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Sustainable Construction Statement

Proposed Semi Detached Dwellings,

Home Barn Place, 37 Chalk Lane, Sidlesham, Chichester

PO20 7LW

Contents

1.0 Introduction

This Sustainable Construction Statement is to be read in conjunction with The Design and Access Statement Rev C, accompanying the application, together with the following drawings as submitted:

2210/010 – Location Existing Site Plan Rev D

2210/011 – Existing Floorplans Elevations and Section Rev A

2210/013 –Proposed Site Plan Rev B

2210/014 – Proposed Floorplans and section AA Rev A

2210/015 – Proposed Elevations Rev B

2210/016 – Proposed Elevational Site Section Rev B

In addition the context of the approved conversion of the existing steel barn is to be considered relative to the more sustainable approach of removing, recycling the barn, and associated slab, and providing the proposed dwellings within a more appropriate, efficient, lower carbon and more sustainable new build construction as demonstrated within this document.

2.0 Land Use

The current approved residential scheme involves the re-use of the existing steel barn slab and frame in the delivery of the proposed 2 No semi detached dwelling units. However like most conversions the overall quality, construction and resultant living environment is a significant compromise; which will have a direct implications on the sustainability of the dwellings and impact on lifetime energy use:

- Orientation and positioning of windows to take best advantage of orientation, sunlight, solar control and ventilation is far from ideal with likely increase in use of electricity for heating, cooling and lighting purposes. The accepted best practice of a form first approach is therefore significantly compromised. This in combination with the construction methodology, and limited capability to provide renewable energy generation (roofscape east or west facing so not suitable for solar panels) presents significant issues when attempting to deliver a highly sustainable, low carbon, low energy living environment.
- The form of the building compromises the layout, with a less than optimum layout which in turn creates spatial inefficiencies and issues around quality of living space.
- The re-use of the frame presents inefficiencies when it comes to thermal design and elimination of cold bridging so generating a thicker wall solution, with increased associated use of energy, materials and labour to facilitate the existing construction. Compromises around re-use of the existing structure will hinder progress in achieving the desired 20% target improvement on envelope performance.
- Whilst the re-use of the existing frame and slab may be more sustainable from an embodied carbon perspective, it is in considering the whole life impacts and compromises where the case of re-use is significantly undermined. Our conclusion is that recycling of the steel roofing sheets and steel frame plus onsite crushing and re-use of the slab in the hardstanding areas, is the most logical and sustainable approach to achieving the two dwellings on this site.

3.0 Design

The proposed design works within the total GIA achievable in the conversion of the existing barn, but reconfigures the areas into an optimum footprint of a depth, length and form that provides a more efficient envelope, enhanced living accommodation within an optimised form through:

- A semi detached volume (3 exposed walls), within a simple rectangular form with pitched roof set down partly within the first floor accommodation; to create a favourable and efficient floor area/ surface area, and reduce unusable space within the roof pitch.
- Orientation of the form of development to provide the optimum aspect, south facing principal living spaces, with appropriate glazed areas and ventilation, fronting south facing private gardens. Access is located to the north of the dwellings and parking located to the east and west elevations; to afford side access directly into the utility/ kitchen spaces as per Lifetime Homes guidance.
- The new dwellings are to be Part M Category 1: Visitable Dwelling compliant. They also follow the 16 point criteria checklist for Lifetime Homes Standards. This allows them to be easily adapted (if ever required), without impacting on the design.
- The design has adopted a form first approach to ensure an inherently sustainable form which in combination with the low carbon construction methodology, and the use of renewables to provide a proportion of the dwellings energy needs, creates modern, highly efficient, low energy and thoroughly sustainable living accommodation.

4.0 Low carbon High Efficiency Construction Methodology

We are proposing an off site manufactured building system utilising SIP's factory manufactured locally and delivered to site for erection. The process of design and manufacture ensures a high degree of fabrication and build tolerance, which reduces waste, facilitates material use efficiencies, is recycling ready at the point of manufacture. SIP's achieve high levels of insulation, low air leakage and minimal thermal bridging, all factory engineered and constructed in a fraction of the time of traditional methods. The efficiencies in terms of time, resource and transportation, for off site component set manufacture, has been well documented but as a construction system it also offers the following benefits:

- Manufacture - SIPs are produced from just four main ingredients. By reducing the number of suppliers and components, there are fewer deliveries. Reduced transport needs results in less congestion, noise pollution and air pollution, which ultimately helps minimise the project's impact on the environment.
- Waste management and recycling - Specialist design and cutting systems ensure that waste is kept to an absolute minimum and where possible, any excess materials can be recycled or repurposed on smaller-scale projects. The EPS insulation is 98% air and just 2% plastic and is one of the few building materials that can truly claim to be 100% recyclable. It can be reused in the manufacture of new EPS products, soil improvements and auxiliary compost material, as well as being added to other building

materials. EPS does not, and has never, contained either CFCs or HCFCs gases, which diminish the ozone layer. EPS is fully recyclable and no waste is created in its manufacture.

- Construction - A SIPs structure has a lightweight shell (approximately 25Kg/m2) and therefore does not need heavy foundation design – it also makes them easy to handle and quick to assemble on site. These weight-related factors create many environmental benefits, such as reduced plant and machinery usage, reduced concrete production for foundations, and fewer people required on site.
- Improved energy efficiency through high performance of the envelope in terms of insulation values, reduced thermal bridging, v low air leakage and associated reduction of energy consumption. SIPs can outperform other building methods in virtually every environmental category because the insulation is a core component of the system rather than an add-on. Timber is naturally low in thermal conductivity and it's 15 times better as an insulator than concrete, 400 times better than steel and 1770 times better than aluminium. SIPs buildings are extremely airtight so the amount of energy used to heat and cool a room can be cut by up to 50%. SIPs contribute to The Code for Sustainable Homes through excellent thermal performance, air tightness and limited cold bridging. Typically, SIPs panels will give U-values as low as 0.13 and significantly reduce cold bridging. We believe that utilising SIP's will give the project the best possible solution to the built envelope and will go a long way to contributing to target 20%. During RIBA stage 4, Technical Design, SAP and TER assessments are to be carried out as part of the detail design development, specification and detailing to deliver the optimum energy performance of the dwellings.
- Sustainability of materials - The crushed concrete from the existing barn slab is to be utilised in the construction of hard standing and driveway areas. Within the SIP's the EPS insulation is 98% air, and just 2% plastic which is fully recyclable. The OSB (Orientated Strand Board) is made from sustainably-harvested spruce, with 35% less timber used compared to traditional building methods. Timber uses just 20% of the energy needed for concrete to make a product with equal strength. The outer skins of SIPs panels are manufactured from Orientated Strand Board (OSB). This is made from young, fast-growing trees grown in plantations accredited by the Forest Stewardship Council (FSC). Young trees produce oxygen and remove more carbon dioxide from our atmosphere than mature trees and are renewable, recyclable, biodegradable and non-toxic. The predominant cladding material is rough sawn boarding sourced from sustainable FSC forest procured via a local sawmill. To ensure robustness and avoid timber use at levels close to the ground, a brick plinth is proposed, built up to the underside of the ground floor window cills. The roof is weathered in clay tile, a material typical of the area and appropriate to the setting and built context – ref D&A for contextual analysis and justification.

5.0 Energy and renewables

To complement the fabric first approach adopted in the design and construction of the proposed dwellings we are making provision for renewables and low carbon hot water and heating systems to further mitigate whole life environmental impact and reduce carbon emissions and running costs:

- Provision of solar panels on the south facing roof slope , low profile and integrated into the roof finish.
- Provision of an air source heat pump, to the side of the properties, serving underfloor heating to the ground floor and wet rads to the first floor accommodation.
- Low energy lighting throughout.
- Provision of smart lighting, heating and hot water control systems with App interface that allows all systems to be controlled within the dwelling or remotely to ensure energy consumption is matched to specific demand.
- Provision of a vehicle electric charging points located to the flank walls of the properties adjoining the parking spaces. Additional electric cycle charging provision via power provision to cycle storage sheds.

6.0 Sustainable drainage

Use of sustainable drainage on this site, via soakaways has proven to be viable. Sustainable soakaways allows water to return to the water table slowly, reduces pressure on nearby sewer networks and mitigates surface water discharge into the sea. All external hard surfacing is to be free draining with details and specifications of surface materials and sub base are to be prepared as part of the stage 4 design.

7.0 Water Usage

During RIBA stage 4 – Technical Design, further assessments are to be carried out to comply with Part G to a maximum water consumption of 110l/per day/ person. The scheme will adopt the following measures to mitigate water use:

- Construction using low water content via reduced foundation works, dry SIP wall, floor and roof constructions and use of low water use finishes
- low use/ water saving water taps, cisterns, shower heads, sanitaryware plus fixed/ supplied appliances
- Rainwater harvesting with water butts for watering or gardens

8.0 Ecology

The proposals seek to be a net contributor to the ecology of the site. The existing building presents no opportunities for nesting birds or bats. The site is dominated by loose hardstanding and greenery is v limited and offers little opportunity for plant growth. Through retaining and introducing new trees, the proposed

hedgerows and planting , this will provide new habitats and promotes carbon capture on the site. Soft landscaped gardens will reduce water run off and provides a greater surface area for water to naturally drain through the ground.

9.0 Lifetime Homes/Building for Life

The proposal address the Lifetime Homes Standards 16 points criteria checklist is as follows:

1 - Parking

- Each unit has a private driveway with 3no car parking spaces.
- All parking areas are provide an electric charging point to facilitate charging of electric vehicles
- Each driveway has at least 1 space with a minimum width of 3.3m.(space adjoining side door)

2 & 3 - Approach to dwellings

- Parking areas are located immediately adjacent to the proposed dwellings.
- All units have been designed to be Part M Category 1: Visitable Dwelling compliant with flush threshold and door opening widths providing level and wide access compliant with Part M, directly from the driveway.

4 - Entrance

- Doors are to be distinguished from walls through the use of colour, texture and materials. Both front and side entrance doors are to be constructed with level threshold access and clear opening widths suitable for Part M compliant wheelchair access.
- Slot threshold drainage ensures weathering and surface water protection to the threshold
- High efficiency low level surface lighting appropriately illuminates what will be a safe approach and egress from the dwelling

5 - Communal access/movement

- The units have been designed to be Part M Category 1: Visitable Dwelling compliant.

6 - Internal doors and hallways

- Movement around the ground floor has been designed to ensure it is Part M Category 1:
- Visitable Dwelling compliant. Hallway and doorway widths allow for those using a wheelchair.

7 - Circulation spaces

- All principle living spaces (living room & kitchen) and circulation spaces on the ground floor allow for somebody using a wheelchair to comfortably turn.

8 - Entrance level living spaces

- Both units have separated living, dining rooms at entrance level.

9 - Potential for entrance level sleeping accommodation

- Both units have rooms which could be adapted into entrance level bedrooms (study/ Bed 4) on a permanent or temporary basis, inc accessible ensuite shower accommodation

10 - Entrance level WC and shower

- The proposed units do not currently provide a full assessable bathroom on the entrance level

however there is space to provide such provision if required and both water and drainage provision will be provided within the locality of the party wall between the study/ bed 4 and the adjoining alcove to the lounge

11 - WC and bathroom provision

- All WCs and Bathrooms throughout the new dwellings will be designed to allow for structurally robust fixing and support adaptations via standard OSB linings to partition walls.

12 - Stairs and potential through-floor lift provision

- The proposed units do not propose to install a lift, although future provision could be provided within entrance hallway, partially within footprint of study / bed 4 onto existing first floor landing. Wall and floor to this area is to be be trimmed in preparation for future adaptations.
- The location would have no significant impact on the main living areas of each dwelling.
- The staircase is of a generous width and could be fitted with a stair lift if required.

13 - Future fitting of hoists

- Both dwellings will be structured with deeper timber joists above first floor ceilings to the master bedroom area, to allow for ceiling hoists to be retrofitted from the master bedroom and dressing/en-suite spaces if ever required.

14 - Bathrooms

- The master bedroom is ensuite with Bed 2 and 3 sharing a family bathroom with separate shower. Thre is also a wc/shower room on the ground floor

15 - Glazing and window handle heights

- The glazed doors within the proposed principal living spaces (living room/ dining/ kitchen) allow views out from both a standing or seated position. At least one openable light in each habitable room will be approachable (including those with restricted movement and reach.)

16 - Location of services controls

- Service controls will have both physical controls and app driven control and monitoring systems to ensure they are accessible both within the dwelling and remotely.

The proposed dwellings satisfy the requirements of Lifetime Homes / Building for life