

Sustainable Design and Construction Statement

Proposal: Application for the Conversion of Part of a Barn to a Residential Annexe

Location: Todmanhaw Farm, Todmanhaw Lane, Wigglesworth. BD23 4RQ

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This Sustainable Design and Construction report has been prepared to summarise how the proposed development at Todmanhaw Farm will minimise resource and energy consumption compared to the minimum under the current building regulations and how it is located and designed to withstand the longer term impacts of climate change in response to Policy Env3 of the Craven Local Plan 2019.

The project is the conversion of part of a barn to form a residential annexe for a family member. Improvements upon the level of the current building regulations are economically achievable due to the nature of the existing buildings and the extensive proposed works. The conversions present a number of opportunities for the applicant to improve upon the industry standard. As the proposal is essentially for a dwelling any measures to minimise future energy cost will be embraced.

Subject to a pay-back analysis measures proposed include:

1. An air-source heat-pump;
2. Locally sourced labour
3. Reclaimed materials
4. Increased thermal insulation - floor, walls and roof.
5. High-quality double-glazing with low-E, soft coating.

PLANNING POLICY

The Craven Local Plan was adopted on 12th November 2019. This document sets out the application response to Policy ENV3 Good Design, Specifically section 't' Sustainable design and Construction.

The development seeks to promote sustainable development in terms of the criteria which apply: Daylighting, ventilation, heating, materials, water use, waste, pollution and energy, and reduce the impact of its associated carbon emissions whilst working within the constraints of the Policy summarised below:

Sustainable Design and Construction

t) Sustainability should be designed in, so that development takes all reasonable opportunities to reduce energy use, water use and carbon emissions and to minimise waste, ensure future resilience to a changing climate and wherever possible to generate power through solar or other means, in accordance with Building Regulations. This should include residential, industrial and commercial developments.

SUMMARY OF SUSTAINABILITY AND CLIMATE CHANGE MITIGATION MEASURES

HEATING/ INSULATION (both the house and the holiday cottage)

1. An air-source heat-pump;
2. Locally sourced labour
3. Reclaimed materials
4. Increased thermal insulation - floor, walls and roof.
5. High-quality double-glazing with low-E, soft coating.

1. HEATING

The proposal is to utilise an air-source heat-pump to heat the annexe and to provide the domestic hot water. The annexe will also have a wood-burning fire and stove.

2. LOCALLY SOURCED LABOUR

An often overlooked but key contributor to the carbon footprint of a project is the distance travelled but the labour. Whilst there may be economic savings in accepting the lowest tender this does not guarantee the lowest carbon implication through travelling to and from site. Ensuring local labour and expertise not only minimises carbon load but bolsters the rural economy.

3. RECLAIMED/ LOCALLY SOURCED MATERIALS

Similarly the supply and procurement of materials can have a huge impact on the carbon footprint of a project. The alterations to the barn will be made possible by retaining all the original stone walls and roof, and the new materials for the internal fit-out and roof will be locally sourced.

4. INSULATION

The whole envelope of the proposed annexe will be insulated beyond the current building regulations standard for a heated, domestic conversion. The applicant will aim for a 25% increase beyond the recommendations of the SAP assessment.

5. WINDOWS AND DOORS

The windows will be of very high quality aluminium frames and double-glazing, and have a much better u-value than the minimum thermal performance acceptable. Triple-glazing will be considered if the thermal benefit makes the pay-back economically feasible.

DRAINAGE AND FLOOD RISK

The site is outside the flood risk zone though rain water run-off from the roof will be retained as existing.

SUSTAINABLE SOURCING OF MATERIALS

The construction of the walls will be part random rubble natural stone reclaimed from the demolition of part of the building, and part timber-clad concrete block. All new materials will be locally sourced - though likely to be new rather than reclaimed due to the nature of timber cladding generally only salvaged once it requires replacement, and concrete blocks rarely recyclable.

Nevertheless all materials will be responsibly sourced by the Main Contractor, and will be specified to have as low an embodied impact as is possible/ available.

Materials with a low embodied impact as defined within the BRE Green Guide to Specification will be selected for use in the building design and construction. The BRE Green Guide to Specification assesses each building element (such as walls, floors, roof and windows) and assigns an Environmental Impact Rating (from A+ to E). The following Green Guide Ratings should be targeted to ensure the development has a low embodied impact:

Roof A+

External walls A+

Internal walls A

Ground and upper floors A

WATER CONSERVATION

The development will minimise potable water usage of the proposed toilets, shower and basin by limiting projected water usage: achieving a reduction of 25% in the annual water consumption when compared to the minimum level required by the water supply (water fittings) regulations. This will be achieved by following the below example sanitary-ware specification

W/C Dual flush -6 litres (full)/ 4 litres (part)

Taps (excluding kitchen) 7.5 litres per minute

CONCLUSION

The development has scope for climate change mitigation measures including increased insulation, and by limiting potable water consumption.

Additional climate change measures extend to the procurement of low-embodied energy materials, transportation, local labour and sustainable drainage. As such the proposal complies with the requirements of Policy ENV3 section 't'.