02.02.2023

Re: sustainability Report CON 7

The application is being submitted by the agent HSDesign on behalf of the Energy Assessor ATSPACE Ltd;

Josh Cunningham
Energy Team Manager

ATSPACE LTD | DELIVERING BEYOND COMPLIANCE
T. 0345 6465 454
E. josh.cunningham@atspaceltd.com W. www.atspaceltd.co.uk
A. Cokenach Estate |Unit 3 & 4|Barkway|Herts|SG8 8DL
ATSPACE LTD Registered No. .8086772 |VAT 934 3705 24

Condition Description:

Prior to above ground works, a detailed energy assessment shall be submitted to and approved in writing by the Local Planning Authority. The energy assessment shall demonstrate how the development will achieve a zero-carbon target through the application of the London Plan energy hierarchy, Be Clean, Be Lean and Be Green in combination with any offsite contribution. The assessment shall provide full details of the measures to be incorporated into the development and their impact on the baseline development (2013 building regulation compliance) in terms of energy (KwHr) and CO2 (KgCo2). The scheme shall demonstrate how the applicant has tried to achieve the full zero carbon onsite and to justify why a lower onsite saving is achieved if applicable.

The assessment shall provide full details of the plans and specifications of any low and zero carbon technology to be used including, for example, roof plans and elevations if PVs are selected. The assessment shall clearly set out any shortfall in emissions below the zero carbon. Thereafter, the development must proceed and be operated in accordance with the approved plans and specifications.

1.1. Working toward Compliance

The Energy Assessor Team; ATSPACE have been tasked with reviewing the proposed scheme and to consider the points raised in the original report compiled by JAW Sustainability on **21st November 2019 REV 02**.

As the development is a major residential development it is required to be zero carbon. In line with the London Plan, there is a target of a 35% reduction over Part L 2013 on site. The rest will be required to be made up via a carbon offset payment. The commercial space is a minor development so is only required to meet Part L. Table 3-1 below details the energy and carbon breakdown of the Part L target emission rate.

	Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)					Electricity CO2 (kg/yr)	Total Energy	Total CO2
	Space Heating	Hot Water	Total		Space Heating	HW	Cooling	Pumps & Fans	Lighting	Total			
Resi	38,745	26,029	64,775	13,991	0	0	0	900	3,607	4,507	2,339	69,282	16,331
Com	0	0	0	0	584	197	1,009	347	5,747	7,884	4,092	7,884	4,092

Table 3-1 Target regulated energy demand and carbon emissions per energy source

1.2. Review with ATSPACE

During the review process it was advised to review the design against the standard 19% Part L target and work towards the 35%. Below will outline how the applicant was attempted to comply with the report supplied by JAW Sustainability.

a. Rev 01; May 2022

Property reference	DER	TER	%DER<TER
Q-03466 APT.01	30.48	31.61	3.57 %
Q-03466 APT.02	25.9	27.56	6.02 %
Q-03466 APT.03	32.91	31.96	-2.98 %
Q-03466 APT.04	40.04	35.3	-13.42 %
Q-03466 APT.05	24.13	26.55	9.12 %
Q-03466 APT.06	24.26	23.42	-3.57 %
Q-03466 APT.07	25.28	26.44	4.38 %
Q-03466 APT.08	31.59	29.15	-8.36 %
Q-03466 APT.09	22.28	24.99	10.85 %
Q-03466 APT.10	28.7	28.04	-2.34 %
Q-03466 H.01	23.29	23.65	1.5 %
Q-03466 H.02	23.29	23.65	1.5 %

10 Unit scheme and 2 semi-detached properties;

- BFRC Rated double glazing [G-Value – 0.50]
- Air Permeability target – 3.00m3/hr/m2@50ps
- Direct electrical heating
- Centralised MVHR
- Solar Panels – account for initial failure in Part L1a

All the flats and dwellings would need to have their appropriate kWh increased to achieve a 19% reduction in CO2 emissions.

b. REV 02; July 2022

Property reference	DER	TER	%DER<TER
Q-03466 APT.01	21.42	31.61	32.23 %
Q-03466 APT.02	18.18	27.56	34.03 %
Q-03466 APT.03	24.77	31.96	22.49 %
Q-03466 APT.04	30.62	35.3	13.27 %
Q-03466 APT.05	15.48	26.55	41.7 %
Q-03466 APT.06	16.49	23.42	29.6 %
Q-03466 APT.07	17.29	26.44	34.6 %
Q-03466 APT.08	22.09	29.15	24.23 %
Q-03466 APT.09	14.81	24.99	40.74 %
Q-03466 APT.10	20.91	28.04	25.44 %
Q-03466 H.01	16.26	23.65	31.23 %
Q-03466 H.02	16.5	23.65	30.22 %

10 Unit scheme and 2 semi-detached properties;

- BFRC Rated double glazing [G-Value – 0.50]
- Air Permeability target – 3.00m3/hr/m2@50ps
- Direct electrical heating
- Centralised MVHR
- Solar Panels – account for initial failure in Part L1a

Further increase PV allocation and increase U-Values, cold bridge calculations et. All the flats and dwellings would need to have their appropriate kWh increased to achieve a 29.40% reduction in CO2 emissions. Better than current Part La of 19%

c. REV 03; October 2022

Property reference	DER ($kg/CO_2/m^2/yr$)	TER ($kg/CO_2/m^2/yr$)	%DER<TER
Q-03466 APT.01	18.13	31.61	42.64 %
Q-03466 APT.02	15.07	27.56	45.32 %
Q-03466 APT.03	21.01	31.96	34.26 %
Q-03466 APT.04	30.62	35.3	13.27 %
Q-03466 APT.05	15.29	26.55	42.41 %
Q-03466 APT.06	16.15	23.42	31.05 %
Q-03466 APT.07	17.16	26.44	35.1 %
Q-03466 APT.08	21.4	29.15	26.59 %
Q-03466 APT.09	13.99	24.99	44.02 %
Q-03466 APT.10	19.88	28.04	29.11 %
Q-03466 H.01	15.93	23.65	32.63 %
Q-03466 H.02	16.17	23.65	31.61 %

10 Unit scheme and 2 semi-detached properties;

- BFRC Rated double glazing [G-Value – 0.50]
- Air Permeability target – 3.00m3/hr/m2@50ps
- Direct electrical heating
- Centralised MVHR
- Solar Panels – account for initial failure in Part L1a

Further increase PV allocation and increase U-Values, cold bridge calculations et. All the flats and dwellings would need to have their appropriate kWh increased to achieve a 34.06% reduction in CO2 emissions. Shortfall of 339.89kg of CO2.

1.3. Conclusion

Based on the above revision 3 CO2 reduction review, ATSPACE have undertaken the following SAP assessments [See Appendix A].

Residential;

CombineReports_Q-03466 APT.01_Design V4.pdf

CombineReports_Q-03466 APT.02_Design V4.pdf

CombineReports_Q-03466 APT.03_Design V4.pdf

CombineReports_Q-03466 APT.04_Design V4.pdf

CombineReports_Q-03466 APT.05.pdf

CombineReports_Q-03466 APT.06.pdf

CombineReports_Q-03466 APT.07.pdf

CombineReports_Q-03466 APT.08.pdf

CombineReports_Q-03466 APT.09.pdf

CombineReports_Q-03466 APT.10.pdf

CombineReports_Q-03466 H.01.pdf

CombineReports_Q-03466 H.02.pdf

Commercial;

BRUKL Report.pdf

SAP Calculations Based on the following; [See Appendix B]

Fabric Component	Resi/ Commercial	Comments
Ground Floor Slab	0.12 W/m2.K	100mm PIR insulation 0.022 W/m.K
Flat Roof [Green Roof]	0.12 W/m2.K	2x Kingspan GreenGuard GG300 – 140mm
Slope Roof	0.15 W/m2.K	70mm above and 70mm between
External Walls	0.12 W/m2.K	75mm Koolthrm K106 with 50mm cavity
Dormer Cheeks	0.14 W/m2.K	
Commercial & Resi Floor	0.12 W/m2.K	2x90mm Kingspan mechanical fix to ceilings
Windows	1.2 W/m2K	G=0.63
Thermal Bridging	Default	

The above u-values represent the maximum beneficial range of U-Value fabric performance suitable for the development. Any increased U-Values would represent diminishing returns and the subsequent root to improve the carbon reduction is through green technologies.

Triple glazing has also been investigated as an option to further reduce the emission rate of the building. This however would create a minimal improvement in the efforts of the building to get closer to Net Zero as there is a high likelihood the G-value of glazing would decrease. The G-value decreasing would cancel out the improvement reducing the U-value of the windows, therefore this is not seen as an acceptable option, especially when taking into consideration the cost of changing to triple glazing. We would deem this to not be economically feasible at this stage of development.

1.4. Renewable Energy

Based on the original JAW Sustainability report, further review of the Green Technologies have been undertaken;

<u>Rejected options and reasoning</u>

1. **Solar Thermal Collectors**
   Devices cannot generate solar thermal energy with the consistency of most fossil fuels, and cannot usually produce solar energy on cloudy days, or after dark. This makes it an unreliable source of energy and contributes to its expense, as those relying on solar energy must have back-up power sources.

   With the lack of roof space and the inconsistency of the system subject to weather conditions, high capital investment and storage concerns, this system is not feasible. If the proposed scheme incorporated a central plant space, this system could be incorporated, however the scheme is not designed to allow for a centralised plant space from planning.

2. **Biomass Heating**
   Biomass is not considered feasible for this development due to issues with fuel storage, access for delivery vehicles and local NOx emissions

3. **Wind Turbines**
   This development is in an urban environment and so a wind turbine will not generate a significant amount of energy.

4. **Ground Source Heat Pump**
   GSHP are not a feasible technology for the site since there is a limited external space available for installation of boreholes.

5. **Air Source Heat Pump**
   A communal system would not be feasible for the development due to its size. The use of individual ASHP is technically feasible, however there is limited roof space that will already be taken up by Solar PV and amenity areas, and units located on the balcony would be noisy. Split system heating cooling has been proposed for the retail space, but not for the residential development.

   In most cases, a backup electrical boiler is required for ASHP. An efficient boiler with storage capacity installed within a well-insulated and air tight dwelling is more cost affective in this situation.

Proposed system

1. **Solar Photovoltaic Panels [Appendix C]**
   There are areas of flat roof that can incorporate solar technologies. Solar PV is ideal for making carbon savings while being a simple technology.

   The current PV array equates to 14,070 kWh/ Year based on 42nr solar panels [335 watt per panel]*

   **Note; JAW Sustainability report allowed for only 29no panels to generate 9.3Kwp.*

1.5. Carbon Off Site;

The measures identified above will be used to achieve a **35%** reduction in Carbon Dioxide emissions. For the residential part, there is a target of "Zero Carbon", which can be achieved through an offset payment when there is a shortfall in site.

The London Plan requires all major developments to achieve net zero carbon. A minimum of a 35 per cent on-site carbon improvement on national Building Regulations must be met and the shortfall to zero carbon is offset by making a cash-in-lieu contribution into the relevant LPA's carbon offset fund. Planning applicants are expected to maximise savings on-site before offsetting.

Following the in-depth design review of the approved planning approval, using a mix of traditional and off-site measures, the proposed scheme achieves 34.06% Carbon Reduction.

On-Site Carbon Reduction;

1. Fabric Efficient Design
2. Air Tightness 3m3/(h.m") @ 50 Pa
3. Electrical direct acting boilers with tanks, including UFH.
4. PV panels
5. MVHR systems
6. G-Glazing to reduce thermal gains in summer
7. 100% Energy Saving light bulbs

Off-site Measures

1. Prefabricated 4th floor using metsec systems and external rain screen
2. Fabricating house floor panels in I-Joists or Posi-Joists/ Posi-Trusts to minimise time on site.
3. Sofit brick systems pre-made off site and installed over windows & balconies.
4. Pre-Cast Staircase procured off site and installed as build commences per floor.

Following the review of Hillingdon Council Our Climate Change Declaration 2030, which implemented the changes in Jan 2020. The amount set out in the original JAW Sustainability Report outlines Offset Payment of £60/tonne equating to £19,067.00

Shortfall on zero carbon for Residential		
Carbon emissions (tonnes / annum)	30 year carbon emissions	Offset payment (£60/tonne)
10.59	318	£ 19,067

Table 3-11 Carbon offset payment

ATSPACE LTD;

After the continued reworking of the development the property is achieving 34.06% - a shortfall of 339.89kg of CO2 from the set 35%. Based on the S106 document signed by the client it states 'Carbon offset Contribution' means a one off payment at £1,800.00 per tonne for each tone where the actual carbon emission is below the carbon emission target [if appliable].

Measuring the Carbon Offset payment; **After acceptance of this document by Hillingdon Council, ATSPACE LTD's next step would be to calculate the exact shortfall between the development's current emission rate and Net Zero. This would then be monetised based on the above-mentioned cost per ton [from 34.06% to Net Zero].**

1.6. Conclusion

This report summarises the proposed sustainable strategy for development at The Star in order to meet the sustainability requirements of the London Borough of Hillingdon and the London Plan. The site is located in the London Borough of Hillingdon. The proposed development consists of 112m2 of commercial space on the ground floor, with 10 apartments located across 3 stories above the commercial space. The site also includes 2 3 storey houses on the same site, as well as covered parking.

As required by the London Plan, the development follows the energy hierarchy, incorporating passive design measures, energy efficient equipment and renewable energy.

The residential section of the development is a major residential development it is required to be zero carbon. The development employs an efficient building fabric, including well insulated walls and highly efficient glazing, efficient systems and PV Panels are specified to maximise carbon savings for the site, resulting in a 34.06% improvement over Part L for the residential areas. The development will further achieve 'zero carbon' through an offset payment in line with the London Plan guidance.

After review of the Original JAW Sustainability Report, ATSPACE has commented on the assumptions and somewhat inaccurate assessment of the renewable energy usage and u-values applied by JAW Sustainability.

Regards,

Josh Cunningham
Energy Team Manager

ATSPACE LTD | DELIVERING BEYOND COMPLIANCE

Assistance from

HSD Developments [UK] Ltd

Appendix A

FINAL VERSION SAP CALCULATION [RESI] AND STATEMENT FOR COMMERCIAL COMPLIANCE

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

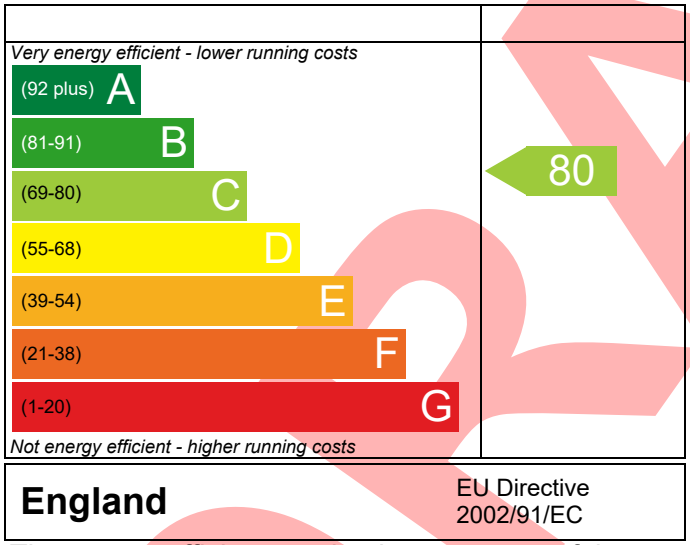
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/09/2022
Produced by:	Paul Whiffin
Total floor area:	49.86 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

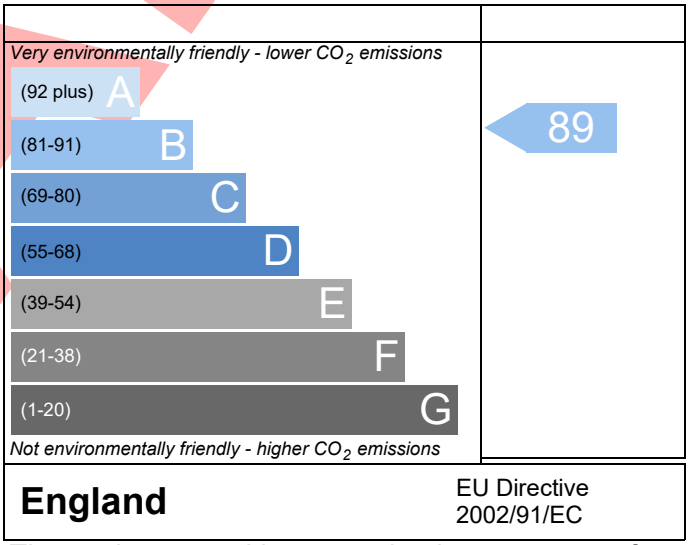
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.01	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	80 C	**DER**	18.13	**TER**	31.61
Environmental	89 B	**% DER<TER**	42.64		
CO_2 Emissions (t/year)	0.73	**DFEE**	34.98	**TFEE**	56.44
General Requirements Compliance	Pass	**% DFEE<TFEE**	38.02		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	31.61	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	18.13	$kgCO_2/m^2$	Pass
	-13.48 (-42.6%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.44	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	34.98	$kWh/m^2/yr$	
	-21.4 (-37.9%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.03 (max. 0.25)	0.03 (max. 0.70)	Pass
Openings	1.26 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing South	13.86 m², No overhang		
Windows facing West	4.09 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Exposed floor U-value	0.05	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	882.64	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.01	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	80 C	**DER**	18.13	**TER**	31.61
Environmental	89 B	**% DER<TER**	42.64		
CO_2 Emissions (t/year)	0.73	**DFEE**	34.98	**TFEE**	56.44
General Requirements Compliance	Pass	**% DFEE<TFEE**	38.02		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.84 m	49.86 m²	2.52 m

7.0 Living Area	24.44	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	37.90	17.86
Sheltered Wall	Cavity Wall	0.13	17.14	17.14

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	20.76

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Exposed Floor	Exposed Floor - Solid		0.05	49.86

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
RW	Window	[1] External Wall	South	None	0.00					13.86	
RSW	Window	[1] External Wall	West	None	0.00					2.02	
RSGD	Window	[1] External Wall	West	None	0.00					2.07	
FSD	Door to Corridor	[1] External Wall	North							2.09	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	8.52	0.040	No	LABC
Independently assessed	E3 Sill	6.65	0.027	No	LABC
Independently assessed	E4 Jamb	23.32	0.029	No	LABC
Table K1 - Default	E20 Exposed floor (normal)	21.84	0.320	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	21.84	0.039	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	2.52	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	2.52	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	8.24	0.000	No	
Table K1 - Default	P8 Party Wall - Exposed floor (inverted)	8.24	0.240	No	LABC

Y-value	0.111	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00

Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	882.64	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

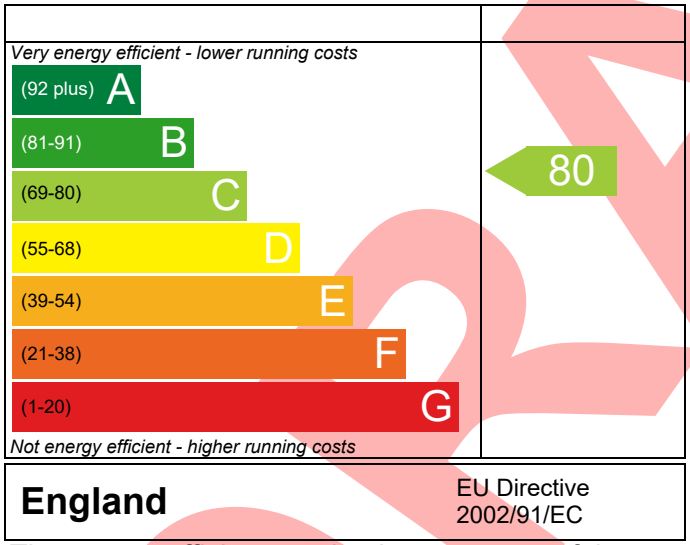
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/09/2022
Produced by:	Paul Whiffin
Total floor area:	71.76 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

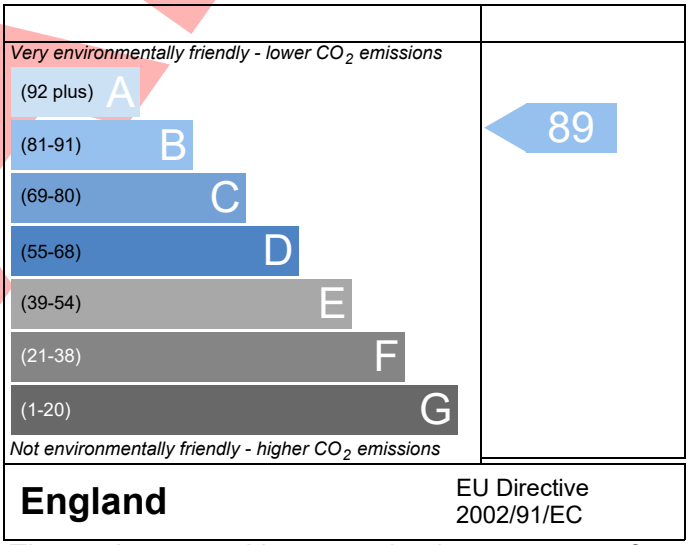
Energy Efficiency Rating



England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.02	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	80 C	**DER**	15.07	**TER**	27.56
Environmental	89 B	**% DER<TER**	45.32		
CO_2 Emissions (t/year)	0.83	**DFEE**	37.77	**TFEE**	53.28
General Requirements Compliance	Pass	**% DFEE<TFEE**	29.11		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	27.56	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	15.07	$kgCO_2/m^2$	Pass
	-12.49 (-45.3%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	53.28	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	37.77	$kWh/m^2/yr$	
	-15.5 (-29.1%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.03 (max. 0.25)	0.03 (max. 0.70)	Pass
Openings	1.23 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Slight		Pass
Based on:			
Overshading	Average		
Windows facing East	19.76 m², No overhang		
Windows facing South	16.03 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	Light-coloured curtain or roller blind, closed 100% of daylight hours		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Exposed floor U-value	0.05	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1270.32	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.02	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	80 C	**DER**	15.07	**TER**	27.56
Environmental	89 B	**% DER<TER**	45.32		
CO_2 Emissions (t/year)	0.83	**DFEE**	37.77	**TFEE**	53.28
General Requirements Compliance	Pass	**% DFEE<TFEE**	29.11		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.58 m	71.76 m²	2.52 m

7.0 Living Area	26.83	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	50.86	12.98
Sheltered Wall	Cavity Wall	0.13	3.53	3.53

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	36.28

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Exposed Floor	Exposed Floor - Solid		0.05	71.76

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.05			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	West							2.09	
RW	Window	[1] External Wall	East	Light-coloured curtain or roller blind	0.00					19.76	100
RSW	Window	[1] External Wall	South	Light-coloured curtain or roller blind	0.00					14.01	100
RSGD	Window	[1] External Wall	South	None	0.00					2.02	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	16.03	0.040	No	LABC
Independently assessed	E3 Sill	14.18	0.027	No	LABC
Independently assessed	E4 Jamb	37.58	0.029	No	LABC
Table K1 - Default	E20 Exposed floor (normal)	21.58	0.320	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	21.58	0.039	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	5.04	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	5.04	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	14.40	0.000	No	
Table K1 - Default	P8 Party Wall - Exposed floor (inverted)	14.40	0.240	No	LABC

Y-value	0.114	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502

Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	Yes	
Light and motion sensor	Yes	

23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	

Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	1270.32	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

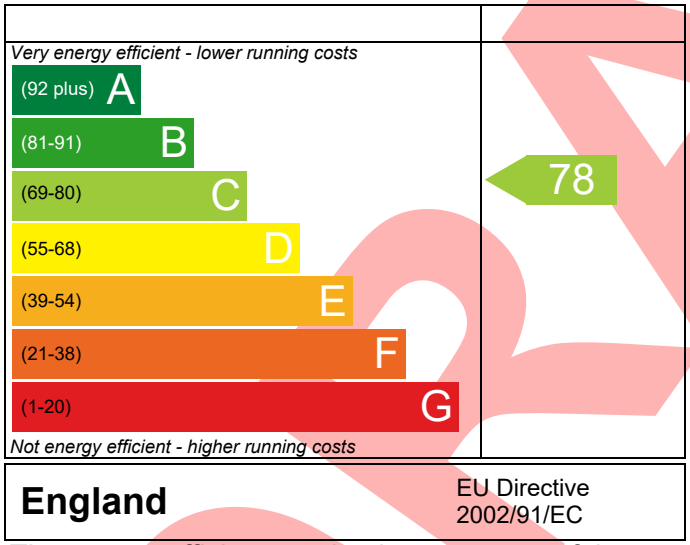
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/09/2022
Produced by:	Paul Whiffin
Total floor area:	50.78 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

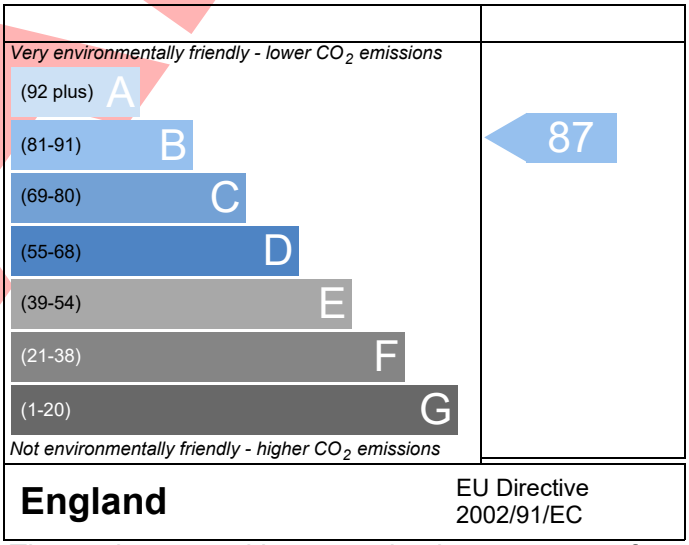
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.03	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	78 C	**DER**	21.01	**TER**	31.96
Environmental	87 B	**% DER<TER**	34.26		
CO_2 Emissions (t/year)	0.83	**DFEE**	42.54	**TFEE**	57.85
General Requirements Compliance	Pass	**% DFEE<TFEE**	26.47		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	31.96	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	21.01	$kgCO_2/m^2$	Pass
	-10.95 (-34.3%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	57.85	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	42.54	$kWh/m^2/yr$	
	-15.4 (-26.6%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.03 (max. 0.25)	0.03 (max. 0.70)	Pass
Openings	1.31 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing East	13.81 m², No overhang		
Windows facing South	4.09 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Exposed floor U-value	0.05	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	898.93	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.03	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	78 C	**DER**	21.01	**TER**	31.96
Environmental	87 B	**% DER<TER**	34.26		
CO_2 Emissions (t/year)	0.83	**DFEE**	42.54	**TFEE**	57.85
General Requirements Compliance	Pass	**% DFEE<TFEE**	26.47		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	15.33 m	50.78 m²	2.52 m

7.0 Living Area	27.11	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	28.07	5.99
Sheltered Wall	Cavity Wall	0.13	10.55	10.55

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	38.19

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Exposed Floor	Exposed Floor - Solid		0.05	50.78

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m^2)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	West							2.09	
RW	Window	[1] External Wall	East	None	0.00					13.81	
RSW	Window	[1] External Wall	South	None	0.00					2.07	
RSGD	Window	[1] External Wall	South	None	0.00					2.02	
FSD	Door to Corridor	[1] External Wall	West							2.09	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	8.50	0.040	No	LABC
Independently assessed	E3 Sill	6.65	0.027	No	LABC
Independently assessed	E4 Jamb	23.32	0.029	No	LABC
Table K1 - Default	E20 Exposed floor (normal)	15.33	0.320	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	15.33	0.039	No	
Independently assessed	E16 Corner (normal)	5.04	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	5.04	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	7.56	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	15.15	0.000	No	
Table K1 - Default	P8 Party Wall - Exposed floor (inverted)	15.15	0.240	No	LABC

Y-value	0.129	W/m^2K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00

Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	898.93	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

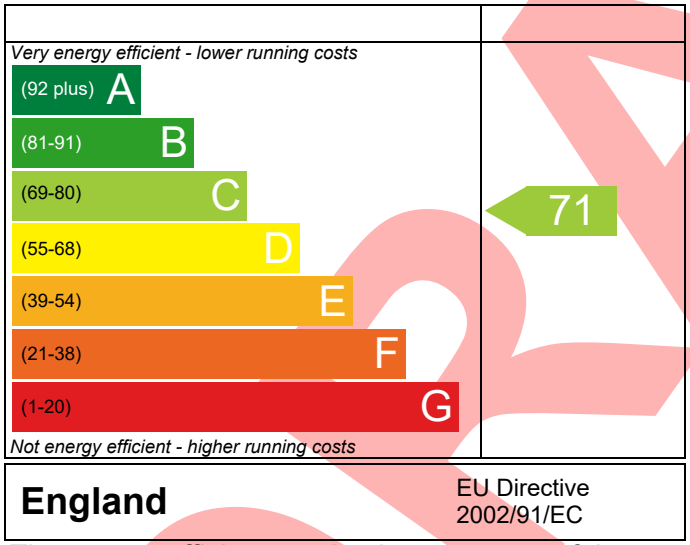
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/09/2022
Produced by:	Paul Whiffin
Total floor area:	52.99 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

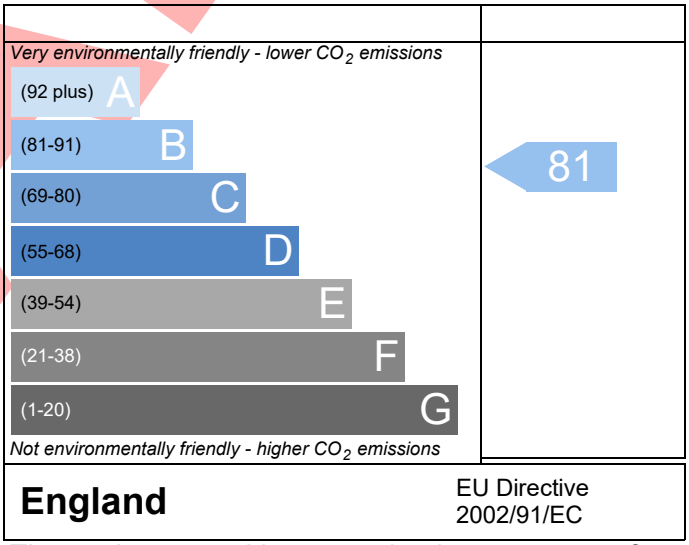
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.04	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	71 C	**DER**	30.62	**TER**	35.30
Environmental	81 B	**% DER<TER**	13.27		
CO_2 Emissions (t/year)	1.27	**DFEE**	62.70	**TFEE**	70.91
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.58		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	35.30	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	30.62	$kgCO_2/m^2$	Pass
	-4.68 (-13.3%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	70.91	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	62.70	$kWh/m^2/yr$	
	-8.2 (-11.6%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.18 (max. 0.25)	0.18 (max. 0.70)	Pass
Openings	1.24 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing North	18.12 m², No overhang		
Windows facing East	7.84 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	938.05	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.04	**Issued on Date**	21/09/2022
Assessment Reference	Design V4	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	71 C	**DER**	30.62	**TER**	35.30
Environmental	81 B	**% DER<TER**	13.27		
CO_2 Emissions (t/year)	1.27	**DFEE**	62.70	**TFEE**	70.91
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.58		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	South
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	26.73 m	52.99 m²	2.52 m

7.0 Living Area	24.10	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	54.76	26.71
Sheltered Wall	Cavity Wall	0.13	12.60	12.60

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	23.81

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Exposed Floor	Exposed Floor - Solid		0.35	52.99

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	South							2.09	
RW	Window	[1] External Wall	North	None	0.00					18.12	
RSW	Window	[1] External Wall	East	None	0.00					7.84	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	11.85	0.040	No	LABC
Independently assessed	E3 Sill	10.85	0.027	No	LABC
Independently assessed	E4 Jamb	28.10	0.029	No	LABC
Table K1 - Default	E20 Exposed floor (normal)	26.73	0.320	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	26.73	0.039	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Default	E25 Staggered party wall between dwellings	5.04	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	9.45	0.000	No	
Table K1 - Default	P8 Party Wall - Exposed floor (inverted)	9.45	0.240	No	LABC

Y-value	0.118	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	

Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	938.05	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

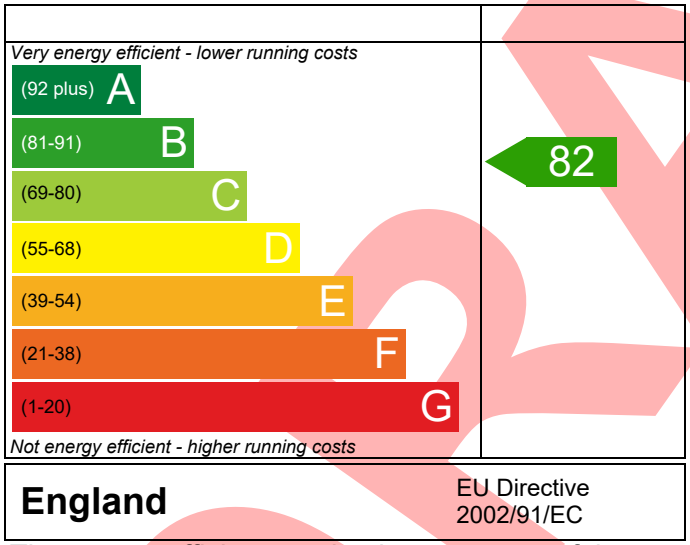
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	49.86 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

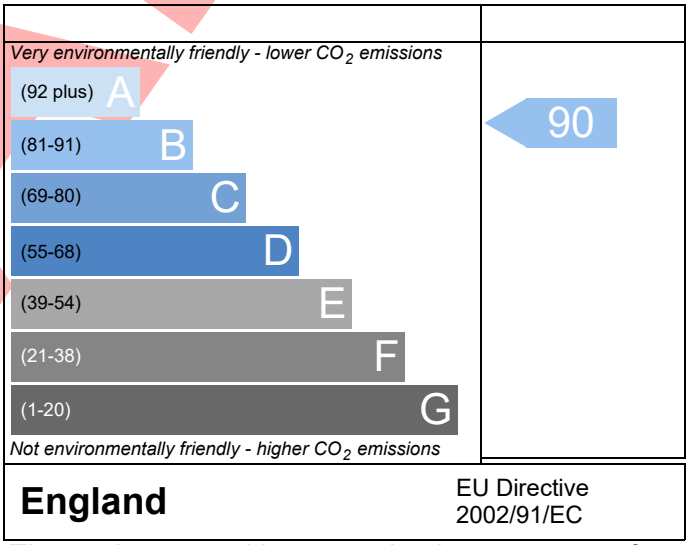
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.05	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	82 B	**DER**	15.48	**TER**	26.55
Environmental	90 B	**% DER<TER**	41.70		
CO_2 Emissions (t/year)	0.65	**DFEE**	28.86	**TFEE**	39.37
General Requirements Compliance	Pass	**% DFEE<TFEE**	26.70		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	26.55	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	15.48	$kgCO_2/m^2$	Pass
	-11.07 (-41.7%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.37	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	28.86	$kWh/m^2/yr$	
	-10.5 (-26.6%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.26 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing South	13.86 m², No overhang		
Windows facing West	4.09 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	882.64	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.05	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	82 B	**DER**	15.48	**TER**	26.55
Environmental	90 B	**% DER<TER**	41.70		
CO_2 Emissions (t/year)	0.65	**DFEE**	28.86	**TFEE**	39.37
General Requirements Compliance	Pass	**% DFEE<TFEE**	26.70		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.84 m	49.86 m²	2.52 m

7.0 Living Area	24.44	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	37.90	17.86
Sheltered Wall	Cavity Wall	0.13	17.14	17.14

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	20.76

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	13.10	13.10

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
RW	Window	[1] External Wall	South	None	0.00					13.86	
RSW	Window	[1] External Wall	West	None	0.00					2.02	
RSGD	Window	[1] External Wall	West	None	0.00					2.07	
FSD	Door to Corridor	[1] External Wall	North							2.09	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	8.52	0.040	No	LABC
Independently assessed	E3 Sill	6.65	0.027	No	LABC
Independently assessed	E4 Jamb	23.32	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	6.31	0.039	No	
Table K1 - Default	E14 Flat roof	15.53	0.080	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	2.52	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	2.52	0.120	No	
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	5.83	0.000	No	
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	2.41	0.240	No	

Y-value	0.057	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	882.64	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

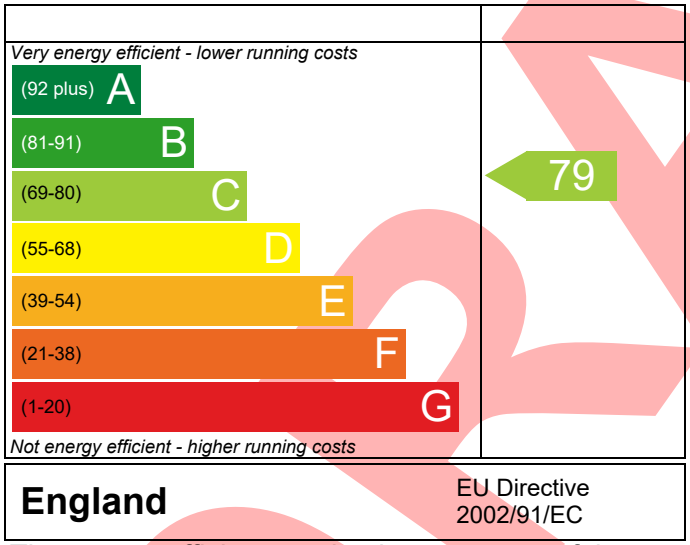
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	71.76 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

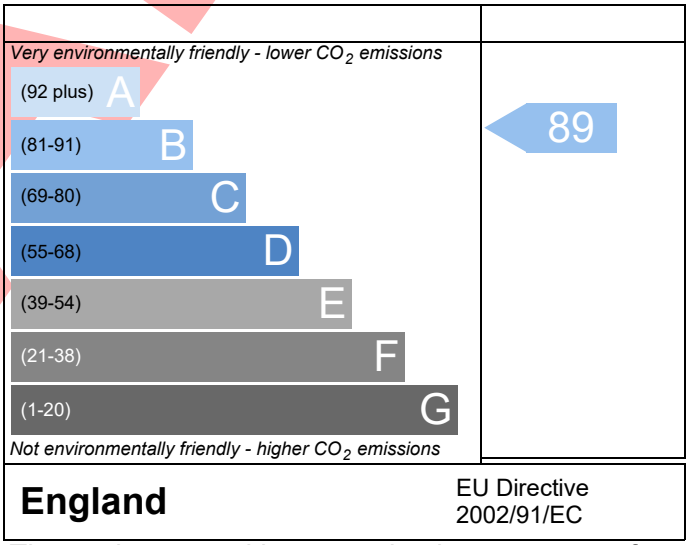
Energy Efficiency Rating



England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.06	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	79 C	**DER**	16.49	**TER**	23.42
Environmental	89 B	**% DER<TER**	29.60		
CO_2 Emissions (t/year)	0.88	**DFEE**	38.45	**TFEE**	39.49
General Requirements Compliance	Pass	**% DFEE<TFEE**	2.64		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	23.42	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	16.49	$kgCO_2/m^2$	Pass
	-6.93 (-29.6%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.49	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	38.45	$kWh/m^2/yr$	
	-1.1 (-2.8%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.23 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Slight		Pass
Based on:			
Overshading	Average		
Windows facing East	19.76 m², No overhang		
Windows facing South	16.03 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1270.32	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.06	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	79 C	**DER**	16.49	**TER**	23.42
Environmental	89 B	**% DER<TER**	29.60		
CO_2 Emissions (t/year)	0.88	**DFEE**	38.45	**TFEE**	39.49
General Requirements Compliance	Pass	**% DFEE<TFEE**	2.64		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.58 m	71.76 m²	2.52 m

7.0 Living Area	26.83	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	50.86	12.98
Sheltered Wall	Cavity Wall	0.13	3.53	3.53

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	36.28

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	26.67	26.67

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	Manufacturer	Window	Double Low-E Soft 0.1			0.50		0.70	1.20
Solid Door	Manufacturer	Door to Corridor							1.80

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	West							2.09	
RW	Window	[1] External Wall	East	None	0.00					19.76	
RSW	Window	[1] External Wall	South	None	0.00					14.01	
RSGD	Window	[1] External Wall	South	None	0.00					2.02	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	16.03	0.040	No	LABC
Independently assessed	E3 Sill	14.18	0.027	No	LABC
Independently assessed	E4 Jamb	37.58	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	3.06	0.039	No	
Table K1 - Default	E14 Flat roof	18.41	0.080	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	5.04	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	5.04	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	14.40	0.000	No	
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	2.41	0.240	No	

Y-value	0.066	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00

Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	1270.32	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

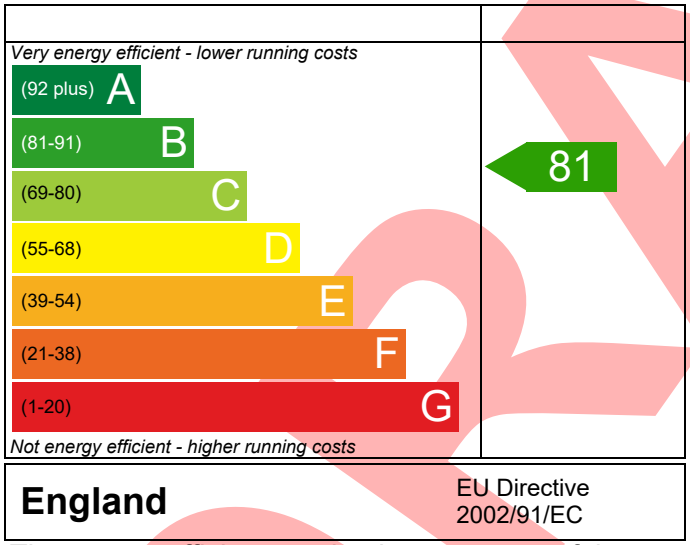
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	50.78 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

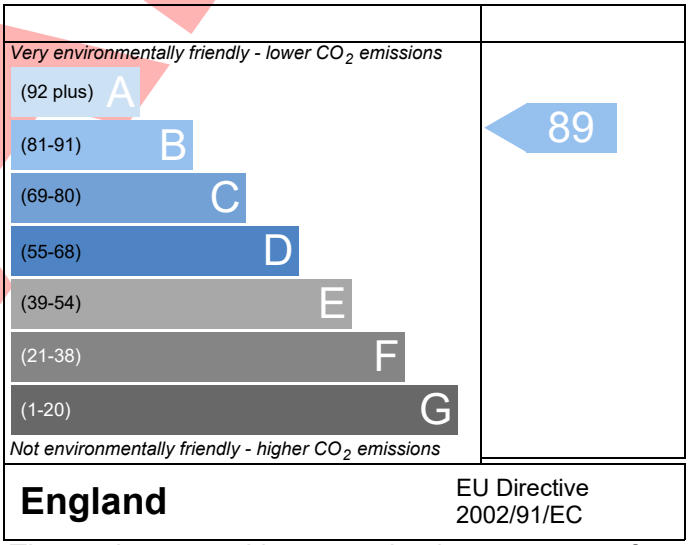
Energy Efficiency Rating



England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.07	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	81 B	**DER**	17.29	**TER**	26.44
Environmental	89 B	**% DER<TER**	34.60		
CO_2 Emissions (t/year)	0.70	**DFEE**	34.71	**TFEE**	39.39
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.88		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	26.44	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	17.29	$kgCO_2/m^2$	Pass
	-9.15 (-34.6%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.39	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	34.71	$kWh/m^2/yr$	
	-4.7 (-11.9%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.31 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing East	13.81 m², No overhang		
Windows facing South	4.09 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	898.93	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.07	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	81 B	**DER**	17.29	**TER**	26.44
Environmental	89 B	**% DER<TER**	34.60		
CO_2 Emissions (t/year)	0.70	**DFEE**	34.71	**TFEE**	39.39
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.88		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	15.33 m	50.78 m²	2.52 m

7.0 Living Area	27.11	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	28.07	5.99
Sheltered Wall	Cavity Wall	0.13	10.55	10.55

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	38.19

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	7.92	7.92

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m^2)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	West							2.09	
RW	Window	[1] External Wall	East	None	0.00					13.81	
RSW	Window	[1] External Wall	South	None	0.00					2.07	
RSGD	Window	[1] External Wall	South	None	0.00					2.02	
FSD	Door to Corridor	[1] External Wall	West							2.09	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	8.50	0.040	No	LABC
Independently assessed	E3 Sill	6.65	0.027	No	LABC
Independently assessed	E4 Jamb	23.32	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	6.90	0.039	No	
Table K1 - Default	E14 Flat roof	7.97	0.080	No	
Independently assessed	E16 Corner (normal)	5.04	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	5.04	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	7.56	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	15.15	0.000	No	

Y-value	0.072	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	898.93	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

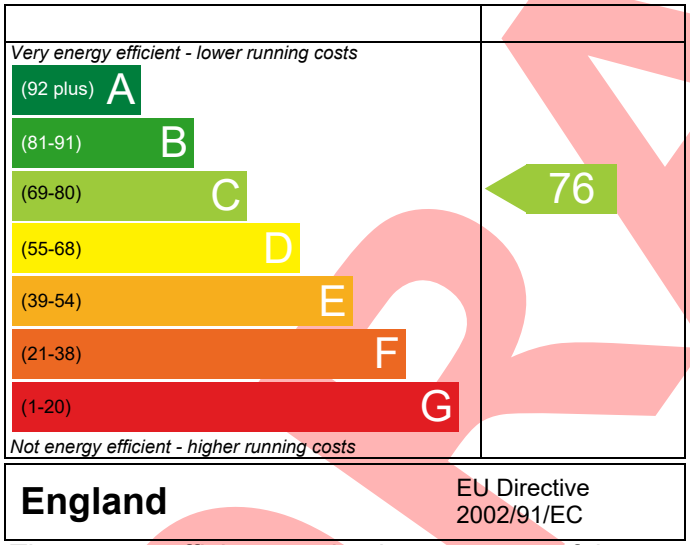
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	62.1 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

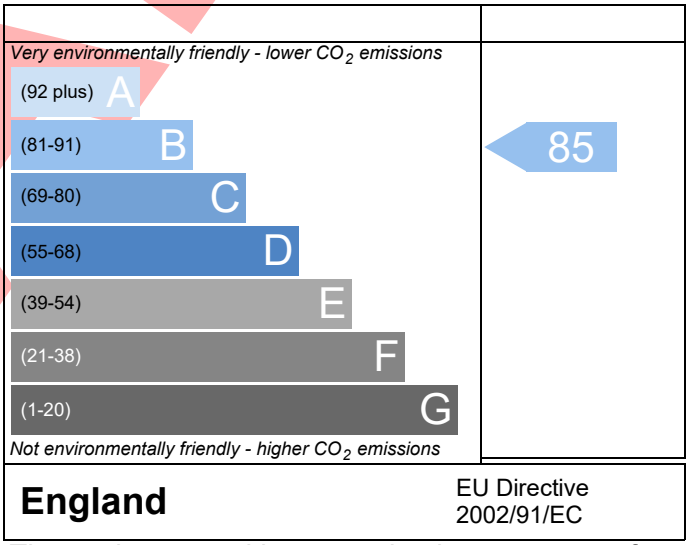
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.08	Issued on Date	21/07/2022
Assessment Reference	Design V3	Prop Type Ref	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	76 C	DER	22.09	TER	29.15
Environmental	85 B	% DER<TER	24.23		
CO_2 Emissions (t/year)	1.04	DFEE	48.61	TFEE	54.71
General Requirements Compliance	Pass	% DFEE<TFEE	11.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	Assessor ID	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	29.15	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	22.09	$kgCO_2/m^2$	Pass
	-7.06 (-24.2%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.71	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	48.61	$kWh/m^2/yr$	
	-6.1 (-11.2%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.13 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.24 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing North	22.17 m², No overhang		
Windows facing East	7.84 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Thermal bridging y-value	0.029	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1099.32	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.08	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	76 C	**DER**	22.09	**TER**	29.15
Environmental	85 B	**% DER<TER**	24.23		
CO_2 Emissions (t/year)	1.04	**DFEE**	48.61	**TFEE**	54.71
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	South
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	32.32 m	62.10 m²	2.52 m

7.0 Living Area	24.10	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	62.37	30.27
Sheltered Wall	Cavity Wall	0.13	19.07	19.07

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	24.95

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	42.02	42.02

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	South							2.09	
RW	Window	[1] External Wall	North	None	0.00					22.17	
RSW	Window	[1] External Wall	East	None	0.00					7.84	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	13.54	0.040	No	LABC
Independently assessed	E3 Sill	12.54	0.027	No	LABC
Independently assessed	E4 Jamb	32.88	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	26.73	0.039	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Default	E25 Staggered party wall between dwellings	5.04	0.120	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	9.45	0.000	No	

Y-value	0.029	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0

Number of open flues	0	0	0
Number of intermittent fans			0
Number of passive vents			0
Number of flueless gas fires			0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	

Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	1099.32	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

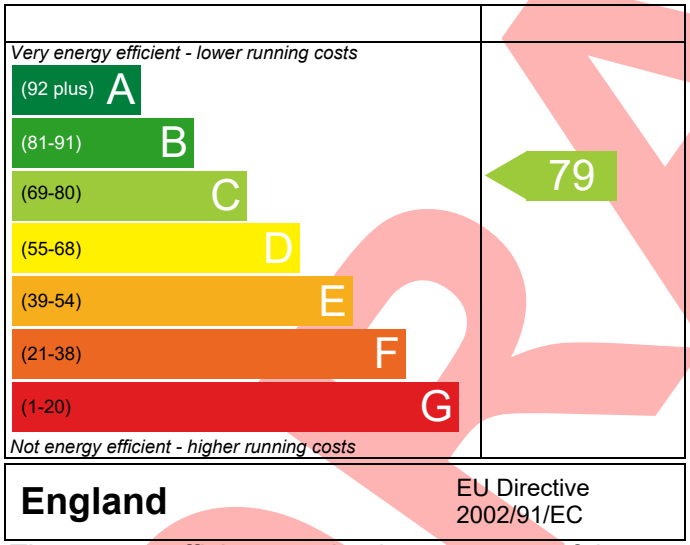
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	77.67 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

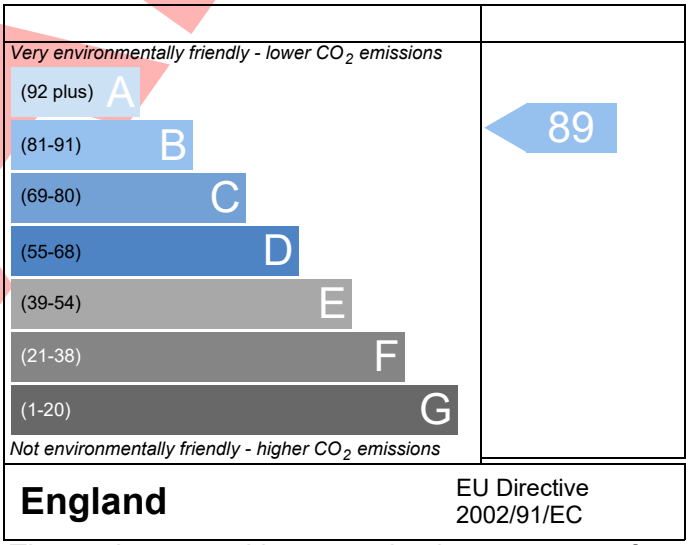
Energy Efficiency Rating



England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.09	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	79 C	**DER**	14.81	**TER**	24.99
Environmental	89 B	**% DER<TER**	40.74		
CO_2 Emissions (t/year)	0.87	**DFEE**	36.60	**TFEE**	46.57
General Requirements Compliance	Pass	**% DFEE<TFEE**	21.40		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	24.99	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	14.81	$kgCO_2/m^2$	Pass
	-10.18 (-40.7%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	46.57	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	36.60	$kWh/m^2/yr$	
	-10.0 (-21.5%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.20 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.24 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing East	12.11 m², No overhang		
Windows facing South	20.21 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1374.95	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.09	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	79 C	**DER**	14.81	**TER**	24.99
Environmental	89 B	**% DER<TER**	40.74		
CO_2 Emissions (t/year)	0.87	**DFEE**	36.60	**TFEE**	46.57
General Requirements Compliance	Pass	**% DFEE<TFEE**	21.40		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	32.04 m	77.67 m²	2.41 m

7.0 Living Area	28.19	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Timber Frame	0.20	60.61	26.20
Sheltered Wall	Cavity Wall	0.13	16.60	16.60

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	15.52

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	77.67	77.67

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	North							2.09	
LSW	Window	[1] External Wall	East	None	0.00					12.11	
RW	Window	[1] External Wall	South	None	0.00					20.21	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	14.44	0.040	No	LABC
Independently assessed	E3 Sill	13.44	0.027	No	LABC
Independently assessed	E4 Jamb	32.97	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	32.04	0.039	No	
Table K1 - Default	E14 Flat roof	32.04	0.080	No	
Independently assessed	E16 Corner (normal)	9.64	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	2.52	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	2.52	0.120	No	
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	6.44	0.000	No	
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	6.44	0.240	No	

Y-value	0.051	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	

Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	1374.95	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

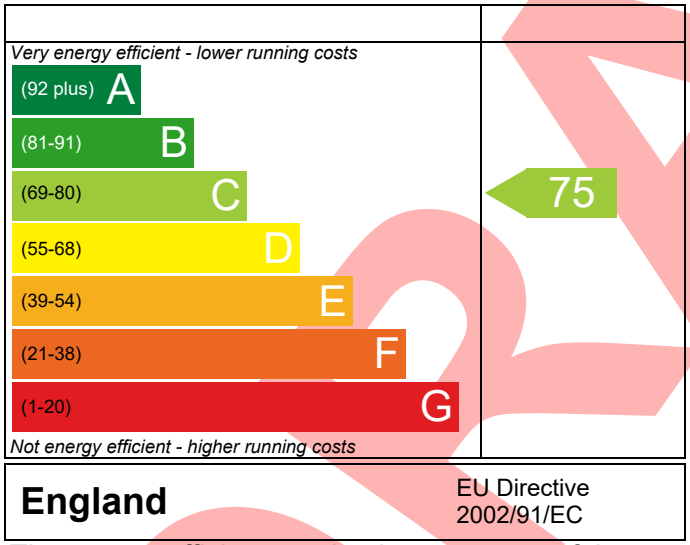
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	Flat, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	77.28 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

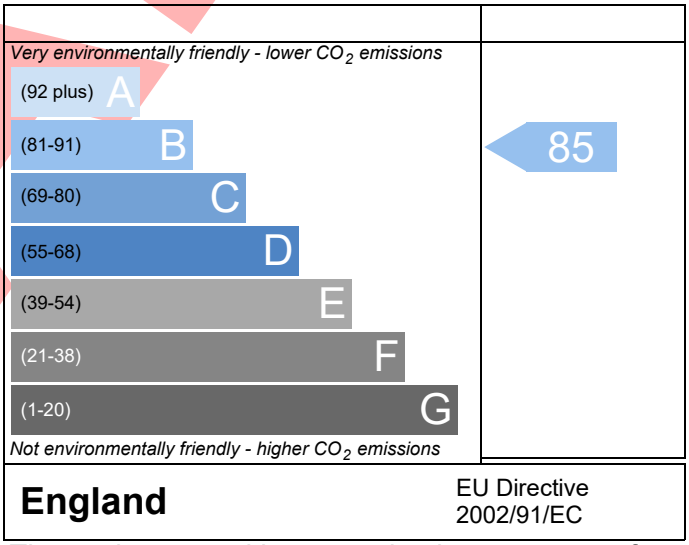
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.10	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	75 C	**DER**	20.91	**TER**	28.04
Environmental	85 B	**% DER<TER**	25.44		
CO_2 Emissions (t/year)	1.19	**DFEE**	49.22	**TFEE**	56.66
General Requirements Compliance	Pass	**% DFEE<TFEE**	13.12		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	28.04	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	20.91	$kgCO_2/m^2$	Pass
	-7.13 (-25.4%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.66	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	49.22	$kWh/m^2/yr$	
	-7.5 (-13.2%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.20 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.16 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.24 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler	

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Secondary heating system	None		
5 Cylinder insulation			
Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		
6 Controls			
Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass
7 Low energy lights			
Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass
8 Mechanical ventilation			
Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium		Pass
Based on:			
Overshading	Average		
Windows facing North Windows facing East	16.11 m², No overhang 16.21 m², No overhang		
Air change rate	6.00 ach		
Blinds/curtains	None		

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.13	W/m²K
Party wall U-value	0.00	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1368.04	kWh/Year

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 APT.10	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	75 C	**DER**	20.91	**TER**	28.04
Environmental	85 B	**% DER<TER**	25.44		
CO_2 Emissions (t/year)	1.19	**DFEE**	49.22	**TFEE**	56.66
General Requirements Compliance	Pass	**% DFEE<TFEE**	13.12		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Semi-Detached
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	36.08 m	77.28 m²	2.41 m

7.0 Living Area	26.58	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Timber Frame	0.20	59.96	25.55
Sheltered Wall	Cavity Wall	0.13	26.99	26.99

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	15.52

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Flat Roof	External Flat Roof	0.16	77.28	77.28

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20
Solid Door	Manufacturer	Door to Corridor							1.80

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
FSD	Door to Corridor	[1] External Wall	West							2.09	
LSW	Window	[1] External Wall	North	None	0.00					16.11	
RW	Window	[1] External Wall	East	None	0.00					16.21	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	14.44	0.040	No	LABC
Independently assessed	E3 Sill	13.44	0.027	No	LABC
Independently assessed	E4 Jamb	32.97	0.029	No	LABC
Independently assessed	E7 Party floor between dwellings (in blocks of flats)	36.08	0.039	No	
Table K1 - Default	E14 Flat roof	36.08	0.080	No	
Independently assessed	E16 Corner (normal)	7.56	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.52	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	2.52	0.060	No	
Table K1 - Default	E25 Staggered party wall between dwellings	2.52	0.120	No	
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	6.44	0.000	No	
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	6.44	0.240	No	

Y-value	0.051	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	

Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	1368.04	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

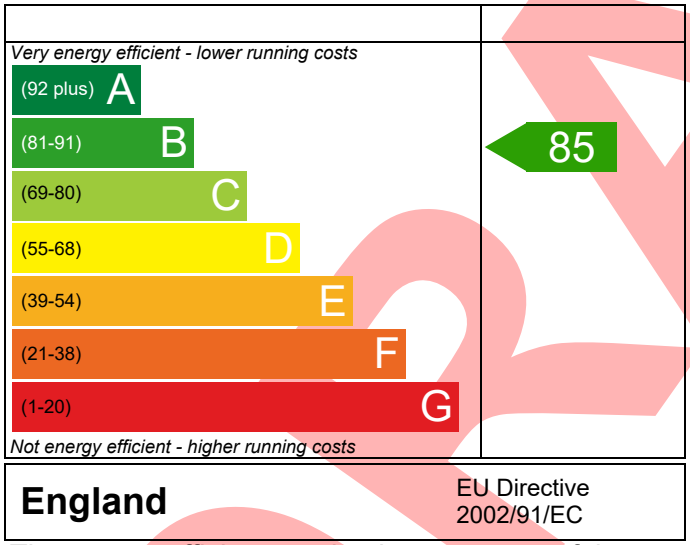
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	House, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	128.11 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

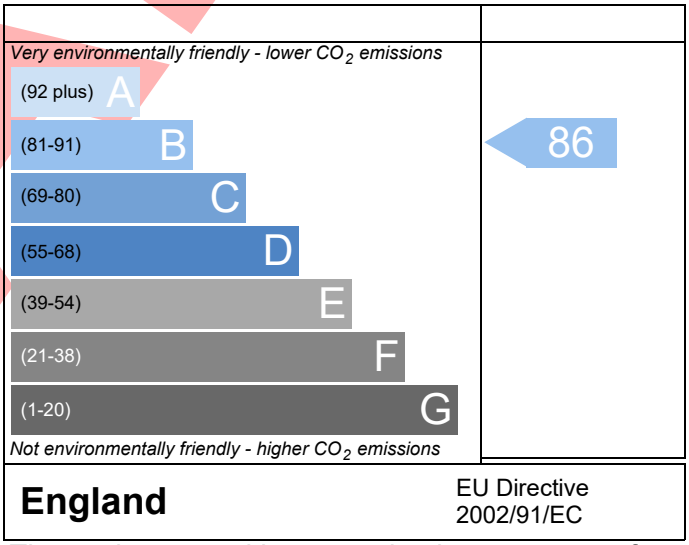
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 H.01	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	85 B	**DER**	16.26	**TER**	23.65
Environmental	86 B	**% DER<TER**	31.23		
CO_2 Emissions (t/year)	1.49	**DFEE**	38.29	**TFEE**	54.81
General Requirements Compliance	Pass	**% DFEE<TFEE**	30.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	23.65	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	16.26	$kgCO_2/m^2$	Pass
	-7.39 (-31.2%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.81	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	38.29	$kWh/m^2/yr$	
	-16.5 (-30.1%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.14 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	Pass
Roof	0.14 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.20 (max. 2.00)	1.20 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler		
Secondary heating system	None		

5 Cylinder insulation

Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		

6 Controls

Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Slight	Pass

Based on:

Overshading	Average
Windows facing South East	16.82 m², No overhang
Windows facing North West	19.32 m², No overhang
Air change rate	6.00 ach
Blinds/curtains	None

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.11	W/m²K
External wall U-value	0.14	W/m²K
Party wall U-value	0.00	W/m²K
Roof U-value	0.11	W/m²K
Thermal bridging y-value	0.037	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1.81	kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 H.01	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	85 B	**DER**	16.26	**TER**	23.65
Environmental	86 B	**% DER<TER**	31.23		
CO_2 Emissions (t/year)	1.49	**DFEE**	38.29	**TFEE**	54.81
General Requirements Compliance	Pass	**% DFEE<TFEE**	30.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	South East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	3
3.0 Date Built	2022
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.84 m	49.86 m²	2.52 m
1st Storey:	21.84 m	49.86 m²	2.90 m
2nd Storey:	21.93 m	28.39 m²	2.01 m

7.0 Living Area	24.44	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	124.75	88.61
Ashlar Wall	Timber Frame	0.11	20.97	20.97
Dormer Cheeks	Timber Frame	0.14	8.11	8.11

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	34.41

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Slope Roof	External Slope Roof	0.15	40.18	40.18
Flat Roof	External Flat Roof	0.16	4.01	4.01
Ashlar Ceiling	External Plane Roof	0.11	15.30	15.30

11.0 Heat Loss Floors

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Description	Type	Construction	U-Value (W/m^2K)	Area (m^2)
Heat Loss Floor 1	Ground Floor - Solid		0.15	49.86

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m^2K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m^2)	Curtain Closed
FW	Window	[1] External Wall	South East	None	0.00					14.32	
RW	Window	[1] External Wall	North West	None	0.00					7.88	
RDW	Window	[1] External Wall	North West	None	0.00					3.07	
FGD	Window	[1] External Wall	South East	None	0.00					2.50	
RGD	Window	[1] External Wall	North West	None	0.00					8.37	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	18.98	0.040	No	LABC
Independently assessed	E3 Sill	15.00	0.027	No	LABC
Independently assessed	E4 Jamb	43.48	0.029	No	LABC
Independently assessed	E5 Ground floor (normal)	22.21	0.084	No	
Independently assessed	E6 Intermediate floor within a dwelling	44.14	0.003	No	LABC
Table K1 - Default	E11 Eaves (insulation at rafter level)	2.81	0.080	No	
Table K1 - Default	E13 Gable (insulation at rafter level)	4.01	0.080	No	
Independently assessed	E16 Corner (normal)	16.63	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.82	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	14.06	0.060	No	
Table K1 - Default	P1 Party wall - Ground floor	5.11	0.160	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	7.94	0.000	No	
Table K1 - Default	R4 Ridge (vaulted ceiling)	10.87	0.080	No	
Table K1 - Default	R7 Flat ceiling (inverted)	7.71	0.040	No	
Table K1 - Default	R8 Roof to wall (rafter)	16.69	0.060	No	
Table K1 - Default	R9 Roof to wall (flat ceiling)	6.03	0.040	No	

Y-value: 0.037 W/m^2K

18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes

Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	

Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	

PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
1.81	South	30°	Modest	Yes

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
Solar water heating	£4,000 - £6,000	£200	B 89	

PREDICTED ENERGY ASSESSMENT

ATSPACE
DELIVERING BEYOND COMPLIANCE

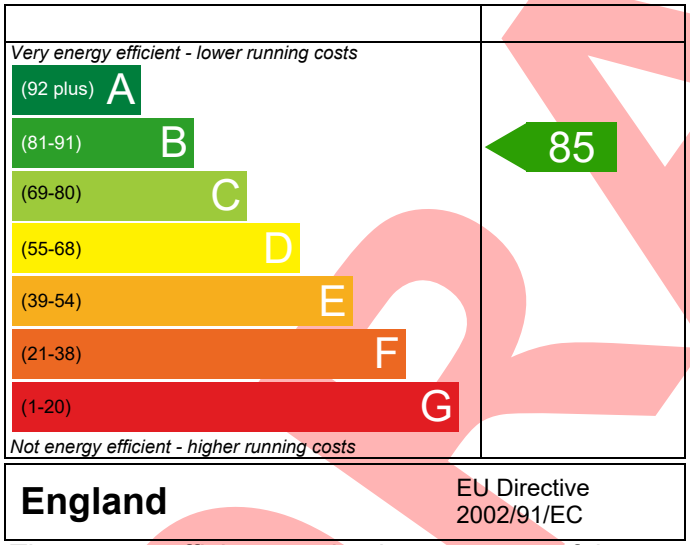
The Star, Uxbridge Road,
Uxbridge,
UB10 0LY

Dwelling type:	House, Semi-Detached
Date of assessment:	21/07/2022
Produced by:	Paul Whiffin
Total floor area:	128.11 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

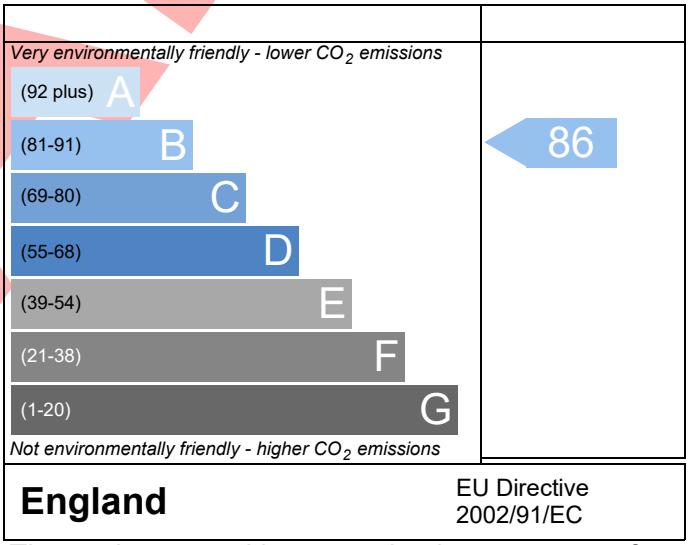
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BUILDING REGULATION COMPLIANCE
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 H.02	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	85 B	**DER**	16.50	**TER**	23.65
Environmental	86 B	**% DER<TER**	30.22		
CO_2 Emissions (t/year)	1.52	**DFEE**	38.29	**TFEE**	54.81
General Requirements Compliance	Pass	**% DFEE<TFEE**	30.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	23.65	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	16.50	$kgCO_2/m^2$	Pass
	-7.15 (-30.2%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.81	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	38.29	$kWh/m^2/yr$	
	-16.5 (-30.1%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.14 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	Pass
Roof	0.14 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.20 (max. 2.00)	1.20 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	$m^3/(h.m^2)$ @ 50 Pa	
Maximum	10.0	$m^3/(h.m^2)$ @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Main heating system	Boiler system with radiators or underfloor - Electric Direct-acting boiler		
Secondary heating system	None		

5 Cylinder insulation

Hot water storage	Measured cylinder loss: 1.90 kWh/day Permitted by DBSCG 2.24		Pass
Primary pipework insulated	No primary pipework		

6 Controls

Space heating controls	Time and temperature zone control		Pass
Hot water controls	Cylinderstat		Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.62		
Maximum	1.5		Pass
MVHR efficiency	94	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Slight	Pass

Based on:

Overshading	Average
Windows facing South East	16.82 m², No overhang
Windows facing North West	19.32 m², No overhang
Air change rate	6.00 ach
Blinds/curtains	None

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	m³/(h.m²) @ 50 Pa	
Maximum	10.0	m³/(h.m²) @ 50 Pa	Pass

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

10 Key features

External wall U-value	0.13	W/m²K
External wall U-value	0.11	W/m²K
External wall U-value	0.14	W/m²K
Party wall U-value	0.00	W/m²K
Roof U-value	0.11	W/m²K
Thermal bridging y-value	0.037	W/m²K
Air permeability	3.0	m³/m²h
Photovoltaic array	1.81	kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Property Reference	Q-03466 H.02	**Issued on Date**	21/07/2022
Assessment Reference	Design V3	**Prop Type Ref**	New Build
Property	The Star, Uxbridge Road, Uxbridge, UB10 0LY		

SAP Rating	85 B	**DER**	16.50	**TER**	23.65
Environmental	86 B	**% DER<TER**	30.22		
CO_2 Emissions (t/year)	1.52	**DFEE**	38.29	**TFEE**	54.81
General Requirements Compliance	Pass	**% DFEE<TFEE**	30.15		

Assessor Details	Mr. Paul Whiffin, Paul Whiffin, Tel: 01763 268685, paul.whiffin@atspaceltd.com	**Assessor ID**	y314-0001
Client	Harjeet Suri, 33244		

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

Orientation	South East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	3
3.0 Date Built	2022
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.84 m	49.86 m²	2.52 m
1st Storey:	21.84 m	49.86 m²	2.90 m
2nd Storey:	21.93 m	28.39 m²	2.01 m

7.0 Living Area	24.44	m²
8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	0.13	124.75	88.61
Ashlar Wall	Timber Frame	0.11	20.97	20.97
Dormer Cheeks	Timber Frame	0.14	8.11	8.11

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing		0.00	34.41

10.0 External Roofs

Description	Type	U-Value (W/m²K)	Gross Area (m²)	Nett Area (m²)
Slope Roof	External Slope Roof	0.15	40.18	40.18
Flat Roof	External Flat Roof	0.16	4.01	4.01
Ashlar Ceiling	External Plane Roof	0.11	15.30	15.30

11.0 Heat Loss Floors

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

ATSPACE
DELIVERING BEYOND COMPLIANCE

Description	Type	Construction	U-Value (W/m^2K)	Area (m^2)
Heat Loss Floor 1	Ground Floor - Solid		0.15	49.86

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m^2K)
Glazing	BFRC data	Window	Double Low-E Soft 0.1			0.50			1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m^2)	Curtain Closed
FW	Window	[1] External Wall	South East	None	0.00					14.32	
RW	Window	[1] External Wall	North West	None	0.00					7.88	
RDW	Window	[1] External Wall	North West	None	0.00					3.07	
FGD	Window	[1] External Wall	South East	None	0.00					2.50	
RGD	Window	[1] External Wall	North West	None	0.00					8.37	

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

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	18.98	0.040	No	LABC
Independently assessed	E3 Sill	15.00	0.027	No	LABC
Independently assessed	E4 Jamb	43.48	0.029	No	LABC
Independently assessed	E5 Ground floor (normal)	22.21	0.084	No	
Independently assessed	E6 Intermediate floor within a dwelling	44.14	0.003	No	LABC
Table K1 - Default	E11 Eaves (insulation at rafter level)	2.81	0.080	No	
Table K1 - Default	E13 Gable (insulation at rafter level)	4.01	0.080	No	
Independently assessed	E16 Corner (normal)	16.63	0.050	No	LABC
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.82	-0.091	No	
Table K1 - Approved	E18 Party wall between dwellings	14.06	0.060	No	
Table K1 - Default	P1 Party wall - Ground floor	5.11	0.160	No	
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	7.94	0.000	No	
Table K1 - Default	R4 Ridge (vaulted ceiling)	10.87	0.080	No	
Table K1 - Default	R7 Flat ceiling (inverted)	7.71	0.040	No	
Table K1 - Default	R8 Roof to wall (rafter)	16.69	0.060	No	
Table K1 - Default	R9 Roof to wall (flat ceiling)	6.03	0.040	No	

Y-value: 0.037 W/m^2K

18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes

Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	1
MVHR Duct Insulated	Yes
Manufacturer SFP	0.62
Duct Type	Rigid
MVHR Efficiency	94.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	20	
Total number of L.E.L. fittings	20	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	Yes	
Light and motion sensor	Yes	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Percentage of Heat	100	%
Main Heating	BEE	
SAP Code	191	
Efficiency (SAP Table)	100.0	%
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	

Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.90	kWh/day
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	

PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
1.81	South East	30°	Modest	Yes

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
Solar water heating	£4,000 - £6,000	£200	B 89	

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

The Star

As designed

Date: Fri Apr 08 11:30:44 2022

Administrative information

Building Details

Address: Uxbridge Road, Uxbridge, Greater London, UB10 0LY

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.b.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v6.1.8

BRUKL compliance check version: v5.6.b.0

Certifier details

Name: Joshua Cunningham

Telephone number: 07757 804 531

Address: Unit 3-4 Cockenach Estate Barkway, Cambridge, SG8 8DL

Criterion 1: The calculated CO_2 emission rate for the building must not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	39
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	39
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	38.4
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.24	0.24	"Block 3 - Store_W_6"
Floor	0.25	0.14	0.15	"Block 3 - WC & Shower_S_3"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.2	1.2	"Block 3 - Commercial Floor_G_8"
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	10

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Project HVAC

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Project DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	Hot water provided by HVAC system	0.008
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	**System type in Non-domestic Building Services Compliance Guide**
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	**Zone**	**Standard**
Block 3 - Store	-	-	-	0.6	-	-	-	-	-	0.94	0.5
Block 3 - WC & Shower	-	-	-	0.6	-	-	-	-	-	0.94	0.5
Block 3 - Commercial Floor	-	-	-	0.6	-	-	-	-	-	0.94	0.5

General lighting and display lighting

	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
Block 3 - Store	100	-	-	9
Block 3 - WC & Shower	-	100	-	15
Block 3 - Commercial Floor	100	-	-	585

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	**Solar gain limit exceeded? (%)**	**Internal blinds used?**
Block 3 - Commercial Floor	YES (+19.5%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m^2]	105.7	105.7
External area [m^2]	252.8	252.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	10	5
Average conductance [W/K]	93.17	124.37
Average U-value [W/m^2K]	0.37	0.49
Alpha value* [%]	22.28	17.74

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
100	**B1 Offices and Workshop businesses**
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others: Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	15.21	30.5
Cooling	0	0
Auxiliary	4.45	3.58
Lighting	17.54	19.35
Hot water	58.44	55.27
Equipment*	38.59	38.59
TOTAL**	**95.64**	**108.7**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	21.74	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	328.84	230.51
Primary energy* [kWh/m^2]	293.61	162.99
Total emissions [kg/m^2]	38.4	39

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: floor heating, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	48.8	280	15.2	0	4.5	0.89	0	1	0
	Notional	89.9	140.6	30.5	0	3.6	0.82	0	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.24	"Block 3 - Store_W_6"
Floor	0.2	0.13	"Block 3 - Commercial Floor_S_3"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.2	"Block 3 - Commercial Floor_G_8"
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	10

Appendix B

U-VALUE DATASHEETS

BBA
CERTIFICATE CS/1004-4
U Value Competency Scheme

Kingspan

Project ID : Online
Structure element : Wall
Description : Brick and block cavity wall, partial fill, 2.5 ties per m², cavity less than or equal to 125mm
File reference : 1E138267D0.FCF

Calculated 'U' value = 0.12W/m²K (Calculated in accordance with BS EN ISO 6946:2017)

Condensation risk has been assessed up to and including Level 4 Humidity Class (dwellings with high occupancy) within UK worst case environmental conditions.

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)	Mean T (K)	Delta T (K)
Outside surface resistance	-	-	0.040	-	-	78.24	0.07
BRICKWORK FACING	102.5	0.770	0.133	42.00	4.31	78.39	0.22
UNV. A/SPACE;	50.0	-	0.665	-	0.05	79.06	1.12
KOOLTHERM K108	75.0	0.018	4.167	-	100.00	83.14	7.03
AERATED BLOCK (k-value = 0.11 W/mK) 6.6% Mortar (100.0mm)	100.0	0.110	0.909	45.00	4.50	87.42	1.53
PLASTER DABS CAVITY. 20.0% Plaster dabs (15.0mm)	15.0	-	0.508	-	0.05	88.61	0.86
KOOLTHERM K118 (12.5mm plasterboard internal finish	52.5	-	2.288	-	100.00	90.97	3.86
PLASTER SKIM	3.0	0.180	0.017	60.00	0.18	92.92	0.03
Inside surface resistance	-	-	0.130	-	-	93.04	0.22

Detailed U-value Calculation Results

Construction includes 3 bridged layers.

Non-bridged layers

Outside surface resistance	0.040 m²K/W
BRICKWORK FACING	0.133 m²K/W
UNV. A/SPACE;	0.665 m²K/W
KOOLTHERM K108	4.167 m²K/W
KOOLTHERM K118 (12.5mm plasterboard internal finish	2.288 m²K/W
PLASTER SKIM	0.017 m²K/W
Inside surface resistance	0.130 m²K/W
Resistance of non-bridged layers, R_{NB}=	7.440 m²K/W

Not all insulation thicknesses shown may currently be stocked, so please check with Kingspan Insulation Customer Service Department on 01544 388601.

BBA

CERTIFICATE CS/1004-1

U Value Competency Scheme

Kingspan Insulation

Project ID : Online
Structure element : Pitched or mansard roof, ceiling at line of pitch
Description : Warm pitched roof - 61-80mm insulation above rafters
File reference : 1E11C17735.FCF

Calculated 'U' value = 0.15W/m²K (Calculated in accordance with BS EN ISO 6946:2007)

Condensation risk has been assessed up to and including Level 4 Humidity Class (dwellings with high occupancy) within UK worst case environmental conditions.

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)	Mean T (K)	Delta T (K)
Outside surface resistance	-	-	0.040	-	-	78.25	0.08
SLATE	10.0	1.900	0.005	250.00	2.50	78.29	0.01
KINGSPAN NILVENT.17 BREATHABLE MEMBRANE	0.5	-	0.006	-	0.25	78.30	0.01
SOFTWOOD TIMBER SARKING BOARD (2 - 3mm Gaps)	18.0	0.140	0.129	60.00	1.08	78.43	0.25
KOOLTHERM K7 - FIXED ABOVE RAFTERS IN A CONTINUOUS LAYER	70.0	0.020	3.500	-	100.00	81.90	6.70
KOOLTHERM K7 - BETWEEN TIMBER RAFTERS 12.7% roof timber - 47mm @ 400mm ctrs + 1% for noggins + loft hatches (70.0mm)	70.0	0.020	3.500	-	100.00	88.60	6.70
TIMBER RAFTER CAVITY; U/V. 12.7% roof timber - 47mm @ 400mm ctrs + 1% for noggins + loft hatches (80.0mm)	80.0	-	0.444	-	0.05	92.37	0.85
POLYTHENE VAPOUR CONTROL LAYER	0.5	-	0.001	-	500.00	92.80	0.00
PLASTERBOARD	12.5	0.190	0.066	50.00	0.63	92.86	0.13
PLASTER SKIM	3.0	0.180	0.017	60.00	0.18	92.94	0.03
Inside surface resistance	-	-	0.100	-	-	93.05	0.19

Detailed U-value Calculation Results

Construction includes 2 bridged layers.

Non-bridged layers

Outside surface resistance	0.040 m²K/W
SLATE	0.005 m²K/W
KINGSPAN NILVENT.17 BREATHABLE MEMBRANE	0.006 m²K/W
SOFTWOOD TIMBER SARKING BOARD (2 - 3mm Gaps)	0.129 m²K/W
KOOLTHERM K7 - FIXED ABOVE RAFTERS IN A CONTINUOUS LAYER	3.500 m²K/W
POLYTHENE VAPOUR CONTROL LAYER	0.001 m²K/W
PLASTERBOARD	0.066 m²K/W
PLASTER SKIM	0.017 m²K/W
Inside surface resistance	0.100 m²K/W
Resistance of non-bridged layers, R_{NB}=	3.863 m²K/W

Not all insulation thicknesses shown may currently be stocked, so please check with Kingspan Insulation Customer Service Department on 01544 388601.

CERTIFICATE CS/1004-2
U Value Competency Scheme

Project ID : Online
Structure element : Flat roof
Description : Flat roof - bonded
File reference : 1E125Q6E4D.FCF

Calculated 'U' value = 0.11W/m²K (Calculated in accordance with BS EN ISO 6946:2007)

Condensation risk has been assessed up to and including Level 4 Humidity Class (dwellings with high occupancy) within UK worst case environmental conditions.

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)	Mean T (K)	Delta T (K)
Outside surface resistance	-	-	0.040	-	-	78.24	0.07
BITUMEN ROOFING FELT 2 LAYERS	6.0	0.230	0.026	0.00	500.00	78.30	0.04
KINGSPAN THERMAROOF TR24	120.0	0.024	5.000	300.00	36.00	82.58	8.52
KINGSPAN THERMAROOF TR27 LPC / FM	80.0	0.025	3.200	300.00	24.00	89.57	5.45
VAPOUR CHECK BITUMINOUS	3.0	0.230	0.013	0.00	300.00	92.31	0.02
SAND CEMENT SCREED	50.0	1.400	0.036	100.00	5.00	92.35	0.06
CONCRETE 1:2:4 2000 kg/m³	150.0	1.400	0.107	100.00	15.00	92.47	0.18
TIMBER BATTEN CAVITY; U/V. 8.8% roof timber - 47mm @ 600mm ctrs + 1% for noggins + loft hatches (25.0mm)	25.0	-	0.163	-	0.05	92.70	0.28
PLASTERBOARD	12.5	0.190	0.066	50.00	0.63	92.90	0.11
PLASTER SKIM	3.0	0.180	0.017	60.00	0.18	92.97	0.03
Inside surface resistance	-	-	0.100	-	-	93.06	0.17

Detailed U-value Calculation Results

Construction includes 1 bridged layer.

Non-bridged layers

Outside surface resistance	0.040 m²K/W
BITUMEN ROOFING FELT 2 LAYERS	0.026 m²K/W
KINGSPAN THERMAROOF TR24	5.000 m²K/W
KINGSPAN THERMAROOF TR27 LPC / FM	3.200 m²K/W
VAPOUR CHECK BITUMINOUS	0.013 m²K/W
SAND CEMENT SCREED	0.036 m²K/W
CONCRETE 1:2:4 2000 kg/m³	0.107 m²K/W
PLASTERBOARD	0.066 m²K/W
PLASTER SKIM	0.017 m²K/W
Inside surface resistance	0.100 m²K/W
Resistance of non-bridged layers, R_{NB} =	8.604 m²K/W

Not all insulation thicknesses shown may currently be stocked, so please check with Kingspan Insulation Customer Service Department on 01544 388601.

BBA
CERTIFICATE CS/1004-4
U Value Competency Scheme

Kingspan

Project ID : Online
Structure element : Flat roof
Description : Inverted Warm Roof (containing water flow reduction layer above insulation)
File reference : 1Z16AM418B.FCF

Calculated 'U' value = 0.12W/m²K (Calculated in accordance with BS EN ISO 6946:2017)

Condensation risk has been assessed up to and including Level 4 Humidity Class (dwellings with high occupancy) within UK worst case environmental conditions.

Correction for inverted roof, Delta Ur = 0.0014W/m²K
(f.x : 0.0010(W.day)/(m².K.mm) p : 1.480mm/day XPS Layer : KINGSPAN GREENGUARD GG300 - INVERTED, KINGSPAN GREENGUARD GG300 - INV

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)	Mean T (K)	Delta T (K)
Outside surface resistance	-	-	0.040	-	-	78.25	0.07
GREEN ROOF SYSTEM	80.0	-	0.000	-	0.00	78.28	0.00
AQUAZONE (with gravel or roof garden)	0.5	-	0.006	-	0.60	78.29	0.01
KINGSPAN GREENGUARD GG300	140.0	0.036	3.889	750.00	105.00	81.88	7.18
KINGSPAN GREENGUARD GG300	140.0	0.036	3.889	750.00	105.00	89.06	7.18
GEOTEXTILE LAYER (non-woven polyester/polypropylene)	0.5	0.000	0.000	0.00	0.00	92.65	0.00
MASTIC ASPHALT 2 LAYERS 20mm	20.0	-	0.029	-	2000.00	92.68	0.05
SAND CEMENT SCREED	50.0	1.400	0.036	100.00	5.00	92.73	0.07
CONCRETE 1:2:4 2000 kg/m³	150.0	1.400	0.107	100.00	15.00	92.87	0.20
Inside surface resistance	-	-	0.100	-	-	93.06	0.18

Detailed U-value Calculation Results

Total resistance of roof
$R_T = (R_{upper} + R_{lower}) / 2 = (8.096 + 8.096) / 2 = 8.096$ m²K/W

(Correction for mechanical fasteners, Delta Uf = 0.0000W/m²K | Correction for air gaps, Delta Ug = 0.0000W/m²K)
(Alpha 0.0 m^{-1} | Fasteners per square metre 0.0000)
(Fasteners cross-sectional area 0.000 mm² | Thermal conductivity of fastener 0.00 W/mK)
Correction for inverted roof, Delta Ur = 0.0014W/m²K

(Delta Uf + Delta Ug + Delta Up + Delta Ur) is less than 3% of (1 / Rt) so U = (1 / Rt) + Delta Ur = 0.12W/m²K

For further information on the specified products, e.g. literature or specification clauses, please follows the links below:-

Aquazone

KINGSPAN GREENGUARD GG300

Not all insulation thicknesses shown may currently be stocked, so please check with Kingspan Insulation Customer Service Department on 01544 388601.

CERTIFICATE CS/1004-2
U Value Competency Scheme

Project ID : Online
Structure element : Solid Ground floor
Description : Solid ground floor (insulation beneath screed / concrete slab)
File reference : 1Q135O5327.FCF

Calculated 'U' value = 0.12W/m²K (Calculated in accordance with BS EN ISO 13370:2007)

Condensation risk has been assessed up to and including Level 4 Humidity Class (dwellings with high occupancy) within UK worst case environmental conditions.

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Mean T (K)	Delta T (K)
Inside surface	-	-	0.170	92.95	0.39
SAND CEMENT SCREED	65.0	1.400	0.046	92.70	0.11
CONCRETE 1:2:4 2000 kg/m³	150.0	1.400	0.107	92.53	0.25
POLYTHENE SEPARATION LAYER	0.5	-	0.001	92.40	0.00
KOOLTHERM K103	110.0	0.018	6.111	85.35	.4.10
DAMP PROOF MEMBRANE	0.9	-	0.001	78.30	0.00
Ground	-	-	0.040	78.25	0.09

Ground Floor Details

Calculation method : Perimeter / Area (As defined in BRE IP 3/90)
Perimeter : 0.00m
Area : 0.00m²
P/A : 0.300
Floor type : Solid floor
Earth conductivity : 2.000W/mK
Soil type : Sand or Gravel

Detailed U-value Calculation Results

Total resistance of solid ground floor
$R_T = (R_{upper} + R_{lower}) / 2 = (6.477 + 6.477) / 2 = 6.477$ m²K/W

(Correction for mechanical fasteners, Delta Uf = 0.0000W/m²K | Correction for air gaps, Delta Ug = 0.0000W/m²K)
(Alpha 0.0 m^{-1} | Fasteners per square metre 0.0000)
(Fasteners cross-sectional area 0.000 mm² | Thermal conductivity of fastener 0.00 W/mK)

(Delta Uf + Delta Ug) is less than 3% of (1 / Rt) so U = (1 / Rt) = 0.12W/m²K

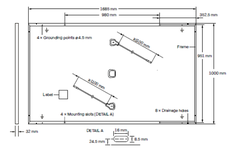
Not all insulation thicknesses shown may currently be stocked, so please check with Kingspan Insulation Customer Service Department on 01544 388601.

Appendix C

RENEWABLE TECHNOLOGIES – PLAN AND DATASHEET

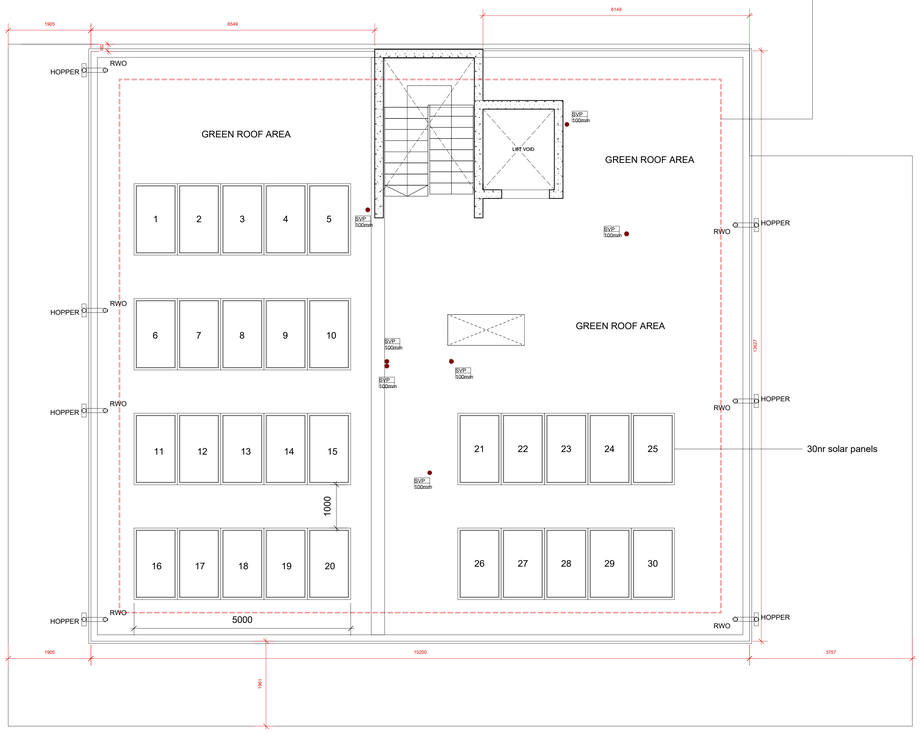
MECHANICAL SPECIFICATION

Format	1685mm × 1000mm × 32mm (including frame)
Weight	18.7kg
Front Cover	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101mm × 32-60mm × 15-18mm Protection class IP67, with bypass diodes
Cable	4mm² Solar cable; (+) ≥1100mm, (-) ≥1100mm
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67



42 PANELS AT 335 W PER PANEL = 14,070kW

CONTRACTORS DESIGN FOR FALL ARREST SYSTEM
- ALLOW FOR RAIL SYSTEM SUITABLE FOR GREEN ROOFS.



10NR BLOCK OF FLATS - PLAN

12NR TOTAL SOLAR PANELS - SEMI-DETACHED

1:50 SCALE

TECHNICAL DESIGN
RIBA STAGE 3 - PLANNING

HSD ARB RIBA

Project: STAR PUB DEVELOPMENT

Title: SOLAR PANELS

SCALE	DRAWN:	REVISION	DATE
1:50 @ A3	H S SURI		
	PG NO: SOLAR -01		

powered by Q.ANTUM DUO

Q.PEAK DUO-G7
325-335

ENDURING HIGH PERFORMANCE

pv magazine award 2017 top innovation

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2020

VDE 11/2016 Quality Tested
- high reliability
- low degradation
- optimized durability
- continous line monitoring

www.VDEinfo.com
ID. 40032587

Q CELLS YIELD SECURITY
- ANTI PID TECHNOLOGY (APT)
- HOT-SPOT PROTECT (HSP)
- TRACEABLE QUALITY (TRA.Q™)
- ANTI LID TECHNOLOGY (ALT)

Q.ANTUM TECHNOLOGY: LOW LEVELISED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 20.2 %.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

Rooftop arrays on residential buildings

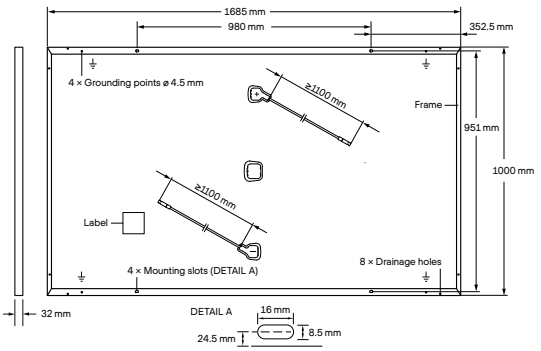
Rooftop arrays on commercial / industrial buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1685 mm × 1000 mm × 32 mm (including frame)
Weight	18.7 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1100 mm, (–) ≥1100 mm
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67

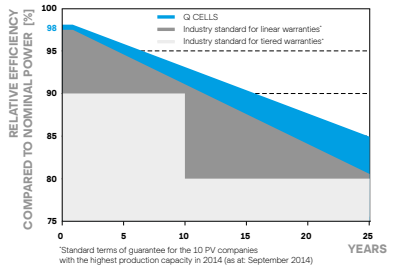


ELECTRICAL CHARACTERISTICS

POWER CLASS				325	330	335
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)						
Minimum	Power at MPP[1]	P_{MPP}	[W]	325	330	335
	Short Circuit Current[1]	I_{SC}	[A]	10.10	10.15	10.21
	Open Circuit Voltage[1]	V_{OC}	[V]	40.36	40.62	40.89
	Current at MPP	I_{MPP}	[A]	9.61	9.67	9.72
	Voltage at MPP	V_{MPP}	[V]	33.81	34.14	34.47
	Efficiency[1]	η	[%]	≥19.3	≥19.6	≥19.9
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]						
Minimum	Power at MPP	P_{MPP}	[W]	243.4	247.1	250.9
	Short Circuit Current	I_{SC}	[A]	8.14	8.18	8.22
	Open Circuit Voltage	V_{OC}	[V]	38.06	38.31	38.55
	Current at MPP	I_{MPP}	[A]	7.57	7.61	7.65
	Voltage at MPP	V_{MPP}	[V]	32.17	32.48	32.79

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

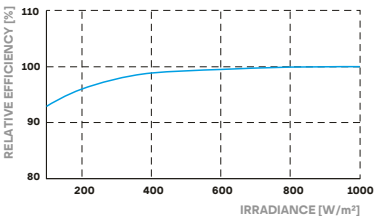
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.35	Nominal Module Operating Temperature	NMOT	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 1703	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2667	Permitted Module Temperature on Continuous Duty	–40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 4000		

QUALIFICATIONS AND CERTIFICATES

VDE Quality Tested, IEC 61215:2016; IEC 61730:2016;
This data sheet complies with DIN EN 50380.

PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per Trailer (24 t)	30
Number of Pallets per 40' HC-Container (26 t)	26
Pallet Dimensions (L × W × H)	1745 × 1130 × 1170 mm
Pallet Weight	639 kg

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

Engineered in Germany

COMPLAINCE COVERSHEET

ATSPACE LTD

Current Carbon Dioxide Reduction statistics for The Star

The Star development comprises No.10 apartments and No.2 semi-detached dwellings. All of which host the following fabric and service details:

- BFRC Rated double glazing (G-value= 0.50)

- Air permeability target of 3.00m^3/hr/m^2@50Pa

- Direct Electric heating via direct action boilers

- Centralise MVHR systems

- Solar P.V. (to account for initial failure in Part L1A compliance)

The current emissions for each flat and dwelling can be seen below with their percentage pass mark.

Property reference	DER ($kg/CO_2/m^2/yr$)	TER ($kg/CO_2/m^2/yr$)	%DER<TER
Q-03466 APT.01	18.13	31.61	42.64 %
Q-03466 APT.02	15.07	27.56	45.32 %
Q-03466 APT.03	21.01	31.96	34.26 %
Q-03466 APT.04	30.62	35.3	13.27 %
Q-03466 APT.05	15.29	26.55	42.41 %
Q-03466 APT.06	16.15	23.42	31.05 %
Q-03466 APT.07	17.16	26.44	35.1 %
Q-03466 APT.08	21.4	29.15	26.59 %
Q-03466 APT.09	13.99	24.99	44.02 %
Q-03466 APT.10	19.88	28.04	29.11 %
Q-03466 H.01	15.93	23.65	32.63 %
Q-03466 H.02	16.17	23.65	31.61 %

The area-weighted CO_2 reduction equals 34.06% beyond current building regulations.

This does not achieve the required reduction rate of 35.00%.

In terms of tonnes of CO_2/yr across the whole development, the shortfall to achieve the 35.00% reduction is 339.89 kg of CO_2.

For any further questions please contact me on:

Email: josh.cunningham@atspaceltd.com

Contact Number: 01763 268 685