

ASHP will be used in all plots.

PV will be fitted to the plots with ASHP Cylinders **if required** to achieve compliance with L12021 or an EPC rating of B.

10.2 WATER CONSUMPTION

The **water consumption will be under 100 litres per person per day**, utilising low-water-use fixtures and water restrictors.

10.3 ELECTRIC VEHICLE CHARGING

Electric Vehicle Chargers will be installed in compliance with the approved document S 2021.

10.4 OVERHEATING AND CLIMATE CHANGE

All dwellings will be assessed for overheating via the Part O 2021 simplified method or the TM59 dynamic modelling approach.

10.5 CARBON REDUCTION

Using fabric and ASHP, an average **reduction of 65.70% in carbon emissions (kg CO₂/year) relative to the L12021 targets** is expected across the site.

10.6 ENERGY REDUCTION

Using fabric and ASHP, an average **reduction of 42.16% in energy consumption (kWh/year) relative to L12021 targets** is expected across the site.

10.7 PART L COMPLIANCE

The development will use a mixture of the above measures to meet the current Part L / 'future homes' requirements, which a plot-type SAP assessment will define.

APPENDIX A – SITE LAYOUT

miller homes												
Accommodation Schedule												
Royal Wootton Bassett												
Region	SW	Date	01/04/24	AC202	Designer	JRB						
PART L Portfolio 2022												
Parking Min.												
Reference	Name	M4(2)/M4(3)	Number	Type	Rate	Total	Sq.m	Bed/s	St/Spaces	Storage	Category/ Parking	
AL24	Baymont	M4(2)	1	Mid	850	850	79	2	4	2	P5	
AL24	Baymont	M4(2)	6	Semi	850	5100	79	2	4	2	P5	
			7	12.3%								
L36	Denton	X	3	Mid	907	2721	84	3	5	2	P5	
L36	Denton	X	10	End	907	9070	84	3	5	2	P5	
L36	Chilton	X	10	Detached	979	9790	91	3	5	2	P5	
L363	Hampton	M4(2)	14	Semi	1069	14666	99	3	5	2	P5	
L363	Hampton	M4(2)	2	Detached	1069	2118	99	3	5	2	P5	
			39	68.4%								
L454	Haywood	X	9	Detached	1130	10170	105	4	7	2	P5	
SBP	M4(2)	2	Detached	1372	2764	127	5	9	2	P5		
			11	19.3%								
			57	Arise 2024								
			57549									
			1360	2400	3000	4000						
			0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	
			0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	
8106 Affordable												
AL11 (GP)	Hasting	M4(2)	4	Maisonette	551	2124	49	1	2	2	P5	
AL11 (FP)	Hasting	K	4	Maisonette	609	2436	57	1	2	2	P5	
2B-MAI	M4(3)	1	Maisonette	723	723	67	2	3	2	P5		
2B-MAI	K	1	Maisonette	828	828	77	2	3	2	P5		
AL24	Baymont	M4(2)	16	House	850	13600	79	2	4	2	P5	
L363	Hampton	M4(2)	4	House	1069	4276	99	3	5	2	P5	
SBP	K	6	House	1098	6588	102	3	6	2	P5		
487P	M4(2)	1	House	1238	1238	115	4	7	2	P5		
SBP	M4(2)	1	House	1372	1372	127	5	8	2	P5		
			38	40.00%								
			38	Arise 2024								
			33185									
			150d	2400d	3000d	4000d						
			21%	47%	26%	5%	100%	85.4%				
			100%	85.4%								
			95	Arise 2024								
			9551.1	90736								
Gross Site Area												
			Acres	16.75			Hectares	6.78				
Open space												
			Acres	10.75			Hectares	4.35				
Total NET Area												
			Acres	5.49			Hectares	2.22				
			Acres	5.71			Hectares	2.30				
			Acres	1.79			Hectares	0.72				
NET Density (Total)												
			Units/Acre	17.29			Units/Hect	42.72				
			Units/Acre	15.38			Units/Hect	38.00				
			Units/Acre	21.24			Units/Hect	52.49				
Coverage (Total)												
			Sqft/Acre	16112.32			Sqft/Hect	40013.38				
			Coverage	Sqft/Acre	15528.64			Sqft/Hect	38370.74			
			Coverage (S106)	Sqft/Acre	18550.13			Sqft/Hect	45836.73			



NORTH

W

E

SUN PATH

0m

5m

10m

20m

30m

40m

KEY:

SITE BOUNDARY

AFFORDABLE DWELLINGS

M4(2) DWELLING

EXISTING TREES/VEGETATION TO BE RETAINED

EXISTING TREES TO BE REMOVED

INDICATIVE PLANTING
(SEE SEPARATE PLOT LANDSCAPING PLANS FOR FURTHER DETAILS)

1.8m SCREEN WALL

1.8m TIMBER FENCE

0.5m TIMBER KNEE RAIL

GATE

SHED/ BIKE STORAGE

BIN COLLECTION POINT

VISITOR PARKING SPACE

ALLOTMENT PARKING SPACE

DIVERTED HV CABLE + 1.5M EASEMENT

FLY ZONE OFFSET

HOGGIN FOOTPATH

MOWN FOOTPATH

Rev

Description

Drawn

Date

miller homes

Miller Homes (Midlands) Ltd
2 Centro Place
Pride Park
Derby, DE24 8RF
Telephone 0870 336 4400
Fax 0870 336 4401
www.millerhomes.co.uk

Project Title

Marlborough Road
Royal Wootton Bassett

Drawing Title

Sketch Layout
Option

Scale

1:500

Drawn By

JRB

Designer Check

LB

Engineer Check

Date

18.09.25

Date

Job No.

SK20

Drawing No.

Revision

D

Original Sheet Size A1

APPENDIX B – RESULTS

Dwelling Type	kg CO ₂ /year per Type	number of Plots	kg CO ₂ /year whole site		Assumed Technology	kg CO ₂ /year per plot	Number of Plots	kg CO ₂ /year whole site	kg CO ₂ /year
	L12021 Target #	Per Type	L12021 Target #			L12021 Design ##	Per Type	L12021 Design ##	% Reduction
2B-MAI - FF *	691	1	691		ASHP Cylinder	308	1	308	-55.40%
2B-MAI - GF *	666	1	666		ASHP Cylinder	302	1	302	-54.63%
3B6P - Det *	1079	6	6474		ASHP	349	6	2093	-67.67%
4B7P - Semi	1037	1	1037		ASHP	335	1	335	-67.66%
5B8P - Det *	1314	3	3942		ASHP	436	3	1307	-66.84%
AL11 Hasting - FF	691	4	2765		ASHP Cylinder	308	4	1233	-55.40%
AL11 Hasting - GF	666	4	2664		ASHP Cylinder	302	4	1209	-54.63%
AL24 Baymont - Semi	893	23	20532		ASHP	295	23	6777	-66.99%
L356 Denton - Semi	919	13	11948		ASHP	304	13	3953	-66.91%
L360 Chilton - Det	1036	10	10356		ASHP	353	10	3528	-65.94%
L363 Hampton - Det	1069	20	21389		ASHP	372	20	7448	-65.18%
L454 Haywood - Det	1150	9	10346		ASHP	371	9	3335	-67.76%
Total		95	92810				95	31830	-65.70%

based on L12021 TER

based on L12021 DER

* Data Assumed

Dwelling Type	kWh/year per Type	number of Plots	kWh/year whole site		Assumed Technology	kWh/year per Type	Number of Plots	kWh/year whole site	kWh/year
	L12021 Target #	Per Type	L12021 Target #			L12021 Design ##	Per Type	L12021 Design ##	% Reduction
2B-MAI - FF *	2789	1	2789		ASHP Cylinder	2052	1	2052	-26.42%
2B-MAI - GF *	2775	1	2775		ASHP Cylinder	2006	1	2006	-27.69%
3B6P - Det *	4353	6	26117		ASHP	2350	6	14097	-46.02%
4B7P - Semi	4037	1	4037		ASHP	2269	1	2269	-43.78%
5B8P - Det *	5072	3	15216		ASHP	2924	3	8772	-42.35%
AL11 Hasting - FF	2789	4	11154		ASHP Cylinder	2052	4	8207	-26.42%
AL11 Hasting - GF	2775	4	11099		ASHP Cylinder	2006	4	8026	-27.69%
AL24 Baymont - Semi	3598	23	82760		ASHP	2006	23	46135	-44.25%
L356 Denton - Semi	3672	13	47736		ASHP	2063	13	26825	-43.80%
L360 Chilton - Det	4163	10	41630		ASHP	2381	10	23814	-42.80%
L363 Hampton - Det	4255	20	85104		ASHP	2513	20	50254	-40.95%
L454 Haywood - Det	4581	9	41225		ASHP	2498	9	22486	-45.46%
Total		95	371641				95	214945	-42.16%

based on the Target worksheet L12021 SAP Box 238 (Total delivered energy for all uses)

based on the Dwelling L12021 SAP Box 238 (Total delivered energy for all uses)

* Data Assumed

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Fri 24 Apr 2026 11:46:24

Project Information			
Assessed By	Matthew Hurd	Building Type	House, Detached
OCDEA Registration	EES/014743	Assessment Date	2026-04-24

Dwelling Details			
Assessment Type	As designed	Total Floor Area	105 m ²
Site Reference	L454 Haywood - Det	Plot Reference	L454 Det - ASHP
Address	L454 Haywood - Det, Royal Wootton Bassett, SN4 7SE		

Client Details	
Name	Miller Homes Limited
Company	Miller Homes Limited
Address	First Floor, Miller House, 2 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate

Fuel for main heating system	Electricity
Target carbon dioxide emission rate	10.95 kgCO ₂ /m ²
Dwelling carbon dioxide emission rate	3.53 kgCO ₂ /m ² OK

1b Target primary energy rate and dwelling primary energy

Target primary energy	57.24 kWh _{PE} /m ²
Dwelling primary energy	36.86 kWh _{PE} /m ² OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency

Target fabric energy efficiency	40.0 kWh/m ²
Dwelling fabric energy efficiency	39.0 kWh/m ² OK

2a Fabric U-values

Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.21	Walls (1) (0.21)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Heat Loss Floor (0.15)	OK
Roofs	0.16	0.07	Roof (1) (0.07)	OK
Windows, doors, and roof windows	1.6	1.33	D1 (1.5)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	135.359	0.21
Ground floor: Heat Loss Floor, Heat Loss Floor	52.49	0.15
Exposed roof: Roof (1)	52.49	0.07 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
D1, (D1) Half Glazed Door	2.121	East	N/A	1.5
W1, Window	0.483	East	1.0	1.3
W2, Window	1.6875	East	1.0	1.3
W3, Window	1.3125	West	1.0	1.3
W4, Window	1.4	East	1.0	1.3
W5, Window	1.4	East	1.0	1.3
W6, Window	0.483	South	1.0	1.3
W7, Window	1.4	West	1.0	1.3
D2 W10, Window	3.801	West	1.0	1.3
W8, Window	1.4	West	1.0	1.3
W9, Window	0.483	North	1.0	1.3

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part 1: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.065	HI-Therm+
External wall	E3: Sill	Calculated by person with suitable expertise	0.004 (!)	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.005 (!)	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.061	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	-0.006 (!)	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.087	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.051	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.037 (!)	
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.092	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	4.5 m ³ /hm ² , Design value	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	274.9%
Emitter type	Radiators
Flow temperature	45°C
System type	Heat Pump
Manufacturer	Vaillant Group UK Ltd
Model	aroTHERM plus 5kW & AI VIH RW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	198.2 litres
Declared heat loss	1.45 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls

Main heating 1 - type: Programmer, room thermostat and TRVs

Function	
Ecodesign class	
Manufacturer	
Model	

Water heating - type: Cylinder thermostat and HW separately timed

Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	89.55555555555556 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Decentralised mechanical extract		
Maximum permitted specific fan power	0.7 W/(l/s)	
Specific fan power	0.15 W/(l/s)	OK
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model	Lo-Carbon NBR dMEV C 100, 498095	
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		