

**Crombies Oak
175 Lowfield Road
Caversham
Reading
RG4 6NG**

SUSTAINABLE DESIGN STATEMENT

April 2017

1 Summary

- 1.1 This Sustainable Design Statement accompanies the full application for planning consent to demolish the existing dwelling and to construct a replacement 4 bedroom house at Crombies Oak, 175 Lowfield Road, Caversham, Reading as shown on the proposed site plan 3412/200.
- 1.2 The site is close to the Emmer Green District Centre and within Zone 3, Secondary Core Area, of the Councils Revised Parking Standards and Design SPG 2011, which characterises this area as containing a variety of land uses, within 400m walk of high frequency bus services.
- 1.3 This statement is required by the provisions of Reading Borough Council's Sustainable Construction Supplementary Planning Document (the SPD) and includes details about how the development has been designed to optimise the use of solar energy, natural daylighting and ventilation and how the design of the building would make efficient use of energy.

2 Introduction

- 2.1 This statement outlines the considerations used as part of the design process as it relates to sustainable construction and the commitment to preserve natural resources throughout the lifecycle of the development.
- 2.2 The statement includes details about how the development has been designed to optimise solar energy, natural daylighting and ventilation and how the design of the building would make efficient use of energy.
- 2.3 The existing site and area context has been made in the Planning Supporting Statement submitted with this application and it is the sole purpose of this statement to respond to the criteria laid down in the SPD.

3 Solar Energy

- 3.1 The development would provide for an area of south facing roof to the rear that may be appropriate for mounting solar panels and we are currently investigating different materials available. Advances in modern technology will eventually produce natural tiles that can harness the solar energy and convert it into electricity. For the time being, however, solar panels are realistically the only proven methods available.
- 3.2 Solar roof panels set 30° either side of due south and set back from the façade are being considered where these would link to hot water storage to give up to 60% of all hot water in a year.
- 3.3 Further to the above, photovoltaic cells, also set 30° as above, could be utilised with the electricity generated linked to batteries and any excess power being fed back into the National Grid. This electricity should be adequate to power all lighting requirements and possibly a carbon filtration system.
- 3.4 Investigations will be made into the benefits of installing a ground and/or air source heat pump system to convert the stored solar energy in the ground and air. This is a clean efficient cost effective alternative to fossil fuel usage. It can generate up to 75% of the

energy requirements for heating and can be topped up with solar power. This system would be designed to run an efficient radiator heating system.

4 Natural Daylighting

- 4.1 High levels of natural daylighting would be achieved where possible; however, in existing urban situations it is not always possible to design and orientate dwellings to maximise the passive solar gain potential but this site does allow for south facing living areas and outdoor amenity areas to allow sun and daylight into that elevation and we propose less glazing to the north elevation to limit heat loss.

5 Natural Ventilation

- 5.1 The proposed building would make maximum use of natural ventilation where it is acknowledged that this is a more sustainable option than air conditioning systems. The use of openings on opposite walls would draw air through the space where these windows would be openable. If any mechanical ventilation is required to supplement the natural ventilation this would be energy efficient, requiring only small levels of energy to run, yet achieve significant benefits in the development.

6 Efficient use of energy in the design

- 6.1 It is important to recognise that the make up of the external walls, roof and elements of glazing are critical factors in storing energy (thermal mass) and reducing the need to heat a building through air leakage. Good building practice standards will be applied together with very high insulation values to create an excellent SAP rating.
- 6.2 Of course the changes we are witnessing to our climate are unprecedented and the impacts are therefore difficult to predict. In this regard, the jury is still out on whether our summers are going to be hotter, whether we will experience more rain in the winter and spring months; greater extremes of heat and drought, storms and wind or even more intense cold. Clearly then, setting out a series of measures to tackle all of the potential scenarios at this stage of the development process is very difficult, although adaption to climate change is very much in everyone's interest.
- 6.3 In this particular case, the use of permeable hard surfacing would reduce the risk of surface water run-off if it is going to get wetter and water butts would also be fitted to rain

water pipes to collect water running off the roofs. Suitable landscaping using plants of local provenance which can adapt to changing circumstances can also be secured.

- 6.4 It is proposed to use low energy lighting throughout this development and ensure it is built to the robust standards required of NHBC and the local building control, not to forget this property will achieve adequate results against air leakage through quality specification.
- 6.5 The sites sustainable location helps to reduce the need to travel, especially by car and the development would be provided with safe and secure cycle storage to encourage this more sustainable mode of transport. The site is also within easy walking distance of local services and transport links.
- 6.6 It is important to recognise the level of emissions created by choosing the wrong materials that create high levels of greenhouse gas through the manufacturing process. The applicant is very aware that it is important to pick locally sourced and processed materials and labour and avoiding the use where possible of steel, concrete blocks and upvc. It is also important to try and reduce toxins by avoiding cement, concrete and mass produced products.

7 Waste Minimisation

- 7.1 Waste minimisation is a significant element in international, national, regional and local environmental policy and has been identified as one of the most pressing environmental challenges we face.
- 7.2 The applicant recognises the importance of minimising waste throughout the life cycle of the development and would recycle all demolition and construction waste where possible. Certainly reclaimed materials would be sourced and used as appropriate in the construction process.
- 7.3 The development would provide for adequate levels of bin storage including recycling bins as appropriate and would incorporate potential for domestic composting.

8 Conclusion

- 8.1 The site is close to local centres and within Zone 3, Secondary Core Area, of the Councils Revised Parking Standards and Design SPG 2011 which characterises this area as containing a variety of land uses, within 400m walk of high frequency bus services.
- 8.2 The south facing rear aspect provides good opportunity to fully maximise natural lighting and heating with large areas of glazing to the rear elevation allowing passive solar gain to open plan living areas and with less glazing to the north to reduce heat loss.
- 8.3 The south facing roof slope to the rear may be suitable for solar capture technology where the energy and electricity produced could be linked to hot water storage and communal lighting requirements. Further to this, consideration is being given to the installation of ground and/or air source heat pumps, which could be utilised to run an efficient radiator heating system.
- 8.4 The development would utilise high levels of insulation to the roof, walls and floors in order to reduce heat loss from the building. Recycled materials would be sourced where appropriate and consideration is being given to the installation of a rain water harvesting system.
- 8.5 The dwelling would be sympathetic to the character of area in terms of the existing built form and is considered to be of sustainable design in a sustainable location.
- 8.6 This statement has set out the design principles that have informed the development in terms of its environmental impact. It is considered that the proposal represents a sustainable form of development that, with the right use of technology, would off-set at least 20% of predicted carbon emissions.