

## **Climate Change, Energy & Sustainable Development Questionnaire**

**The Hillier Almshouses, Farnham Road, Guildford**

Prepared by Ivan Ball

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**8<sup>th</sup> November 2023**



Applicant's name:	The Hillier Almshouses
Agent's name:	Nye Saunders
Site Address:	Farnham Road, Guildford
Application reference (if known):	Not Known
Description of proposal: (e.g. total and types of units/floorspace)	Construction of a first-floor extension to provide four new 1-bedroom apartments and the construction of a ground-floor Dayroom.
Questionnaire prepared by: (name and qualification/job title)	Ivan Ball – Bluesky Unlimited – Sustainability Consultant
Signature of above:	
Energy information prepared by: (name and qualification/job title):	Ivan Ball – Bluesky Unlimited – Sustainability Consultant
Signature of above:	

## Part 1: Sustainable design, construction and climate change adaptation

### 1. Efficient use of minerals, use of secondary aggregates, waste minimisation and reuse of material from excavation and demolition (Policy D2 1a & 1b). See 'Error! Reference source not found.' in the sustainable design and construction guide in section 5 of the SPD.

1.a Will the use of primary minerals be minimised through e.g. the use of renewable materials, recycled and secondary aggregates, and other recycled and reused materials? Please provide details.

*Recycled and secondary aggregates will be used where feasible.*

1b. Will demolition/excavation material from the proposed works be reused on site? Please provide details of where material will be derived and where it will be used.

*There are minimal areas of demolition, which can be identified between the existing and proposed plans. The demolition is required to provide a more efficient and coherent layout.*

1c. Will unused mineral waste be sent for reuse or recycling? Please provide details.

*Any mineral waste will be stored separately from general waste and will be reused or recycled.*

1d. Will non-mineral construction waste (e.g. packaging, timber, plastics) be minimised? Please provide details.

*Any non-mineral waste will be minimised and will be segregated from general waste and will be recycled where applicable.*

1e. Will locally sourced materials be used? Please provide details.

*Where practical locally sourced materials will be specified. Any external materials will be specified to match the existing.*

1f. Will materials be sustainably sourced (e.g. FSC certified timber)? Please provide details.

*All structural timber will be FSC or PEFC certified.*

**2. Low energy design: landform, layout, building orientation, massing and landscaping (Policy D2 1c and 2). See 'Error! Reference source not found.' and 'Error! Reference source not found.' in the sustainable design and construction guide in section 5 of the SPD.**

2a. Will operational energy demand be minimised through low energy design and the use of energy efficient fabric? Please provide details. This information should align with the energy data provided in parts 2a and 2b of this questionnaire.

*The specification of the thermal elements will follow good practice standards and will seek to exceed the requirements set out in Approved Document L1.*

2b. Has the layout of the site, landscaping and orientation of buildings taken account of solar receipts and other environmental factors to reduce the need for mechanical heating and artificial lighting in the development? Please provide details.

*The layout of the apartments has been designed within the context of the existing building. However, Flat 30 has principal orientations towards the south, Flat 31 towards the north and south, Flat 32 towards the north and Flat 33 towards the east, west and north.*

2c. Will the internal layout of buildings make best use of solar gain and natural light? Please provide details.

*See 2B above.*

2d. Will passive cooling/ventilation measures be incorporated into the scheme? Please provide details.

*The traditional construction of the building provides for high thermal mass and all windows will be openable to provide purge ventilation in summer periods.*

2e. Will the scheme include mechanical cooling (e.g. air conditioning)? If so, explain why passive measures would not be adequate.

*The design of Flats 31 & 33 provides for cross ventilation.*

**3. Water efficiency (Policy D2 1d). See 'Error! Reference source not found.' in the sustainable design and construction guide in section 5 of the SPD.**

3a. If the scheme includes new dwellings, will these be designed to the national optional building regulation water efficiency standard of 110 litres per person per day (regulation 36(2b))? The relevant Water Efficiency Calculation (s) (Part G) for the new dwellings should be submitted to the Council prior to occupation.

*The apartments will achieve a water efficiency standard of 110 litres per person per day and a sample specification is attached.*

3b. For all developments, will water efficiency measures be incorporated into the scheme to reduce the demand for water? Please provide details.

*See above.*

3c. For all developments, will water harvesting measures be incorporated into the scheme? Please provide details.

*There is insufficient space to include any external rainwater harvesting tanks and no new soft landscaping is provided. Internal greywater harvesting is not appropriate and therefore not proposed.*

**4. Measures that enable sustainable lifestyles for building occupants (Policy D2 1e). See 'Error! Reference source not found.' in the sustainable design and construction guide in section 5 of the SPD.**

4a. Will measures that enable sustainable lifestyles for building occupants be incorporated into the scheme? Please provide details.

*The apartments are within an existing developed residential area. They are close to community, retail and leisure facilities. The apartments are also close to existing public transport routes.*

**5. Climate change adaptation (Policy D2 4 and P4). See 'Error! Reference source not found.' in the sustainable design and construction guide in section 5 of the SPD.**

5a. Will the scheme incorporate adaptations for the full range of expected climate impacts including: hotter/drier summers, warmer/wetter winters, more frequent and severe heatwaves and overheating, and more frequent and severe heavy rainfall events and flooding? Please provide details.

*The apartments are to be provided within an existing building which has been constructed using traditional methods. This includes masonry walls, concrete lower floors and tiled roofs. The heavy weight structure will provide for cooling conditions within the summer period and the openable windows provide for cross ventilation during the night-time periods (to Flats 31 & 33). Glazing will be double glazed and the 'g' value (solar transmittance) will be optimised to balance maximising winter solar gain versus minimising summer overheating. The development does not include any additional parking spaces and therefore EV charging points are not proposed.*

5b. Will the use of soft landscaping and permeable surfaces be maximised (as opposed to hard surfacing)? Please provide details.

There is an existing courtyard within the horseshoe shape of the building, which includes existing soft landscaping.

5c. Will surface water be managed by Sustainable Drainage Systems (SuDS)? Please provide details.

*There will be no changes to the volume or rate of runoff from the building.*

**6. Any further information**

6. Please provide information about any other sustainable design, construction and climate change measures that will be incorporated into the scheme.

*See above.*

## Part 2a: Energy

### 7. Combined (Cooling) Heating and Power ((C)CHP) networks (Policy D2 6, 7 and 8).

7a. Will the development fall within the vicinity of a (C)CHP/heat distribution network (of any scale from single building to district heat)? If so, please list the identified networks.

*It is understood the site is not within the vicinity of a heat distribution network.*

7b. If the development will fall within the vicinity of a (C)CHP/heat distribution network, will the proposed development connect to it or be connection-ready? If not, please set out a clear justification.

*The proposal is for the extension of an existing building to provide four new apartments and a new dayroom. The connection to an external network is not practical or appropriate.*

7c. Is the development within a Heat Priority Area? If so, is a (C)CHP or heat distribution network proposed as the primary source of energy for the development? If not, please set out a clear justification.

*It is understood the site is not within the vicinity of a heat priority area.*

7d. If a new (C)CHP or heat distribution network is proposed, is it designed in accordance with the CIBSE Heat Networks Code of Practice? If not, please provide a clear justification.

*N/A*

### 8. Low and zero carbon energy

8. If the scheme includes the provision of low and zero carbon technologies, provide details of the proposed energy systems here including: type of technology, location of installation and predicted energy yield.

*Heat pump hot water cylinders will provide hot water to the four new apartments. In addition, an array of photovoltaic panels is proposed on the east orientated existing pitched of the building. The strategy follows a fabric first approach.*

### 9. New buildings: Carbon reduction calculation

9a. Will the proposed scheme deliver any new buildings (net or gross)?

*The proposal is for four new 1-bedroom apartments.*

9b. If the answer to 9a is yes, please complete the following carbon reduction calculation template in part 2b.

## Part 2b: Carbon reduction calculation

For guidance on how to complete this table, see section '**Error! Reference source not found.**' in section **Error! Reference source not found.** of the SPD. Add more rows as appropriate.

1. Reference	2. Target Emission Rate (TER)	3. Dwelling Emission Rate (DER) or Building Emission Rate (BER)	4. % carbon reduction from TER
Flat 30-33	13.00	5.73	55.92%

*The calculations are based on Part L – 2021. The dayroom needs to achieve minimum U-values for the various thermal elements but a SAP calculation is not required.*

# Summary for Input Data



Property Reference	Hillier 1BF 37 TOP		Issued on Date	08/11/2023
Assessment Reference	Hillier 1BF 37 TOP	Prop Type Ref	1BF 37 TOP	
Property	Hillier Almshouse, Farnham Road, Guildford, Surrey, GU27LT			

SAP Rating	83 B	DER	5.73	TER	13.00
Environmental	97 A	% DER < TER			55.92
CO <sub>2</sub> Emissions (t/year)	0.19	DFEE	17.73	TFEE	19.88
Compliance Check	See BREL	% DFEE < TFEE			10.85
% DPER < TPER	9.33	DPER	62.06	TPER	68.44

Assessor Details	Mr. Ivan Ball	Assessor ID	X001-7283
Client			

## SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North	
Property Tenure	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Top-floor flat	
Which Floor	2	
2.0 Number of Storeys	1	
3.0 Date Built	2023	
4.0 Sheltered Sides	3	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m <sup>2</sup> K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	Yes	
Smart gas meter fitted	Yes	

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	9.44 m	37.00 m <sup>2</sup>	2.40 m

8.0 Living Area	19.80	m <sup>2</sup>
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Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Gross Area(m <sup>2</sup> )	Nett Area (m <sup>2</sup> )	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		22.66	15.91	0.00	None	6.75	Enter Gross Area

Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Single plasterboard on both sides, dense cellular blocks, cavity	0.00		41.52		None

Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Gross Area(m <sup>2</sup> )	Nett Area (m <sup>2</sup> )	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof	External Flat Roof	Plasterboard, insulated flat roof	0.10	9.00	37.00	37.00	None	0.00	Enter Gross Area	0.00

Description	Storey Index	Construction	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Party Floor 1	Lowest occupied	Timber I-joists, carpeted	20.00	37.00

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m <sup>2</sup> K)

# Summary for Input Data



Opening Type 1      Manufacturer Window      Double Low-E Soft 0.05      0.63      0.70      1.20

## 13.0 Openings

Name	Opening Type	Location	Orientation	Area (m <sup>2</sup> )	Pitch
Living Room	Opening Type 1	External Wall 1	South	2.70	
Kitchen	Opening Type 1	External Wall 1	South	1.35	
Bedroom	Opening Type 1	External Wall 1	South	2.70	

## 14.0 Conservatory

None

## 15.0 Draught Proofing

100 %

## 16.0 Draught Lobby

No

## 17.0 Thermal Bridging

Calculate Bridges

### 17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Non Gov Approved Schemes	4.50	0.06	0.06	No
E3 Sill	Non Gov Approved Schemes	4.50	0.04	0.04	No
E4 Jamb	Non Gov Approved Schemes	9.00	0.02	0.02	No
E10 Eaves (insulation at ceiling level)	Non Gov Approved Schemes	9.44	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Non Gov Approved Schemes	9.44	0.04	0.04	No
E18 Party wall between dwellings	Non Gov Approved Schemes	4.80	0.04	0.04	No

Y-value      0.03      W/m<sup>2</sup>K

## 18.0 Pressure Testing

Yes

Designed AP<sub>50</sub>      4.00      m<sup>2</sup>/(h.m<sup>2</sup>) @ 50 Pa

Test Method      Blower Door

## 19.0 Mechanical Ventilation

### Mechanical Ventilation

Mechanical Ventilation System Present      No

## 20.0 Fans, Open Fireplaces, Flues

## 21.0 Fixed Cooling System

No

## 22.0 Lighting

No Fixed Lighting      No

Name	Efficacy	Power	Capacity	Count
Lighting 1	80.00	5	400	26

## 24.0 Main Heating 1

SAP table

Percentage of Heat      100.00 %

Fuel Type      Electricity

SAP Code      405

In Winter      100.00

In Summer      170.00

Controls SAP Code      2403

## 25.0 Main Heating 2

None

## 26.0 Heat Networks

None

Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1									
Heat source 2									
Heat source 3									
Heat source 4									
Heat source 5									

## 28.0 Water Heating

Water Heating      Independent

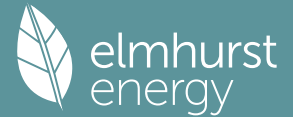
SAP Code      941

Fuel Type      Electricity

Flue Gas Heat Recovery System      No

Waste Water Heat Recovery Instantaneous System 1      No

# Summary for Input Data



Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	No
Cold Water Source	From mains
Bath Count	1

## 28.3 Waste Water Heat Recovery System

### 29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	No
Cylinder In Heated Space	No
Independent Time Control	No
Insulation Type	Measured Loss
Cylinder Volume	200.00 L
Loss	1.20 kWh/day
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	No

### 31.0 Thermal Store

None

### 32.0 Photovoltaic Unit

One Dwelling	
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	No
Battery Capacity [kWh]	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
0.40	South	30°	Modest		No	0.80		

### 34.0 Small-scale Hydro

None

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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### Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
		0	0
		0	0
		0	0



## Water efficiency measures

In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

The water efficiency measures included will ensure that the water use target of 110 litres per person per day is achieved for the apartments (including 5l/p/d for external water use). This is the standard set by the optional requirements of the Building Regulations (Part G – 2016) and exceeds the requirements of the planning policy.

Water efficient devices will be fully evaluated, and installed, wherever possible. The specification of such devices will be considered at detailed design stage and each will be subject to an evaluation based on technical performance, cost and market appeal, together with compliance with the water use regulations.

The following devices will be incorporated within the apartments:

- water efficient taps;
- water efficient toilets;
- low output showers;
- flow restrictors to manage water pressures to achieve optimum levels and
- water meters.

Below is a typical specification, which would achieve the 105 Litres per person per year target (excluding five litres per person per day allowance for external water use).

Schedule of Appliance Water Consumption		
Appliance	Flow rate or capacity	Total Litres
WC	6/3 litres dual flush	17.64
Basin	2.0 litres/min.	4.74
Shower	9.0 litres/min	39.33
Bath	175 litres	19.25
Sink	5.0 litres/min	12.56
Washing Machine	6.75 litres/kg	14.18
Dishwasher	1.25 litres/places	4.50
		112.20
	Normalisation Factor	0.91
		102.10