Sustainability Statement

Site: Lister Tower, Fritham, SO43 7HH

Proposal: Alterations and refurbishment to tower; conversion of stable block to ancillary accommodation.

Date: 1 September 2021

Details of how the Proposal reduces carbon emissions and incorporates measures to reduce its contribution to climate change:

1. **Making the most efficient use of land, buildings and natural resources including site layout and building design.** Guidance: Energy consumption can be significantly reduced through the location of development, site layout and building design, the type of materials used, the use of existing and new resources and the efficient management of the construction process.
The clients require an accessible dwelling and adaptable studio space in which to 'home-work.' Existing structure and materials are to be re-used as much as possible. There is **no proposed net gain of habitable floor area** on the site, nor will the proposals be visible from outside of the site. Natural cross ventilation is facilitated across the open plan spaces reducing the need for extensive mechanical intervention.

2. **Energy Hierarchy*** Guidance: Level 1 – Reduce the need for energy; Level 2 – Using energy more efficiently; Level 3 – Supplying energy efficiently; Level 4 – Use low carbon and renewable energy. There are opportunities in all types of development to use low carbon and renewable energy sources, however what is appropriate will depend on the physical nature of the building, its site characteristics and the surrounding landscape.
The proposal is to improve the thermal efficiency of the dwelling and ancillary studio, using high levels of insulation to achieve thermal u-values that exceed the current building regulations. The existing oil boiler is proposed to be replaced with an air source heat pump, while the enlarged glazing to the south is to make use of passive solar gains and natural light. PAD studio are industry leaders in sustainable design and are engaged with the RIBA Climate Challenge and Architects declare.

The project architect is a certified PassivHaus designer. Windows whilst respectful of the historic context will be high quality composite double-glazed systems from leading manufactures in the field with test certificates available. The building envelope will be airtight and fully wrapped construction, where we anticipate an air-tightness level of well below 3m3.h @ 50Pa. Passive ventilation will be adopted to ensure fresh air changes and a holistic environment is maintained at all time for the inhabitant. Diurnal temperature fluctuations will be mitigated through high levels of thermal mass.

3. Minimising Flood Risk**

Guidance: Directing development away from flood risk areas, reducing overall risk from flooding within the National Park and areas outside it, upstream and downstream.

No additional roof surface area is proposed. Sustainable drainage measures and soakaways will be enhanced and connected into the existing drainage structure.

4. Carbon Reductions

Guidance: Consideration of means of reducing carbon emissions for the development. Seeking to take every opportunity to reduce carbon and build sustainably.

As far as possible the embodied carbon content of materials used will be minimised. It is hoped that the client will also work with us in a post occupancy programme to evaluate the energy used and produced post construction. It is our philosophy to not only reduce the carbon content but to implement cradle-to-cradle philosophy. This means that the materials used will be eligible for recycling and/or re-use in the future. Timber will be used for structural purposes keeping high carbon solutions, such as steel, to a minimum.

The house is currently heated with an oil boiler. Coming off oil is a priority for the clients.

5. Water Efficiency.
Guidance: Water conservation methods include ensuring that the design of buildings and their surrounding landscape maximises water efficiency and minimises water wastage; identifying opportunities to use water more efficiently during the construction of the development; designing surface water drainage systems to take into account future changes in rainfall.
Restrictors, low-flush toilets and eco-shower fittings are specified as standard in conjunction with minimising external hard surfaces. Sustainable drainage measures and soakaways will be enhanced and connected into the existing drainage structure.

*Energy Hierarchy

Level 1 – Reduce the need for energy

The energy hierarchy places great emphasis on Integrated Passive Design. Key methods include:

- *Orientation* – making best use of high summer sun angles & low winter sun angles on southern exposures;
- *Thermal mass* – to store heat in the winter and act as a heat sink for cooling in the summer;
- *Natural ventilation* – designing controlled flows through buildings for cooling;
- *Zoning* – to allow different thermal requirements to be compartmentalised.

Level 2 – Using energy more efficiently

Using energy more efficiently means not wasting energy or using more than is required. The following potential energy efficiency measures should be considered:

- High levels of insulation.
- Utilising appropriate forms of glazing
- Installing heating controls.
- Using energy efficient heating and heat recovery systems.
- Adding draught strips on doors, windows & letter boxes.
- Fitting chimney balloons.
- Installing zoned low energy lighting and presence sensors.
- Replacing doors in existing buildings.
- Upgrading to a high efficiency condensing boiler
- Adding a sun pipe/tunnel

Level 3 – Supplying energy efficiently

Supplying energy efficiently refers to connecting to existing low carbon heat networks. Connection to, or development of, a mini district heating network can be a carbon efficient means of energy supply.

Level 4 – Use low carbon and renewable energy

Once the energy needs of a new building have been minimised through design, consideration needs to be given as to how the remaining energy needs can be met through:

- Heat pumps: ground source heat pumps and air source heat pumps.
- Wood burning stoves/biomass boilers.
- Solar thermal/hot water panels.
- Solar photovoltaic/electric panels.
- Hydro power, small scale water turbines.
- Anaerobic digesters.

**Minimising Flood Risk

Sustainable Urban Drainage Systems (SuDS) remove water quickly and efficiently and should be included in the original design and layout of a proposal wherever possible. The approach used will differ with each application and the circumstances of each site.