

# **NEW SUSTAINABLE DWELLING AT LAND OFF SHAY LANE, IPSTONES**

## **ENERGY AND SUSTAINABILITY STATEMENT**

DECEMBER 2023



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## **1.0 Introduction**

The National Planning Policy Framework (NPPF) and Local Planning policies no longer promote the use of sustainable building standards such as Code for Sustainable Homes (CfSH) for use in residential development. It is recognised that much of the basic requirements of the codes are now incorporated into the government produced Technical Housing Space Standards and the Approved Building Regulations Documents.

Staffordshire Moorlands District Council (SMDC) do not currently have any Supplementary Planning Documents (SPD's) or equivalent advice documents on creating sustainable residential development through recognised standards.

This Energy and Sustainability Statement sets out the current standards that the applicant would need to meet and how they plan to exceed these requirements by aligning with the more rigorous benchmarks set out in Future Home Standards (FHS) due for implementation from 2025.

The Approved Building Regulations Documents focus on specific areas of construction where the most benefit can be achieved, these include the incorporation of high levels of insulation, reducing thermal bridging, providing energy efficient heating and hot water, air tightness and appropriate levels of natural and mechanical ventilation. The elements discussed are a simplified description of the regulations and their impact can only be fully understood when RIBA Stage 4 Technical Design work is undertaken. The figures outlined are the current and future minimum parameters and U-values required to meet the Building Regulations.

This statement is to be read and considered in conjunction with the drawings and reports submitted as part of the planning application.

## 2.0 Project Description

The application site is located on the South-eastern boundary of Ipstones. The site is sheltered from distant views by mature trees, woodland and landscaping that surround the site. It has also been placed in a hollow within the site, further reducing its height in comparison to existing dwellings nearby (despite its more elevated topography).

The proposed dwelling has been designed to relate to its context and has been orientated to respond to the road running along the North and North Eastern boundary of the site. It presents a traditional appearance to the more visible elevations from the site boundary and incorporates smaller bottom hung inward opening hopper style windows and larger, vertical openings with slim frames that represent a door sized openings.

The traditional appearance of the elevations also limits glazing facing northwards, reducing heat loss, maintaining privacy whilst allowing ventilation through openable windows as well as purge ventilation through rooflights recessed into the roof covering. Overall, the traditional appearance along the North and North Eastern boundary and simple form of the dwelling gives the impression of a simple agricultural building/barn.

The form of proposed dwelling creates a courtyard type garden that predominantly faces South.

In response to the orientation and more private aspect it naturally facilitates the incorporation of larger areas of glass that will benefit from controlled solar gain and high levels of natural light within the habitable areas of the proposed dwelling.

The South, South-western and South-eastern elevations are visibly more contemporary and open as they are more sheltered from external views/public, enhancing occupants privacy whilst being open to internal views of the site.

The proposed dwelling has been designed to meet Lifetime Home/Approved Document Part M M4 category 2 Accessible and Adaptable dwelling standards.

The size of the proposed dwelling has been reduced throughout the design process in order to limit its overall footprint to only what is required by the applicants.

This has, in part, been influenced by elevated construction costs and recent energy price hikes as well as the potential build budget.

The applicants have a desire to build a sustainable long-term home within Ipstones, where they would be able to live more freely (off the land whilst reducing their working hours) as well as continuing to contribute to the vitality of the village.

### 3.0 Thermal Performance & Sustainability in relation to Building Regulations (Part L)

#### New Build Dwelling - Approved Document L Volume 1: Dwellings (2021 Update – Applied from 15<sup>th</sup> June 2022)

Approved Document L (2021 Edition) applied from 15<sup>th</sup> June 2022. The document has been introduced as an interim uplift as part of the government's roadmap for a new Future Homes Standard in 2025. The interim uplift to standards contained in Approved Document L, Volume 1: Dwellings (Conservation of fuel and power) will result in a 31% cut in CO<sub>2</sub> emissions for new dwellings in comparison to the previous Approved Document L Part L1A standards. SAP 2012 is also being updated to SAP 10.2, this considers updated guidance and an updated calculation methodology.

The below figures are referenced from Table 4.1 and Table D1 of the Approved Document, outlining the maximum U-values for individual elements and a notional dwelling specification that would meet the requirements of a SAP (10.2) calculation.

| <b>New Build thermal elements</b> | Approved Document L 2021 Edition Limiting Fabric Parameters U-Value W/m <sup>2</sup> K | Approved Document L 2021 Edition Notional Dwelling Specification U-Value W/m <sup>2</sup> K |
|-----------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| External Walls                    | 0.26                                                                                   | 0.18                                                                                        |
| Floor                             | 0.18                                                                                   | 0.13                                                                                        |
| Roof                              | 0.16                                                                                   | 0.11                                                                                        |
| Windows and Doors                 | 1.6                                                                                    | 1.2                                                                                         |
| Airtightness                      | 8m <sup>3</sup> /h m <sup>2</sup>                                                      | 5m <sup>3</sup> /h m <sup>2</sup>                                                           |

The fuel/carbon factor for electricity will be lower than mains gas following changes to SAP calculations. This is due to the increased influence of renewable technologies producing energy and reducing the emissions of the national electricity grid. This will influence a shift away from gas fired appliances for space and water heating. Instead, new dwellings will be encouraged to incorporate renewable and energy efficient technology (such as Heat Pumps) to improve their homes energy efficiency and reduce their carbon output. The above notional dwelling is based on using an Air Source Heat Pump (ASHP) and water cylinder with an immersion heater for space and water heating demand.

It should be noted that the notional dwelling provided is just one example of a house that could achieve compliance. It sets a target for all three criteria, in effect outlining a 'recipe' for fabric specification: U-values for the walls, roof, floors, windows and doors, as well as parameters for thermal bridging, air permeability and heating design. Building to the notional dwelling would mean the dwelling will pass a SAP calculation, however, it is not the only way, or necessarily the best way. The provided example is most appropriate for a fabric first energy efficiency approach in line with the FEES (Fabric Energy Efficiency Standards).

In addition to lower U-Values, as part of meeting the requirements of the Building Regulations, drawings are required to identifying

the insulation layer as well as junctions to ensure that thermal bridges can be calculated and kept to a minimum. These drawings also need to identify the position, continuity, and extent of the air barrier within the construction build up. This ensures that key areas of construction can be installed as designed and all members of a project and construction team understand the principles needed to meet the new Approved Document.

To further enforce this, an on-site audit is required to be undertaken prior to covering up work to confirm that the designed details have been constructed as intended. A Building Regulations Compliance Report (BREL) with photographic evidence of build quality would be sent to Building Control and a copy provided to the homeowner on completion of the works.

**Comparison of Approved Document L/Future Home Standards U-values and parameters**

The table below demonstrates the requirements of the current version of Part L Approved Document that would apply to development on the application site and those of the Future Home Standard proposed to be implemented in 2025.

It should be noted that the Building Regulations represent the minimum standard and the applicant would decide to meet lower (better) U-values to further enhance the environmental credentials and performance of the dwelling. As self/custom builders and eventual owner occupiers of the dwelling they would see the direct benefits of this additional investment through lower energy bills/usage and a better internal environment to live in.

The changes from previous versions of the Building Regulations Approved Documents and the Future Home Standard primarily relate to more tightly controlled requirements for air tightness and Hot water/Space Heating systems. The applicant aims to achieve a dwelling that will allow them to be as self-sufficient as possible.

The applicant intends to aim for and meet the requirements of the Future Home Standard from the outset. Aiming to meet or exceed this higher standard will avoid the applicant needing to further retrofit the proposed dwelling in the future.

(Table on next page)

| <b>New Build<br/>thermal elements</b>                | Approved Document L 2021<br>Edition<br>Notional Dwelling<br>Specification<br>U-Value W/m <sup>2</sup> K<br>(New Build) | Indicative Future Homes<br>Standard (implementation<br>expected in 2025)<br>Notional U-Value W/m <sup>2</sup> K<br>Specification<br>(New Build)                          |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| External Walls                                       | 0.18                                                                                                                   | 0.15                                                                                                                                                                     |
| Floor                                                | 0.13                                                                                                                   | 0.11                                                                                                                                                                     |
| Roof                                                 | 0.11                                                                                                                   | 0.11                                                                                                                                                                     |
| Windows and Doors                                    | 1.20/1.0                                                                                                               | 0.8/1.0                                                                                                                                                                  |
| Airtightness                                         | 5m <sup>3</sup> /h m <sup>2</sup>                                                                                      | 5m <sup>3</sup> /h m <sup>2</sup>                                                                                                                                        |
| Primary system for Hot<br>Water and Space<br>Heating | Gas boiler with low<br>temperature heating                                                                             | Low Carbon Heating i.e. Heat<br>pump with Water Cylinder<br>topped with immersion Heater<br>and under floor heating                                                      |
| Ventilation system type                              | Natural (with extract fans)                                                                                            | Natural (with extract fans)                                                                                                                                              |
| Additional systems<br>required to meet<br>standards  | Solar PV Panels - 40% of<br>ground floor area & Waste<br>water heat recovery (WWHRS –<br>min efficiency 36%)           | No additional requirements as<br>standard focuses on fabric<br>energy efficiency standards<br>(FEES). Additional system<br>supplement and improve on<br>higher standards |

#### **4.0 Additional applicable Building Regulations from 15<sup>th</sup> June 2022**

In addition to the changes to Part L, new Building Regulations Approved Documents were updated or introduced. These came into effect on 15<sup>th</sup> June 2022 and are highlighted below.

Approved Document Part O (Over Heating) introduces the need for proposed buildings to be assessed against several factors. These include the size of glazing/glass within each elevation depending on orientation, limiting amounts of glass to a percentage of floor area and to consider the ability to purge ventilate a dwelling and shade areas of glass during summer months where solar gains are most likely.

These factors have been incorporated into a new Approved Document to ensure suitable internal environments for occupants. It also suggests low tech solutions to this potential issue that include fixed shading devices comprising of shutters, external blinds, roof overhangs or awnings.

The Approved Document also requires the glazing design to consider noise, pollution, security, protection from falling and protection from entrapment.

This new document has works in combination with all the Approved Documents but has key interactions with Parts B, F, J, K, L, M & Q.

Approved Document Part F (Ventilation) is being upgraded to include specific ventilation requirements, working directly alongside Part O to ensure that dwellings have sufficient air changes and purge ventilation to stop rooms from overheating, for user comfort and good indoor air quality. Whilst this document prioritises natural ventilation, it also encourages mechanical ventilation where appropriate.

Approved Document Part S (Infrastructure for the charging of electric vehicles) was implemented on 15<sup>th</sup> June 2022. This document covers the standards, classification, limitations, exemptions, and provisions for charging for electric vehicles.

In this instance, as a single dwelling, 1No. space /electrical charging point would be required. This will be placed in close proximity to the outbuilding/parking provisions outlined on AL04 Site Plan as proposed.

## 5.0 Renewables and Energy Efficient Considerations

The applicant will consider the incorporation of renewable technologies to improve and enhance the environmental performance of the dwelling as part of the Technical Design and Construction phase of the project.

They intend for the proposed dwellings hot water and space heating provision to be served by an air source heat pump, hot water cylinder with back up immersion heating and under floor heating.

In addition to these core elements, given their ambitions, they plan to incorporate other renewable and energy saving technologies such as Photovoltaic Solar Panels with battery storage and Waste Water Heat Recovery (WWHR) Systems to further improve upon the sustainability of the proposed dwelling. The ultimate goal for the applicant would be to realise a dwelling that could be off-grid and 'free running' whenever possible.

The surface water and rain water collected from the roof of the proposed dwelling will be collected and stored in a partially submerged water 'holding' tank. This water would then be reused where possible within the house as 'grey water' and externally to water plants, vegetables, trees and hedgerow as and when required. This will reduce their water consumption dramatically and further reinforce the environmental and sustainable credentials of the proposed dwelling.

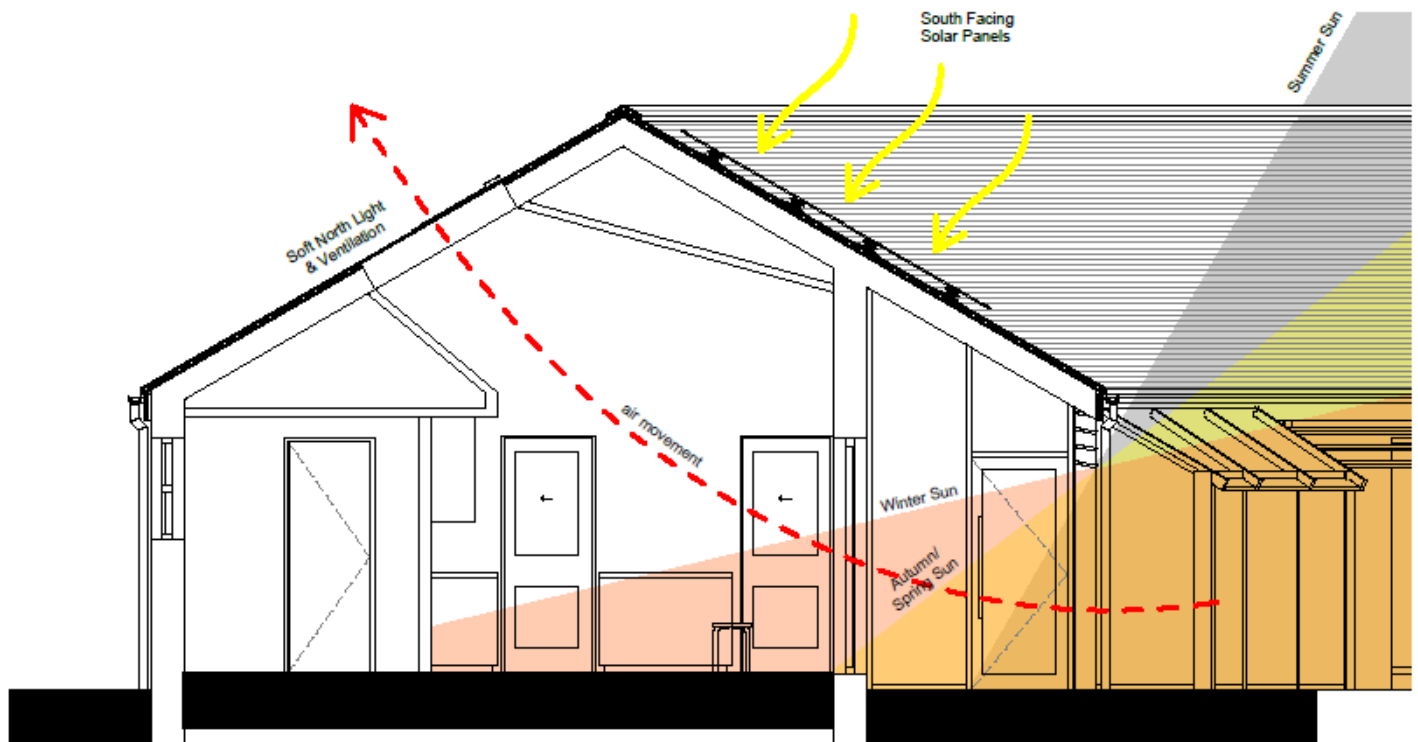
All these technologies and methodologies will work in combination with high levels of insulation, appropriate levels of air tightness and good workman ship to avoid cold bridging and air leakage from the proposed dwelling. All these measures will result in lower energy usage, lower carbon footprint and therefore lower energy bills. This is in line with the governments agenda to move away from a future dependency on gas as a primary energy source.

The energy performance of the proposed dwelling in any scenario will be considered through approved software that utilises a Standard Assessment Procedure Calculation (SAP). The environmental performance will be displayed through and an Energy Performance Certificate (EPC).

A section of the building has been provided below to demonstrate how the roof overhang and solar shading (brei-solei) will work with the orientation of the proposed dwelling to avoid overheating during the summer but also benefit from high levels of diffuse natural light throughout the year. This section also demonstrates the natural ventilation strategy intends to work, drawing air through the building.

The applicant intends to work with the principles of Passivhaus construction to achieve the best possible outcome for the proposed dwelling. It is not their intention to seek formal certification as the Passivhaus standard does not encourage elements of the free-running low tech approaches incorporated into the design of the proposed dwelling.

(Section on next page)



Section through Kitchen/Utility/Pantry  
 Grey hatch – Summer Sun Angle  
 Yellow hatch – Spring/Autumn Sun Angle  
 Orange hatch – Winter Sun Angle

Yellow arrows – Direct exposure of sun to PV Solar Panels  
 Red arrow – Air movement with bi-fold doors and skylight open

Right hand side of section faces directly South. Habitable rooms have been placed to face this direction to benefit from higher levels of natural light, controlled solar gain (when desired) and privacy from external views along the Northern border of the site.

Rooms to the left of the section have been placed here to keep them cool. They are predominantly the service areas of the building or areas that would not benefit from views (Utility/Pantry, Hall/Dog boot, Shower/WC and Plant Room).

This is also the case for the bedrooms. They have been located on the Northern side of the dwelling, with the roof overhang and hallway within this area acting as a barrier to overheating.

The sun space will act as a heat capacitor during the winter months, generating heat by being unprotected from solar gain. It acts as an extension to the living space, facilitating internal views of the site. Throughout the year and in particular the winter months it would be used for growing produce, acting as a green house.

A dedicated plant room has been provided to house the required tanks, electrical wiring and technology removing the need for an additional external outbuilding in close proximity to the house.

Retractable/adjustable horizontal solar shading screens have been provided to the corner of the master bedroom elevation. This would allow the applicant to control solar gain from a lower angled morning

sun, choosing how much light and solar gain they wish to allow into the building dependent upon the position of these screens.

## **6.0 Lifetime Homes Standard/M4 (2) Category: Accessible and Adaptable Dwelling**

The proposed new build dwelling meets the criteria for the Lifetime Homes Standard and Approved Document Part M M4 Category 2 Accessible and Adaptable Dwelling.

The proposed dwelling is situated on a single level with wide hallways and door openings.

Meeting this criteria would allow the applicant or any potential future resident to occupy the dwelling for a prolonged period of time, potentially when they are less mobile or have less ambulant visitors. Whilst the Lifetime Homes Standard is now obsolete and has been integrated into Approved Document Part M. It provides a good barometer for the future adaptability of a dwelling and how it could be used by less mobile occupiers or visitors both now and in the future.

The applicant is considering these requirements now as they do not want to alter the building at a later date.

## **7.0 Conclusion**

This document demonstrates that the proposed new build dwelling would be of a higher quality in relation to its thermal performance and overall sustainability in comparison to existing dwellings in proximity to the site and aims to meet and/or exceed higher standards due to be implemented in 2025.

The proposed development incorporates a simple, elongated, single storey form to avoid being overbearing on its context. The proposed layout and built development works in combination with the contours of the site and sustainable principles in relation to the buildings orientation.

The proposed dwelling resembles the local context and offers a private, paired down, traditional appearance from the road and opens up, presenting a more contemporary facade to the less visible and more private areas.

The proposed dwelling would be highly sustainable, will both enhance and enable the applicants to live off the land. The proposed dwelling incorporates sustainable features and design principles that are further enhanced by utilising technology.

There is no reason on energy and sustainability grounds that the application should be refused.

## **Bibliography**

### **Publications**

Approved Document F Volume 1 (Ventilation), 2021 Edition  
Approved Document L Volume 1: Dwellings (Conservation of Fuel and Power), 2021 Edition  
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