



# Energy & Sustainability Statement

Site at 197, Headley Way, Headington, Oxford,  
OX3 7SU



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**Report produced by -**

Ian Bacon  
Director  
Blewburton Limited  
23 St Martin's Street  
Wallingford  
Oxon  
OX10 0AL

Tel: 01491 825337

E-mail: [info@blewburton.com](mailto:info@blewburton.com)

Web: [www.blewburton.com](http://www.blewburton.com)



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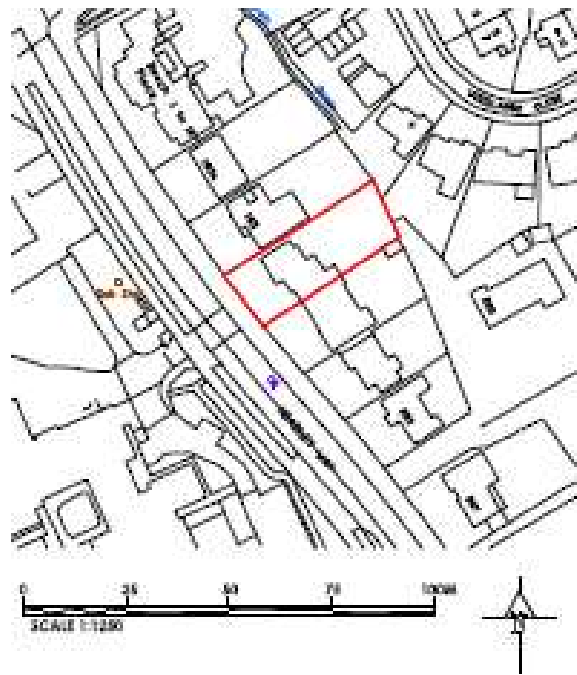
## 1.0 Introduction

- 1.1 Blewburton Limited has been commissioned to prepare an Energy & Sustainability Statement as part of a planning application for a development on land at 197, Headley Way, Headington, Oxford. The development will see the construction of a short terrace of two four-bedroom and one three-bedroom, two and a half storey houses, with the second floor located within the roof of each dwelling.
- 1.2 The site is located within the jurisdiction of Oxford City Council (OCC) and as such the planning application will be looking to satisfy the Oxford Local Plan 2036 policy RE1: Sustainable design and construction. The key elements of this are as follows:
1. Maximising energy efficiency and the use of low carbon energy;
  2. Conserving water and maximising water efficiency;
  3. Using recycled and recyclable materials and sourcing them responsibly;
  4. Minimising waste and maximising recycling during construction and operation;
  5. Minimising flood risk including flood resilient construction;
  6. Being flexible and adaptable to future occupier needs; and
  7. Incorporating measures to enhance biodiversity value.
- 1.3 This Energy and Sustainability Statement therefore relates to these requirements and sets out the energy and sustainability measures to be implemented in the proposed development and demonstrates that they are integral to the design of the proposed scheme.
- 1.4 Staff at Blewburton Limited have been involved in all issues of sustainability for many years, from the writing of sustainability statements, through to operating as licensed BREEAM, Home Quality Mark, Code for Sustainable Homes and energy assessors and have an applied and constantly updated knowledge of the key sustainability issues involved with projects in the built environment.

## 2.0 The Site

- 2.1 The site area to be developed covers an approximate area of 330m<sup>2</sup> and is located at 197, Headley Way, Headington. It is approximately rectangular in plan with its long axis running in a North-east to South-west direction. The site is currently occupied by a to-be-demolished dwelling and associated gardens and car parking area.
- 2.2 The site is situated within suburban Oxford, and is surrounded by dwellings and roads.
- 2.3 The proposal is to construct a two and a half-storey building comprising two, four-bedroom and one, three bedroom houses in a terrace style, with the second floor being a room-in-the roof design. Off street car parking, private gardens and a bin store will also be provided.
- 2.4

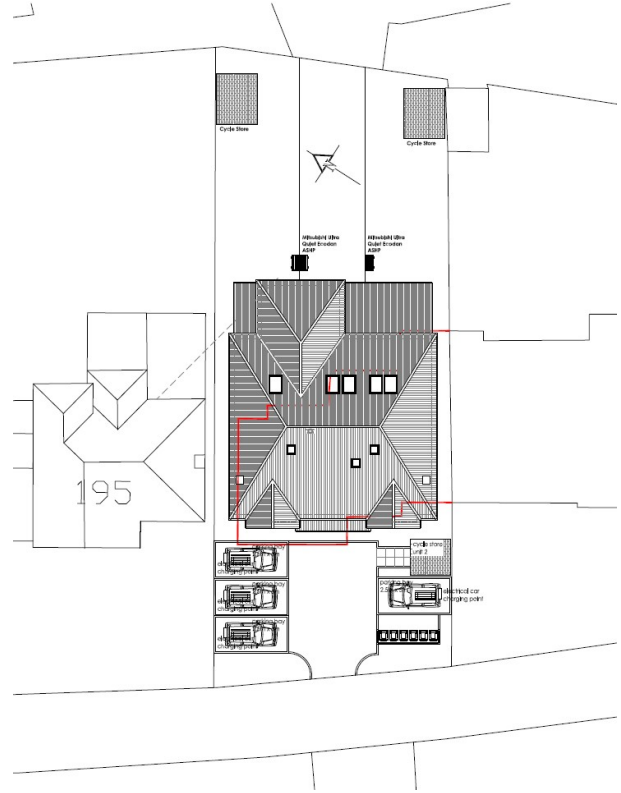
A map showing the location of the site is shown below in Figure 1, with Figure 2 showing an aerial image of the site and Figure 3 showing the proposed site layout.



*Figure 1: Map showing site location*



**Figure 2: Aerial view of the site**



**Figure 3: Proposed site layout**

## 3.0 Energy Conservation and Carbon Emissions

3.1 Policy RE1 of the Oxford local Plan 2036 states that,

*Planning permission will only be granted for new build residential and student accommodation developments (or 25 student rooms or more) which achieve at least a 40% reduction in the carbon emissions from a code compliant base case. This reduction is to be secured through on-site renewable energy and other low carbon technologies (this would be broadly equivalent to 25% of all energy used) and/or energy efficiency measures.*

3.2 The energy demand and associated carbon emissions for the proposed dwellings has been calculated using SAP (Part L) software supplied by Elmhurst Energy and this produces carbon emission figures for regulated energy use, with and without the introduction of low and zero carbon technologies. This allows for calculations of the code compliant baseline figure and the actual proposed carbon offset figure for the site as whole.

3.3 The approach to compliance with Part L of the Building Regulations and establishing the code baseline is driven by a fabric first strategy and as such, the proposed energy efficiency measures for the building are listed below:

- Ground floor U-values of 0.09 & 0.11, dependent on P/A ratio of property (Part L minimum standard is 0.18);
- External wall U-values of 0.18 (Part L minimum standard is 0.26);
- Party walls with cavities fully insulated and sealed for a U-value of 0.00 (Part L minimum standard is 0.20);
- Insulated pitched roof U-values of 0.15 and loft spaces of 0.11 (Part L minimum standard is 0.16);
- High specification windows, roof windows and solid doors with a U-values of 1.4/1.3/1.2 respectively (Part L minimum standard is 1.6);
- Specification of high efficiency gas fired condensing boilers (Part L minimum standard is 88%), heating underfloor heating to the G/F and radiators on the upper floors – mains gas Vaillant ecoFIT sustain 630 boiler (89.8% efficiency) used in the calculations;
- Best practice heating control systems – time and temperature zone control system and a weather compensation unit in all units;

- Use of Accredited Construction Details (ACD) to deal with issues around non-repeat thermal bridging at external wall junctions with sills, jambs, ground floor, upper floors, corners and roofs and hi-therm lintels specified;
  - Air pressure testing results of 4.0 m<sup>3</sup>/hm<sup>2</sup> (@50Pa) or lower (Part L allows for a result of up to 8.0m<sup>3</sup>/hm<sup>2</sup> (@50Pa));
  - All new light fittings installed will be of the low energy variety, with external lights featuring daylight sensors.
- 3.4 The orientation of the new dwellings is within 30 degrees of south to ensure maximum benefits from natural daylight. The units are also within a more-or-less standard rectangular design, as this provides a more efficient envelope.
- 3.5 This approach to form, building location and fabric, when modelled by the software sees the building as whole (and therefore the site) comply with Part L of the Building Regulations, in so far as the average Design Energy Rating (DER) is below the average Target Energy Rating (TER) – see Table 1 below. The TER is also the Code baseline for the site, so the final approach showing a 40% uplift over this is required for compliance.

BLOCK COMPLIANCE		Design SAP elmhurst energy			
Calculation Type: New Build (As Designed)					
Block Reference	Gas block	Issued on Date			
Block Name					
Assessor Details	Mr. Ian Bacon, Ian Bacon, Tel: 01455 883250, ian.bacon@blewburton.com	Assessor ID	T238-0001		
Client					
Block Compliance Report - DER					
Block Reference: Gas block		Block Name:			
Property-Assessment Reference	Multiplier	Floor Area (m <sup>2</sup> )	DER (kgCO <sub>2</sub> /m <sup>2</sup> )	TER (kgCO <sub>2</sub> /m <sup>2</sup> )	% DER/TER
554008-001	1	144.42	15.17	15.32	0.98 %
554009-001	1	139.54	14.06	14.25	1.32 %
554010-001	1	144.42	15.04	15.20	1.07 %
Totals:	3	428.38	44.27	44.77	
Average DER = 14.76 kgCO <sub>2</sub> /m <sup>2</sup>		% DER/TER	PASS		
Average TER = 14.93 kgCO <sub>2</sub> /m <sup>2</sup>		1.14 %			

**Table 1: Design Stage Part L Block Compliance Figures**

- 3.6 There are currently no district heat networks available for this site to connect to, so the additional uplift required will be met through the installation of on-site low or zero carbon technologies (LZCs).
- 3.7 The following LZC technologies have been ruled out as impractical for this site:



- a. Biomass: Plant and fuel storage requirements require more space than is available, installation costs are prohibitive for a development of this size, management of a communal system is not an option for this site and emissions might also be at unacceptable levels for this locality.
- b. Wind: Planning permission for a wind turbine(s), either free standing or building mounted is regarded as unlikely and the technology is broadly unreliable in urban environments due to the nature of wind around buildings.
- c. Ground Source Heat Pumps: Due to the restricted area of land available on site, these would have to be bore hole based systems, which are restrictively expensive.
- d. Solar Thermal: This technology would work, but will not provide nearly enough offset to meet the requirements of OCC, so this technology has been deemed unsuitable for this development.

3.8 This leaves Air Source Heat Pumps (ASHP) and solar photovoltaics (PV) as the options to consider as both are viable and ASHPs have been selected as the southerly aspected roof space available is limited, although this technology could still be deployed with some success if chosen.

3.9 Accordingly, the proposed dwellings have been modelled to replace the mains gas heating system with a Mitsubishi Ecodan 8.0 kW PUZ-WM50YAA for the end terrace units and an Ecodan 6kW PUZ-WM60VAA to the mid-terrace unit, supplying all space heating and hot water provision. This sees the site wide TER alter to 65.86 and the DER at 34.14, which is 48.16% uplift over the base case requirements and significantly above the 40% uplift required by OCC. The results are shown in Table 2 below.

BLOCK COMPLIANCE		Design SAP elmhurst energy			
Calculation Type: New Build (As Designed)					
Block Reference	Gas block	Issued on Date			
Block Name					
Assessor Details	Mr. Ian Bacon, Ian Bacon, Tel: 01455 883250, ian.bacon@blewburton.com	Assessor ID	T238-0001		
Client					
Block Compliance Report - DER					
Block Reference: Gas block		Block Name:			
Property-Assessment Reference	Multiplier	Floor Area (m <sup>2</sup> )	DER (kgCO <sub>2</sub> /m <sup>2</sup> )	TER (kgCO <sub>2</sub> /m <sup>2</sup> )	% DER/TER
554008-002	1	144.42	11.57	22.60	48.81 %
554010-002	1	144.42	11.63	22.42	48.12 %
554009-002	1	139.54	10.94	20.84	47.50 %
Totals:	3	428.38	34.14	65.86	
Average DER = 11.39 kgCO <sub>2</sub> /m <sup>2</sup>		% DER/TER		<b>PASS</b>	
Average TER = 21.97 kgCO <sub>2</sub> /m <sup>2</sup>		48.16 %			

**Table 2: Design Stage Part L Block Compliance Figures once ASHP units are added**

3.10 Finally, where specified, all ‘White Goods’ – fridges, freezers and dishwashers – will be rated as minimum ‘A’ under the EU Energy Labelling Scheme and attention will be paid

to the energy specification of all electrical equipment to be installed within the dwellings. Where not specified, then details regarding the EU Energy Labelling scheme for energy efficient appliances will be supplied to all initial occupants.

## 4.0 Water Conservation

4.1 Policy RE1 of the Oxford local Plan 2036 states that,

*Proposals for new residential development are to meet the higher water efficiency standard within Building Regulations Part G2 of water consumption target of 110 litres per person per day.*

4.2 This requirement reflects the fact that the south-east of England is increasingly a water stressed region and it is therefore essential to use water efficiently to reduce consumption and the need for large infrastructure schemes to boost supply. The simplest way of reducing water consumption is through the installation of water efficient fittings and plumbing.

4.3 The actual specifications of the water using products for this scheme are yet to be established, however, the following notional specification is considered realistic for this type of development and an assessment of the efficiency of the proposed dwellings domestic water-consuming components has been undertaken using the Building Research Establishment's water calculator.

4.4 The water consumption (litres/person/day) for the proposed dwellings shows a figure of 104.4l/p/d with the following proposed specification (which is below the 110.00l/p/d required by OCC policy):

- Dual 4.0/3.0 litre flush WCs;
- Shower flow rates of 8.0L/min;
- Basin tap flow rates of 3.0L/min;
- Kitchen tap flow rates of 4.0L/min;
- Bath overflow capacity of 165 litres;
- Water efficient washing machines and dishwashers.

4.5 Externally, the provision of downpipes will be reviewed and if an appropriate location can be found, a rainwater harvesting butt will be provided for use in watering plants on site and the external cleaning of household goods.

4.6 The provision of water meters is also recognised as an important tool in reducing water usage and in a domestic context they can encourage people to monitor and reduce their water consumption by an average of 10% to 15%. Therefore, the dwellings will each have an individual, easily accessible water meter installed as part of their specification.

## 5.0 Materials

5.1 The materials used for this scheme will be new and the developer is committed to ensuring that all materials score as highly as possible in the BRE Green Guide to Specification.

5.2 The Green Guide assesses a comprehensive range of construction details for all main building elements to determine the environmental impact of the materials used. Construction details are rated from A+ to G dependent on the assessed impact against a range of environmental indicators. Materials used in this development are expected to achieve an A or A+ rating.

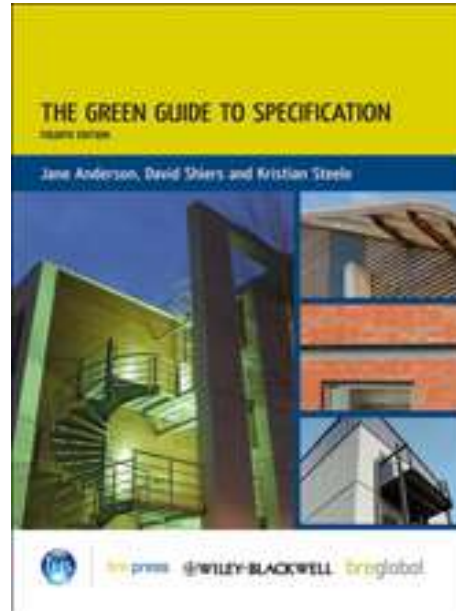
5.3 In addition, wherever possible, all building and finishing materials will be sought from suppliers and manufacturers registered to an environmental management scheme such as FSC or PEFC for timber based products and BES6001 or ISO14001 for all other materials. This will ensure that, as far as possible, the materials have been sourced from suppliers certified as ethical and responsible as far into the supply chain as is reasonable.

5.4 Also, the main contractor will be required to source all materials from local suppliers to reduce transportation and its associated carbon emissions and to support the local economy.

5.5 All insulation materials selected for this development will have a Global Warming Potential of below 5 in order to minimise the impact on climate change.

5.6 All materials selected will be assessed for their durability in line with their proposed level of use and exposure, with a particular focus on materials that are well adapted to handling climatic variations and that are long lasting, robust and low maintenance.

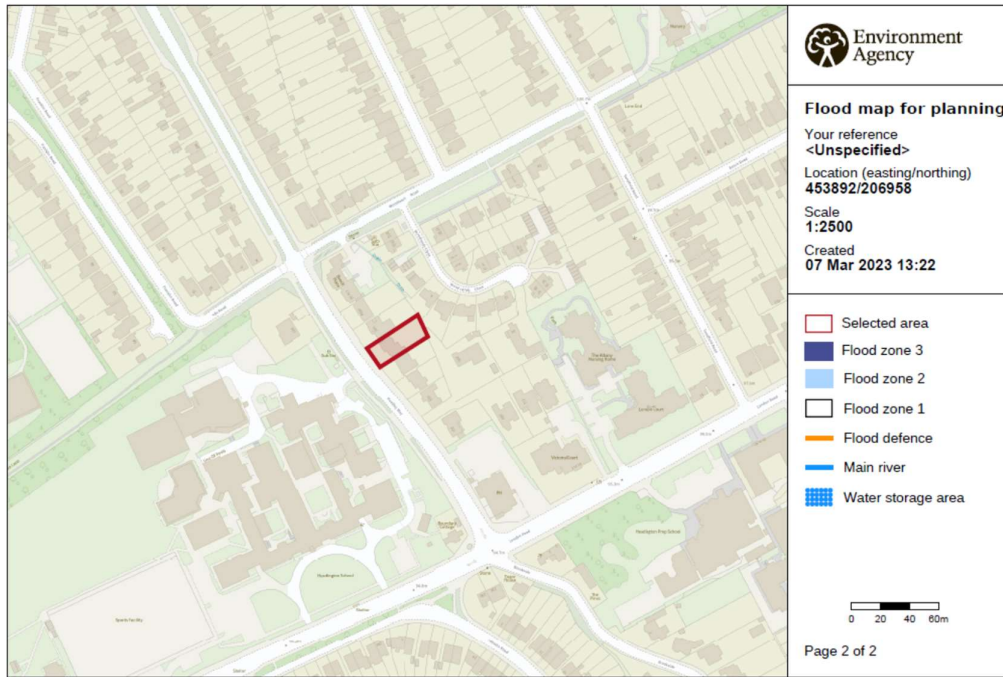
5.7 Finally, attention will also be paid to materials specified for the internal environment with a focus on materials/finishes containing low/no volatile organic compounds (VOCs) in an effort to improve the internal environment for occupants as internal air pollution is increasingly recognised as having negative impacts on health.



**Figure 4: The Green Guide to Specification**

## 6.0 Flood Risk & Surface Water Management

- 6.1 Flooding information obtained from the Environment Agency (EA) website confirms that the site lies within Flood Zone 1 – Low Risk, as shown in the image below.



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**Figure 5: EA Flood Map for the local area**

- 6.2 SUDS options will be employed on site, such permeable paving, and where hard landscaping is installed, attention will be given to the opportunity for a porous surfacing.

## 7.0 Ecology & Land-use

- 7.1 The ecology of the site equates to that of a standard suburban garden, with the front being predominantly hardstanding with small trees and shrubbery on the border, with similar trees and shrubbery to the borders at the back, surrounding a large patio and a mown lawn area. Ground level views of the front and rear of the site are shown below.



*Figure 6: The existing site from the front*

- 7.2 The borders of the site will not be developed and all trees of value will receive adequate protection for the duration of the construction period on site.
- 7.3 The new dwellings will have private, individual gardens to the rear and additional landscaping will be planted with a focus on native or wildlife enhancing plant selections. No compost containing peat will be used.
- 7.4 To encourage and assist local fauna, appropriately located bird boxes will be installed around the site and small hedgehog holes will be cut into fences to prevent barriers arising preventing the movement of smaller mammals.



**Figure 7: The existing rear garden**

## 8.0 Future Needs

- 8.1 Policy RE01 of the emerging Local Plan states that new buildings should,  
  
*Be flexible and adaptable to future occupier needs.*
- 8.2 The proposed designs for this site maximise the useable space within the housing, through functional layout, and provide scope to adapt and modify the housing to meet future requirements.
- 8.3 The scheme has also been developed to meet the majority of the Lifetime Homes standards, which ensures a flexible blueprint for accessible and adaptable housing in any setting.
- 8.4 The dwellings will be fully fitted with the latest broadband access technology and fittings will be installed to facilitate home working.



## 9.0 Construction Site Management

- 9.1 The construction process can have a detrimental effect on the local environment and community if poorly managed, and, in an effort to mitigate against this, the main contractor will be encouraged to develop a Construction Management Plan. It will be required to include details on how negative impacts associated with, noise, dust, odour, vibration and any other forms of pollution or nuisance will be removed, reduced or mitigated against.
- 9.2 In addition, the main contractor will sign up to, and deliver, a score of at least 39 points (with a minimum score of 13 points in each section) under the Considerate Constructors Scheme.
- 9.3 They will also be required to set targets, monitor and report on energy and water use arising from site based activities and adopt best practice policies in respect of air and water pollution.
- 9.4 A comprehensive Site Waste Management Plan (SWMP) will be developed prior to the start of construction reflecting the recognition that reduction of waste begins in the design and procurement stage of a project and carries on through to the sign-off and completion of the building. This SWMP will set targets and procedures for the sorting, reusing and recycling of construction waste into defined waste groups, either on site or through a licensed contractor. This plan will then be updated and monitored throughout the construction process, with any lessons fed back to all relevant parties at the end of the process.
- 9.5 Finally, all timber and timber based products used on the project as part of the construction process (shuttering, temporary fencing etc. – not fundamental elements of the final buildings which is covered in Section 5 - Materials) will be from suppliers that can demonstrate that the timber is from legally harvested and traded sources.

## 10.0 Summary & Next Steps

- 10.1 In summary, the proposed scheme as outlined in this and other documents and drawings submitted is felt to comply with OCC policy with regards energy and sustainability.
- 10.2 Carbon dioxide emissions are minimised across the site, including both for the building fabric and services and will meet the requirement of a 40% reduction in carbon emissions.
- 10.3 Water efficiency, site/construction management and the generation of waste, whilst seeking to maximise reuse and recycling strategies, have all been addressed.
- 10.4 Attention will be paid to the sustainable procurement of materials, using local supplies where feasible, with attention being paid to the internal air quality of the dwellings too.
- 10.5 The emerging Local Plan supports the monitoring of schemes in the form of post construction testing in order to improve understanding of the issues and also to ensure that performance standards for low carbon buildings are linked to as-built performance.
- 10.6 Therefore, it is proposed that Blewburton Limited can, on completion of construction, undertake a confirmation exercise of the anticipated carbon savings through the production of 'As Built' SAP calculations.
- 10.7 They will also be available to undertake a site visit to visually confirm that those issues identified within this report that can be seen have been implemented and they will seek additional paperwork and reports for verification from the appointed main contractor for this scheme to allow for an 'As Built' energy and sustainability statement to be issued to OCC for formal sign off.

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