Refurbishment, single story and two-story extension

15 Lee Close,
Charlbury,
Chipping Norton,
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Sustainability Statement

FREEMAN Architecture

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Introduction

This statement is to be read in conjunction with the submitted drawings to outline the environmental impact and sustainability of the proposed works. With in this report it will set out the design intensions for the improved of the existing fabric and thermal performance of the new structure; along with the Energy improvements and supplements to reduce the overall impact of the project in its local environment.

Thermal improvements

For new structure of the building fabric, it is intended for the performance of this elements will exceed the minimum requirements set out in the current building regulations Part L1. The table below stated the minimum allowable thermal performance started within the Par L1.

Limiting U-values for new fabric elements in existing dwellings

Element type	Minimum U-value W/m²K
Roof	0.15
Wall	0.18
Floor	0.18
Window	1.4
Rooflight	2.2
Doors with >60% of internal face glazed	1.4
Other doors	1.4

Detailing the window replacement

Where possible, the windows will be replaced in line with the insulation layer of the external wall to continue the thermal line of the dwelling. The connection of the window to the external wall needs to be carefully considered as this is a weak spot thermally. It will to be designed so that the risk of condensation between the external wall and window is reduced. The use of low conductivity cavity closers and products like Thermobate as a good way to reduce thermal bridging, and reduce the risk of condensation.

Airtightness

When installing the windows, care will be given to the junction between the window frame and the airtightness layer of the external wall. High performance airtightness tape will be used to limit infiltration as the connection between windows and external walls.

Windows:
designed to minimize thermal bridging.

i. Lintels: independent lintels with an insulated cavity closure between the inner and outer lintel. For common leaf lintels, the base plate will not be continuous, and the lintel core will be insulated.

ii. Insulated cavity closers will be used for all construction types. Additionally, insulated plasterboard will be used in reveals to abut jambs and within reveal soffits.

Ground floors and external walls:
the wall-to-floor junctions will be detailed to achieve continuity of insulation.

i. Perimeter floor insulation to abut or extend the full depth of the main floor insulation.
ii. Masonry construction: external or cavity wall insulation to extend below the dampproof course (where applicable) and be at least the equivalent of one full block height (215mm) below the underside of the floor structure/slab and beyond the depth of the floor insulation.

Roofs:
Continuation of the insulation across the wall-to-eaves and wall-to-gable junctions.

i. Wall insulation to be installed to the top of the wall plate; in some places, such as the eaves, may be above the cavity closure or barrier. In all cases, roof insulation will be continuous with wall insulation.

ii. Roofs insulated at ceiling level: loft insulation at the eaves to extend beyond the wall insulation without any reduction in thickness due to the pitch of the roof. At gables and party walls, insulation will extend to the wall edges.
iii. Roofs insulated at rafter level: at the eaves, insulation will extend to the top of the external wall. Voids between insulation at the top of the external wall and the cavity wall.

Internal insulation

Use breathable materials internally e.g. wood fibre insulation, hemp lime insulation. Avoiding the use of non-breathable materials internally e.g. rigid insulation. Even though this can achieve a good thermal performance and is often cheaper, it can increase the condensation risk and make detailing around junctions more complicated. The combustibility of materials will be considered, natural products are likely to be combustible but can be used safely in the right application.

Energy Generation / Reduction

In this section it will be outlined the actions taken to reduce the overall demand the building will draw from the national grid and measures that will be put in place to generate its own supplies.

Peak reduction

• Use passive measures and efficient systems to reduce heating, cooling and hot water peaks

Active demand response measures

• These measures reduce the electricity consumption for a certain period.
• Install heating and cooling set point control with increased comfort bands, controlled with smart thermostats or home energy management systems.
• Integrate thermal storage of heat into communal or individuals system within a building.
• Reduce lighting ventilation and small power energy consumption

Behaviour change

- Raise awareness of how best to use electricity and the impacts.
- Consideration of incentives to reduce peak demand.
- Encourage responsible occupancy.

Water efficiency and domestic hot water

Other measures to reduce the developments impact on the environment will be implemented to reduce the consumption of clean water and also the use of harvested water for the use within the garden.

Reduce distribution losses

- All pipework will be insulated and designed to ensure there are no 'dead legs' containing more than 1 litre. Tapping points (e.g. taps, shower connections) should be clustered near the hot water source. Small bore pipework should be carefully sized based on peak demands, minimising the diameter where possible.

Insulate to minimise losses from hot water tanks

- The standby losses of hot water tanks are highly variable, and can have a significant impact on overall energy use. Target a hot water tank heat loss of less than 1 kWh/day equivalent to 0.75 W/K.

Water consumption

It is set out in the table below the designed consumption for all new and replaced fittings within the property.

Appliance / Fitting	AECB Good Practice Fittings Standard
Showers	6 to 8 l/min measured at installation. Mixer to have separate control of flow and temperature although this can be achieved with a single lever with 2 degrees of freedom (lift to increase flow, rotate to alter temperature). All mixers to have clear indication of hot and cold, and with hot tap or lever position to the left where relevant.
Basin	taps 4 to 6 l/min measured at installation (per pillar tap or per mixer outlet). All mixers to have clear indication of hot and cold with hot tap or lever position to the left.
Kitchen sink taps	6 to 8 l/min measured at installation. All mixers to have clear indication of hot and cold with hot tap or lever position to the left.
WCs	≤ 6 l full flush when flushed with the water supply connected. All domestic installations to be dual flush. All valve-flush (as opposed to siphon mechanism). WCs to be fitted with an easily accessible, quarter turn isolating valve with a hand-operated lever. Where a valve-flush WC is installed, the Home User Guide must include information on testing for leaks and subsequent repair.
Baths	≤ 180 litres measured to the centre line of overflow without allowing for the displacement of a person. Note that some product catalogues subtract the volume of an average bather. A shower must also be available. If this is over the bath then it must be suitable for stand-up showering with a suitable screen or curtain.