

Energy Statement

Energy and Carbon Reduction

Land Adj. to 300 Kings Road, Reading

Reference Number: 008435

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PLANNING



DESIGN



ON-CONSTRUCTION



EXISTING BUILDINGS

Project name: Land Adj. to 300 Kings Road, Reading

Ref: 008435

Author: Dean Shores

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Author:

Initial review by:

Secondary review by:



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George Leadley



Samuel Palmer

Summary of changes:

Rev A – Report revised following comments from Beth Evans on 22.08.22

Rev B – Calculations revised adding 14x PV panels totalling to 4.20kWp or 228.15 apportioned kwh/year per plot also report revised following comments from Beth Evans on 25.08.22.

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Company Profile

Established in 2007 as a family firm, we set out to create a sustainable, resilient business, establishing a happy and positive working environment for both clients and colleagues. It was important for us to offer adaptable and growing solutions for the areas of the construction industry that would benefit from them the most.

Creating an environment that was a pleasure to work in for both colleagues and clients was, and remains, incredibly important to us. Building our future on the foundations of honest relationships, flexibility and efficiency means that we value every client's success as though it were our own.

We have grown to become a trusted construction compliance partner. We continue to grow, to offer packages of sustainability, environmental and acoustic services, with the long-term aim of making our clients' lives easier, so they can focus on the jobs that they enjoy.

Today, the business works with a wide spectrum of clients from household name plc firms, one-off builds and everything in between. Our client list includes many of the nation's major house builders and contractors, as well as universities and public sector organisations. The team also lends their know-how to many architectural practices, M&E consultants and planners.

Introduction

This report has been prepared by the FES Group on behalf of Titan Property Developments to accompany the planning application for the proposed development known as Land Adj. to 300 Kings Road, Reading.

The development proposals will see the construction of 14 new apartments.

This report reviews the proposed energy and carbon reduction strategy advanced by Titan Property Developments within the context of local and national planning policy. The report in particular considers and evaluates the measures incorporated into the design of the development to reduce the predicted CO₂ consumption of the site over 2013 Building Regulations under SAP2012.

The following documents were considered when formulating the report:

- National Planning Policy Framework 2021 – The NPPF strengthens the emphasis on sustainable development and encourages Local Authorities to adopt standards consistent with the Government's zero carbon building policy and other nationally described standards.
- Building Regulations Part L1A 2013 – Approved Document L1A 2013 Conservation of Fuel and Power in new dwellings sets minimum energy efficiency and fabric efficiency standards for all new domestic buildings.
- Sustainable Design and Construction SPD (December 2019) - "In achieving Zero Carbon Homes for major residential developments, the preference is that new build residential of ten or more dwellings will achieve true carbon neutral development on-site. If this is not achievable, it must achieve a minimum of 35% improvement in regulated emissions over the Target Emissions Rate in the 2013 Building Regulations, plus a Section 106 contribution of £1,800 per remaining tonne towards carbon offsetting within the Borough (calculated as £60/ tonne over a 30 year period)."
- Reading Borough Local Plan (adopted November 2019) - Policy H5 (Standards for New Housing) confirms that all major new build residential development should be designed to achieve zero carbon homes, unless it can be clearly demonstrated that this would render a development unviable.

Sustainable Design

The building fabric, the building services and the management of a building broadly determine the energy use of a building. In understanding this, design teams can take measures to advance sustainable design from the earliest stages of a development. However sustainability is not limited to issues concerning energy consumption. Material selection, the protection of local environments, addressing flood risk and the health and wellbeing of future occupants are all issues requiring consideration. Addressing all these issues in an integrated and intelligent manner will result in truly sustainable developments.

Material Selection

Significant amounts of energy and natural resources are consumed in the production, transportation and disposal of building materials. Two issues are of significant importance in the procurement of materials: the environmental impact of materials and the sourcing of materials. Titan Property Developments is dedicated to taking pro-active measures to addressing these issues.

The developer will choose materials which have a lesser environmental impact. This will be implemented during the procurement process. Suppliers will be obliged to produce Environmental Management System certificates covering the sourcing and production of materials. Timber or timber composite products will be sourced from responsible sources. Suppliers will be obliged to provide full Chain of Custody Certificates right through the supply chain; from the initial timber yard, manufacturing process, transformation and distribution. Secure certificates must be produced by valid accrediting bodies – FSC, PEFC, CSA, SFI & MTCC.

	BRE Green Guide Rating
External Wall	A+
Ground Floor	B
Intermediate Floor	C
Roof	A+
Internal Walls	A
Windows	A

Table 1- Green Guide Rating of Specification

Flood Risk

The Flood and Water Management Act 2010, directs developers to avoid, reduce and delay the discharge of rainfall to public sewers and watercourses through the use of Sustainable Urban Drainage Systems (SUDS) with the aim of protecting watercourses and reducing the risk of localised flooding and pollution.

As detailed in the submitted Drainage Strategy, the following SUDS measures have been considered:

- Infiltration - Not possible owing to the close proximity of new piled footings.
- Swales - Not possible owing to insufficient area of soft landscaping.
- Pollution Control - Will be provided by trapped road gullies.
- Attenuation - Will be provided by over-sizing the below ground SW drainage.
- Transportation and Conveyance - Runoff from new access roads will be collected in trapped road gullies and a conventional piped drainage system.



Pollution during Construction

The contractor will be required, under the terms of their contract, to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies:

- The Control of Dust and Emissions from Construction & Demolition: Best Practice Guidance.

The sustainable management and monitoring of waste generated during the construction of a development is a major concern to local and national planners.

Furthermore the site will allow the successful segregation of waste on site in line with Best Practice policies. However the contractor will be obliged to adopt many of the principles of the waste hierarchy:

- Accurate specifications of materials and volumes.
- Recycling and re-use of waste on site.
- Arrange take back schemes with suppliers.
- Instruct a licensed waste contractor to segregate site waste for recycling.



Health and Wellbeing

In achieving ever stricter levels of energy efficiency, it is important that designers do not lose sight of the fact that they are building homes that people can live in and not just occupy. This is an integral part of sustainability, and a hugely important consideration if the population (and the market place) is to tolerate the sustainability agenda. While it is quite difficult to measure or even quantify health and wellbeing, the following measures are a sample of the efforts made by Titan Property Developments to address this issue: The proposed properties will have sufficient living /dining space. While this is obviously a marketing consideration, it does fall within this category.

The principal living rooms have sufficient glazing to allow natural light to penetrate into the rooms. Numerous studies have shown this to be beneficial to the general health and happiness of occupants. For future residents of the scheme, each apartment provides a spacious living environment which benefit from an acceptable outlook. The Daylighting Assessment concludes that all habitable rooms within the development exceed the BRE average daylight threshold with the exception of a bedroom 3 in flat 03-03.

- The constrained nature of the site means it is difficult to provide any private amenity space, however, the scheme has a significant amount of communal space to the front of the building.
- The apartment block has dedicated bin storage in line with the Council's waste and recycling collection scheme.

Water Efficiency

The average person consumes some 150 litres per day; this represents an annual increase of 1% since the 1930s. Despite the United Kingdom's wet and temperate climate, climate change will most probably result in an increase in the occurrence of drought orders and hosepipe bans. With this in mind, it is not difficult to appreciate that within the next few decades the UK (particularly the South East) will face regular water shortages.

In response to this water efficiency has gained equal billing, alongside energy efficiency. The following are the principle policy drivers.

- The Approved Document G (2015) restricts new build dwellings to a maximum consumption of 125 litres per person per day. The Water Efficiency Calculator of New Dwellings also includes an allowance for external water use.
- The Code for Sustainable Homes was first introduced in April 2007. While now disbanded, Included within the Code was mandatory water efficiency standards. Homes constructed to Code for Sustainable Homes Level 3 and 4 must achieve a maximum internal water consumption of 105 litres per person per day. Dwellings constructed to Code Levels 5 and 6 must achieve an internal water consumption of 80 litres per

- Part L 2013 and SAP 2012 will take account of Part G and water consumption in the calculation of the forecasted energy demand of a dwelling – 125 litres/person/day



The below table details the recommended sanitary ware fittings to be adopted by Titan Property Developments to meet with the requirement to achieve 125 Litres per person per day as required by Building Regulations Part G 2015.

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person Per Day
WC (Dual Flush)	Full Flush (litres)	4	1.46	0.00	5.84
	Part Flush (litres)	2.6	2.96	0.00	7.70
Taps (excluding kitchen tap)	Flow rate (litres/minute)	6	1.58	1.58	11.06
Baths (where shower present)	Capacity to overflow (litres)	180	0.11	0.00	19.80
Showers (where bath present)	Flow rate (litres/minute)	9	4.37	0.00	39.33
Kitchen sink tap	Flow rate (litres/minute)	6	0.44	10.36	13.00
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
Total					118.38

Contribution from Greywater (litres/person/day)	0
Contribution from Rainwater (litres/person/day)	0
Total Internal Water Consumption	118.38
Normalisation Factor	0.91
Water Consumption with Normalisation Factor	107.73
External Use	5.00
Part G Water Consumption	112.73

Table 2 – Water Consumption

Renewable Technologies

There are a number of recognised renewable technologies which have the potential to reduce the energy consumption of a dwelling. However given the nature of the development, we judge that the following technologies are worthy of consideration;

- Solar thermal panels.
- Biomass
- Photovoltaic panels.
- Air source heat pumps.
- Combined Heat & Power
- Wind Power

Solar Thermal

Solar thermal panels use radiant solar energy to heat water for domestic consumption. The system works successfully across the UK as they can work in diffuse weather conditions. In comparison to other technologies it is considered a reliable and proven technology. The system works most efficiently when the panel or evacuated tube is mounted on a 10-60° pitch facing due south, though other combinations do work successfully. During late spring to early autumn months, the system can be expected to meet some 70-90% of a dwellings domestic hot water needs.

Most systems in the UK are two panel systems, typically 4 sq m in size and accompanied with a 180-250 litre cylinder with a dedicated solar storage capacity of 65-110 litres. The typical installation costs for solar thermal vary, especially when large volumes are considered. However a rough estimate is £3500 per plot.

Occupants can expect annual savings in the region of £50-85 per year, which is relatively modest. Solar thermal panels do not qualify for feed in tariffs, however it is expected that solar thermal systems will benefit from the Renewable Heat Incentive. A 20-25 year payback can be expected, dependent on usage and dwelling type.

Taking into consideration the proposed development, the site layout and orientation a two panel systems is recommended for consideration.



Biomass

Biomass boilers offer an environmentally sound, heating solution. Heating is generated by burning biomass, such as wood pellets or logs. This will emit the same amount of CO₂ as is absorbed while the plants were growing, therefore, the biomass is classed as carbon neutral.

Unfortunately, such a provision for this development is both unfeasible and out of proportion to the requirement.



Photovoltaic

Photovoltaic panels convert sunlight into electricity for use within a dwelling. PV panels use cells to convert light into electricity. A PV cell usually consists of 1 or 2 layers of a semi-conducting material such as silicon. The greater the intensity of sunlight, the more electricity is generated. PV systems can come in different forms. The most aesthetically pleasing are PV tiles which resemble roof tiles. However the most popular are modules which can either sit on the roof or be integrated into it. The technology is most efficient when oriented due south. However panels orientated south of east or west are suitable. Generally panels orientated away from due south require a greater surface area to generate a set amount. PV is a viable option and if installed on a select number of plots across a development, this would be the most cost effective solution to a site wide CO2 reduction. Titan Property Developments have confirmed that PV will be installed to address the condition.



Air Source Heat Pumps

Air source heat pumps extract heat from the outside air. The heat is absorbed into a fluid, which is pumped through a heat exchanger. Low grade heat is then extracted by the refrigeration system and after passing through the compressor is concentrated into a higher temperature. This energy is then used to heat water for space and hot water use within the dwelling. While heat pumps use national grid electricity, and so are not a renewable resource, they utilise a heat source which is naturally renewed in our environment and so are considered a low carbon technology.

Heat pumps have stated CoPs in the region of 2-4, though test results outside of the laboratory have produced mixed results. Typically the heat pump is located on an external wall. It is generally accepted that 1kW in heat pump size will provide enough heating for 20m² of floor space.

While the use of heat pumps reduces the energy consumption of a dwelling (when gas is considered the baseline), the carbon benefit is currently not correctly represented within the SAP software methodology, Which does not take into account the decarbonised grid over the last 5 years. This is set to be updated with the upcoming SAP10 methodology and as a result we would recommend ASHP's for consideration in the lifetime reduction of the dwelling. Provisions for future upgrades to ASHP's when current gas boilers reach then end of their life expectancy is also recommended. Titan Property Development's have confirmed that they will also install ASHPs for every apartment.



Combined Heat and Power (CHP)

Combined heat and power utilises the waste energy in the generation of electricity to provide space heating and hot water to a development. In conventional means of power generation copious amounts of energy is wasted in the form of heat. The utilisation of this waste heat can see efficiencies of CHP systems typically exceed 90%.

Combined heat and power is not a renewable technology but instead is a DECC recognised low carbon technology which qualified for the Low Carbon Building Programme. To qualify as a renewable technology the use of biomass pellet or bio-diesel would be required. At the present time biomass CHP is very much in its infancy in the UK. Furthermore it is imagined there will be significant problems in locating a sustainable and local source of pellet. Without such a source the reliability of such a system and the net carbon benefit of pellet sourced from a distance are questionable. As a result we do not recommend CHP for consideration on this development.



Wind Power

The principle of harnessing wind power is well established in the UK with access to over 40% of the total European wind resource. Until recently, developments have been concentrated within coastal regions; however technological advances mean that wind power is viable in many urban locations.

Wind turbines are a means of capturing the power within a moving air mass (wind) and converting it into electricity. As yet there is no simple and practical method of incorporating wind generated electricity to sites containing a number of buildings, or requiring high energy usage.

Furthermore, the urban location also means that it would prove difficult to harness sufficient wind energy to meet the needs of the development. The high density of urban areas obstructs air patterns and reduces the efficiency of the turbine. The size of the turbine required is also likely to detract unacceptably from the local area and generate a significant amount of noise, both of which prejudice local residential amenity.

For these reasons, together with the high installation costs, potential noise pollution and high likelihood of not achieving planning approval we are not proposing to employ wind turbines on this site.



Energy Strategy

The Context

The proposed works fall under the scope of Approved Document L1A 2013. The Approved Document sets minimum fabric energy efficiency standards and a maximum CO2 emission rate for residential buildings. To place the proposed energy strategy into its correct regulatory context it is worthwhile summarising the minimum standards included in the Approved Document.

Element	Part L1A 2013 Minimum Standard
External Walls	0.30W/m2K
Roof	0.20W/m2K
Floor	0.25W/m2K
Glazing & Doors	2.00W/m2K
Air Test	10.00m3/h.m2 at 50Pa

Table 3 – Minimum Fabric Efficiency Standards

Proposed Strategy

The National Planning Policy Framework requires that all development proposals are in line with the Government's zero carbon buildings programme.

The figures and calculations detailed in this report have been taken from SAP 2012 (2013 Building Regulations).

In response to this guidance, and recent shifts within the industry, Titan Property Developments proposes the adoption of a fabric first energy strategy which addresses the core policy goals of sustainable construction:-

- Reduced CO2 emissions to combat the causes of climate change.
- Reduced energy consumption to address legitimate concerns of energy security.

By reducing the energy requirement of the building, the sustainable credentials of each development are enhanced and are not validated by simply bolting on expensive renewable equipment. By focusing on fabric performance and the provision of efficient heating systems each dwelling is intrinsically "green".

Before the potential of various technologies can be assessed, it is first necessary to calculate the base line energy consumption of the development and hence the target reduction.

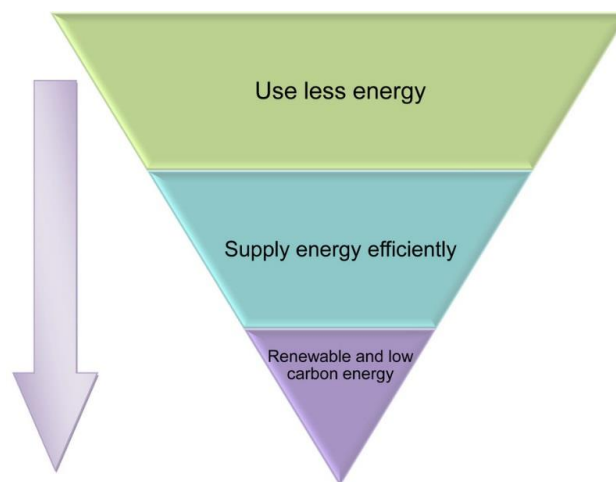
The proposed dwellings were modelled in SAP2012 to determine the energy consumption and corresponding CO2 emissions of the development. Standard Assessment Procedure, or SAP, is the Government's approved methodology for the calculation of energy consumption and CO2 emissions for new build dwellings.

In line with best practice the proposed energy strategy for Land Adj. to 300 Kings Road, Reading will adhere to the principles of the Energy Hierarchy;

- Be Lean – reduce the need for energy.
- Be Clean – supply and use energy in the most efficient manner.
- Be Green – supply energy from renewable sources.

Adhering to the principles of the Energy Hierarchy has a number of benefits. The principle benefits are;

- By reducing the energy requirement of each dwelling the renewable requirement shrinks in proportion. This has obvious cost benefits.
- The sustainable credentials of each development are enhanced and are not validated by simply bolting on expensive renewable equipment. By focusing on the fabric performance and the provision of efficient heating systems each dwelling is intrinsically “green”.



Be Lean.

Titan Property Developments have confirmed Lean measures equal to a 9.68% reduction in fabric heat loss across the building envelope. This greatly reduces the need for energy within a dwelling.

Be Clean.

Titan Property Developments have confirmed Clean measures where the heating controls proposed are time, temperature & zone controls to allow the user to maximise the control to ensure efficient use of the main heating system. 100% Low Energy Lighting to be installed alongside mechanical extract ventilation.

Be Green.

Titan Property Developments have confirmed Green measures where Photovoltaic panels are being considered, along with air source heat pumps to achieve 25.30% reduction in emissions.

Establishing a Baseline

To adequately ascertain the potential of Titan Property Developments preferred strategy, a baseline energy consumption associated with the development must be calculated. As such the development was modelled in SAP 2012 to determine the current CO₂ emission and associated energy requirement prior to the incorporation of improved fabric efficiencies and renewable technologies. The table below summarises the results calculated.

House Type	No	Baseline Emission Rate (kg/year)	Baseline Energy Rate (kWh/year)
Apartment 00-01	1	1,750.69	5,045.43
Apartment 01-01	1	2,175.38	6,265.45
Apartment 01-02	1	1,450.18	4,161.71
Apartment 01-03	1	1,613.91	4,603.13
Apartment 01-04	1	1,342.49	3,829.89
Apartment 02-01	1	1,900.77	5,445.84
Apartment 02-02	1	1,450.18	4,161.71
Apartment 02-03	1	1,613.91	4,603.13
Apartment 02-04	1	1,476.23	4,229.51
Apartment 03-01	1	1,491.38	4,285.57
Apartment 03-02	1	1,450.18	4,161.71
Apartment 03-03	1	2,131.94	6,110.81
Apartment 04-01	1	2,535.18	7,320.51
Apartment 04-02	1	2,553.60	7,377.39
TOTAL	14	24,936.02	71,601.78

Table 4 – Baseline Energy Consumption & CO₂

The calculations summarised in the table above confirm Land Adj. to 300 Kings Road, Reading has a baseline site wide energy requirement of 71,601.78 kWh/year and an associated CO₂ emission rate of 24,936.02 kgCO₂/year.

Fabric and Building Services Specification

Titan Property Developments proposes a series of fabric and building service enhancements that exceeds the minimum requirements of Part L1A 2013. By placing a significant emphasis on the performance of the fabric of each property, reductions in energy and carbon will be achieved. The following table details the anticipated fabric efficiency and building services standards to be incorporated into the design. These measures constitute the lean efforts.

Element	Part L 2013	Enhanced Specification
Wall	0.30W/m ² K	0.14W/m ² K
Roof	0.20W/m ² K	0.10/0.11W/m ² K
Floor	0.25W/m ² K	0.12W/m ² K
Glazing & Doors	2.00W/m ² K	1.30/1.40W/m ² K
Air Test	10m ³ /h.m ² at 50Pa	5.01m ³ /h.m ² at 50Pa
Renewables (PV)	-	Total: 4.20kWp Apportioned kwh/year per plot: 228.15

Table 5 – Enhanced Specification Summary & Comparison

The U-values above show that the minimum requirements of Part L1A have been exceeded.

In addition to the summary above the following additional measures will be incorporated into the design, constituting the **clean** measures to reduce energy consumption;

- Titan Property Developments have adopted a set of ACD thermal bridging details which is being implemented on the site. These reduce thermal bridging throughout junctions and penetrations through the building fabric.
- Efficient independent heating systems will be provided with a time and temperature zone control. This will allow the eventual occupants to exercise control over their heating system and thus reduce energy consumption.
- Energy efficient lamps will be installed in each light fitting

- Water consumption is now included in the calculation of a property's energy consumption. Thus each property will adhere to the requirements of Building Regulations Part G 2015.
- It is clear that the proposed strategy places a great importance on the efficiency of a buildings thermal envelope and internal building services. This emphasis is to be encouraged. It recognises that it is inherently more sustainable to invest resources in reducing a property's long term energy consumption in contrast to short term generation benefits.

Reduced Emission Rate & Energy Requirement

To determine the benefits of the proposed specification, the development was again modelled in SAP 2012. The table below summarises the results calculated.

House Type	No	Enhanced Emission Rate (kg/year)	Enhanced Energy Rate (kWh/year)
Apartment 00-01	1	1,244.15	2,397.24
Apartment 01-01	1	1,548.00	2,982.79
Apartment 01-02	1	1,156.04	2,227.81
Apartment 01-03	1	1,231.78	2,373.53
Apartment 01-04	1	1,099.83	2,119.37
Apartment 02-01	1	1,397.43	2,693.23
Apartment 02-02	1	1,156.04	2,227.81
Apartment 02-03	1	1,231.78	2,373.53
Apartment 02-04	1	1,174.81	2,263.71
Apartment 03-01	1	1,180.39	2,274.62
Apartment 03-02	1	1,156.04	2,227.81
Apartment 03-03	1	1,521.71	2,932.57
Apartment 04-01	1	1,760.49	3,392.09
Apartment 04-02	1	1,768.78	3,408.33
TOTAL	14	18,627.26	35,894.43

Table 6 – Reduced Emission Rate & Energy Requirement

The calculations summarised in the table above confirm Land Adj. to 300 Kings Road, Reading has a reduced energy requirement of 35,894.43 kWh/year and an associated emission rate of 18,627.26 kgCO₂/year. These are respectively 49.87% and 25.30% reductions over the baseline calculated previously.

In order to comply with the planning requirements, it is necessary for this development to show measures have been taken to ensure high energy efficiency and best practice with regards to energy consumption inline with the Energy Hierarchy.

Evaluation

The FES Group was instructed by Titan Property Developments to review the performance of the proposed Energy Strategy for the development at Land Adj. to 300 Kings Road, Reading. The energy strategy was detailed previously but can be best summarised as follows;

- Titan Property Developments proposes an energy strategy, which addresses the two policy concerns of sustainable design and construction: climate change and energy security.
- Titan Property Developments has proposed a fabric first strategy, which includes the installation of air source heat pumps and PV solar panels achieving long term reductions in CO2 emissions and climate change.
- The proposed fabric and building services specification will permanently reduce regulated emissions by 25.30% and the proposed energy demand by 49.87% This is a significant betterment and demonstrates that the proposed development will have a reduced reliance on national resources (gas and electricity).

After detailed analysis we can conclude that the preferred energy strategy adheres to the principles and aspirations of sustainable design and construction as advanced by national and local government and the house building industry. We therefore recommend the adoption of the preferred energy strategy by Titan Property Developments.

Policy H5 (Standard for New Housing) states that all major new build residential development to be designed to achieve zero carbon homes, unless it can be clearly demonstrated that this would render a development unviable.

The Sustainable Design and Construction SPD (December 2019) confirms in paragraph 3.11 that "In achieving Zero Carbon Homes for major residential developments, the preference is that new build residential of ten or more dwellings will achieve true carbon neutral development on-site. If this is not achievable, it must achieve a minimum of 35% improvement in regulated emissions over the Target Emissions Rate in the 2013 Building Regulations, plus a Section 106 contribution of £1,800 per remaining tonne towards carbon offsetting within the Borough (calculated as £60/tonne over a 30 year period).

As the scheme cannot viably achieve zero carbon homes nor a 35% improvement, it will instead seek to achieve a 25% improvement in regulated emissions over the Target Emissions Rate in the 2013 Building Regulations due to the limited roof space for additional solar PV panels. The remaining 10% reduction in emissions will be addressed by offsetting which would total the offset contribution to £25,650.

Appendix A

Disclaimer

Future Energy Surveys Ltd T/A The FES Group and its staff shall not to be held liable for any damage or loss sustained as a result of using of the information provided in this report. The report is based on drawings and information provided by the client and/or project design team at the time of issue. The information and the drawings provided to us determine the results within the report. If anything changes during the course of the ongoing design or construction, the reduction and calculations will be incorrect. The FES Group will not be held responsible for the implications of such change.

As such this report should be viewed as providing a reasonable assessment of the predicted performance of the development based on current knowledge

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 01-04			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 01-04, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	83 B	DER	21.71	TER	26.50
Environmental	86 B	% DER<TER	18.06		
CO ₂ Emissions (t/year)	0.92	DFEE	35.13	TFEE	39.03
General Requirements Compliance	Pass	% DFEE<TFEE	9.99		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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:		19.73 m	50.66 m²	2.40 m
7.0 Living Area	33.98	m²		
8.0 Thermal Mass Parameter	Precise calculation			
Thermal Mass	171.61	kJ/m²K		

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	42.02	34.82
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	5.33	3.21

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	35.83

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	68.59

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	50.66

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.66

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
Rear Windows	Window	[1] External Wall	West	None	0.00					7.20	

14.0 Conservatory

None

15.0 Draught Proofing

100

 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	4.01	0.500	No
Table K1 - Approved	E4 Jamb	13.80	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	39.46	0.070	No
Table K1 - Approved	E16 Corner (normal)	7.20	0.090	No
Table K1 - Approved	E18 Party wall between dwellings	2.40	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	7.20	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	29.86	0.000	No

Y-value

0.150

 W/m²K

18.0 Pressure Testing

Yes

Designed AP₅₀

5.01

 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀

 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

No

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				2
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

22.0 Lighting

Internal

Total number of light fittings	6	
Total number of L.E.L. fittings	6	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No
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23.0 Electricity Tariff

Standard

24.0 Main Heating 1

Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	<= 35°C	

25.0 Main Heating 2

None

Community Heating

None

28.0 Water Heating

Water Heating	HWP From main heating 1
Flue Gas Heat Recovery System	Main Heating 1
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 Only Heating Hot Water	No

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Pipes insulation	Fully insulated primary pipework
31.0 Thermal Store	None
32.0 Photovoltaic Unit	More Dwellings, One Block
Apportioned	228.15

kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 02-01	Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF
Property	Apt 02-01, Land Adjacent. 300 Kings Road, Reading		

SAP Rating	82 B	DER	19.49	TER	26.51
Environmental	86 B	% DER<TER	26.49		
CO ₂ Emissions (t/year)	1.18	DFEE	41.38	TFEE	47.70
General Requirements Compliance	Pass	% DFEE<TFEE	13.24		

Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com	Assessor ID	w976-0001
Client	Freeths LLP		

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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:	28.73 m	71.70 m ²	2.40 m

7.0 Living Area	39.13	m ²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	151.54	kJ/m ² K

9.0 External Walls			U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Description	Type	Construction				
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	46.08	36.96
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	22.87	20.75

9.1 Party Walls			U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Description	Type	Construction			
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	23.21

9.2 Internal Walls			Kappa (kJ/m ² K)	Area (m ²)
Description	Construction			
Internal Wall (Steel)	Other		14.00	111.98

10.0 External Roofs			U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Description	Type	Construction				
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	20.95	20.95

10.1 Party Ceilings

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	50.75

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	71.70

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					9.12	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	4.81	0.500	No
Table K1 - Approved	E4 Jamb	23.40	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	45.23	0.070	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	10.17	0.240	No
Table K1 - Default	E14 Flat roof	12.23	0.080	No
Table K1 - Approved	E16 Corner (normal)	7.20	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	7.10	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	17.28	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	2.06	0.240	No

Y-value	0.127	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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 half open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	3.00

Mechanical Ventilation

Mechanical Ventilation System Present	No
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SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

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				3
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	7	
Total number of L.E.L. fittings	7	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted No

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

	Database	
Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	<= 35°C	

25.0 Main Heating 2

None

Community Heating None

28.0 Water Heating

Water Heating	HWP From main heating 1
Flue Gas Heat Recovery System	Main Heating 1
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 Only Heating Hot Water	No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store	None
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32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 02-02	Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF
Property	Apt 02-02, Land Adjacent. 300 Kings Road, Reading		

SAP Rating	82 B	DER	23.07	TER	28.94
Environmental	85 B	% DER<TER	20.28		
CO ₂ Emissions (t/year)	0.98	DFEE	43.88	TFEE	47.77
General Requirements Compliance	Pass	% DFEE<TFEE	8.15		

Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com	Assessor ID	w976-0001
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Client	Freeths LLP
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SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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				
	Ground Floor:	Heat Loss Perimeter 29.48 m	Internal Floor Area 50.11 m ²	Average Storey Height 2.40 m

7.0 Living Area	33.03	m ²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	158.48	kJ/m ² K

9.0 External Walls						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	38.93	27.53
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	21.94	19.82

9.1 Party Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	16.99

9.2 Internal Walls				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other		14.00	37.49

10.1 Party Ceilings				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted		90.00	50.11

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.11

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					6.84	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	5.76	0.500	No
Table K1 - Approved	E4 Jamb	28.20	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	50.72	0.070	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	4.80	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	14.16	0.000	No

Y-value 0.141 W/m²K

18.0 Pressure Testing

Yes

Designed AP₅₀ 5.01 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ 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 No

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				2
Number of passive vents				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of flueless gas fires 0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings 6
Total number of L.E.L. fittings 6
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database

Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes
Insulation Type Measured Loss

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 02-03				Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF			
Property	Apt 02-03, Land Adjacent. 300 Kings Road, Reading					
SAP Rating	84 B	DER	17.31	TER	22.68	
Environmental	87 B	% DER<TER	23.66			
CO ₂ Emissions (t/year)	1.05	DFEE	33.43	TFEE	36.34	
General Requirements Compliance	Pass	% DFEE<TFEE	8.00			
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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

	Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		23.79 m	71.16 m²	2.40 m
7.0 Living Area	35.66	m²		
8.0 Thermal Mass Parameter	Precise calculation			
Thermal Mass	166.69	kJ/m²K		

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	39.89	26.21
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	17.21	15.09

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	29.64

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	112.99

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	71.16

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	71.16

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
LH Windows	Window	[1] External Wall	South	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					9.12	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	6.71	0.500	No
Table K1 - Approved	E4 Jamb	33.00	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	47.58	0.070	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.40	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	2.40	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	7.20	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	24.70	0.000	No

Y-value	0.167	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	m³/(h.m²) @ 50 Pa
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Property Tested ?		
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As Built AP ₅₀		m³/(h.m²) @ 50 Pa
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19.0 Mechanical Ventilation

Summer Overheating

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

Mechanical Ventilation System Present	No
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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				3
Number of passive vents				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of flueless gas fires 0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings 6
Total number of L.E.L. fittings 6
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database

Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes
Insulation Type Measured Loss

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 02-04			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 02-04, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	82 B	DER	23.19	TER	29.14
Environmental	85 B	% DER<TER	20.41		
CO ₂ Emissions (t/year)	1.00	DFEE	41.63	TFEE	47.80
General Requirements Compliance	Pass	% DFEE<TFEE	12.91		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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				
	Ground Floor:	Heat Loss Perimeter 19.73 m	Internal Floor Area 50.66 m ²	Average Storey Height 2.40 m

7.0 Living Area	33.98	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	140.92	kJ/m ² K

9.0 External Walls						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	42.02	34.82
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	5.33	3.21

9.1 Party Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	35.83

9.2 Internal Walls					
Description	Construction			Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other			14.00	68.59

10.0 External Roofs						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	28.27	28.27

10.1 Party Ceilings

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	22.39

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.66

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
Rear Windows	Window	[1] External Wall	West	None	0.00					7.20	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	4.01	0.500	No
Table K1 - Approved	E4 Jamb	13.80	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	21.95	0.070	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	10.71	0.240	No
Table K1 - Default	E14 Flat roof	17.51	0.080	No
Table K1 - Approved	E16 Corner (normal)	7.20	0.090	No
Table K1 - Approved	E18 Party wall between dwellings	2.40	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	7.20	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	29.86	0.000	No

Y-value	0.130	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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	No
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20.0 Fans, Open Fireplaces, Flues

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				2
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

22.0 Lighting

Internal

Total number of light fittings

Total number of L.E.L. fittings

Percentage of L.E.L. fittings %

External

External lights fitted

23.0 Electricity Tariff

24.0 Main Heating 1

Percentage of Heat %

Database Ref. No.

Fuel Type

Main Heating

SAP Code

In Winter

In Summer

Controls

PCDF Controls

Sap Code

Is MHS Pumped

Heat Emitter

Flow Temperature

25.0 Main Heating 2

Community Heating

28.0 Water Heating

Water Heating

Flue Gas Heat Recovery System

Waste Water Heat Recovery Instantaneous System 1

Waste Water Heat Recovery Instantaneous System 2

Waste Water Heat Recovery Storage System

Solar Panel

Water use ≤ 125 litres/person/day

SAP Code

Immersion Only Heating Hot Water

29.0 Hot Water Cylinder

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 03-01				Issued on Date	31/08/2022
Assessment Reference	Rev A		Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 03-01, Land Adjacent. 300 Kings Road, Reading					
SAP Rating	81 B	DER	23.57	TER	29.78	
Environmental	85 B	% DER<TER	20.86			
CO ₂ Emissions (t/year)	1.00	DFEE	46.53	TFEE	50.42	
General Requirements Compliance	Pass	% DFEE<TFEE	7.72			
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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				
	Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		25.98 m	50.08 m ²	2.40 m

7.0 Living Area	33.79	m ²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	161.2	kJ/m ² K

9.0 External Walls						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	39.48	27.60
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	22.87	20.75

9.1 Party Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	16.61

9.2 Internal Walls				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other		14.00	46.70

10.1 Party Ceilings				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted		90.00	50.08

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.08

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacture	Door to Corridor							1.40
Windows	Manufacture	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					6.84	
Rear Window	Window	[1] External Wall	West	None	0.00					5.04	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	5.96	0.500	No
Table K1 - Approved	E4 Jamb	23.40	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	35.51	0.070	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	9.48	0.240	No
Table K1 - Approved	E16 Corner (normal)	7.20	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	7.10	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	13.84	0.000	No

Y-value	0.155	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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	No
---------------------------------------	---------------------------------

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				2

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

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 5
Total number of L.E.L. fittings 5
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database

Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 03-02				Issued on Date	31/08/2022
Assessment Reference	Rev A		Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 03-02, Land Adjacent. 300 Kings Road, Reading					
SAP Rating	82 B	DER	23.07	TER	28.94	
Environmental	85 B	% DER<TER	20.28			
CO ₂ Emissions (t/year)	0.98	DFEE	43.88	TFEE	47.77	
General Requirements Compliance	Pass	% DFEE<TFEE	8.15			
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East					
Property Tenure	Unknown					
Transaction Type	New dwelling					
Terrain Type	Suburban					
1.0 Property Type	Flat, Mid-Terrace					
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						
		Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height	
			25.36 m	50.11 m ²	2.40 m	
7.0 Living Area	33.03			m ²		
8.0 Thermal Mass Parameter	Precise calculation					
Thermal Mass	158.48			kJ/m ² K		
9.0 External Walls						
Description	Type	Construction		U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)
						Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)		0.14	14.00	38.93
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)		0.20	14.00	21.94
9.1 Party Walls						
Description	Type	Construction		U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame		0.00	20.00	16.99
9.2 Internal Walls						
Description	Construction				Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other				14.00	37.49
10.1 Party Ceilings						
Description	Construction				Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted				90.00	50.11
11.1 Party Floors						

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.11

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					6.84	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	5.76	0.500	No
Table K1 - Approved	E4 Jamb	28.20	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	50.72	0.070	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	4.80	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	14.16	0.000	No

Y-value	0.141	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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	No
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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				2
Number of passive vents				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of flueless gas fires 0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings 6
Total number of L.E.L. fittings 6
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database

Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes
Insulation Type Measured Loss

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 03-03				Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF			
Property	Apt 03-03, Land Adjacent. 300 Kings Road, Reading					
SAP Rating		84 B	DER	15.81	TER	22.15
Environmental		87 B	% DER<TER	28.63		
CO ₂ Emissions (t/year)		1.30	DFEE	38.72	TFEE	42.35
General Requirements Compliance		Pass	% DFEE<TFEE	8.59		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, End-Terrace
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:	37.82 m	96.25 m ²	2.40 m

7.0 Living Area	49.13	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	160.52	kJ/m ² K

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	67.75	44.47
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	23.02	20.90

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	29.64

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	144.14

10.0 External Roofs

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Ceiling above Corridor	External Flat Roof	Plasterboard, insulated flat roof	0.20	9.00	7.20	7.20

10.1 Party Ceilings

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	89.05

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	96.25

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
LH Windows	Window	[1] External Wall	South	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					13.68	
RH Window	Window	[1] External Wall	North	None	0.00					5.04	

14.0 Conservatory

None

15.0 Draught Proofing

100

 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	10.71	0.500	No
Table K1 - Approved	E4 Jamb	47.40	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	40.82	0.070	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	7.62	0.240	No
Table K1 - Approved	E16 Corner (normal)	9.60	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	4.80	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	4.80	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	4.80	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	11.52	0.000	No

Y-value	0.140	W/m²K
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18.0 Pressure Testing

Yes

Designed AP ₅₀	5.01	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	No
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SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

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				3
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	8	
Total number of L.E.L. fittings	8	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted No

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

	Database	
Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	<= 35°C	

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 Only Heating Hot Water	No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store	None
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32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 04-01			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-TF		
Property	Apt 04-01, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	81 B	DER	18.93	TER	27.26
Environmental	84 B	% DER<TER	30.57		
CO ₂ Emissions (t/year)	1.53	DFEE	51.54	TFEE	59.00
General Requirements Compliance	Pass	% DFEE<TFEE	12.63		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
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				
	Ground Floor:	Heat Loss Perimeter 48.18 m	Internal Floor Area 93.00 m ²	Average Storey Height 2.40 m

7.0 Living Area	39.64	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	108.97	kJ/m ² K

9.0 External Walls						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	63.83	40.19
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	41.02	38.90
Stud Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.07	9.00	23.50	23.50

9.1 Party Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	12.34

9.2 Internal Walls				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other		14.00	119.38

10.0 External Roofs						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	48.02	48.02
Warm Roof	External Slope Roof	Plasterboard, insulated slope	0.10	9.00	63.02	57.00

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	93.00

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacture	Door to Corridor							1.40
Windows	Manufacture	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
Roof Windows	Manufacture	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Roof Windows	Roof Window	[2] Warm Roof	North	None						3.44	
Rear Windows	Window	[1] External Wall	West	None	0.00					23.64	
LH Roof Windows	Roof Window	[2] Warm Roof	South	None						2.58	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	15.56	0.500	No
Table K1 - Approved	E4 Jamb	12.84	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	29.98	0.070	No
Table K1 - Approved	E11 Eaves (insulation at rafter level)	19.76	0.040	No
Table K1 - Approved	E13 Gable (insulation at rafter level)	8.37	0.040	No
Table K1 - Default	E14 Flat roof	17.09	0.080	No
Table K1 - Approved	E16 Corner (normal)	9.57	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	9.60	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	4.77	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	5.76	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	3.33	0.240	No
Table K1 - Default	P5 Party wall - Roof (insulation at rafter level)	3.44	0.080	No
Table K1 - Default	R1 Head of roof window	7.91	0.080	No
Table K1 - Default	R2 Sill of roof window	7.91	0.060	No
Table K1 - Default	R3 Jamb of roof window	10.64	0.080	No
Table K1 - Default	R4 Ridge (vaulted ceiling)	21.50	0.080	No
Table K1 - Default	R6 Flat ceiling	12.37	0.060	No
Table K1 - Default	R7 Flat ceiling (inverted)	11.54	0.040	No

Y-value 0.082 W/m²K

18.0 Pressure Testing

Yes

Designed AP₅₀ 5.01 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

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	No
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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				3
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	8	
Total number of L.E.L. fittings	8	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No
------------------------	----

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	<= 35°C	

25.0 Main Heating 2

None

Community Heating	None
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28.0 Water Heating

0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Instantaneous System 1		
Waste Water Heat Recovery	No	
Instantaneous System 2		
Waste Water Heat Recovery	No	
Storage System		
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Only Heating Hot Water	No	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 04-02				Issued on Date	31/08/2022
Assessment Reference	Rev A		Prop Type Ref	008435-SAP-Apartment-TF		
Property	Apt 04-02, Land Adjacent. 300 Kings Road, Reading					
SAP Rating		81 B	DER	19.45	TER	28.08
Environmental		84 B	% DER<TER	30.73		
CO ₂ Emissions (t/year)		1.54	DFEE	53.39	TFEE	61.23
General Requirements Compliance		Pass	% DFEE<TFEE	12.81		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East
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

Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	45.06 m	90.94 m ²	2.40 m

7.0 Living Area	36.08	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	112.2	kJ/m ² K

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	62.12	38.48
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	36.26	34.14
Stud Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.07	9.00	21.68	21.68

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	12.34

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	143.14

10.0 External Roofs

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	53.50	53.50
Warm Roof	External Slope Roof	Plasterboard, insulated slope	0.10	9.00	54.78	48.76

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	90.94

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacture	Door to Corridor							1.40
Windows	Manufacture	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
Roof Windows	Manufacture	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Roof Windows	Roof Window	[2] Warm Roof	North	None						3.44	
Rear Windows	Window	[1] External Wall	West	None	0.00					23.64	
LH Roof Windows	Roof Window	[2] Warm Roof	South	None						2.58	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	15.56	0.500	No
Table K1 - Approved	E4 Jamb	12.84	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	90.94	0.070	No
Table K1 - Approved	E11 Eaves (insulation at rafter level)	15.98	0.040	No
Table K1 - Approved	E13 Gable (insulation at rafter level)	19.76	0.040	No
Table K1 - Default	E14 Flat roof	15.11	0.080	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	9.60	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	4.77	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	5.76	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	3.33	0.240	No
Table K1 - Default	P5 Party wall - Roof (insulation at rafter level)	3.44	0.080	No
Table K1 - Default	R1 Head of roof window	7.91	0.080	No
Table K1 - Default	R2 Sill of roof window	7.91	0.060	No
Table K1 - Default	R3 Jamb of roof window	10.64	0.080	No
Table K1 - Default	R4 Ridge (vaulted ceiling)	21.50	0.080	No
Table K1 - Default	R6 Flat ceiling	12.38	0.060	No
Table K1 - Default	R7 Flat ceiling (inverted)	11.54	0.040	No

Y-value 0.103 W/m²K

18.0 Pressure Testing

Yes

Designed AP₅₀ 5.01 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

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	No
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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				3
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	8	
Total number of L.E.L. fittings	8	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No
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23.0 Electricity Tariff

Standard

24.0 Main Heating 1

Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	<= 35°C	

25.0 Main Heating 2

None

Community Heating	None
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28.0 Water Heating

HWP From main heating 1	
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Instantaneous System 1		
Waste Water Heat Recovery	No	
Instantaneous System 2		
Waste Water Heat Recovery	No	
Storage System		
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Only Heating Hot Water	No	

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store	None	
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32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 00-01			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-GF		
Property	Apt 00-01, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	81 B	DER	22.13	TER	31.14
Environmental	85 B	% DER<TER	28.93		
CO ₂ Emissions (t/year)	1.07	DFEE	51.05	TFEE	58.10
General Requirements Compliance	Pass	% DFEE<TFEE	12.14		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, 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

	Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		33.48 m	56.22 m ²	2.40 m
7.0 Living Area	35.03	m ²		
8.0 Thermal Mass Parameter	Precise calculation			
Thermal Mass	202.12	kJ/m ² K		

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	53.22	41.82
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	27.12	25.00

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	60.58

10.0 External Roofs

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Floor above Corridor	External Flat Roof	Plasterboard, insulated flat roof	0.20	9.00	3.69	3.69

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	52.53

11.0 Heat Loss Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Slab on ground, screed over insulation	0.12	110.00	56.22

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacture	Door to Corridor							1.40
Windows	Manufacture	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
LH Windows	Window	[1] External Wall	South	None	0.00					6.84	
Rear Windows	Window	[1] External Wall	West	None	0.00					4.56	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	5.76	0.500	No
Table K1 - Approved	E4 Jamb	28.80	0.050	No
Table K1 - Approved	E5 Ground floor (normal)	33.48	0.160	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	31.45	0.070	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	5.67	0.240	No
Table K1 - Approved	E16 Corner (normal)	12.00	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.40	-0.090	No

Y-value	0.101	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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 half open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	3.00

Mechanical Ventilation

Mechanical Ventilation System Present	No
---------------------------------------	---------------------------------

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				2
Number of passive vents				0
Number of flueless gas fires				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

21.0 Fixed Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	5
Total number of L.E.L. fittings	5
Percentage of L.E.L. fittings	100.00 %
External	
External lights fitted	No

23.0 Electricity Tariff	Standard
24.0 Main Heating 1	
	Database
Percentage of Heat	100 %
Database Ref. No.	102573
Fuel Type	Electricity
Main Heating	PET
SAP Code	224
In Winter	0.0
In Summer	0.0
Controls	CHD Time and temperature zone control
PCDF Controls	0
Sap Code	2207
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	≤ 35°C

25.0 Main Heating 2	None
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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 Only Heating Hot Water	No

29.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Measured Loss
Cylinder Volume	200.00 L

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 01-01				Issued on Date	31/08/2022
Assessment Reference	Rev A		Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 01-01, Land Adjacent. 300 Kings Road, Reading					
SAP Rating	81 B	DER	21.59	TER	30.34	
Environmental	84 B	% DER<TER	28.84			
CO ₂ Emissions (t/year)	1.31	DFEE	57.44	TFEE	60.38	
General Requirements Compliance	Pass	% DFEE<TFEE	4.87			
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com				Assessor ID	w976-0001
Client	Freeths LLP					

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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

	Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		28.73 m	71.70 m ²	2.40 m
7.0 Living Area	39.13	m ²		
8.0 Thermal Mass Parameter	Precise calculation			
Thermal Mass	213.61	kJ/m ² K		

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	46.08	36.96
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	22.87	20.75

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	23.21

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	111.98

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	71.70

11.0 Heat Loss Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Exposed Floor	Exposed Floor - Solid	Other	0.20	110.00	71.70

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					9.12	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	4.81	0.500	No
Table K1 - Approved	E4 Jamb	23.40	0.050	No
Table K1 - Default	E20 Exposed floor (normal)	28.73	0.320	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	28.73	0.070	No
Table K1 - Approved	E16 Corner (normal)	7.20	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	7.10	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	9.67	0.000	No
Table K1 - Default	P7 Party Wall - Exposed floor (normal)	5.55	0.160	No
Table K1 - Default	P8 Party Wall - Exposed floor (inverted)	4.12	0.240	No

Y-value W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather

Cross ventilation possible

Night Ventilation

Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of open flues	0	0	0
Number of intermittent fans			3
Number of passive vents			0
Number of flueless gas fires			0

21.0 Fixed Cooling System

22.0 Lighting

Internal

Total number of light fittings	7	
Total number of L.E.L. fittings	7	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No
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23.0 Electricity Tariff

24.0 Main Heating 1

	Database	
Percentage of Heat	100	%
Database Ref. No.	102573	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	0.0	
In Summer	0.0	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	≤ 35°C	

25.0 Main Heating 2

Community Heating	None
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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 Only Heating Hot Water	No

29.0 Hot Water Cylinder

Cylinder Stat	Yes
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SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 01-02			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 01-02, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	82 B	DER	23.07	TER	28.94
Environmental	85 B	% DER<TER	20.28		
CO ₂ Emissions (t/year)	0.98	DFEE	43.88	TFEE	47.77
General Requirements Compliance	Pass	% DFEE<TFEE	8.15		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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:	29.48 m	50.11 m ²	2.40 m

7.0 Living Area	33.03	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	158.48	kJ/m ² K

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	38.93	27.53
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	21.94	19.82

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	16.99

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	37.49

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	50.11

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	50.11

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
RH Windows	Window	[1] External Wall	North	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					6.84	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	5.76	0.500	No
Table K1 - Approved	E4 Jamb	28.20	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	50.72	0.070	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	4.80	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	7.20	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	2.40	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	14.16	0.000	No

Y-value	0.141	W/m²K
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18.0 Pressure Testing

Designed AP ₅₀	5.01	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	No
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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				2
Number of passive vents				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of flueless gas fires 0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings 6
Total number of L.E.L. fittings 6
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database
Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes
Insulation Type Measured Loss

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	008435 - Apt 01-03			Issued on Date	31/08/2022
Assessment Reference	Rev A	Prop Type Ref	008435-SAP-Apartment-MF		
Property	Apt 01-03, Land Adjacent. 300 Kings Road, Reading				
SAP Rating	84 B	DER	17.31	TER	22.68
Environmental	87 B	% DER<TER	23.66		
CO ₂ Emissions (t/year)	1.05	DFEE	33.43	TFEE	36.34
General Requirements Compliance	Pass	% DFEE<TFEE	8.00		
Assessor Details	Mr. Paul Bainbridge, Paul Bainbridge, Tel: 01904 674890, paul.bainbridge@thefesgroup.com			Assessor ID	w976-0001
Client	Freeths LLP				

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

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
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:		23.79 m	71.16 m²	2.40 m
7.0 Living Area	35.66	m²		
8.0 Thermal Mass Parameter	Precise calculation			
Thermal Mass	166.69	kJ/m²K		

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	39.89	26.21
Wall to Corridor	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.20	14.00	17.21	15.09

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	29.64

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall (Steel)	Other	14.00	112.99

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	71.16

11.1 Party Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	71.16

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Door to Corridor							1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Door to Corridor	[2] Wall to Corridor	East							2.12	
LH Windows	Window	[1] External Wall	South	None	0.00					4.56	
Rear Windows	Window	[1] External Wall	West	None	0.00					9.12	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	6.71	0.500	No
Table K1 - Approved	E4 Jamb	33.00	0.050	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	47.58	0.070	No
Table K1 - Approved	E16 Corner (normal)	4.80	0.090	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.40	-0.090	No
Table K1 - Approved	E18 Party wall between dwellings	2.40	0.060	No
Table K1 - Default	E25 Staggered party wall between dwellings	7.20	0.120	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	24.70	0.000	No

Y-value 0.167 W/m²K

18.0 Pressure Testing

Yes

Designed AP₅₀ 5.01 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ 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 No

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				3
Number of passive vents				0

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Number of flueless gas fires 0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings 6
Total number of L.E.L. fittings 6
Percentage of L.E.L. fittings 100.00 %

External

External lights fitted No

23.0 Electricity Tariff Standard

24.0 Main Heating 1 Database
Percentage of Heat 100 %
Database Ref. No. 102573
Fuel Type Electricity
Main Heating PET
SAP Code 224
In Winter 0.0
In Summer 0.0
Controls CHD Time and temperature zone control
PCDF Controls 0
Sap Code 2207
Is MHS Pumped Pump in heated space
Heat Emitter Radiators
Flow Temperature <= 35°C

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 Only Heating Hot Water No

29.0 Hot Water Cylinder Hot Water Cylinder

Cylinder Stat Yes
Cylinder In Heated Space Yes
Independent Time Control Yes
Insulation Type Measured Loss

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Cylinder Volume	200.00	L
Loss	1.57	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	228.15	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None