

ENERGY STATEMENT

Proposed development at:
Queens Farm, Ifield Place, Shorne, Gravesend, Kent,
DA12 3HU



This document has been prepared by Achieve Green¹ for the sole use of our client. Achieve Green owe no duty of care to any third parties in respect of its content. No third party may rely upon this document without the prior and express written agreement of Achieve Green. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

¹ Achieve Green and Energytest are trading names of Achieve Green Ltd, Company Registration No. 7013944



Contents

1.	Executive Summary.....	3
2.	Introduction	3
2.1.	Overview of the proposed development.....	4
3.	Policies and Drivers	4
3.1.	National and International Policy	4
3.2.	Local Policy: Gravesham District Council	5
3.2.1.	Project policy.....	5
4.	Energy hierarchy	6
5.	Establishing the baseline.....	6
6.	Energy efficient design measures ("be lean").....	6
7.	Energy efficient systems ("be clean")	7
7.1.	Combined heat and power	7
7.2.	District heating networks.....	7
8.	Low and zero carbon energy sources ("be green").....	8
8.1.	Photovoltaics.....	8
8.2.	Heat Pumps	8
8.3.	Solar thermal.....	9
8.4.	Wind turbines	9
8.5.	Biomass	9
8.6.	Proposed low and zero carbon energy sources	10
8.6.1.	Lifecycle cost and payback for photovoltaic installation	10
8.6.2.	Available grants for photovoltaic installation	10
9.	Results: Calculated CO ₂ savings	11
10.	Appendix A: SBEM BRUKL Reports.....	12



1. Executive Summary

This Energy Statement has been prepared by Achieve Green in support of a full planning application for a material change of use that will create six light industrial units at Queens Farm, Ifield Place, Shorne, Gravesend, Kent, DA12 3HU.

The design has been developed to address the Renewable and Low Carbon Energy requirements of Gravesend District Council.

A base case has been developed, against which potential savings can be assessed. As this development is classified as a material change of use, the baseline has been established based on the minimum requirements of Approved Document L2 (2021).

This proposed development features improved insulation and air tightness standards, when compared against the compliance requirements of Approved Document L2 2021 of the Building Regulations. In addition, this proposed development will incorporate a mechanical and electrical specification that surpasses the requirements of Approved Document L2 2021.

Having minimised energy consumption in the first instance, the potential for remaining energy demands to be met via a decentralised energy source has been considered. It is evident this proposed development is neither within the coverage of an existing district heating network, nor is there an expectation that a district heating network will be developed at this site in the near future.

Due to its size, this development is not suitable for combined heat and power.

An assessment has been carried out to determine the potential for renewable energy systems to reduce CO₂ emissions further. In order to meet the expectations of the Local Planning Authority it is intended that photovoltaic arrays totalling 73.32 kWp shall be installed upon the available roof area.

The total reduction in emissions resulting from energy efficiency measures and the installation of renewable technology is 81.4% compared to the regulated emissions from a building designed to just meet Building Regulations (2021) Part L2.

2. Introduction

Energy use in buildings is a significant contributor to global CO₂ emissions and global warming. Designing energy efficient buildings and incorporating low and zero carbon energy generation is a vital part of ensuring this development incorporates sustainability as a core part of its design.

The purpose of the report is to assist evaluating parties to understand the energy consumption and performance of the proposed development and consider its performance against the "lean, clean, green" performance standard.

This application, seeks by its design to surpass the CO₂ emission target of Approved Document L2 2021 by a minimum of 10% of the regulated energy consumption.

2.1. Overview of the proposed development

The proposed development consists of the construction of a six light industrial units.

Proposed ground floor plan:



3. Policies and Drivers

3.1. National and International Policy

The Climate Change Act (2008) sets a legally binding target for reducing UK carbon dioxide (CO₂) emissions to zero by 2050. It also provides for a Committee on Climate Change, which sets out carbon budgets binding on the Government for 5-year periods.

The National Planning Policy Framework (NPPF) 2021, reflects the requirements of the Climate Change Act 2008 in paragraphs 153 and 155 as follows:

"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity



and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure."

"New development should be planned for in ways that:

- a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and
- b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards."

"To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
- b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers."

3.2. Local Policy: Gravesham District Council

Sustainability is key to Gravesham District Council planning policy and should be considered with every planning application.

3.2.1. Project policy

Planning policy leads to maximise on-site reductions in CO₂ emissions.

4. Energy hierarchy

In line with best practice the proposed energy strategy for this development will follow the principals of the energy hierarchy.

The energy hierarchy has three priorities, seeking to reduce energy use before meeting remaining demand by the cleanest means possible:

- 1) Be lean – use less energy: Optimise the building fabric, glazing, and structure to minimise energy consumption in the first instance by using low U-values and good air tightness, and ensure that active systems run as energy efficiently as possible.
- 2) Be clean – supply energy efficiently: Further reduce carbon emissions through the use of decentralised energy where feasible, such as combined heat and power (CHP).
- 3) Be green – use renewable energy: When the above design elements have been reasonably exhausted, supply energy through renewable sources where practical.



5. Establishing the baseline

For buildings that are subject to a material change of use, the baseline is established by applying the minimum standards of Approved Document L1.

The baseline calculations are based on buildings that are the same size and shape as the proposed building and have the same exposed facades.

6. Energy efficient design measures (“be lean”)

Enhancing the thermal performance of the building envelope helps to future-proof the structure and also yields the greatest CO₂ savings. Adding renewable technology will then yield maximum carbon reductions with lower long-term costs for the developer.

The proposed non-domestic development will achieve compliance with Approved Document L1 2021 without reliance on the contribution of renewable technology.

The following energy-efficient design measures are proposed:

	Proposed development	L2 2021 requirements
Replacement external wall U-value (W/m ² K)	0.36	0.26
Roof U-value (W/m ² K)	0.18	0.18

Replaced ground floor U-value (W/m ² K)	0.18	0.18
Air permeability	5 m ³ /h.m ²	15 m ³ /h.m ²

Having reduced energy demand through improvements to the fabric, this development shall seek to reduce energy consumption further through the specification of mechanical and electrical systems with efficiencies that surpass the requirements of Approved Document L1 2021:

	Proposed development	L1 2021 requirements
Lighting	95-130 Lm/W	95 Lm/W

7. Energy efficient systems ("*be clean*")

7.1. Combined heat and power

Combined heat and power (CHP) systems use relatively cheap and clean fuels (such as natural gas) to generate heat and electricity on site. A typical CHP system uses combustion of natural gas to drive a turbine that produces electricity. The heat generated is captured and used to produce hot water.

As losses are minimised the carbon footprint of the energy generated is very low. However this is dependent on there being sufficient year-round local heat demand to fully utilise the heat generated by the CHP plant. An example would be developments of at least 500 dwellings, universities or hospitals.

Due to its size, this development is not suitable for combined heat and power.

7.2. District heating networks

In a district heating network heat is supplied from one or more central energy centres to multiple buildings within the network. Supply to multiple buildings guarantees high year-round local heat demand which in turn allows the use of low carbon technologies within the energy centre, such as combined heat and power systems. Large plant and aggregated demand allows systems within the energy centre to run more efficiently.

Hot water is distributed within the network via highly insulated pipes. To connect to the network individual boilers are replaced with separately metered heat exchangers.

Due to the fact this proposed development is neither within the coverage of an existing district heating network, nor is it within an area designated as having potential for a future network, district heating can be discounted as a viable option.

8. Low and zero carbon energy sources ("*be green*")

8.1. Photovoltaics

Solar photovoltaics (PV) capture the sun's energy using photovoltaic cells. The cells convert sunlight into electricity, which can be utilised on site or transferred into the National Grid. PV cells are made from layers of semi-conducting material, usually silicon. When light shines on the cell it creates an electric field across the layers. The stronger the sunshine, the more electricity is produced. Groups of cells are mounted together in panels or modules that can be mounted on a roof.

The power of a PV cell is measured in kilowatts peak (kWp). This is the rate at which the cell generates energy at peak performance in full direct sunlight.

Photovoltaics offer high CO₂ savings, are simple to install and suitable for most buildings. The only limiting factor for PV is the availability of suitable roof space.

Feasibility assessment: Feasible and appropriate. There is sufficient unshaded roofspace available for a photovoltaic installation.

8.2. Heat Pumps

Heat pumps collect low temperature heat from renewable sources (such as the air or ground) and concentrate the heat to a usable temperature via a reverse refrigeration cycle. Useable heat is transferred to the dwelling via a heat exchanger and can be used for low temperature central heating and domestic hot water, though an immersion top-up may be required for DHW.

Heat pumps have some impact on the environment as they generally use grid supplied electricity to run the pumps. It is common for heat pumps to have a coefficient of performance of three, meaning that for every 1kWh of electricity used, over 3kWh of heat can be generated. The renewable component of the output is therefore taken as the difference between the output energy and the input energy, in this scenario the heat pump will be deemed to have delivered 2kWh of renewable energy.

Ground source heat pumps require external horizontal ground loops, or as is more likely in built-up environments, vertical loops fed into bore holes. The application of ground source heat pumps is therefore constrained by site ground conditions and available space.

Air source heat pumps have a slightly lower seasonal efficiency than ground source heat pumps, but require less space. Noise and space considerations should be assessed when determining an appropriate site for external condensing units.



Heat pumps are a very good option for sites not connected to the gas network, or as a replacement of existing electric or oil-fired heating systems.

Feasibility assessment: Feasible but relatively low heating and Domestic Hot Water demand.

8.3. Solar thermal

Solar thermal systems, use free heat from the sun to warm domestic hot water. A conventional boiler, heat pump or immersion heater can be used to make the water hotter, or to provide hot water when solar energy is unavailable.

Solar thermal systems are most appropriate for buildings with high year-round domestic hot water demand. Although a typical solar thermal system will be able to meet half the annual domestic hot water demand for a dwelling, many will use electricity to run pumps within the system.

Feasibility assessment: Feasible but relatively low Domestic Hot Water demand.

8.4. Wind turbines

Wind turbines use blades to catch the wind. When the wind blows, the blades are forced round, driving a turbine which generates electricity. The stronger the wind, the more electricity produced.

There are two types of domestic-sized wind turbine: Pole mounted and building mounted. Pole mounted turbines are free standing and are erected in a suitably exposed position, and are often about 5kW to 6kW in size. Building mounted turbines are smaller and can be installed on the roof of a home where there is a suitable wind resource. Often these are around 1kW to 2kW in size.

Large scale turbines, in exposed locations offer one of the best financial returns of all renewable energy systems as the payback of the system increases dramatically with the size of the turbine. However small-scale systems offer much lower levels of performance and recent studies have questioned the viability and output from such systems, particularly in urban environments.

Feasibility assessment: Potentially feasible and appropriate. Investigation of site wind conditions would be required.

8.5. Biomass

Biomass heating systems, burn wood pellets, chips or logs to provide warmth in a single room or to power central heating and hot water boilers. The carbon dioxide emitted when wood is burned is the same amount that was absorbed over the months and years that the plant was

growing. The process is sustainable as long as new plants continue to grow in place of those used for fuel. There are some carbon emissions caused by the cultivation, manufacture and transportation of the fuel, but as long as the fuel is sourced locally, these are much lower than the emissions from fossil fuels.

When specifying biomass heating systems is important to consider the potential technical issues surrounding delivery and storage of fuel.

Although the CO₂ savings from biomass are substantial, the high levels of NO_x emissions can make biomass systems unsuitable for urban environments.

Feasibility assessment: Feasible but relatively low heating and Domestic Hot Water demand.

8.6. Proposed low and zero carbon energy sources

With carbon emissions within the building already reduced through an enhanced fabric and energy efficient systems, it is proposed that a further reduction will be achieved through the installation of **photovoltaic arrays totalling 73.32 kWp**.

8.6.1. Lifecycle cost and payback for photovoltaic installation

Typically installed costs are around £1,700 per kWp², therefore a 10kWp system would cost approximately £124,644. To achieve the best payback from the electricity generated, it is recommended to use most of the electricity onsite rather than export it, to save the cost of imported electricity. By using the electricity onsite, the site's running costs are reduced.

Assuming 90% of the generated electricity is used on site and an electricity unit cost of 17.56p/kWh, this would save approximately £9,440 per annum. The exported electricity would then be purchased by the grid for 5.5/kWh giving a further saving of £330 per annum. So, in total an annual saving of £9,770 could be achieved in optimum conditions.

This would give a payback period of 12.8 years.

8.6.2. Available grants for photovoltaic installation

There are currently no available grants for commercial installations of photovoltaic arrays at this location.

² <https://www.cat.org.uk/info-resources/free-information-service/energy/solar-photovoltaic/>

9. Results: Calculated CO₂ savings

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-domestic buildings

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)
	Regulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	11.9
After energy demand reduction and renewable energy	2.2

Table 2: Regulated carbon dioxide savings from each stage of the Energy Hierarchy for non-domestic buildings

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Total Cumulative Savings	9.7	81.4

4 St John's Road
Tunbridge Wells
Kent TN4 9NP

Tel: 01892 577 572
sales@achievegreen.co.uk
www.achievegreen.co.uk



10. Appendix A: SBEM BRUKL Reports

Project name

Units 1-6 - Notional

As designed

Date: Wed Jun 03 10:39:51 2026

Administrative information

Building Details

Address: Queens Farm, Ifield Place, Shorne, Gravesend,
DA12 3HU

Certifier details

Name: [REDACTED]

Telephone number: [REDACTED]

Address: Achieve Green Ltd, 4 St John's Road Tunbridge
Wells, Kent TN4 9NP

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 317.05The CO₂ emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	1.82
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	6.5
Target primary energy rate (TPER), kWh _e /m ² annum	18.01
Building primary energy rate (BPER), kWh _e /m ² annum	68.01
Do the building's emission and primary energy rates exceed the targets?	BER > TER BPER > TPER

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

Fabric element	U _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	GF - Unit 1 WC_P_5
Floors	0.18	0.18	0.25	GF - Unit 1 WC_S_3
Pitched roofs	0.16	0.16	0.16	Mezzanine - Unit 2_R_8
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	-	-	No external windows/roof-windows
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_{a-Limit} = Limiting area-weighted average U-values [W/(m²K)]U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	15

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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

1- Panel Heaters

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

1- Electric DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
GF - Unit 1 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 6 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 5 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 4 WC		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
GF - Unit 1		95	-	-
GF - Unit 1		95	-	-
GF - Unit 3		95	-	-
GF - Unit 2		95	-	-
GF - Unit 3		95	-	-
GF - Unit 2		95	-	-
GF - Unit 6		95	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
GF - Unit 5		95	-	-
GF - Unit 4		95	-	-
GF - Unit 6		95	-	-
GF - Unit 5		95	-	-
GF - Unit 4		95	-	-
GF - Unit 1 WC		95	-	-
GF - Unit 6 WC		95	-	-
GF - Unit 5 WC		95	-	-
GF - Unit 4 WC		95	-	-
Mezzanine - Unit 2		95	-	-
Mezzanine - Unit 1		95	-	-
Mezzanine - Unit 6		95	-	-
Mezzanine - Unit 4		95	-	-
Mezzanine - Unit 3		95	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF - Unit 1	N/A	N/A
GF - Unit 3	N/A	N/A
GF - Unit 2	N/A	N/A
GF - Unit 6	N/A	N/A
GF - Unit 5	N/A	N/A
GF - Unit 4	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1835.2	1835.2
External area [m ²]	5528.7	5528.7
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	15	4
Average conductance [W/K]	1461.01	1551.17
Average U-value [W/m ² K]	0.26	0.28
Alpha value* [%]	13.05	30.2

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	31.31	11.29
Cooling	0	0
Auxiliary	0.07	0.1
Lighting	11.51	8.79
Hot water	1.06	1.06
Equipment*	11.68	11.68
TOTAL**	43.96	21.23

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	9.46
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>9.46</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	171.85	127.99
Primary energy [kWh _{PE} /m ²]	68.01	18.01
Total emissions [kg/m ²]	6.5	1.82

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling									
Actual	118.4	6.2	0	0	0	0	0	0	0
Notional	94	17.4	0	0	0	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas									
Actual	261	0.3	90.6	0	0.2	0.8	0	1	0
Notional	157.6	1.8	32.7	0	0.3	1.34	0	----	----

Key to terms

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

Project name

Units 1-6

As designed

Date: Mon Jun 01 12:10:06 2026

Administrative information

Building Details

Address: Queens Farm, Ifield Place, Shorne, Gravesend,
DA12 3HU

Certifier details

Name: [REDACTED]

Telephone number: [REDACTED]

Address: Achieve Green Ltd, 4 St John's Road Tunbridge
Wells, Kent TN4 9NP

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 317.05The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	1.82
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.21
Target primary energy rate (TPER), kWh _e /m ² annum	18.01
Building primary energy rate (BPER), kWh _e /m ² annum	8.31
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

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

Fabric element	U _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.35	GF - Unit 1 WC_P_5
Floors	0.18	0.18	0.18	GF - Unit 1 WC_S_3
Pitched roofs	0.16	0.16	0.16	Mezzanine - Unit 2_R_8
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	-	-	No external windows/roof-windows
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_{a-Limit} = Limiting area-weighted average U-values [W/(m²K)]U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	5

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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

1- Panel Heaters

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

1- Electric DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
GF - Unit 1 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 6 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 5 WC		0.3	-	-	-	-	-	-	-	-	-	N/A
GF - Unit 4 WC		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
GF - Unit 1		130	-	-
GF - Unit 1		130	-	-
GF - Unit 3		130	-	-
GF - Unit 2		130	-	-
GF - Unit 3		130	-	-
GF - Unit 2		130	-	-
GF - Unit 6		130	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
GF - Unit 5		130	-	-
GF - Unit 4		130	-	-
GF - Unit 6		130	-	-
GF - Unit 5		130	-	-
GF - Unit 4		130	-	-
GF - Unit 1 WC		95	-	-
GF - Unit 6 WC		95	-	-
GF - Unit 5 WC		95	-	-
GF - Unit 4 WC		95	-	-
Mezzanine - Unit 2		130	-	-
Mezzanine - Unit 1		130	-	-
Mezzanine - Unit 6		130	-	-
Mezzanine - Unit 4		130	-	-
Mezzanine - Unit 3		130	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF - Unit 1	N/A	N/A
GF - Unit 3	N/A	N/A
GF - Unit 2	N/A	N/A
GF - Unit 6	N/A	N/A
GF - Unit 5	N/A	N/A
GF - Unit 4	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1835.2	1835.2
External area [m ²]	5528.7	5528.7
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	5	4
Average conductance [W/K]	1445.98	1551.17
Average U-value [W/m ² K]	0.26	0.28
Alpha value* [%]	13.19	30.2

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	26.61	11.29
Cooling	0	0
Auxiliary	0.07	0.1
Lighting	8.5	8.79
Hot water	1.06	1.06
Equipment*	11.68	11.68
TOTAL**	36.25	21.23

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	32.55	9.46
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	32.55	9.46

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	150.54	127.99
Primary energy [kWh _{PE} /m ²]	8.31	18.01
Total emissions [kg/m ²]	1.21	1.82

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling									
Actual	107	5.9	0	0	0	0	0	0	0
Notional	94	17.4	0	0	0	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas									
Actual	221.8	0.1	77	0	0.2	0.8	0	1	0
Notional	157.6	1.8	32.7	0	0.3	1.34	0	----	----

Key to terms

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