

FEBRUARY 7, 2025

DEVELOPMENT AT PARCEL R10, PHASE 2B OF THE SOUTH WOKINGHAM

Energy Statement

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ON BEHALF OF MILLER HOMES

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1.0 INTRODUCTION

1.1 CONTEXT

This Statement was prepared by Energy & Design Ltd. on behalf of Miller Homes Limited to support a planning application for the proposed 215 dwelling development at Parcel R10, Phase 2b of the South Wokingham.

This energy and sustainability statement shows that the requirement will be met to comply with the following Documents:

Building Regulations L12021

National Planning Policy Framework (NPPF)

Condition 65 - Low and Zero Carbon Technologies

1.2. DESCRIPTION OF DEVELOPMENT

The development at Parcel R10, Phase 2b of the South Wokingham site, proposes 215 plots. These plots comprise a range of detached, semi-detached, terraced, and apartment properties.

The current site is shown below.



1.3. PROJECT BRIEF

The development is being designed in accordance with condition 65 of the notification of approval of planning permission dated 19th July 2024.

2.0 METHODOLOGY

2.1 ASSESSMENT METHODOLOGY

Energy & Design Ltd. has modelled sample types using the L12021 methodology to calculate the dwellings' CO₂ emissions (kgCO₂/year), total energy demand, and end design usage.

This will allow us to show compliance via the following method.

1. Baseline CO₂ emissions: This will be calculated and provided in Total CO₂ emissions (kgCO₂/year). SAP uses the Target Emission Rate (TER = CO₂ kilograms, per M² of total useful floor area, per year) to establish the baseline according to the approved document Part L12021. This rate is then multiplied by the total useful floor area to determine the overall CO₂ emissions.
2. Subsequently, the Design Emission Rate (DER) is multiplied by the total useful floor area to determine the Design's overall CO₂ emissions. The reduction in emissions is then calculated by comparing it to the Target rate.

3.0 BASELINE ENERGY DEMAND

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 total energy demand.

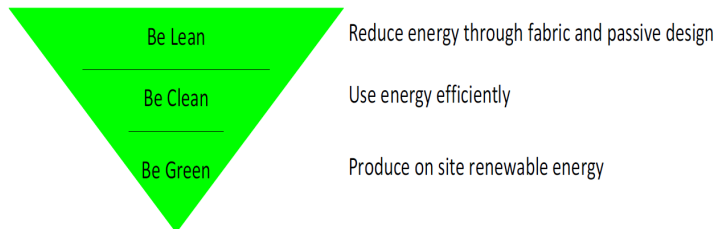
The proposed dwellings have been modelled in L12021 software, and the maximum CO₂ emissions permitted for the site to comply with L12021 are as per the baseline.

The baseline CO₂ emissions are shown below:

Target Emission Rate: Compliant with AD L12021	
Total CO ₂ emissions – kgCO ₂ /year	204,822

4.0 CO₂ REDUCTION STRATEGY – FABRIC, LOW CARBON, AND RENEWABLE APPROACH

4.1 ENERGY HIERARCHY



The proposed dwellings have been designed by the 'energy hierarchy', which 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.

4.2 ENERGY EFFICIENCY MEASURES

The proposed design will reduce thermal energy demand by targeting improved insulation levels, air leakage, and fabric u-values that align 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, with most homes orientated to the South or West.
- 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.
- 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 reflects the actual as-built dwelling more accurately, 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)	1.6	1.30
Door U-Value (W/m ² K)	1.6	1.50
Design Air Permeability m ³ /h.m ² at 50 Pa	8.00	4.50

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)
- 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 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.

5.5 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 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.**

5.6 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.

5.7 CONCLUSION

The following technologies have been deemed suitable for this development.

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

For this site, it is currently proposed that all dwellings incorporate ASHP to reduce CO₂.

5.8 PROPOSED FABRIC & LZC RESULTS

ASHP has been chosen as the preferred technology for this development to reduce emissions over L12021 regulations.

Target L12021 & Design Emission Rate L12021: Compliant		
Target Total CO ₂ emissions – kgCO ₂ /year L12021	204,822	
Design Total CO ₂ emissions – kgCO ₂ /year L12021	78,513	
Total achieved reduction kgCO₂/year	126,309	61.67%

6.0 WATER CONSUMPTION

6.1 WATER CALCULATOR

In line with condition 65, all new developments must be designed to use water efficiently.

Utilising low-water-use fixtures and water restrictors, water consumption will be under 105 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.

breglobal

Job no:	07/02/2025
Date:	Matthew Hurd
Assessor name:	BREAM-900
Registration no:	Miller Homes Ltd - Sample
Development name:	

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALC.)

House Type:		Type 1		Type 2		Type 3	
Description:		SAMPLE					
Installation Type	Unit of measure	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day
Is a dual or single flush WC specified?		Dual		Select option:		Select option:	
WC	Full flush volume	4	5.84		0.00		0.00
	Part flush volume	2.6	7.70		0.00		0.00
Taps (excluding kitchen and external taps)	Flow rate (litres / minute)	5	9.48		0.00		0.00
Are both a Bath & Shower Present?		Bath & Shower		Select option:		Select option:	
Bath	Capacity to overflow	155	17.05		0.00		0.00
Shower	Flow rate (litres / minute)	8	34.96		0.00		0.00
Kitchen sink taps	Flow rate (litres / minute)	6	13.00		0.00		0.00
Has a washing machine been specified?		No		Select option:		Select option:	
Washing Machine	Litres / kg		17.16		0.00		0.00
Has a dishwasher been specified?		No		Select option:		Select option:	
Dishwasher	Litres / place setting		4.50		0.00		0.00
Has a waste disposal unit been specified?		No		Select option:		Select option:	
Water Softener	Litres / person / day		0.00		0.00		0.00
Calculated Use		109.7		0.0		0.0	
Normalisation factor		0.91		0.91		0.91	
Code for Sustainable Homes	Total Consumption	99.8		0.0		0.0	
	Mandatory level	Level 3/4		-		-	
Building Regulations 17.K	External use	5.0		5.0		5.0	
	Total Consumption	104.8		0.0		0.0	
	17.K Compliance?	Yes		-		-	

(BASIC CALC.)

6.0 SUMMARY

6.1 HOT WATER AND HEATING SOURCE

Each plot will be equipped with an air source heat pump (ASHP) to comply with L12021 and meet the reduction requirements stipulated in condition 65.

Houses will use ASHP for hot water and heating.

Each apartment will be equipped with an ASHP cylinder for hot water and panel heaters for heating.

6.2 CARBON REDUCTION

Using ASHPS, an average **61.67% reduction** in carbon emissions (kgCO₂/year) against L12021 targets is expected **across the site**.

This exceeds the requirement of condition 65.

6.3 WATER CONSUMPTION

Water consumption will be **under 105 litres per person per day**.

APPENDIX A – SITE LAYOUT



Parcel R10					
Private	Code	Type	ft²	Number	Total ft²
1 Bed Apartments					
Block 4 - 1BAP	1 Bed (182P) Apartment	539	4	2156	2
	1 Bed (182P) Apartment	540	7	3780	3
	Block 5 - 1BAP	540	3	1620	2
	1 Bed (182P) Apartment	539	3	1617	2
Block 6 - 1BAP	1 Bed (182P) Apartment	541	3	1623	2
	1 Bed (182P) Apartment				
2 Bed Apartments					
Block 3 - 2BAP	2 Bed (284P) Apartment	781	8	6248	3
	2 Bed (284P) Apartment	756	6	4536	3
	2 Bed (284P) Apartment	754	3	2262	3
	2 Bed (284P) Apartment	758	3	2274	3
2 Bed Houses					
L255 / L255A - Delmont	2 Bed (3P) House	758	21	15918	4
3 Bed Houses					
L356 - Denton	3 Bed House	907	4	3628	5
L358 / L358A - Whitton	3 Bed House	947	14	13258	6
L360 - Chilton	3 Bed House	979	10	9790	5
L361 - Braxton	3 Bed House	996	7	6972	5
L362 - Clayton	3 Bed House	1018	2	2036	5
L363 / L363A - Hampton	3 Bed House	1050	2	2100	3
L367 - Kington	3 Bed Townhouse	1177	2	2354	6
L368 - Clarkston	3 Bed Townhouse	1268	11	13948	5
L454 - Haywood	3 Bed +Study House	1130	5	5650	6
L461 - Fordwood	3 Bed +Study House	1267	2	2534	6
A - House Type A	3 Bed Townhouse	1487	5	7435	6
B1 - House Type B1	3 Bed Townhouse	1319	2	2638	6
3BH	3 Bed Townhouse	1380	3	4140	5
D - House Type D	3 Bed Townhouse	1567	2	3134	7
4 Bed Houses					
L456 - Westerwood	4 Bed House	1151	4	4604	6
L467 - Bearwood	4 Bed House	1379	2	2758	6
L473 - Clearwood	4 Bed House	1637	1	1637	7
Sub Totals				139	130650
Affordable					
Shared					
2 Bed Flats					
Block 1 - 1BFL	1 Bed (182P) Flat	540	11	5940	2
	1 Bed (182P) Flat	539	3	1617	2
	1 Bed (182P) Flat	541	3	1623	2
2 Bed Flats					
Block 2 - 2BFL	2 Bed (283P) Flat	664	8	5312	3
	2 Bed (283P) Flat	658	3	1974	3
	2 Bed (283P) Flat	669	3	2007	3
2 Bed Houses					
AL24 / AL24A - Baymont	2 Bed House	850	10	8500	4
AL32 / AL32A - Lockton	2 Bed House	1001	10	10010	5
3 Bed Houses					
AL41 - Torwood	3 Bed House	1143	2	2286	6
Sub Totals				53	39269
Shared					
2 Bed Houses					
AL24 / AL24A - Baymont	2 Bed House	850	8	6800	4
AL32 / AL32A - Lockton	3 Bed House	1001	10	10010	5
AL34 - Easton	3 Bed Townhouse	1168	5	5840	5
Sub Totals				23	22650
Grand Totals				215	192569
Net area (Acres)			11.90	Sqft/Acre	16182

- KEY**
- SITE BOUNDARY
 - FENCING REFER TO ENCLOSURES LAYOUT FOR DETAILS
 - 1.8m BRICK SCREEN WALL
 - BLOCK PAVED SURFACE COLOUR: BRINDLE RED
 - BLOCK PAVED SURFACE COLOUR: CHARCOAL GREY
 - TURF TO GARDENS
 - INDICATIVE TREE PLANTING (subject to detailed landscape design)
 - EXISTING TREES TO BE RETAINED(refer to ARB survey)
 - EXISTING RPA TO BE RETAINED(refer to ARB survey)
 - EXISTING TREES TO BE REMOVED(refer to ARB survey)
 - EXISTING SHRUB PLANTING (refer to ARB survey)
 - INDICATIVE TREE PLANTING (refer to detailed landscape proposals)
 - INDICATIVE SHRUB PLANTING (refer to detailed landscape proposals)
 - GATE
 - DOOR AND PATIO TO REAR ACCESS
 - DOOR/LEVEL THRESHOLD AND PATH IN CONCRETE SLABS
 - FOOTPATH
 - ACTIVE FRONTAGE / ADDITIONAL WINDOW
 - PRIVATE DWELLINGS
 - AFFORDABLE-RENTED DWELLINGS
 - AFFORDABLE-SHARED OWNERSHIP DWELLINGS
 - DWELLINGS WITH CHIMNEYS
 - SHED FOR CYCLE STORAGE
 - RAIN GARDEN
 - INDICATIVE LOCATION OF AIR SOURCE HEAT PUMPS

0 5 10 15 20 25m

SITE LAYOUT 1:500

PARCEL R11

WATERLOO ROAD

Pond

Locks Farm

The Barn Great Oaks

X	05.02.25	Redline boundary & paths to plot 1119 updated & double garage SR for plots 1140 & 1141 changed.	DGP	
W	30.01.25	Parking bays re-arranged on the private drive ways following LPA's comments, sub-station pushed forward by 1.2m, foot & cycle way connection shown at the eastern gateway, parking & house types changed & arrangements realigned for plots 1137-1139 to accommodate emergency access, private M402 units redistributed, redline boundary & accommodation schedule updated.	DGP	
V	23.01.25	Plot 1100 been changed to 1361 (Brixton) and footprints for blocks 1-4 updated.	DGP	
U	17.01.25	Blocks 1 & 4 re-positioned while the visitor's bays relocated following client's comments been received.	DGP	
T	16.01.25	Tree survey been updated as per ACV's latest info been received. SR Blocks 2-3 re-positioned & visitor's cycle racks been introduced for the flat/apartment blocks.	DGP	
S	15.01.25	Plots 1110 & 1111 changed to 1367 (Ripston), cycle storage for block 5 handed and road layouts amended following latest highways & pre-app comments been received.	DGP	
Rev.	Date	Description	Drawn	Checked

Client

Project

South Wokingham Phase R10

Drawing Title

Proposed Planning Layout

Scale

1:500 @ A0

Drawn

SR

Checked

DGP

Date

JUNE 2024

File

P1914.R10.01

Drawing Status

Dwg No

P1914.R10.01

Rev

X

PLANNING

APPENDIX B – CARBON REDUCTION RESULTS

Type Reference	Target L12021				Design L12021				
	# Total CO2 / Year	Plots Per type	Site Total CO2 / Year			## Total CO2 / Year	Plots Per type	Site Total CO2 / Year	Percentage reduction
	(TER X TFA)				Technology	(DER X TFA)			CO2/Year
3BH	1,287	3	3,861		ASHP	435	3	1,305	66.20
A*	1,367	5	6,833		ASHP	462	5	2,309	66.20
B1*	1,204	2	2,407		ASHP	407	2	814	66.20
Baymont	900	18	16,197		ASHP	345	18	6,214	61.63
Beauwood	1,273	2	2,545		ASHP	472	2	943	62.94
Braxton	1,109	7	7,760		ASHP	401	7	2,805	63.86
Chilton	1,002	10	10,019		ASHP	359	10	3,591	64.16
Clarkston	1,122	11	12,344		ASHP	390	11	4,289	65.25
Clayton	1,065	2	2,130		ASHP	390	2	779	63.41
Clearwood	1,410	1	1,410		ASHP	481	1	481	65.91
D*	1,420	2	2,840		ASHP	526	2	1,052	62.94
Delmont	863	21	18,125		ASHP	322	21	6,756	62.72
Denton	922	4	3,690		ASHP	354	4	1,415	61.64
Easton	1,181	5	5,903		ASHP	408	5	2,039	65.46
Flat Ground Floor*	859	21	18,047		ASHP	394	21	8,279	54.13
Flat Mid Floor*	737	29	21,377		ASHP	316	29	9,170	57.10
Flat Top Floor*	835	21	17,531		ASHP	364	21	7,644	56.40
Fordwood	1,339	2	2,677		ASHP	459	2	918	65.70
Hampton	977	2	1,954		ASHP	362	2	725	62.91
Haywood	1,147	5	5,737		ASHP	417	5	2,084	63.68
Kipton	1,105	2	2,210		ASHP	374	2	747	66.19
Lockton	967	20	19,340		ASHP	352	20	7,048	63.56
Torwood	1,025	2	2,051		ASHP	380	2	760	62.94
Westerwood	1,156	4	4,623		ASHP	404	4	1,617	65.03
Whitton	944	14	13,210		ASHP	338	14	4,728	64.21
Total		215	204,822				215	78,513	61.67

* = Assumed Data

= data taken from the L12021 Target SAP worksheet section 12a box 273 and multiplied by section 1 box 4

= data taken from the L12021 design SAP worksheet section 12a box 273 and multiplied by section 1 box 4