

Technical Note

Project Title	Bartons Road, Southleigh		
Subject	Condition 23 of Outline Permission	Date	01/04/2022
Author	RDM	Our Ref	1673RCF-18-220401 Condition 23 Note

1.1 Introduction

The Bartons Road development in Southleigh is proposed to consist of a total of 70 dwellings, through a mixture of 64no. detached, semi-detached, and terraced houses, along with a total of 6no. flats. This technical note is written to provide a summary of the proposed design measures implemented in the development, in order to reduce carbon emissions and energy demand.

This technical note is issued in order to address the requirements of Condition 23 of the outline planning permission for the site.

1.2 Low Carbon Design

Low carbon design is sought for the development through the following measures:

1.2.1 Solar Gain

Glazing has been positioned and sized such that the risk of summertime overheating has been minimised as far as possible, whilst also maximising the capacity for solar gains during winter months. High glazing g values of around 0.72 (72% solar transmittance) allow for significant solar gains during the winter months, whilst the sizing of window openings has been chosen to help mitigate the risk of overheating.

This will also help to reduce reliance on artificial lighting, thus further decreasing electrical energy demand within each home. The majority of homes within the development are oriented such that they have south-facing elevations, and all dwellings are at least dual-aspect.

1.2.2 Natural Ventilation or Mechanical Ventilation

Natural ventilation is proposed, with intermittent extract provided in WCs and bathrooms. Kitchens will have extractive cooker hoods. Through use of natural ventilation, energy consumption from ancillary equipment can be minimised, helping to reduce carbon emissions resulting from electricity consumption.

As all dwellings will be at least dual-aspect, a good level of cross-ventilation can be achieved, which will help maintain occupant comfort during hotter summer months, thus reducing potential demand for mechanical cooling.

1.2.3 Fabric Performance

A good standard of building fabric is proposed for the development, with low U-values and careful consideration of thermal bridges. This helps to reduce space heating demand, and is anticipated to result in a 15% improvement in fabric energy efficiency over the notional dwelling in Part L 2013. A summary of the proposed U-values is shown in Table 1.

Element	Limiting 2013 U-value (W/m ² /K)	Notional 2013 U-value (W/m ² /K)	Target U-value (W/m ² /K)
Ground Floor	0.25	0.13	0.12
Walls	0.30	0.18	0.25
Party walls	0.20	0.00	0.00
Roof	0.20	0.13	0.11
Windows	2.0	1.40	1.20
Rooflights	2.0	1.40	1.40
Doors	1.8	1.20	1.10
	Limiting m ³ /h/m ²	Notional m ³ /h/m ²	Target m ³ /h/m ²
Air Permeability	10	5	5.1 – 7.1

Table 1: U-values for typical building elements

Air permeability will vary by dwelling type to prevent stale air from impacting health and wellbeing.

Thermal bridges are reduced where possible, using bespoke details to limit heat transfer. This reduces heat loss through thermal bridging by around 25% over a standard detail.

1.2.4 Passivhaus Principles

Whilst formal certification under the Passivhaus scheme is not sought for this development, the principles of Passivhaus are being implemented – i.e., reducing energy demand through a fabric-first approach, maximising solar gains, and orienting dwellings as efficiently as possible within the limitations of the site.

These principles are further explained in earlier sections of this document.

1.2.5 *Minimise greenhouse gas emissions*

Energy-efficient gas combination boilers of at least 89.6% efficiency are proposed to provide space heating and domestic hot water. Through the combination of these measures, the development is anticipated to save 5% of regulated carbon dioxide emissions over the Building Regulations 2013.

Natural gas has relatively low carbon emissions associated with its use, sitting at around 216 gCO₂/kWh, which will help to keep greenhouse gas emissions associated with the use of this development fairly low.

1.2.6 *District heating or CHP*

Due to the low density of the development, communal heating systems are not thought to be viable, as significant hot water pipework runs would be required, resulting in high distribution losses and a reduced financial viability of the development. This also therefore impacts the viability of combined heat and power (CHP), which relies on use of communal heating.

Due to improvements to the national grid, gas-fired CHP typically achieves lower carbon savings in a real-world application, as natural gas is being used to produce electricity. As the grid often fluctuates in carbon intensity, grid electricity is often less carbon-intensive than natural gas, and so electricity generated via CHP does not achieve carbon savings.

1.3 Home Quality Mark

The Home Quality Mark is an assessment scheme which replaces the Code for Sustainable Homes, and is operated by the BRE. Within this assessment scheme, there are 500 potential credits, and a total of nine potential ratings. There are as below:

	1 Star	1.5 Star	2 Star	2.5 Star	3 Star	3.5 Star	4 Star	4.5 Star	5 Star
Minimum total credits	Minimum requirements only	90	100	120	150	190	240	300	400
Percentage		18	20	24	30	38	48	60	80

A Home Quality Mark assessment is currently underway for the development as led by Method Consulting. This assessment process has identified a potential route towards achieving between a 3 and 4 Star rating within the Home Quality Mark One technical standard.

Within the Home Quality Mark scheme, dwellings are individually assessed and provided with their own ratings, as a number of credits are individually weighted on a home-by-home basis. Some dwellings will therefore perform better than others, and the site will not have an overall rating (though ratings could be averaged out to give a rough indication of performance).

At present, the worst-performing dwellings are looking to achieve around 163 credits, for a 3 Star rating. Those better-performing dwellings are pushing beyond this to around 244 credits, for a 4 Star rating.

1.4 Conclusion

The Bartons Road development is currently incorporating energy efficiency measures that are set to reduce energy demand, with a 15% improvement in fabric energy efficiency over the Part L 2013 notional dwelling. As a result, carbon emissions associated with the scheme are set to be reduced by at least 5% over Part L 2013. A Home Quality Mark assessment is underway with a minimum target of a 3 Star rating, with some dwellings currently on track to achieve a 4 Star rating.