



39 Oak Avenue

Ickenham

Energy and Sustainability Statement

Document Issue Record

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1.0 Executive Summary

EEABS (Elmstead Energy Assessments & Building Services) were instructed to produce an Energy and Sustainability Statement for the proposed development at 39 Oak Avenue, Ickenham.

This energy and Sustainability statement can be used as a supporting document to the planning application to demonstrate that the overall energy and Sustainability strategy of the proposed development will meet the requirements set out by Building Regulations and Hillingdon Local Planning Policy.

Relevant Planning Policies

From inspection of the relevant policies for the proposed development we consider that the following target needs to be met in order to comply with Part L Building Regulations and Hillingdon Local Planning Policies.

- The new development should achieve a minimum of at least a 10% on-site carbon emission reduction beyond Part L of the Building Regulations.

Assessment Methodology

To calculate the estimated carbon emissions for the dwelling we have used Design SAP 2012 software which is approved by Building Regulations. The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 2012 methodology.

The appraisals within this strategy are based on the Building Regulations Part L (2013) calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise.

Carbon Emission Results

Savings have been made in the proposed design by following the Be Lean, Be Clean, Be Green Energy Hierarchy of the London Plan.

The results show that by implementing the measures described throughout this report the carbon emissions of the proposed development would be 2.91 tonnes CO₂, compared to 3.36 tonnes CO₂ for the Baseline. This would be an overall improvement of 13.14% therefore satisfy the requirement of a minimum 10% reduction set by Policy DMEI 2 of the Hillingdon Local Plan.

The SAP Calculation sheet for the proposed design can be found within Appendix A.

Sustainability Measures

In collaboration with the Energy Assessment of the development, an analysis of the overheating within the dwelling has also been carried out following the cooling hierarchy of the London Plan.

The SAP calculation carried out for the proposed development shows that it has a 'Not Significant' chance of overheating, this is considered as a pass under the SAP 2012 methodology.

Any demolition will be recycled where possible. A demolition audit will be carried out before any works progress on site to identify which materials can be recycled. The development will also consider the concept of the waste hierarchy in both the demolition of any structures and when constructing the proposed building.

The building, wherever possible, will use BRE Green Guide 'A' rated materials and manufacturers will be chosen that can demonstrate their products are sustainably sourced and manufactured.

The water usage will not exceed a maximum of 105 litres/person/day as required by Policy DMEI 10 of the Hillingdon Local Plan. Calculations to prove this can be carried out at later design stages once specific sanitaryware has been selected.

The extent of possible flooding on the site has also been analysed using data from the government flood warning information service. The flood map shows that the proposed development site is within Flood Zone 1.

The surface water flood map service states that the proposed site sits within an area of medium risk from surface water flooding. The final drainage design must reduce surface water run-off rates to no higher than the pre-development greenfield run-off rate in a 1:100 year storm scenario, plus an appropriate allowance for climate change.

The road noise map below shows that the site is located far away from high levels of road noise.

Conclusion

This energy and sustainability statement has shown that the proposed new dwelling located at 39 Oak Avenue, Ickenham would satisfy the energy and sustainability requirements of Building Regulations and Hillingdon Local Planning Policies.

2.0 Introduction

EEABS (Elmstead Energy Assessments & Building Services) were instructed to produce an Energy and Sustainability Statement for the proposed development at 39 Oak Avenue, Ickenham.

This energy and Sustainability statement can be used as a supporting document to the planning application to demonstrate that the overall energy and Sustainability strategy of the proposed development will meet the requirements set out by Building Regulations and Hillingdon Local Planning Policy.

2.1 Planning Policy Context

Numerous policies that relate to the energy efficiency and carbon emissions of the development have been considered in preparation of this energy assessment.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework encourages local planning authorities to adopt proactive strategies to mitigate and adapt to climate change. They should plan for new development in ways which reduce greenhouse gas emissions; actively support energy efficiency improvements to existing buildings; and set local sustainability requirements which are consistent with the government's policies and standards.

2.1.2 Building Regulations Part L 2013

The assessment of the development against policy targets has been carried out using Part L 2013 benchmarks. Criterion One of the Building Regulations Part L1A 2013 is mandatory and requires that a dwelling does not exceed the CO₂ emission rate of that set by a Target Emission Rate (TER) calculated in accordance with Appendix R from the SAP 2012 methodology. It also requires that a dwelling does not exceed the Target Fabric Energy Efficiency (TFEE).

2.1.3 The London Plan

The latest London Plan guidance on the preparation of Energy Assessments is from April 2020 and has been used to structure this energy statement.

As this development is not more than 10 units it is not considered as a major development and therefore the requirements of the London Plan should not strictly apply, however the guidance will still be followed, and every effort will be made to ensure the most energy efficient and carbon minimal design possible.

Policy SI 2 of the London Plan requires development proposals to make the fullest contribution to minimising carbon dioxide emissions through on site methods in accordance with the following energy hierarchy:

- Be lean: use less energy
- Be clean: supply energy efficiently
- Be green: use renewable energy

2.1.4 London Borough of Hillingdon

The London Borough of Hillingdon Local Plan Part 2 - Development Management Policies (Adopted Version January 2020) Policy DMEI 2 states that all developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with the London Plan targets.

Following early discussions with the planners they have stated that the proposed dwelling would need to achieve an energy efficiency standard of 10% CO₂ improvement over Building Regulations requirements Part L 2013 (TER Baseline), in accordance with Policy DMEI 2 of the Hillingdon Local Plan: Part 2 - Development Management Policies (2020) and Policy SI 2 of the London Plan (2021).

3.0 Assessment Methodology

The following methodology has been used to calculate the CO2 emissions for the development.

3.1 SAP 2012

To calculate the estimated carbon emissions of the development we have used Design SAP 2012 software which is approved by Building Regulations. The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 2012 methodology.

3.2 Limitations

The appraisals within this strategy are based on the Building Regulations Part L (2013) calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise.

Occupants may operate their systems differently, and/or the weather may be different from the assumptions made by Part L approved calculation methods, leading to differing energy requirements once the development is in operation.

4.0 Energy Assessment

The following sections describe how the baseline and proposed developments Carbon Emissions have been calculated.

4.1 Baseline Target

The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 2012 methodology. This Baseline CO₂ emission rate is then used as the basis for the target CO₂ reductions required throughout the Energy Hierarchy.

Table 1 - Baseline Carbon Emission Results

Unit	Area (m ²)	CO ₂ Emission Rate (kgCO ₂ /m ²)	Total CO ₂ Emissions (Tonnes of CO ₂)
39 Oak Avenue	231.40	14.50	3.36

The results show that the total Target CO₂ emissions for the development is estimated to be 3.36 Tonnes of CO₂ per annum.

4.2 Proposed Design

4.2.1 Passive Design Measures

Passive design measures are those which reduce the initial energy demand of the building through passive means, for example wall insulation once installed requires no other means of operation and its performance is also unlikely to deteriorate.

Where possible the development has taken a fabric first approach to reducing the initial energy demand by the following methods:

Glazing Performance

Windows and glazed doors are to be highly efficient double glazing and will have a low U-value of 1.4 W/m².K, helping to reduce the amount of heat loss through the glazing.

Thermal Envelope

The inclusion of high levels of thermal insulation not only helps to reduce the buildings overall energy demand and therefore carbon emissions, but it also plays a vital role in securing the occupant's thermal comfort.

It also helps to reduce the buildings peak heating load required meaning that smaller plant equipment can be sized, helping to further improve not only carbon emissions but also the cost of the development.

The proposed walls, floor, and roofs will provide significant savings over the Part L1 limiting fabric parameters.

Thermal Bridging

Thermal bridges are junctions between parts of the build through which heat can escape, for example the junction where a roof and wall construction meet. To reduce heat loss through these areas all thermal bridges should use Accredited Construction Details (ACD) where possible.

Air Permeability

The air permeability of the development is a measure of how much volume of air can penetrate through its fabric. Therefore, a well built, highly sealed building would result in less unwanted heat loss, and therefore provide a more efficient building.

Part L Building Regulations have a maximum limit of $10 \text{ m}^3/\text{h.m}^2$ that must be achieved, the proposed development will target a value of $5.0 \text{ m}^3/\text{h.m}^2$.

Summary of Passive Design Measures

The table below shows a summary of the passive design measures included for within the development and how they compare against the Part L1 requirements.

Table 2 - Summary Table of Passive Design Measures

Parameter	Part L1a Limiting Values	Development Proposal	% Improvement
U-Values			
Walls	$0.30 \text{ W/m}^2.\text{K}$	$0.18 \text{ W/m}^2.\text{K}$	40%
Floors	$0.25 \text{ W/m}^2.\text{K}$	$0.15 \text{ W/m}^2.\text{K}$	40%
Roofs	$0.20 \text{ W/m}^2.\text{K}$	$0.15 \text{ W/m}^2.\text{K}$	25%
Glazing	$2.00 \text{ W/m}^2.\text{K}$	$1.40 \text{ W/m}^2.\text{K}$	30%
Air Permeability	$10 \text{ m}^3/\text{h.m}^2$	$5.0 \text{ m}^3/\text{h.m}^2$	50%

The summary of passive measures shows that the proposed development will be a considerable improvement over the Part L1 limiting fabric parameters.

4.2.2 Energy Efficiency Measures

Energy efficiency measures are those which seek to supply to remaining demand for energy, after the initial demand has been lowered through passive means, in the most efficient way.

The following energy efficiency measures have been incorporated within the proposed development:

Heating and Hot Water

The heating and hot water is assumed to be provided by a Vaillant ecoFIT Sustain 630 gas boiler with a seasonal efficiency of 89.8%. The hot water cylinder is 200 litres with a measured loss of 1.57 kWh/day.

Lighting

The lighting for the development will consist of low energy LED lighting throughout.

Ventilation

The ventilation is assumed to be natural through the use of opening windows, this reduces energy costs and carbon emissions associated with whole house mechanical ventilation systems. Wet rooms and kitchen areas will have local intermittent mechanical extract ventilation.

4.2.3 Renewable Technologies

We have assumed that a 1.5 kW (4No. 375W panel) PV system will be installed on the south-east facing roof of the property.

4.2.4 Proposed Design Results

The results below show total carbon emissions in kgCO₂/m² and tonnes CO₂ for the proposed design as previously described.

Table 3 - Proposed Design Carbon Emission Results

Unit	Area (m ²)	CO ₂ Emission Rate (kgCO ₂ /m ²)	Total CO ₂ Emissions (Tonnes of CO ₂)
39 Oak Avenue	231.40	12.59	2.91

The results show that under the proposed design the carbon emissions would be 2.91 tonnes CO₂, compared to 3.36 tonnes CO₂ for the Baseline. This would be an overall improvement of 13.14% therefore satisfy the requirement of a minimum 10% reduction set by Policy DMEI 2 of the Hillingdon Local Plan.

The SAP Calculation sheet for the proposed design can be found within Appendix A.

5.0 Sustainability

5.1 Overheating/Climate Change Adaptability

In collaboration with the Energy Assessment of the development, an analysis of the overheating within the building has also been carried out.

1. Minimise Internal Heat Gains

To minimise internal heat gains low energy lighting will be used throughout the development. Any new heating pipework will also be well insulated, white goods and computer equipment should also be of the highest efficiency.

2. Reduce the Amount of Heat Entering the Building

Highly efficient windows will reduce the amount of solar gain entering the dwelling.

3. Use of Thermal Mass and High Ceilings to Manage Heat within the Building

The building will have a medium thermal mass and it will be well insulated with an improved air permeability value to stop heat from first entering the building.

4. Passive Ventilation

Windows will be openable to allow for fresh air when required.

5. Mechanical Ventilation

A whole house Mechanical supply and extract ventilation system has not been proposed at this stage in order to keep energy consumption to as low as possible. One could be considered further into the detailed design stage if required.

The SAP calculation carried out for the proposed development shows that it has a 'Not Significant' chance of overheating, this is considered as a pass under the SAP 2012 methodology.

5.2 Land Use and Waste

Any demolition will be recycled where possible. A demolition audit will be carried out before any works progress on site to identify which materials can be recycled.

The development will also consider the concept of the waste hierarchy shown below in both the demolition of any structures and when constructing the proposed building.

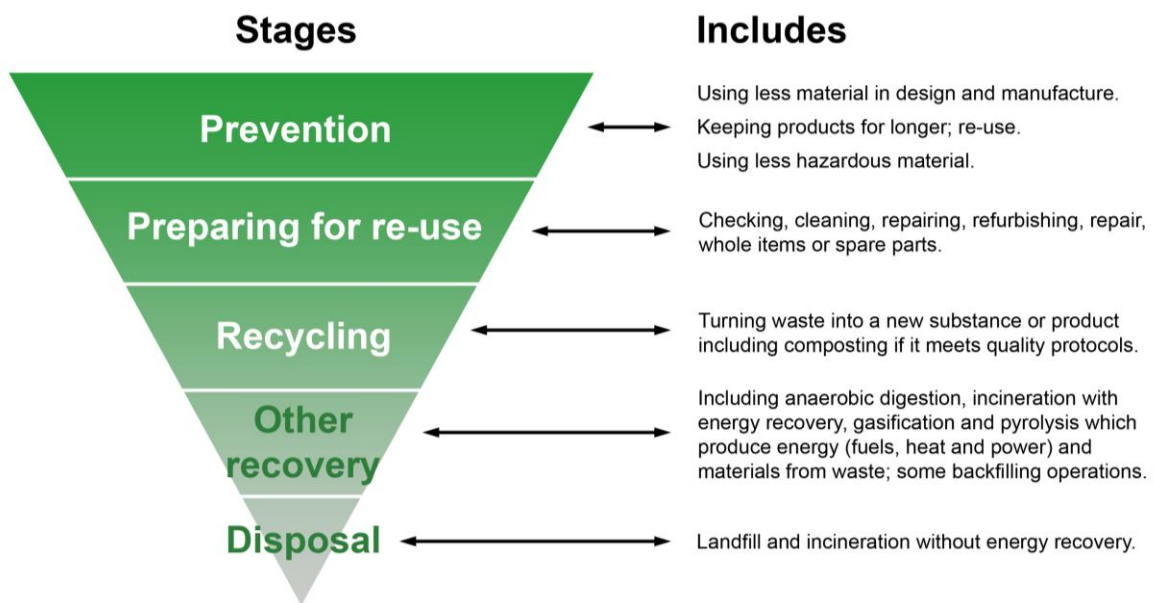


Figure 1 - Waste Hierarchy Diagram

5.3 Materials Use

As mentioned above it is the design team's intention to minimise waste during the construction process through careful consideration of materials and construction methodology. The building, wherever possible, will use BRE Green Guide 'A' rated materials and manufacturers will be chosen that can demonstrate their products are sustainably sourced and manufactured.

5.4 Water Efficiency

All taps, toilets and showers will be specified that are considered to be low water use.

The water usage for the dwelling will not exceed a maximum of 105 litres/person/day as required by Policy DMEI 10 of the Hillingdon Local Plan.

Calculations to prove this can be carried out at later design stages once specific sanitaryware has been selected.

5.5 Flood Risk

The extent of possible flooding on the site has also been analysed using data from the government flood warning information service.

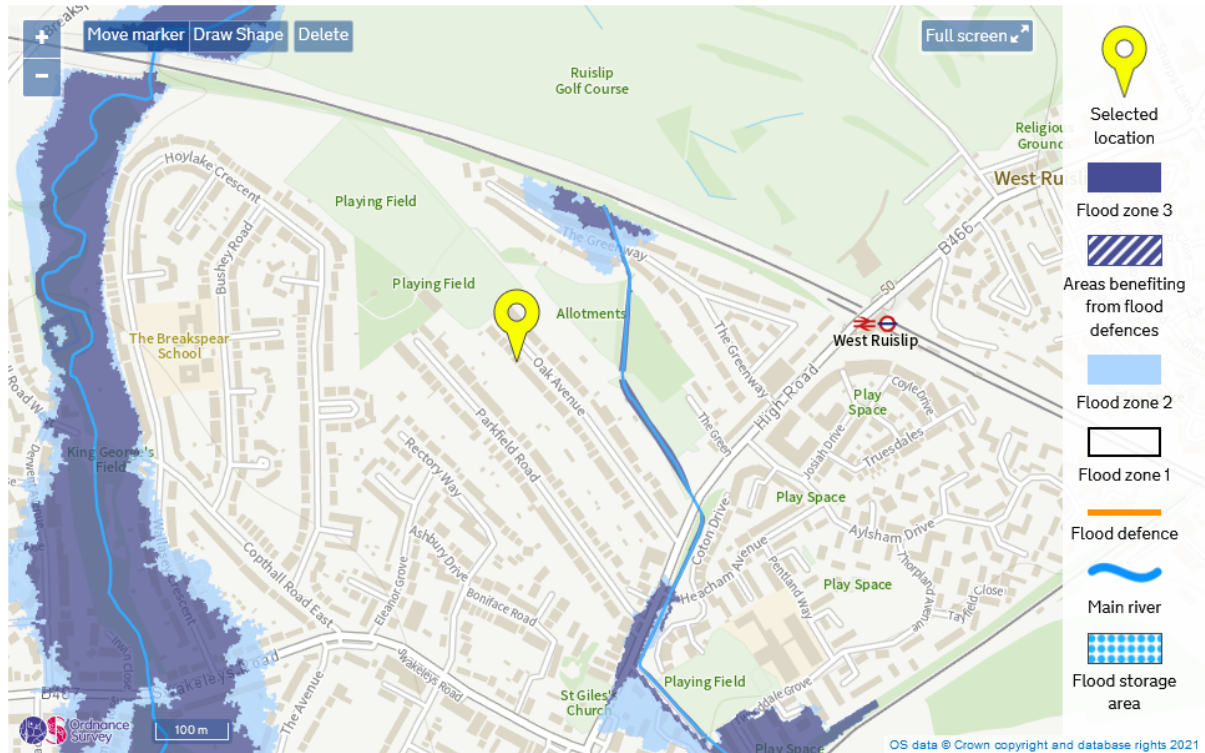


Figure 2 - Flood Risk Map for the Site

The flood map shows that the proposed development site is within Flood Zone 1.

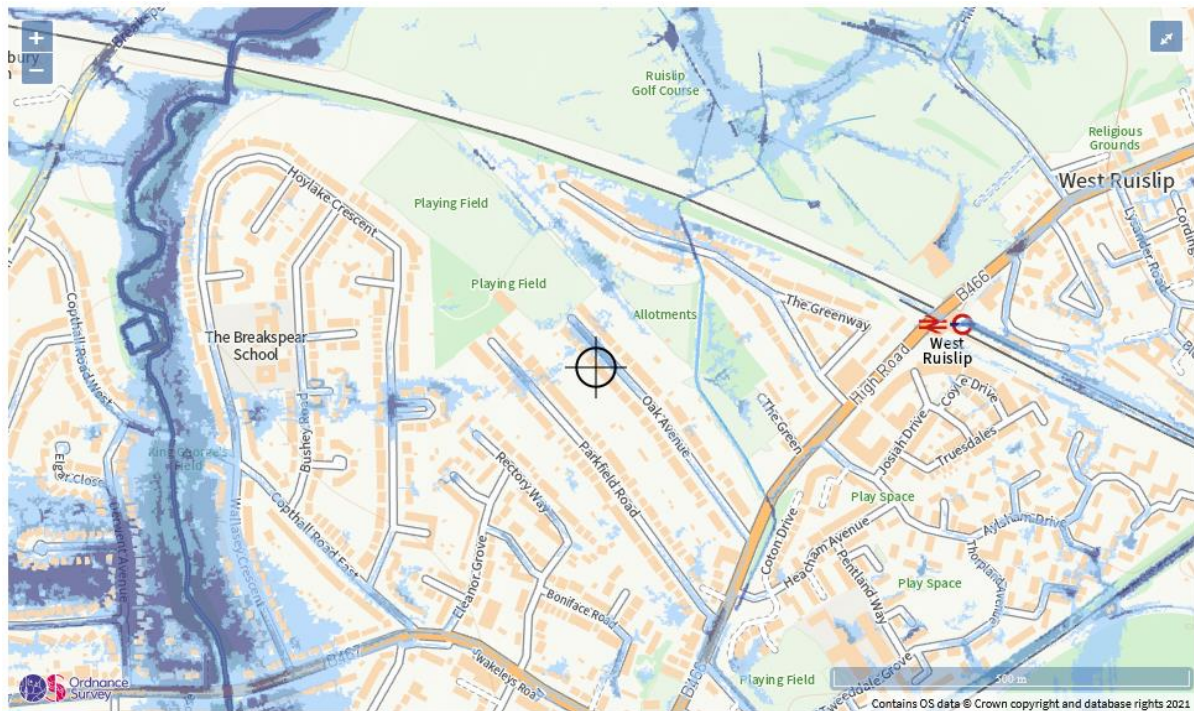


Figure 3 - Surface Water Map for the Site

The surface water flood map service states that the proposed site sits within an area of medium risk from surface water flooding. The final drainage design must reduce surface water run-off rates to no higher than the pre-development greenfield run-off rate in a 1:100 year storm scenario, plus an appropriate allowance for climate change.

5.6 Noise

The road noise map below shows that the site is located far away from high levels of road noise.

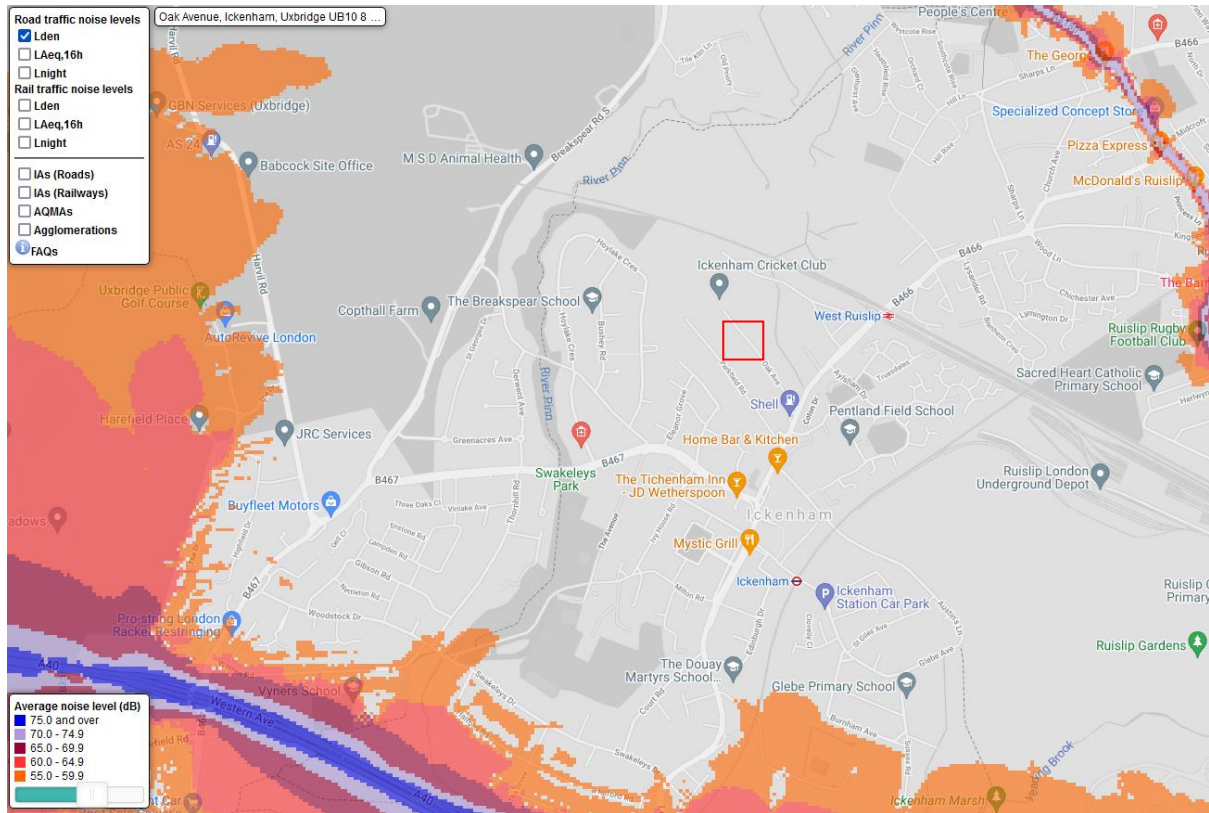


Figure 4 - Road Noise Map for the Site



Appendix A

SAP 2012 Calculation Sheet and Predicted Energy Assessment

PREDICTED ENERGY ASSESSMENT

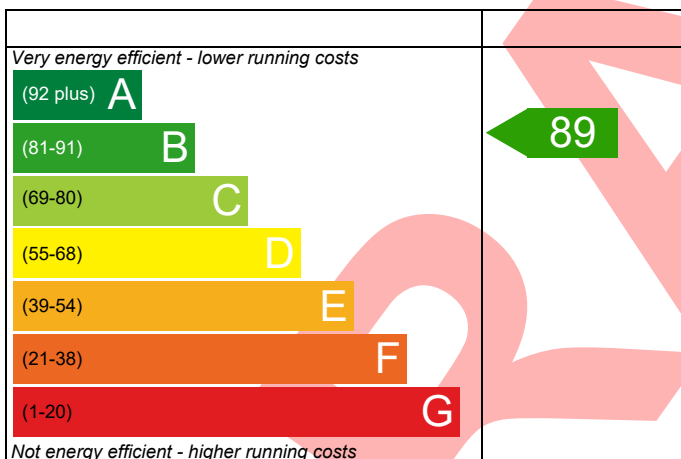
39, Oak Avenue,
Ickenham,
UXBRIDGE,
UB10 8LR

Dwelling type: House, Detached
Date of assessment: 27/10/2021
Produced by: Darren Coham
Total floor area: 231.4 m²

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

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating

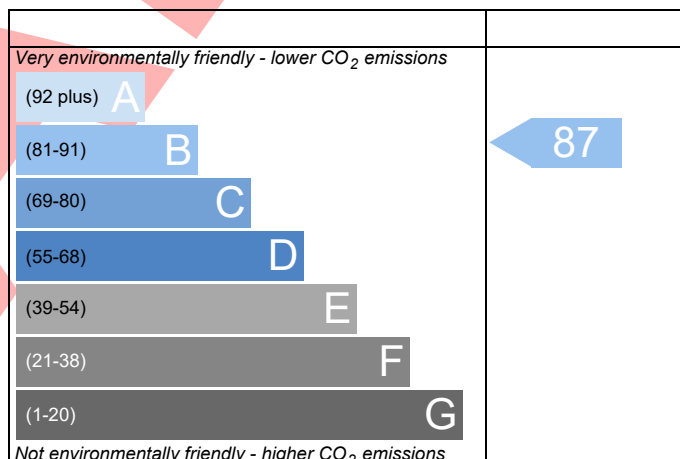


England

EU Directive
2002/91/EC

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

Environmental Impact (CO₂) Rating



England

EU Directive
2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

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

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)

Property Reference	000254			Issued on Date	27/10/2021
Assessment Reference	001	Prop Type Ref			
Property	39, Oak Avenue, Ickenham, UXBRIDGE, UB10 8LR				
SAP Rating	89 B	DER	12.59	TER	14.50
Environmental	87 B	% DER<TER	13.14		
CO ₂ Emissions (t/year)	2.29	DFEE	54.99	TFEE	58.50
General Requirements Compliance	Pass	% DFEE<TFEE	5.99		
Assessor Details	Mr. Darren Coham, Darren Coham, Tel: 07887912456, darrencoham@hotmail.com			Assessor ID	R789-0001
Client					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	14.50	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	12.59	kgCO ₂ /m ²	Pass
	-1.91 (-13.2%)	kgCO ₂ /m ²	

1b TEE and DFEE

Target Fabric Energy Efficiency (TFEE)	58.50	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	54.99	kWh/m ² /yr	
	-3.5 (-6.0%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	Pass
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	Pass
Roof	0.15 (max. 0.20)	0.15 (max. 0.35)	Pass
Openings	1.39 (max. 2.00)	1.40 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	5.00 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

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

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)

Main heating system

Boiler system with radiators or underfloor - Mains gas
Data from database
Vaillant ecoFIT sustain 630 VU 306/6-3 (H-GB)

Efficiency: 89.8% SEDBUK2009
Minimum: 88.0%

Pass

Secondary heating system

None

5 Cylinder insulation

Hot water storage

Measured cylinder loss: 1.57 kWh/day
Permitted by DBSCG 2.24

Pass

Primary pipework insulated

Yes

Pass

6 Controls

Space heating controls

Time and temperature zone control

Pass

Hot water controls

Cylinderstat

Pass

Independent timer for DHW

Pass

Boiler interlock

Yes

Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100 %

Minimum

75 %

Pass

8 Mechanical ventilation

Not applicable

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)

Not significant

Pass

Based on:

Overshading

Average

Windows facing North East

25.65 m², No overhang

Windows facing South East

5.66 m², No overhang

Windows facing South West

27.87 m², No overhang

Windows facing North West

6.32 m², No overhang

Air change rate

8.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

5.00 (design value) m³/(h.m²) @ 50 Pa

Maximum

10.0 m³/(h.m²) @ 50 Pa

Pass

10 Key features

Door U-value

1.00 W/m²K

Photovoltaic array

1.50 kW

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