

Energy Report

Residential Development to provide four new dwellings
at
THE RUDDERY, ASHWELL ST, ASHWELL, BALDOCK, SG7 5FQ



PLANNING CONSULTANTS: DLA Town Planning Ltd.

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Prepared by:



accredited SAP assessors

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BRIEF

Monitor Energy Consultancy has been instructed to undertake an Energy Report, to accompany the Planning application for this proposed development for four new detached residential dwellings. This report sets out how the proposals will meet the standards required of North Hertfordshire District Council's Local Plan 2022 Supplementary Planning Document to provide high quality sustainable design and demonstrates that the development will achieve the SPD Gold level standard with on-site reductions of **50%** minimum compared with Building Regulations Part L of which **10%** minimum reduction is through fabric first measures and EPC ratings of Band A.

SITE LAYOUT AND KEY DESIGN FEATURES

The proposed design incorporates the following key features:

- South-facing fenestration to optimise solar gain with limited openings to the north.
- Full-height south-facing windows on Plots 1 and 2 are shaded by extended roof verandas to avoid summer overheating.
- Better than current Building Regulations standards for insulation and ventilation are proposed, including 400mm thick external walls to accommodate high insulation levels and high insulating double-glazed units.
- 6kWp of photovoltaic panels for Plots 1 and 2, 5kWp for Plots 3 and 4.
- Air-source heat pumps for all dwellings.

ESTABLISHING CO₂ EMISSIONS

This energy statement seeks to identify the carbon footprint for this development and to demonstrate that the requirements of the SPD Gold standard have been met.

The Standard Case Target CO₂ Emission Rates (TER)s have been calculated using SAP 10 in accordance with Building Regulations Part L 2021 with the results detailed below.

Table 1 illustrates the CO₂ emissions for the regulated loads (for heating, hot water, pumps, fans and lighting) associated with each dwelling if built to comply with Building Regulations Part L 2021. The results calculated are tabulated below and a summary of the SAP calculations confirming the **TERs** can be found in **Appendix A**.

	Total Area GIA	Standard Case TER (CO ₂ kg/m ² /yr)	Total CO ₂ (kg/yr)
Plot 1	226.36	7.28	1647.90
Plot 2	233.08	7.2	1678.18
Plot 3	181.47	8.03	1457.2
Plot 4	181.47	8.12	1473.54
	822.38		6 256.82

Table 1: Standard (Building Regulations Compliant) Case SAP 10 results for all proposed new dwellings.

The total CO₂ emissions for the Building Regulations 2021 Compliant case has been calculated at 6 256.82kg CO₂/yr.

DWELLING FABRIC EFFICIENCY MEASURES

In order to achieve the required target CO₂ emissions, a fabric first approach has been adopted, using enhanced standards of insulation for floor, walls windows and roof:

- U-Value for ground floors of 0.10 W/m²K using 150mm Kingspan or similar PIR insulation compared to Building Regulations standard of 0.18 W/m²K,
- U-Value for cavity walls of 0.14 W/m²K using aircrete blocks and 200mm mineral wool insulation, compared to Building Regulations standard of 0.18 W/m²K,
- U value of 0.17 W/m²K for walls between house and garage areas using cavity walls as above or 80mm insulated plasterboard on blockwork,
- U-Value for roof areas with flat ceilings of 0.11 W/m²K using 400mm mineral wool insulation compared to Building Regulations standard of 0.15 W/m²K,
- U-value for roof areas with sloping ceilings of 0.14 W/m²K using 100mm Kingspan K107 between rafters plus 60mm Kingspan K118 below, compared to Building Regulations standard of 0.15 W/m²K,
- High performing double-glazed doors windows and rooflights with low e glass and 16mm minimum gap, argon filled to achieve a maximum U-Value of 1.2 W/m²K compared to Building Regulations standard of 1.6 W/m²K,
- Hi-Therm insulated lintels and BRE approved thermal details eg Knauf, to be used for all junctions where applicable, to limit cold bridging at linear junctions with a calculated user defined psi values to achieve a maximum thermal bridging y value of 0.024 compared to standard default y value of 0.2,

- High levels of air tightness with a design air permeability rate of 5m³/hr/m³ at 50 Pa pressure compared to Building Regulations standard of 8m³/hr/m³

The Dwelling Fabric Efficiency (**DFEE**) has been calculated for the dwellings as proposed and the results are tabulated in Table 2 below and a summary of the SAP calculations confirming the **DFEEs** and **TFEEs** can be found in **Appendix A**.

. The overall improvement in fabric efficiency for the dwellings as proposed compared to Building Regulations Part L is **13.23%**, greater than the 10% minimum requirement for fabric first measures to achieve SPD Gold level standard.

	Total Area GIA	Dwelling Fabric Energy Efficiency (DFEE) (kWh/m ² /yr)	Target Fabric Energy Efficiency (TFEE) (kWh/m ² /yr)	% DFEE/TFEE
Plot 1	226.36	32.93	38.1	13.56%
Plot 2	233.08	33.00	38.12	13.42%
Plot 3	181.47	34.69	39.87	12.97%
Plot 4	181.47	35.06	40.45	12.88%
	822.38	135.70	156.33	13.23%

Table 2: SAP 10 Dwelling Fabric Efficiency results for all proposed new dwellings.

ADDITIONAL ENERGY EFFICIENCY MEASURES

- Mitsubishi Ecodan or similar air source heat pumps have been chosen for the heating system with time and temperature zone controls, to allow heating individual zones to be controlled separately, in order to reduce unnecessary energy use,
- 5 or 6kWp of PV panels (the maximum that can be installed on the roof space for each unit, sited unobtrusively, on the south facing sides offering ideal inverter/battery locations and electric vehicle charging points. The proposed layout of the panels are shown on the site layout and roof plan in **Appendix B**.
- Electric vehicle charging point to each plot,
- Water efficient sanitaryware, in particular flow restrictors to the showers will be installed to reduce the demand for hot water, with calculations required to demonstrate a maximum of 110l of water use per person per day compared with Building Regulations Part G standard of 125l per person per day,
- 100% Low energy lights with a minimum efficiency of 100 lumens per watt,

- Smart energy meters and monitoring.

The resulting Actual Case Dwelling Emission Rates (DER)s for the scheme as proposed have been calculated using SAP 10 in accordance with Building Regulations Part L 2021 with the results detailed below a summary of the SAP calculations confirming the **DERs** can be found in **Appendix A**.

	Total Area GIA	Actual Case DER (CO ₂ kg/m ² /yr)	Total CO ₂ (kg/yr)
Plot 1	226.36	0.32	72.44
Plot 2	233.08	0.37	86.24
Plot 3	181.47	0.40	72.59
Plot 4	181.47	0.42	76.22
	822.38		307.48

Table 3: Actual Case SAP 10 results for all new dwellings as proposed.

CONCLUSION

The total carbon emissions for the development as proposed are **307.48 kgCO₂/yr** compared to **6 256.82 CO₂/yr** for the Building Regulations 2021 Compliant case, a reduction of **95.08%**. The proposals therefore achieve the North Hertfordshire District Council's SPD Gold standard.

There is potential for the future developer to improve the proposed scheme to achieve 100% reduction, for example by incorporating additional energy saving technologies such as mechanical ventilation with heat recovery (MVHR) and waste water heat recovery system (WWHR).

A summary of the calculations are appended below with the **TER** and **TFEE** calculations indicating the Building Regulation compliant case and the **DER** and **DFEE** calculations indicating the dwellings as actually proposed. Full SAP calculations are available on request.

APPENDIX A

TER, DER, TFEE and DFEE CALCULATIONS

Block Compliance



Block Reference	The Ruddery	Issued on Date	05/09/2025
Block Name			
Calculation Type	New Build (As Designed)		
Assessor Details	Mrs. Nicola Battista	Assessor ID	L706-0001
Client			

Block Compliance Report - DER				
Block Reference: The Ruddery	Block Name:			
Property-Assessment Reference	Floor area (m ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% DER/TER
01 - Plot 1 with PV	226.36	0.32	7.28	95.60 %
02 - Plot 2 with PV	233.08	0.37	7.20	94.86 %
03 - Plot 3 with PV	181.47	0.40	8.03	95.02 %
04 - Plot 4 with PV	181.47	0.42	8.12	94.83 %
Totals:	822.38	1.51	30.63	
Average DER = 0.37 kgCO ₂ /m ²	% DER/TER	PASS		
Average TER = 7.61 kgCO ₂ /m ²	95.09 %			

Block Compliance Report - DFEE				
Block Reference: The Ruddery		Block Name:		
Property-Assessment Reference	Floor area (m ²)	DFEE (kWh/m ² /yr)	TFEE (kWh/m ² /yr)	% DFEE/TFEE
01 - Plot 1 with PV	226.36	32.39	38.10	14.99 %
02 - Plot 2 with PV	233.08	32.35	38.12	15.15 %
03 - Plot 3 with PV	181.47	34.01	39.87	14.69 %
04 - Plot 4 with PV	181.47	34.38	40.25	14.59 %
Totals:	822.38	133.12	156.33	
Average DFEE = 33.17 kWh/m ² /yr	% DFEE/TFEE	PASS		
Average TFEE = 38.97 kWh/m ² /yr	14.88 %			

Block Compliance Report - DPER				
Block Reference: The Ruddery		Block Name:		
Property-Assessment Reference	Floor area (m ²)	DPER (kWh/m ² /yr)	TPER (kWh/m ² /yr)	% DPER/TPER
01 - Plot 1 with PV	226.36	2.65	38.56	93.13 %

Block Compliance

02 - Plot 2 with PV	233.08	3.05	38.24	92.02 %
03 - Plot 3 with PV	181.47	3.28	42.35	92.26 %
04 - Plot 4 with PV	181.47	3.51	42.82	91.80 %
Totals:	822.38	12.49	161.97	
Average DPER = 3.09 kWh/m ² /yr	% DPER/TPER	PASS		
Average TPER = 40.25 kWh/m ² /yr	92.32 %			

APPENDIX B

SITE LAYOUT AND ROOF PLANS

