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Manor Barn
Great Trill Farm
Musbury, Axminster, Devon, EX13 8TU

Proposed Conversion and adaptation of existing manor barn to form 1No. 4 bedroom dwelling.

Climate Change Strategy and Sustainability Document

Contents

1.0 Introduction

This document has been produced in order to explain how the proposals relating to the conversion and adaptation of Manor Barn at Great Trill Farm, will assist East Devon District Council in meeting the goals set down in the local authority's Climate Change Action Plan 2020-2025, adopted by the council on the 8th January 2020.

In The Climate Change Action Plan 2020-2025, the council committed to promoting and enabling a shift to more sustainable and low carbon operations.

The council recognises the importance of offering leadership in supporting and enabling the development and delivery of local solutions to help address the global problems of climate change and in so doing, its strategy sets out the council's commitment and ambition for delivering the transition to a low carbon and climate resilient East Devon District Council.

1.1 Devon Climate Change Declaration

East Devon District Council committed itself to the Devon Climate Change Declaration in July 2019.

This declaration has been prepared by a Devon wide consortium of public, private and voluntary organisations. It sets out an ambition to tackle climate change that covers the whole of Devon including those who live, work and visit the county.

It understands the fact that global carbon emissions must reduce by at least 45% by 2030 from 2010 levels and reach net zero by 2050, in order to avoid the worst effects of climate change, by keeping warming below 1.5 degrees.

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The county will lead in the global response to climate change through collective action, innovation, and influence.

The local authority will engage with its residents, businesses, and visitors to develop and implement a plan to facilitate the reduction of Devon's production and consumption emissions to meet IPCC recommendations.

Its transformational change will include the following:

- Deployment of more renewable, decentralised and smart energy systems.
- Retrofitting energy-efficient measures into its buildings.
- Constructing zero-carbon new buildings.
- Changing consumption to use less, re-use more and chooses low-carbon options.
- Empowering the people of Devon with the knowledge and skills to act collectively.

The local authority will work to understand the near term and future risks of climate change for Devon in order to plan for how its infrastructure, public services and communities will have to adapt for a 1.5-degree warmer world.

The local authority calls upon central government to prioritise decarbonisation and adaptation within decision making and to work with local authorities by using its powers to provide resources and funding necessary to accelerate the transition to a low-carbon and resilient economy and society.

It challenges every organisation, business, community, and individual to do the same.

2.0 The Proposals

The proposals forming the subject of this application for planning and listed building consent relate to the conversion and adaptation of half of a grade ii listed Manor Barn, to form a dwelling. The other half will remain ostensibly as an unheated and uninsulated barn.

Planning and listed building consent was originally granted to convert the Manor Barn into 2No. 4 bedroom dwellings. The applicant only intends to convert half of the barn to provide 1No. 4 bedroom dwelling and in so doing will immediately reduce the potential carbon footprint of the building by approximately 50%.

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3.0 Energy Strategy and Carbon Emissions

3.1 It is recognised that the generation of energy to heat, light and cool buildings is responsible for approximately half of the total CO2 emissions of the UK. Part L of the Building Regulations requires a minimum standard of energy efficiency in all new and refurbishment development; however, it is the intention with this development to go beyond this.

3.2 As a first step in dealing with carbon emissions arising from energy use within buildings it is important to consider designing in, energy efficiency measures as part of the construction/refurbishment of the buildings as these will be difficult to retrofit in the future and this will also reduce the amount of energy required by a building.

3.3 The extant planning approvals relating to the building including the details approved by East Devon Council in 2013 relating to discharge of condition 5 of the original consents, detail the walls and ceiling being lined with insulation and dry lining.

It is well recognised that when dealing with sensitive heritage assets such as the host building, a balance must be achieved whereby the fabric of the building is upgraded to meet, as far as possible, the thermal performance of the enclosing envelope of the building as set down in Approved Document L1B of the Building regulations, whilst at the same time preserving the fabric, character and setting of the listed building.

Overtime a wealth of research and experience has been gathered on best practice in this respect and one of the key aspects is ensuring the building continues to 'breath'. To upgrade the enclosing fabric of the building in a manner that will provide the requisite thermal performance, whilst allowing the passage of moisture into and out of the building to continue without detrimental effect.

Accordingly, therefore, the proposal is to tie in with the detail approved relating to condition 5 and line the external walls of the dwelling with a breathable wall lining and insulation.

The walls will be lined using limebased plaster products and the insulation will be Isolair Pavatex Woodfibre Insulation or similar. The combination of which will allow the existing wall structure to breathe. The products also have a lower overall carbon footprint than standard building products such as Gypsum based plasters and plasterboards and phenolic or polyisocyanurate based insulation boards.

The ground floor of the new dwelling will be formed using a breathable limecrete floor slab laid over recycled foamed glass insulation, as produced by the likes of Ty Mawr Lime.
This method of construction allows the floor to breathe, thus helping to avoid the effects of rising damp to the perimeter walls were a damp proof membrane to be installed. The method of construction also uses relatively low carbon footprint materials. The slab will also allow the installation of underfloor heating which operates at a lower water temperature than a radiator system and so has energy saving benefits in this respect as well.

The roof will be insulated using layers of Rockwool laid over the horizontal ceiling.

3.3 Reduction of heat loss is a key element of an energy strategy and reduction in carbon emissions and it is proposed that insulation within floors, roofs and walls will meet or exceed the minimum standards required under Part L1B (Conservation of Fuel and Power) of the Building Regulations, as will the U-values for glazing and doors.

3.4 It is proposed that the following U-values will be achieved in the dwelling.

- Ground floors – 0.155-0.168.
- External walls – 0.28 (this improvement will be delivered through the installation Isolair Pavatherm insulation to the internal skin of the retained stone walls - Part L1B minimum compliance is 0.3);
- Roofs – 0.177 (this improvement will be delivered through the installation of multiple layers of Rockwool insulation within the roof void, laid over the ceiling).
- Windows – 1.6 (Part L1B minimum compliance is 1.6); It is proposed that the windows will be double glazed using slimline double-glazed units. This will allow a significantly better thermal performance of the windows above single glazing, whilst also maintaining the proportions of glazing bars and window frames etc which are an important part in the character of the listed building.
- Glazed and solid doors – 1.8 (Part L1B minimum compliance is 1.8)
- Roof lights – 1.4 ((Part L1B minimum compliance is 1.4).

3.5 Consideration has been given to the use of heat pump technology with the building, but these technologies only work to their full potential in buildings with good air tightness, which whilst possible in new builds, is not so easy in a change of use or refurbishment project such as this and is therefore rejected as appropriate for this site.

3.6 An electric vehicle charging point will be installed at the east end of the barn, adjacent to the proposed parking spaces. The electricity being generated by the solar panels located elsewhere at Great Trill Farm and so, a sustainable form of charging electric vehicles.

3.7 The building will be heated in the main using electricity generated by the solar panels located on the solar barn elsewhere at Great Trill Farm, therefore offering a carbon neutral, sustainable method of heating. It is acknowledged that this may need to be supplemented by heating oil during the coldest months of the year.

4.0 Waste & Recycling

4.1 Waste arising from the construction process has been an area of focus for some years now, with the industry making good strides in re-use and reduction of materials, which not only helps the environment, it also engenders significant cost savings to developers.

4.2 With this in mind, the appointed contractor for the scheme will be required to develop a site waste management plan (SWMP) prior to the start of the scheme reflecting the recognition that reduction of waste begins in the design and ordering stage of a project and carries on through to the sign-off of the building. This SWMP will set targets and procedures for the sorting, reusing, and recycling of construction waste into defined waste groups, either on site or through a licensed contractor.

4.3 As the proposed scheme involves an existing structure, the SWMP will also include a refurbishment audit, to see if any of the materials being removed can be recycled for use on this or other building projects in the area or the materials recycled for use by others.

4.4 The generation of waste does not stop at the end of the construction process and adequate provision will be supplied to the proposed dwelling, both internally and externally, to allow for the sorting of general waste from recyclable materials.

4.5 The kitchen will be supplied with a fixed, 30l capacity recycling bin and there is sufficient room adjacent to the property for private, secure storage of waste and recyclable bins, to be supplied by the local authority.

4.6 Provision for composting of food waste arising from the kitchen will also be supplied in the form of a compost cone, along with information on how to successfully compost, to further reduce waste streams arising from the new development.

5.0 Water Resource Management

5.1 The UK has a poor record in being profligate with its abundant water resource, therefore, on this site only water efficient products will be specified.

5.2 The actual water using products are yet to be established, however an assessment of the efficiency of the proposed dwelling's domestic water-consuming components will be undertaken using the Building Research Establishment's (BRE) water calculator.

5.4 Consideration has been given to the use of grey-water harvesting systems, such as the EcoPlay unit, pictured below, however this is deemed to be an expensive and rather technical solution to an issue that can be dealt with through the specification mentioned above.

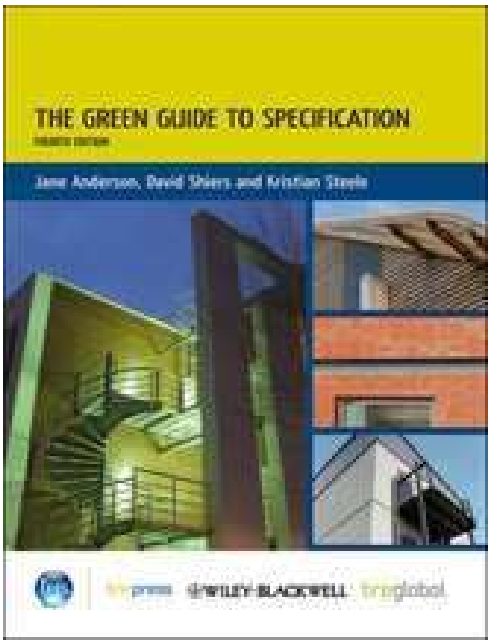
5.5 Rainwater harvesting will not be utilised as the carbon footprint arising from the pumps involved with such a system is heavy and again, it is more efficient to specify the low flush WCs detailed above in 5.3.

5.6 Externally, a rainwater harvesting butt will be provided to each unit, with an external tap for use in the gardens and for car washing – see example above.

5.7 The provision of water meters is also recognised as an important tool in reducing water usage and in a domestic context they can encourage people to monitor and reduce their water consumption by an average of 10% to 15%. Therefore, the dwelling will have an individual, easily accessible water meter installed as part of the specification.

6.0 Materials Selection and Sustainable Construction Methods

6.1 Much of the material in place will be retained, with the main focus for new materials being internal, however, the applicant is committed to ensuring that all new materials used score as highly as possible in the Building Research Establishment's Green Guide to specification – see Figure 9 to right.



6.2 In addition, wherever possible all building and finishing materials will be sought from local suppliers and manufacturers registered to an environmental management scheme such as FSC, BES6001, ISO14001 or EMAS. This will ensure that the materials have been sourced from suppliers certified as ethical and responsible as far into the supply chain as possible.

Where possible, much of the timber involved in the construction process will sourced directly from the Great Trill Farm estate

In a similar manner, the stone involved in the construction will be hand picked from the fields when they are cultivated.

6.3 All insulation materials selected for these buildings will have a Global Warming Potential of below 5 and where possible be made from natural products.

6.4 Finally, attention will also be paid to materials specified for the internal environment with a focus on materials/finishes containing low/no volatile organic compounds (VoCs) in an effort to improve the internal environment for occupants as internal air pollution is increasingly recognised as having negative impacts on health.

7.0 Flexibility & Adaptability

7.1 The listed status of the building and the fact that this project is a change of use rather than a new build, means that the options for flexibility and adaptability are reduced, however, some options as detailed below are included.

7.2 Where new interventions to the existing fabric have been proposed, these are easily removable, without further harm to the fabric, should future occupants choose to do so.

7.3 Access to the dwelling will be level and also by way of Part M of the Building Regulations, compliant thresholds are supplied at the principal entrances, to allow for easy access for all future occupants.

7.4 The dwelling, has sufficient space to be conducive to home working.

8.0 ICT

8.1 High speed broadband coverage is available to this site and will be supplied to the dwelling.

8.2 In addition, internet enabled smart meters to allow occupants to track and reduce energy use, with information sent to workstations, tablets or smartphones, will also be supplied to both proposed dwellings.

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