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Energy Statement

Project:	Proposed Development Land South of Turners Pasture, Cheadle, ST10
Client:	Brian Reid
Date:	18/11/2020

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Executive Summary

- Development of 6 dwellings at land south of Turners Pasture, Cheadle, ST10, comprising 2 house types
    - House Type K - 3 bed bungalow TFA = 90.3m^2
    - House Type H - 3 bed bungalow TFA = 93.2m^2
- The application is considered to be a major development and therefore an Energy/Sustainability Statement is required.
    - Theory of the energy hierarchy followed:
        - Reduce the need for energy
            - Construction/insulation specification will yield the following U Values
                - Floor = 0.12
                - Walls = 0.25
                - Roof = 0.11
                - Openings = 1.40
            - Ensure the continuity of insulation in all relevant junctions/details, but following the Concrete Block Association details
            - Insulated composite lintels (such as Keystone Hi Therm or similar)
        - Use energy more efficiently
            - Mains gas combination boiler with built in Flue Gas Heat Recovery System (FGHRS) (such as Ideal Logic Code Combi ESP or similar)
            - All lighting to be low energy
            - Ventilation via Mechanical Ventilation Heat Recovery System (MVHR) (such as Nuaire MRXBOX-ECO2 or similar)
        - Supply energy from renewable sources
            - No renewable technologies specified, as a large % improvement over building regulations is already achieved via reducing the need for energy and using energy more efficiently
- Results:
    - House Type K achieves a **12.05%** improvement over the requirements of Building Regulations. House Type H achieves a **13.32%** improvement.

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1. General

This energy statement has been prepared by Energytest Ltd. in support of a planning application for the development of 6 dwellings at land south of Turners Pasture, Cheadle, ST10.

The statement provides an initial assessment of the CO2 emissions of the dwelling using approved standard calculation methods (SAP 2012), reviews the various option for renewable technologies and demonstrate how the planning condition will be met by implementing appropriate fabric efficiency measures and renewable and/or low energy technologies.

1.1 Development

The proposed development involves the construction of 6 detached bungalow dwellings on land south of Turners Pasture.

There will be three of each of the two dwelling types (K and H)

- House type K is a 3 bedroom bungalow with a floor area of approximately 90.3 m^2.
- House type H is a 3 bedroom bungalow with a floor area of approximately 93.2 m^2.

Construction will be traditional, utilising beam and block floors, masonry cavity walls and joisted roofs. Heating will be via mains gas combination boilers.

The development will meet and exceed the requirements of Approved Document L1A of the Building Regulations.

2. Planning Requirements

The application is considered to be a major development and therefore an Energy/Sustainability Statement is required.

The following documents have been considered in preparing for this statement:

- The High peak Local Plan (Adopted 2016)

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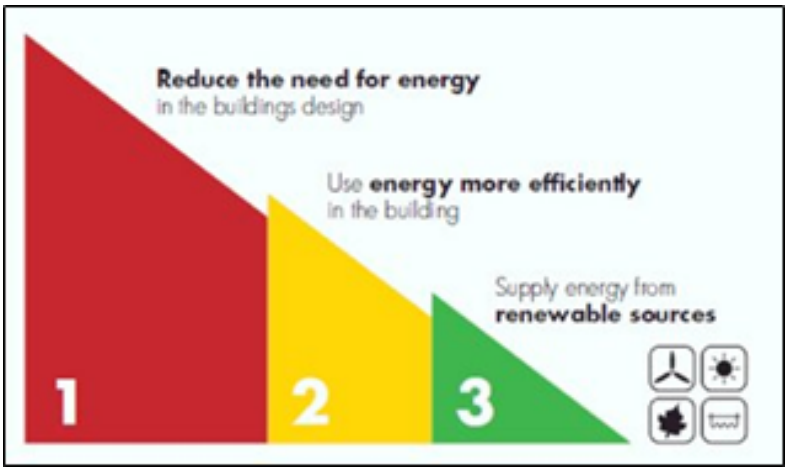
- Policy S1 Sustainable Development Principles
- Policy EQ1 Climate Change
- Policy WQ 6 Design and Place Making

The Local Plan requires new development to reduce greenhouse gas emissions and adopt the principles as set out in the energy hierarchy, and by promoting energy efficiency and the use of renewable / low carbon energy sources.

2.1 The Energy Hierarchy

The principle of the energy hierarchy is demonstrated by the diagram below:



The principle concludes that improvements to building fabric and services should be implemented first with additional renewable energy installations to follow.

Enhancing the thermal performance of the building envelope helps to future-proof the structure and yields the greatest CO_2 savings. Adding renewable technologies will then yield maximum emissions reductions with lower long-term costs for the developer.

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3. Proposed Specification

3.1 Reduce the need for energy

The proposed development will incorporate levels of insulation above those required by Approved Document L1A of the Building Regulations.

Thermal Element	Building Regulations U Values (W/m^2K)	Achieved U Values (W/m^2K)	Specification
Ground Floor	0.13	0.12	75mm screed on 150mm PIR insulation on concrete floor slab
Cavity Walls	0.18	0.25	100mm brick, 100mm Dritherm 32 insulation, 100mm Plasmor Fibolite block
Joisted Roof	0.13	0.11	400mm loft roll insulation
Openings	1.4	Glazing - 1.4 Doors - 1.4	Double glazed UPVC
Air Leakage	5 $m^3/h.m^2$	4.50 $m^3/h.m^2$	An air pressure test is required upon completion
Thermal Bridging	Accredited Construction Details	Concrete Block Association Details	Care will be taken to ensure the continuity of insulation in details to reduce thermal bridging.
Lintels	-	-	Insulated composite lintels I.e. **Keystone Hi Therm** or similar

This specification ensures that the Dwelling Fabric Energy Efficiency (DFEE) is better than the Target Fabric Energy Efficiency (TFEE).

Plot No.	TFEE (kWh/m^2/year)	DFEE (kWh/m^2/year)	% Improvement
1 (House Type K)	61.96	51.83	16.35
2 (House Type H)	61.11	50.69	17.06

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This means that house type K's fabric energy efficiency is 16.35% better than a corresponding notional dwelling built as per Building Regulations L1A requirements. House type H is 17.06% better.

3.2 Use energy more efficiently

- Each dwelling will be heated via a mains gas system boiler with built in Flue Gas Heat Recovery System (FGHRS)such as the **Ideal Logic Code Combi ESP1** or similar.
    - FGHRS work by utilising the heat from the waste flue gases to preheat the cold water entering the boiler - thus improving the efficiency of the boiler.
- The space heating will be emitted through radiators.
- The controls will include programmer, room thermostat and TRVs on radiators.
- All light fittings within each dwelling will be low energy.
- A Mechanical Ventilation Heat Recovery System (MVHR) will be installed such as a **Nuaire MRXBOX-ECO2** (SFP 0.66 and efficiency of 87%), or similar.
    - MVHR units work by continuously extracting air from the wet rooms and simultaneously pulling in fresh air from outside which is filtered and warmed - thus retaining warm air within the dwelling which would otherwise have been lost with conventional ventilation systems.

3.3 Supply energy from renewable sources

With the specification outlined above, (reducing the need for energy and using energy more efficiently) the dwellings are achieving a considerable % improvement over the Building Regulations target. Therefore, there are no renewable technologies proposed for this development.

However, the following are options for this site:

3.3.1 Solar Photovoltaic Panels

These solar panels harness the sun's energy to generate electricity. They work most efficiently on Southerly facing roofs and so will be most effective on plots 5 and 6. Plot 1 has a South East facing roof

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which will also be suitable for the panels. However, plots 2-4 have East or West facing roofs, which diminish the efficiency of the panels quite considerably.

3.3.2 Solar Thermal Panels

These solar panels harness the sun's energy to produce hot water. Like PV above, they work most effectively on Southerly facing roofs so will not be effective on plots 2-4. Internal space would also need to be sought for the hot water storage cylinder, which is needed for these panels. This has not been considered as the developers are going to be using combination boilers.

3.3.3 Air Source Heat Pumps

Although not renewable technology, heat pumps are considered to be a low carbon technology as they are incredibly efficient. Space would need to be sought for the external unit and for a hot water storage cylinder. The developers are going to instead use highly efficient mains gas combination boilers (with built in FGHRS) as the primary heating system.

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6. Results

The table below shows the how the Dwelling Emissions Rate (proposed dwelling) exceeds the Target Emission Rate (notional dwelling):

Plot No.	TER ($kgCO_2/year/m^2$)	DER ($kgCO_2/year/m^2$)	% Improvement
1 (House Type K)	19.76	17.38	12.05
2 (House Type H)	19.34	16.76	13.32

As the table shows, House Type K achieves a 12.05% improvement over the requirements of Building Regulations, and House Type H achieves a 13.32 improvement.
