PFORPROJECT LTD

NB5:- Sustainability Audit Report by Ana Petrovska

Blue Moon Paddock, Woodfield Lane, Essendon, Hertfordshire AL9 6JJ

On behalf of Mr James Westrope

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CIBSE LOW CARBON ENERGY ASSESSORS

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1.0 INTRODUCTION

1.1 This Sustainability Audit Report has been prepared to accompany the planning application appeal for the development at Blue Moon Paddock, Woodfield Lane, Essendon, Hertfordshire AL9 6JJ. The report demonstrates the sustainability measures integrated in the design, in line with the relevant planning policies with respect to energy and sustainability.

1.2 This Sustainability Audit Report has considered the following key Planning Policy, Sustainability Guidance and relevant reports:

- Welwyn Hatfield District Plan, Supplementary Design Guidance, February 2005 (this SPG document includes a sustainability checklist);
- Code for Sustainable Homes Guidance;
- Energy and Sustainability Statement submitted for Planning prepared by EAL Consult.

1.3 The proposed development scheme subject to this planning appeal achieves the sustainability criteria in the checklist – Policy SD1 Sustainable Development in Chapter 3 Sustainable Development.

1.4 This report addresses the sustainability criticisms of the Local Authority and endorses the proposed scheme in regards to energy efficiency and sustainability.

2.0 ENERGY AND SUSTAINABILITY APPRAISAL OF THE SCHEME

2.1 In terms of energy efficiency, the implementation of the sustainability design features that are proposed would ensure that the equivalent of Code for Sustainable Homes Level 6 is achieved, furthermore the project scheme incorporates many design principles of a Passive House, which is a rigorous, voluntary standard for energy efficiency in a building, reducing its ecological footprint. The sustainability benefits that flow from achieving the above standards are a result of the designer's bespoke and unique approach to dealing with the particular characteristics of this green belt site.

2.2 Even though the Code for Sustainable Homes Certification was officially withdrawn, the sustainability principles embedded in this technical guidance, represent the highest sustainability standards when it comes to a great

building practice within the building industry. As such, the nine categories of the CFSH are considered as essential aims and objectives of the relevant local Plan Policies, which the proposed development fully adheres to.

2.3 Each of the nine categories such as Energy, Water, Materials, Surface Water Run – off, Health & Wellbeing, Management, Ecology, Waste & Pollution have been respected and achieved in the highest possible standard in the proposed scheme.

2.4 The development has incorporated the following (renewable) energy saving and sustainability measures:

- **Total system power of 9kWp Photovoltaic Panels**, mounted on the roof under 45 degrees, oriented South East for a maximum efficiency. The PV panels suggested are one of the highest efficiency panels present on the market today.

  The mount angle of 45 degrees is completely acceptable from a technical point of view as it has insignificant impact in terms of reducing the efficiency of the panels where any potential shadowing of the panels is avoided.

  The dwelling achieves triple more energy production (kWp) compared to that of a conventional dwelling's use/requirement.

  Please refer to the Roof Layout drawing P/604 (Appendix NB7) which shows the precise location and sizing of the panels. Their position has been carefully considered in order to minimise the visual impact upon the design and appearance of the building.

- **A TESLA home battery 7Kw** is used as energy storage to maximise the usefulness of the solar panels. Tesla Powerwall integrates seamlessly with the PV panels system, enabling to self-power the house and even go off-grid.

- **Highly Efficient Air Source Heat Pump** with SCOP 3.99 and A++ Energy Efficiency rating is used.

  The ASHP would have minimal impact on the land as there is no requirement for bore holes (compared to a Ground Source Heat Pump GSHP).

Internal Plant spaces for HP's in general are minimal as the requirement for flues and burners associated with boilers are omitted.

The model used is producing less C02 than the base model and has a total saving annually in terms of cost and C02 production.

Please refer to the architect's diagram (Sustainability Integration Overview; Appendix NB6) showing the location of the heat pump location which has no impact upon the design and appearance of the building.

- **Highest industry standards are used in terms of building techniques and building fabric materials;**

  Outstanding and innovation aspects of the scheme (new building techniques):

  Timber design - Kingspan TEK Building System, from sustainably sourced timber. Innovative timber & insulation composite system with an U-value even lower than 0.10 W/m2.K is used, to create a highly energy efficient building.

  It's Structural Insulated Panel (SIP) technology is the next generation of timber based construction.

  The system has a 2008 BRE Global Green Guide Summary Ratings of A+. (Highest rating possible).

  The insulation core of the panels is manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

  It is an innovative system due to the following:

  - Can provide a more controllable indoor environment than traditional construction methods, such as masonry, due to the System's potential for superior air–tightness.
  - First SIP building system in the UK and Ireland to receive BBA and NSAI Agrément certification.
  - Used on the UK's first house to achieve Code for Sustainable Homes – Level 6 (BRE Innovation Centre 2007).
  - Perfect high performance building fabric.
  - Solution for Passivhaus design.

Very Low Air Permeability – The system above can achieve air leakage rates as good as 0.08 air changes per hour at normal pressures (approximately 1 m3/hour/m2 at 50 Pa). This guaranties a very air tight building to prevent heat loss through the building fabric.

Enhanced construction details – Enhanced construction details will be used to prevent heat loss from junctions and avoid thermal bridging issues. The enhanced construction details are the highest industry standard of accredited construction details.

High Performance Glazing – The scheme adopts high performance solar glazing with U-value as low as 1.0 W/m2.K. Argon filled glazing system with low g-value (0.4) to optimise solar gains.

The orientation of the building is determined by the individual site characteristics and the footprint established by the existing built structures on that part of the site that is agreed to comprise previously developed land. However, careful design along with low U-value glazing allows for a balance between beneficial solar gain and possible overheating.

Internal heat generation due to solar gain has been minimised through energy efficient design, reducing the building summer overheating risk. A combination of high levels of fabric performance and insulation has been implemented, resulting in low U-values.

- **Sustainable urban drainage system**

  All rainwater will be collected into a pool. The rainwater attenuation pond provides irrigation to the green wall, powered by the PVs/battery store.

- **Green living wall**

  South facing modular green living wall is proposed to enhance the ecology features on site, minimise visual impact and mitigate any excessive solar gains.

  Living green walls are a surefire way to enhance a building's visuals, improve air quality as well as offsets the carbon footprint of people and fuel emissions.

3.0 CONCLUSION

3.1 The above measures demonstrate that the project covers and exceeds all aspects of sustainable design and construction. The sustainability aspirations are practically and realistically achieved on site. As every sustainable development is unique in its own aspect, it can be regarded that the proposal has an outstanding and innovative character, bearing in mind the context of the location where it is proposed.

3.2 The building achieves net zero carbon emissions (equivalent of Code Level 6), and exceeds the Council's Policy requirement for a min. of Code Level 4 building as well as the Part L1A 2013 Building Regulations requirements.

3.3 For all of these reasons, the LPA's concerns and criticisms over the sustainability credentials of the proposals are not justified. Rather, the project architect's approach to this issue is exemplary and truly innovative, and the scheme is commended to the Inspector accordingly.