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286-292 Wells Road Planning Feedback – Energy & Sustainability Response

Energy & Sustainability Statement and Response

Max Fordham was appointed to produce an Energy & Sustainability statement for the proposed refurbishment and change of use of 286-292 Wells Road.

In producing the Energy & Sustainability statement, reference was made to the existing Bristol Planning policies as follows:

- Core Strategy (2011) containing policies
    - BCS13 Mitigating and adapting to climate change
    - BCS14 Energy Hierarchy
    - BCS15 Sustainable Design and Construction
- Sustainability Practice Note (2020) and subsequent addenda (latest June 2023)

Bristol Council have provided planning feedback indicating that, in their view, the scheme is not compliant with policies BCS13, BCS14 and BCS15, although have not stated specifically which policy wording the proposal is non-compliant with.

This note has been put together to demonstrate how the scheme complies with the existing policies.

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BCS13
BCS13 sets out the following generic measures for mitigating climate change.

Development should mitigate climate change through measures including:

- *High standards of energy efficiency including optimal levels of thermal insulation, passive ventilation and cooling, passive solar design, and the efficient use of natural resources in new buildings.*
- *The use of decentralised, renewable and low-carbon energy supply systems.*

Development should adapt to climate change through measures including:

- *Site layouts and approaches to design and construction which provide resilience to climate change.*
- *Measures to conserve water supplies and minimise the risk and impact of flooding.*
- *The use of green infrastructure to minimise and mitigate the heating of the urban environment.*
- *Avoiding responses to climate impacts which lead to increases in energy use and carbon dioxide emissions.*

BCS13 Policy Requirement	**Response**
Optimal levels of thermal insulation, passive ventilation and cooling, passive solar design, efficient use of natural resources	Levels of thermal insulation balanced against what is feasible for an existing building. Passive ventilation is proposed to all flats. Heat pumps allow for active cooling to be incorporated in future without the need for incorporating it from day 1 (which would increase energy consumption).
Decentralised, Renewable, Low Carbon Energy Supply Systems	Fully incorporated into design
Site layout	Limited ability to change on existing site
Conserve water supplies	Low flow fittings proposed
Green infrastructure	Limited ability to change on existing site
Avoiding responses to climate impacts which lead to increase in energy use and carbon dioxide emissions	Heat pumps and solar panels will result in reduced grid energy consumption and associated emissions and this will significantly outweigh benefits which can be achieved through insulation measures.

BCS14
BCS14 sets out the following requirements:

Proposals for the utilisation, distribution and development of renewable and low-carbon sources of energy, including large-scale freestanding installations, will be encouraged. In assessing such proposals the environmental and economic benefits of the proposed development will be afforded significant weight, alongside considerations of public health and safety and impacts on biodiversity, landscape character, the historic environment and the residential amenity of the surrounding area.

Development in Bristol should include measures to reduce carbon dioxide emissions from energy use in accordance with the following energy hierarchy:

1. *Minimising energy requirements;*
2. *Incorporating renewable energy sources;*
3. *Incorporating low-carbon energy sources.*

Consistent with stage two of the above energy hierarchy, development will be expected to provide sufficient renewable energy generation to reduce carbon dioxide emissions from residual energy use in the buildings by at least 20%. An exception will only be made in the case where a development is appropriate and necessary but where it is demonstrated that meeting the required standard would not be feasible or viable.

BCS14 Policy Requirement	Response
Minimise energy requirements	Energy requirements have been reduced by improving the building fabric in line with Building Regulations requirements. Since the Core Strategy was published in 2011, the Building Regulations requirements have tightened, resulting in developments following the energy hierarchy by default (e.g. improving building fabric to reduce energy consumption before providing energy efficiently). The BCC *CCS Practice Note Addendum and FAQs_June 2023 heat network update final* acknowledges this.
Incorporating renewable energy sources	Fully incorporated into scheme (heat pumps and PV)
Incorporating low-carbon energy sources	Fully incorporated into scheme (heat pumps and PV)
Reduce carbon dioxide emissions from residual energy use in the buildings by at least 20%.	Fully incorporated into scheme, which achieves 3.5x the reduction requirement.

In addition, there is growing acknowledgement in the industry that the energy hierarchy as included in BCC policy is not the only hierarchy and may not always be the most suitable. It is now becoming common to follow a "Fabric fifth" approach as summarised below:

1. Heat pumps (incorporated into scheme)
2. Smart controls and smart tariffs (incorporated into scheme)
3. Basic ventilation and fabric measures (incorporated into scheme)
4. On site renewables and energy storage (incorporated into scheme)
5. Deep retrofit (not proposed)

It is highly like that energy and carbon savings from incorporating heat pumps and PV would far outweigh any reductions from further fabric improvements, which increase both cost and risk.

BCS14 continues:

The use of combined heat and power (CHP), combined cooling, heat and power (CCHP) and district heating will be encouraged. Within Heat Priority Areas, major development will be expected to incorporate, where feasible, infrastructure for district heating, and will be expected to connect to existing systems where available.

New development will be expected to demonstrate that the heating and cooling systems have been selected according to the following heat hierarchy:

1. *Connection to existing CHP/CCHP distribution networks*
2. *Site-wide renewable CHP/CCHP*
3. *Site-wide gas-fired CHP/CCHP*
4. *Site-wide renewable community heating/cooling*
5. *Site-wide gas-fired community heating/cooling*
6. *Individual building renewable heating*

This heat hierarchy is clearly out of date as it refers to technology which has been demonstrated not to be compatible with a low carbon future (CHP).

In this case, individual renewable heating allows the temperature of the heating systems to be run at a lower temperature than a site-wide renewable scheme, which would require centralised heat pumps to run continuously at a temperature suitable for provision of Domestic Hot Water. Individual heat pumps connected to individual hot water cylinders mean that – for the majority of the time – they can run at a much lower temperature and therefore run more efficiently, saving energy and carbon.

BCS15
BCS15 states:

Sustainable design and construction will be integral to new development in Bristol. In delivering sustainable design and construction, development should address the following key issues:

- *Maximising energy efficiency and integrating the use of renewable and low-carbon energy;*
- *Waste and recycling during construction and in operation;*
- *The type, life cycle and source of materials to be used;*
- *Flexibility and adaptability, allowing future modification of use or*
- *Layout, facilitating future refurbishment and retrofitting;*
- *Opportunities to incorporate measures which enhance the biodiversity value of development, such as green roofs.*

BCS15 Policy Requirement	**Response**
Maximising energy efficiency and integrating the use of renewable and low-carbon energy	The scheme demonstrates a 67% reduction in carbon emissions due to integration of energy efficiency and low carbon energy sources, far exceeding the BCC target of 20%.
Waste and recycling during construction and in operation	Significant waste storage is provided to allow the separation of waste streams for recycling. The majority of materials for the building exist on site already
Conserving water resources and minimising vulnerability to flooding	Low flow fittings to be specified. Development is in a low flood risk area.
The type, life cycle and source of materials to be used	To be developed during detailed design stage but new materials are minimised by maintaining as much of the existing fabric as possible
Flexibility and adaptability, allowing future modification of use; Layout, facilitating future refurbishment and retrofitting	Commercial and domestic services fully segregated. Commercial area suitable for a wide range of uses.
Opportunities to incorporate measures which enhance the biodiversity value of development, such as green roofs	Limited opportunity due to space required for heat pumps, solar panels and AOVs

Further BCC Feedback

BBC Feedback	Response
This would increase energy demand as the flats would require higher levels of electric lighting during the day and limited opportunities for ventilation / single-sided ventilation would increase the risk of the flats overheating.	Window openings are limited by the existing building. Modern, LED lighting is very efficient and providing increased daylighting is unlikely to make a significant reduction to total energy consumption relative to providing heat pumps and PV panels. Improving daylighting through larger windows will increase heat loss and increase the risk of overheating. There is no current Bristol policy on requirements for mitigating overheating.
The statement provides limited information on how these units would be mechanically cooled.	No flats are proposed to be mechanically cooled. However, heat pumps *allow for* the installation of cooling in future, if/when needed. Not installing them from day 1 will result in reduced energy consumption.
To ensure the development incorporates measures to minimise the effects of, and can adapt to a changing climate in accordance with policies BCS13 (Climate Change), BC14 (sustainable energy), BCS15 (Sustainable design and construction), DM29 (Design of new buildings), BCAP20 (Sustainable design standards), and emerging policies NZC1 (Climate change, Sustainable Design and Construction) and NZC4 (Climate Adaptation) and NZC3 Embodied carbon. Site Characterisation and Risk Assessment To ensure the development contributes to minimising the effects of, and can adapt to a changing climate in accordance with policies BCS13 (Climate change) and BC14 (sustainable energy),(DM29 (Design of new buildings), BCAP20 (Sustainable design standards), BCAP21 (connection to heat networks), and emerging policies NZC1 (Climate change, sustainable design and construction) and NZC2 (net-zero operational energy).	All NZC policies mentioned are not current.
In addition to this, Flats 2, 6 and 8 are located along the southern section of the buildings, with all, but one, of the windows to be located on the southern elevations of the building, resulting in significant solar gains that may result in potential overheating for future occupiers. Minimal information has been provided within the submitted energy statement regarding the proposed cooling of these single aspect units, failing to comply with relevant sustainability policies.	There are no current Bristol policies in relation to overheating or the requirements for mitigation. Overheating modelling of flats of concern could be undertaken if required. BCC to confirm specific requirements.

Summary

It is our belief that the proposed development meets the requirements of existing Bristol planning policy. Further, it is our believe that if requirements to focus on reducing energy demand as a primary strategy are enforced, this would result in significantly lower carbon savings than will be achieved through the proposed strategies of:

- focusing on supplying heating and hot water efficiently though the use of heat pumps
- providing renewable energy through on site photovoltaic panels

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Appendix – Improvement in Building Regulations Fabric Limits since BCC Core Strategy Released (2011)

		Domestic		Commercial	
Existing/New	**Fabric**	**Part L1B 2010**	**Part L1 2021**	**Part L2B 2010**	**Part L1 2021**
Existing	**Walls - Cavity**	0.55	0.55	0.55	0.55
Existing	**Walls – Internal / External Insulation**	0.30	0.30	0.30	0.30
Existing	**Floor**	0.25	0.25	0.25	0.25
Existing	**Roof**	0.16-0.18	0.16 (10% improvement)	0.16-0.18	0.16-0.18
New	**Roof**	0.16-0.18	0.15 (15% improvement)	0.16-0.18	0.16-0.18
New	**Wall**	0.28	0.18 (35% improvement)	0.28	0.26 (10% improvement)
New	**Floor**	0.22	0.18 (20% improvement)	0.22	0.18 (20% improvement)
New	**Window**	1.6	1.4 (10% improvement)	1.8	1.6 (10% improvement)
New	**Rooflight**	1.6	1.4 (10% improvement)	1.8	2.2 (20% reduction)
New	**Door**	1.8	1.4 (20% improvement)	1.5-3.5	1.3-3 (10% improvement)