Mount Avenue, Chaldon
Energy & Sustainability Strategy

Version B

NUPLANET

Project Details

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Contents

Executive Summary

The purpose of this Energy & Sustainability Strategy is to demonstrate that the proposed development on land at Mount Avenue, Chaldon is a sustainable development, as measured against relevant local and national planning policies.

The application is for outline planning permission for the erection of up to 30 dwellings [including 50% affordable] including provision of vehicular and pedestrian access, landscaping [incorporating SUDS] and other associated infrastructure provision. All matters reserved except access.

This report demonstrates a commitment to achieve significant reductions in carbon emissions over Part L 2021 across all stages of the Energy Hierarchy through setting early design targets and is fully compliant with all relevant planning policies.

Through the incorporation of sustainable design and construction methods, energy and water saving measures, sustainable transport methods, waste reduction techniques, and measures to enhance the ecological value of the site, a high quality and sustainable development is proposed.

BE LEAN

Significant reductions in $C0_2$ emissions can be achieved through a fabric first approach and incorporation of passive design features. Early fabric efficiency targets have been set to help reduce heat loss and reduce CO_2 emissions.

BE CLEAN

The availability of district heating networks has been assessed as part of this energy strategy, but no opportunities have been identified.

BE GREEN

The use of LZCs and renewable energy systems has been reviewed, and Air Source Heat pump heating and DHW systems and Photovoltaic [PV] arrays have been identified as the most suitable technologies for this development, leading to further reductions in CO_2 emissions.

KEY SUSTAINABILITY FEATURES

- Low carbon heating & hot water systems throughout
- Maximum internal water consumption of 110l/pp/day
- Segregated bins for refuse, and recycling.
- Use of materials with low environmental impact
- Dwellings designed to meet Part M4[2] to create an accessible, inclusive development
- Provision of cycle storage and electric vehicle charging points for all units
- Enhanced ecology through compensatory planting, wildlife friendly measures.
- Site impacts monitored throughout construction programme

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Introduction

This Energy & Sustainability Strategy has been prepared on behalf of the Sigma Homes by NuPlanet, a specialist Building Performance Consultancy.

This strategy sets out the design and construction measures to be followed to ensure the delivery of a high quality, low energy, sustainable development on the land at Mount Avenue, Chaldon.

Development overview

The proposed scheme involves the redevelopment of the site to provide the following:

- Residential [C3] development for up to 30 units [15 affordable housing units provided highlighted in purple on site plan opposite].
- All houses to have private gardens
- Open Space provision of 0.47ha
- At least 10% Biodiversity Net Gain onsite
- Off-road parking for up to 56 vehicles, with a further 8 visitors parking spaces

TABLE 01 – INDICATIVE UNIT MIX	NUMBER OF UNITS [PRIVATE]	NUMBER OF UNITS [AFFORDABLE]
ONE BED APARTMENTS	-	4
TWO BED HOUSES	4	5
THREE BED HOUSES	10	5
FOUR BED HOUSES	1	1
TOTAL	15	15

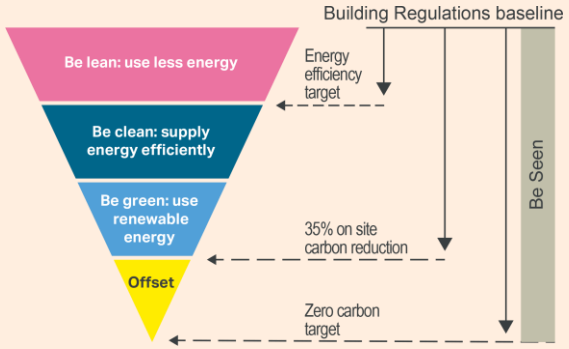
FIGURE 01 – SITE PLAN [ECE ARCHITECTURE]

Objectives

The objectives for this report are to demonstrate how the development responds to national and local planning sustainability policies, and how CO_2 emissions from the development will be minimised in accordance with national building regulations requirements.

Energy hierarchy

- The purpose of the Energy Hierarchy is to demonstrate that climate change mitigation measures are a fundamental part of the development's design philosophy.
- Be Lean: Considers passive design and energy efficiency measures.
- Be Clean: Exploit local energy resources [such as secondary heat] and supply energy efficiently and cleanly.
- Be Green: Maximise opportunities for renewable energy producing, storing, and using renewable energy on-site.
- Be Seen: Monitor, verify, and report on energy performance



Methodology

The formulation of the Energy Strategy for the proposed outline development has considered several important objectives, including:

- All national and local planning policies and requirements.
- A viable reduction in CO_2 emissions with an affordable, deliverable, and technically appropriate strategy.
- A high-quality development that is adaptable to future changes in climate.
- Minimising the negative impact of the proposed development on both the local and wider climate and environment.
- To achieve the highest viable levels of sustainable design and construction.
- Minimising emissions of pollutants such as oxides of nitrogen and particulate matter; and
- To create a pleasant, safe, and friendly living environment that will be flexible to its occupants' needs.

Planning policy and drivers

All new developments are governed by national and local planning requirements that set out how we will meet the challenges of a changing environment.

The NPPF [2024] sets out the Government's planning policies for England and how these should be applied. It provides a framework within which Local Authorities can prepare local development plans. The framework sets out a presumption in favour of sustainable development, promoting high standards of design that reduce carbon emissions and support renewable and low carbon technologies.

Tandridge District Council's Core strategy [2008] and Part 2: Detailed Policies [2014-2029] contains various planning policies that cover sustainable development, and how projects are expected to tackle climate change through their design and construction.

Please note, a more up to date Local Plan was adopted in 2023 but was withdrawn on the 14 February 2024. A New Local Plan is underdevelopment and scheduled for 2028.

The relevant policies considered as part of this study are listed opposite, more detailed information on each policy can be found in Appendix 01.

NATIONAL POLICY – NPPF

Relevant policies

- Chapter 02. Achieving Sustainable Development
- Chapter 14. Meeting the challenge of climate change, flooding, and coastal change

LOCAL POLICY TANDRIDGE DISTRICT COUNCIL

Relevant policies

- Policy CSP 14: Sustainable Construction
- Policy CSP 15: Environmental quality
- Policy CSP 17: Biodiversity
- DP1: Sustainable Development

It is worth noting that the current Tandridge District Council policy is of a significant age, with sustainable design requirements set inline with the former Code for Sustainable Homes standard, which was withdrawn in 2015.

BUILDING REGULATIONS

The applicable Building Regulations addressed in this report include:

- Approved Document Part L
- Approved Document Part O
- Approved Document Part F
- Approved Document Part G

The latest version of the above documents has been used in each case.

Further details of planning policy and key drivers can be found in Appendix 01.

Energy Strategy

An outline Energy Strategy has been developed by NuPlanet Sustainable Solutions, in collaboration with the client and design team, to ensure opportunities for minimising energy use and CO_2 emissions across the site are maximised through a fabric first approach.

The development has set a minimum CO_2 emissions reduction target over Part L1 2021 requirements of 20% through renewable technologies, which exceeds Code for Sustainable Homes Level 3 requirements for new-build houses in Planning Policy CSP14 Sustainable Construction.

Be Lean

The Be Lean stage of the Energy Hierarchy is a fundamental first step as it focuses on reducing energy demand through efficiency passive design measures. Minimising energy waste at design and operation levels can lead to significant reductions in carbon emissions and energy consumption.

Prioritising energy efficiency before implementing low-carbon or renewable systems helps to optimise the design proposals and embed sustainability into the scheme from the early stages.

Be Lean

Building Design

Every effort will be made to optimise the orientation of the development, maximise access to natural light and reduce artificial lighting demand, whilst also minimising potential for overheating throughout the development.

Thermal Envelope

A fabric first approach will be adopted for the development to minimise energy consumption through passive design measures. The building fabric [walls, floors, and roofs] will be designed to exceed the minimum requirements of Building Regulations Part L.

Thermal Bridging

30% of heat loss can occur through thermal bridging through the building fabric. By adopting enhanced construction details throughout the development further improvements in energy efficiency and emissions reductions will be achieved.

Air Permeability [Airtightness]

All new buildings are required to have air permeability tests on completion to confirm heat losses through uncontrolled ventilation [draughts]. To build on the higher standards of thermal efficiency in the building fabric, a target air permeability rate of 5m3/hr.m^2 has been set.

Fenestration

Windows and external doors are designed to exceed the minimum requirements of Building Regulations Part L. The size and orientation of glazed elements has been optimised to provide all interior space with a high standard of daylight to reduce reliance on artificial lighting.

This optimised approach also maximises solar gains during the winter months, whilst minimizing overheating during the summer.

Ventilation

A natural ventilation strategy will be adopted to ensure all ventilation requirements within the property are met.

Heating

For the purposes of the ‘Be Lean’ phase of the report the heating is assumed to be provided by efficient electric panels with programmer & room thermostats.

Further investigations into suitable heating systems are explored in the ‘Be Green’ phase of the report.

Domestic hot water [DHW]

The hot water demand in the ‘Be Lean’ section of the report is provided by a 100-260L cylinders with a heat loss efficiency of 2.00kWh/day.

The cylinders are fed by a dual immersion heater.

Lighting

Low energy, LED lighting with a minimum efficacy of 85lm/W will be used throughout the development to minimise the energy requirement for the artificial lighting systems. External and common area lighting will be linked to daylight or motion sensors to prevent unnecessary use.

Be Lean: Summary

Following the implementation of passive design and energy efficiency measures set out on the previous page, the ‘Be Lean’ stage will deliver a reduction in CO_2 emissions beyond the baseline notional development.

The fabric and services specifications used in the analysis are shown in Table 02.

In addition to minimising energy consumption across the development, the strategy outlined in this phase will deliver a thermally efficient, comfortable development with high levels of natural daylight.

TABLE 02		BE LEAN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.18
	ROOF	0.11
	WINDOWS	1.2 [0.63 G-VALUE]
	EXTERNAL DOORS	1.2 [0.63 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		5 M³/HR.M² @50PA
VENTILATION STRATEGY		NATURAL WITH INTERMITTENT FANS
HEATING		ELECTRIC PANEL HEATERS WITH PROGRAMMER & ROOMSTAT
HOT WATER SYSTEM		100-210L DHW CYLINDERS WITH IMMERSION
RENEWABLES		NOT INCLUDED AT THIS STAGE

Be Clean

Be Clean investigates how energy can be supplied efficiently to proposed developments by connecting sites to a heating or cooling network to further reduce carbon emissions. Due to the decarbonization of the electricity grid Combined Heat and Power systems [CHP] will not be considered as the use of these systems will create a net increase in carbon emissions.

District energy systems

There are no existing or planned Heat Networks within the vicinity of the development site.

Summary

Further reductions in emissions are unachievable at this stage, so the total reduction through the first two stages of the Energy Hierarchy remains as calculated at the Be Lean phase. Tables 03 outlines the specification at this stage.

TABLE 03		BE LEAN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.18
	ROOF	0.11
	WINDOWS	1.2 [0.63 G-VALUE]
	EXTERNAL DOORS	1.2 [0.63 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		5 M³/HR.M² @50PA
VENTILATION STRATEGY		NATURAL WITH INTERMITTENT FANS
HEATING		ELECTRIC PANEL HEATERS WITH PROGRAMMER & ROOMSTAT
HOT WATER SYSTEM		100-210L DHW CYLINDERS WITH IMMERSION
RENEWABLES		NOT INCLUDED AT THIS STAGE

Be Green

Be Green encourages the incorporation of Low and Zero Carbon [LZC] technologies in a development to reduce site dependency on grid services and lower CO_2 emissions. A feasibility study has been undertaken to assess the suitability of each technology for the development; the study is provided in the following tabulated form.

LZC Feasibility study

Photovoltaics [PV] — Proposed

PVs generate electricity from sunlight. PV systems require accessible roof space for the system to be installed and function correctly.

SUITABILITY

Available roof area per dwelling – min. $8m^2$

The PV panels can be installed on the flat roof to the annex building, which would minimise visual impact within the setting.

The typical install costs of a 4.0kWp PV system on a roof is £5,000-£7,500.

Potential energy generation – A PV array on the proposed development would generate a proficient level of regular solar electricity due to the open surrounding allowing for minimal overshading, this would help running costs by reducing the need for grid electricity.

PROPOSAL

The most southerly facing roofs on each new dwelling will be fitted PV array of between 1.5kWp to 4kWp to help offset electric consumption on site.

Solar thermal [hot water] — Suitable

Solar thermal collectors provide hot water by utilising the energy present in sunlight to heat a collector; this is then transferred to a circulating fluid and used to heat hot water.

SUITABILITY

Available roof area – min. $8m^2$

Typical installation capital costs of a solar thermal system are around £4,000- £5,000 for an average 3.6m2 system.

Potential – Solar thermal is considered a viable technology for the project due to the location and available roof area.

PROPOSAL

Other technologies may offer further benefits, so no system has been included at the preliminary design stage.

Small scale wind turbines — Not Suitable

Whilst small scale wind turbines can produce a high degree of energy, this is dependent on a consistent flow
of air which makes them difficult to design into most developments.

SUITABILITY

Available space – There is limited available space on the site to support a wind turbine.

A small-scale wind turbine system will have a big visual impact on this project, with a reasonably high installation capital cost of around £20,000 for a 2.5kW system.

PROPOSAL

Due to the highly complex requirements for a wind turbine installation to run efficiently, and potential impact of reverberation and noise on the occupants this technology is not considered appropriate for the development

Ground source heat pump [GSHP] — Suitable

GSHPs extract heat [or coolth] from the ground. Systems can be installed horizontally in the ground over a large area, or vertically in boreholes. A heat exchanger is used to convert the extracted heat for use in heating and DHW.

SUITABILITY

Available space – There is limited space for horizontal heat loops, but the site could support vertical borehole loops.

A typical installation cost for a horizontal GSHP system is around £25,000 to £40,000, a vertical borehole system will cost more [around £40,000-£60,000] for a system of this size.

GSHPs are regarded as a very efficient way to meet the heating & hot water demand of a low energy house.

PROPOSAL

It is considered that a GSHP system is not the most suitable solution for this development due to the high capital installation cost, making other systems more viable.

Air source heat pump [ASHP] — Proposed

ASHPs utilise the temperature difference between external and internal spaces. A heat exchanger is used to convert the extracted heat for use in heating and DHW.

SUITABILITY

Available space– ASHP systems will require external compressor units which could easily be accommodated within the site area.

The typical installed capital costs of an 5kW ASHP system is around £8,000-£14,000 each.

PROPOSAL

It is considered that an ASHP would be an ideal solution for this development.

Biomass boiler — Not Suitable

Biomass boilers use a carbon neutral fuel source, such as wood pellets, to generate heat for hot water and heating. These systems require significant space for both the boilers and storage of the fuel.

SUITABILITY

Available space – Communal biomass boiler systems will require a storage facility for the fuel and plant space, which is not available on this project.

There are several pros and cons for using this technology. Historically this type of system was regarded as a defer carbon neutral system that will generate the dwellings heat & hot water demand using largely waste material. However, more recent studies have confirmed that burning biomass fuel can lead to high pollution issues.

PROPOSAL

Biomass has been ruled out given limited space and high pollution issues.

Exhaust air heat pump

Not suitable

Exhaust air heat pumps are a commonly adopted technology for smaller dwellings with lower heat loss, such as flats.

Heat is recovered from exhaust air extracted from the kitchen and bathrooms and used to heat the dwelling, provide hot water, and meet ventilation requirements.

SUITABILITY

Available space – Exhaust air heat pumps will commonly provide a heating, hot water and ventilation solution through one large unit. There is often no need for an external unit.

These systems normally have a built-in electric immersion heater or require an electric boiler to top up the heat demand, which is why they are more suited for efficient buildings to help keep running costs to a minimum.
An Exhaust air heat pump will typically cost between £15,000-£20,000 per dwelling, but will offer a compact heating, hot water and ventilation solution.

PROPOSAL

It is considered that this technology would not be suitable this project due to the size of the proposed property.

Energy storage

Suitable

Energy storage allows for energy created on site to be captured and stored for use later, this would be achieved through the installation of an accumulator or battery system.

Typically, these systems are paired with photovoltaics to maximise on-site energy use before electricity is exported back to the grid.

SUITABILITY

Available space – battery storage could potentially be installed within the garage.

Battery storage is an ideal partner for PV, allowing solar electricity to be stored during periods when the house is unoccupied, for use when the occupant returns.

The battery storage systems are normally wall mounted and can be located either internally or externally.

Capital install costs of a storage system are between £5,000-£10,000, but in the current energy market could be regarded as a good investment, especially if connect to EV charging.

PROPOSAL

It is considered that battery storage would be a viable technology for this project and could be considered as part of the PV system installation.

Be Green: Summary

The feasibility study has highlighted several appropriate Low or Zero Carbon Technologies [LZC] for the proposed development. The following are seen as the most appropriate for inclusion:

- Air source heat pump [ASHP]
- 1.5kWp to 4.00kWp PV array on the most southerly facing roofs

The specification is set out in Tables 04.

The PV systems will offset a portion of the energy demand through on-site generation, reducing the reliance on national grid supplied energy.

TABLE 04		BE LEAN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.18
	ROOF	0.11
	WINDOWS	1.2 [0.63 G-VALUE]
	EXTERNAL DOORS	1.2 [0.63 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		5 $M^3/HR.M^2$ @50PA
VENTILATION STRATEGY		NATURAL WITH INTERMITTENT FANS
HEATING		ASHP, UNDERFLOOR HEATING & RADIATORS WITH PROGRAMMER & ROOMSTAT
HOT WATER SYSTEM		ASHP FED 100-210L DHW CYLINDERS
RENEWABLES		1.5-4KWP PV ARRAY WILL BE FITTED TO THE MOST SOUTHERLY FACING ROOF ON EACH PROPOSED DWELLING

Be Seen

Monitoring and reporting

Energy display devices that can monitor electricity and primary heating fuel consumption will be provided to each dwelling. These will be installed in a visible location such as a hallway or a kitchen. This can empower occupants to be more aware of their usage and therefore make energy and cost savings, where possible.

Operational cost

Considering operational costs for the end user is important when reviewing Energy Strategy options as the energy hierarchy focuses predominately on carbon emissions, which can lead to unintended consequences in the form of higher operational energy bills.

Each dwelling on the proposed development will be designed achieve a reduction in CO_2 emissions through passive design measures at the Be Lean stage, which in turn will result in lower heat demand, and savings in energy consumption and cost.

The Be Green stage of the Energy Strategy has highlighted that Air Source Heat Pumps and PV are the most suitable LZC technology, which will reduce dependency in grid electricity through onsite generation, resulting in financial savings to the end user.

Unregulated Energy

Unregulated energy includes small power electricity use from computers, plug in entertainment devices, washing machines, refrigeration, and cooking appliances.

It is anticipated that the proportion of unregulated energy will significantly increase when compared with regulated energy as the efficiency of buildings improved under each revision of Building Regulation Part L.

It is therefore foreseeable that deciding which appliances are purchased and how they are used will become a bigger consideration when looking to improve energy efficiency across our homes and workplace.

Educating the building users on how to reduce energy consumption through the use of their equipment will play a major role in future.

This can be through providing user guides, which will include guidance measures on selecting high rated white goods, energy star rated computers and monitors, and installing voltage optimization and power factor equipment.

Sustainability Strategy

The purpose of this section of the report is to demonstrate that the proposed development on the land at Mount Avenue, Caterham is a high quality and sustainable development, as measured against relevant local and national planning policies.

The proposal is to create a development of high quality, highly sustainable, family homes, which is sympathetic to the local area, whilst also considering its commitments to climate and environmental responsibility.

The following chapters of the report will help demonstrate how the proposed scheme has been designed to adapt to climate change through the incorporation of sustainable design and construction methods, energy and water saving measures, sustainable transport methods, waste reduction techniques, and measures to protect the ecological value of the site.

Flood risk & drainage

The risk of flooding in both rural & urban areas has increased over recent years through a mix of climate change bringing high levels of rain fall which are closer to 100-year storm levels, and extensive development of greenfield sites resulting in the reduction of permeable surfaces. This has led to increased surface water run-off into an already over loaded drainage system.

A drainage report has been undertaken by AWA Engineers to identify potential design considerations across the site to help develop the proposed drainage design.

Flood risk

The site is within flood zone 1 has a low probability of flooding from rivers and the sea.

Sustainable drainage design

The proposed drainage strategy for the site will be to incorporate deep bore soakaways, allowing for rainwater infiltration within the deep chalk layers, which will minimise surface water run-off from the site and maximise the sustainability credentials of the development.

Please refer to the full drainage report for further detail.

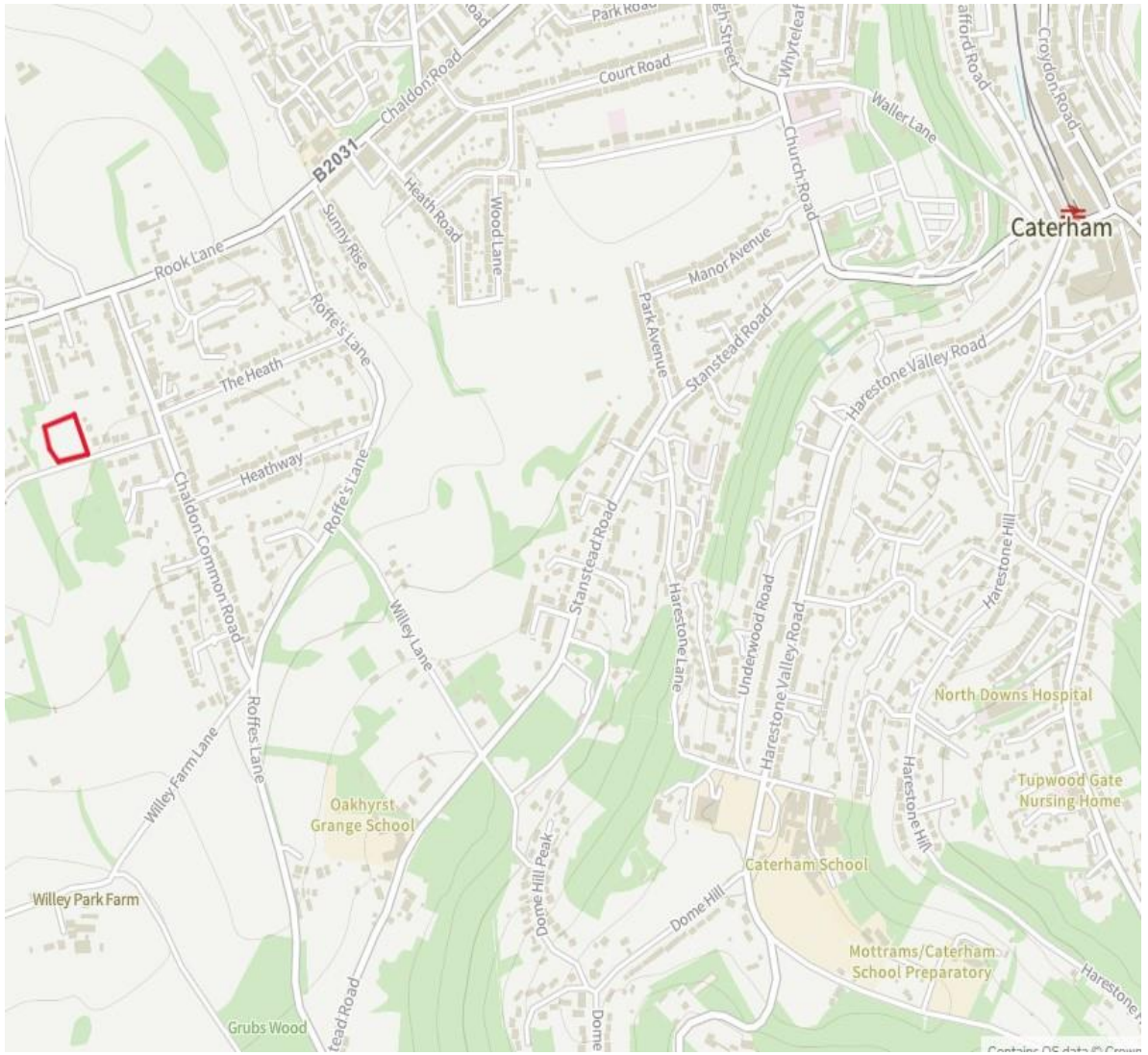


FIGURE 03 – FLOOD RISK MAP [GOV.UK]

Reducing water consumption

Conservation of water is an important factor in any sustainable development as the processing of fresh drinking water uses a lot of energy. Water use in our homes contributes around 35 million tonnes of CO_2 per annum [which is on average 1.5tonnes per family]. Global warming and climate change has also seen longer periods of drought over recent years.

Part G of the Building Regulations requires new dwellings to have a maximum water consumption of 125 litres/person/day [l/p/d], with an optional target of 105 l/p/d.

A target has been set in line with good practise, that all new dwellings will targets a minimum water efficiency of 105 litres/person/day.

Table 5 sets out the flow / flush rate targets for sanitaryware fittings and appliances that will be installed to minimise water consumption and meet planning policy.

TABLE 5	TARGET
DUAL FLUSH TOILET FLUSH RATE	6 / 3L
TAP FLOW RATE [BATHROOMS / ENSUITES / W.C.]	5L/MIN
TAP FLOW RATE [KITCHENS]	5L/MIN
BATH VOLUME TO OVERFLOW	180L
SHOWER FLOW RATES	8L/MIN
WASHING MACHINE CONSUMPTION	8.17L/KG OF WASHING
DISHWASHER CONSUMPTION	1.0L PER PLACE SETTING

Energy efficiency

Energy efficient white goods

The EU Energy Labelling Scheme was updated in March 2021 and now uses A to G rankings only, instead of A+++ to D ratings as before. The new regulations incorporate updated standards with stricter performance requirements and calculations, making it easier to compare efficiency across products. As the energy classes are intended to be in place for at least 10 years, no products will fall into the category of Class A at this current time.

Under the new labelling scheme, the proposed development will set the following minimum standards:

- Fridges, freezers, and fridge-freezers – C rating
- Washing machines an – C rating
- Dishwashers – C rating

Lighting

High quality lighting design is an important and desirable feature that supports how you feel and use your home and workplace. The proposed development will provide adequate access to and control of lighting within the dwelling.

This is a basic function that will contribute to comfort and health living.

Careful consideration will be made to ensure that background lighting levels will meet the requirements as set out in CIBSE Internal Lighting guide & SLL Lighting Guide with the following targets set as shown in Table 6.

All internal lighting will be energy efficient with a maximum average wattage of 9W/m^2 and will offer pave luminous efficacy greater than 85 lumens per circuit watt.

External & communal lighting will be controlled through a mix of motion sensors, dusk to dawn sensors, and timer controls.

TABLE 6	LUX LEVELS
ENTRANCE LOBBIES AND STAIRWELLS	150
KITCHENS	500
LIVING SPACE	200
BATHROOMS	200
BEDROOMS	150
HOME OFFICE	500
CIRCULATION SPACE AND STORES	100

Sustainable transport

The applicant has commissioned Motion to undertake a Transport assessment in support of the planning application. There is a commitment by the applicant to ensure that a sustainable transport policy is adopted.

Local amenity access

Sustainable transport links are central to the sustainability debate. They provide a positive contribution to environmental, and economic sustainability of the places they serve.

The provision of alternative sustainable transport options and associated facilities reduces dependency on traditionally fuelled cars and has the following benefits:

- Encourages active travel and helps improve people's health and wellbeing.
- Reduces congestion and encourages clean travel which helps to improve the air quality of the local area; and
- Provides cost savings compared with maintaining and running traditionally fuelled cars.

The development site is situated approximately 800m east of the village of Chaldon, 2.3-kilometers [32-minute walk or 11-minutes cycle] west of central Caterham and 1.5-kilometers [23-minute walls or 6-minute cycle] to Caterham-on-the-Hill, which offers residential amenities including a railway station, shops, pubs & restaurants, library, sports facilities, etc.

Cycling and walking

Secure cycle storage will be provided within each new dwelling.

Local footpath with street lighting offers a traffic free route to local amenities.

Electric Vehicle [EV] charging

The new dwelling will be provided with an active fast-charging [7kW] electric vehicle [EV] charging point. This is in line with Approved Document Part S of the Building Regulations.

Public transport

The site is within 150m of the nearest bus stop at the junction of Mount Avenue. This stop provides services to Warlingham and Reigate via Caterham.

The nearest railway station to the site is Caterham Station [2.3-kilometers], which can be accessed via the 411 bus services. Caterham station offers direct routes to London Bridge.

Please refer to the full Transport Statement report for further detail.

Pollution

Noise Pollution

The Applicant is committed to reducing noise disturbance to internal and external areas of dwellings to improve the health and wellbeing of the occupants and to help protect community cohesion.

The impact of breakout noise on the surrounding environment can be reduced and absorbed through an effective planting programme.

Air Quality

Poor air quality is the greatest environmental risk to public health in the UK and is known to exacerbate the impact of pre-existing health conditions. It is not only a major risk to human health, but also has significant damaging impacts on both plants and animals.

Between 1990 and 2017, the UK's estimated emissions of nitrogen oxides reduced by 70%, and the estimated emissions of PM10 particulate matter reduced by 55% (DEFRA, 2018). This must continue to fall in future years. The applicant is committed to reducing the proposed development's negative impact on air quality during construction and operation.

This development has considered its potential impact on air pollution and has moved to minimise this at the operational stage through implementing a series of embedded design measures comprising an all-electric energy strategy [which includes exhaust air heat pumps and PV], the installation of an electric a vehicle charging, energy efficiency measures, provision of cycle parking and implementation of a travel plan to encourage sustainable transport modes.

Ventilation

To avoid problems associated with the build-up of pollutants and humidity levels within the dwellings, whilst avoiding excessive heat loss, ventilation will be designed to meet the requirements of Approved Documents L & F.

Pollution

Light pollution

Reducing the impact of light pollution from artificial street lighting on Dark Skies is essential for preserving natural ecosystems, improving human health, and allowing us to appreciate the night sky. Light pollution, caused by excessive or poorly directed artificial lighting, diminishes the visibility of stars and disrupts nocturnal wildlife. Fortunately, there are effective measures to mitigate its impact.

The first step is the widespread adoption of fully shielded streetlights on low level lighting columns that focus light downward and prevent it from spilling into the sky or neighbouring areas. This ensures that light is directed where it is needed, minimizing waste and glare. Transitioning to energy-efficient LED lighting is another key strategy, but it is crucial to choose LEDs with warmer colour temperatures, such as 3000K or lower, to reduce blue light emissions. Blue light contributes significantly to skyglow and can interfere with the circadian rhythms of both humans and wildlife.

Employing ‘Smart’ lighting technologies, such as pre-set dimming photocells, Central Management Systems that control light switching times, motion sensors, timers, and dimmers, can further reduce unnecessary lighting. These systems allow streetlights to operate only when needed, conserving energy and minimizing environmental impact.

Public awareness and education are vital for fostering a cultural shift toward preserving Dark Skies. By promoting the benefits of reduced light pollution—such as energy savings, enhanced stargazing opportunities, and healthier ecosystems—local governments and advocacy groups can encourage residents and businesses to participate in the effort.

By implementing these strategies, we can significantly reduce the impact of light pollution from street lighting on Dark Skies, restoring the natural beauty of the night and creating a more sustainable and harmonious coexistence with our environment.

The following design criteria will be followed:

- All external lights will offer downlighting only
- Wall lights to be fitted with a 36-degree beam angle, and at no higher than 1500mm from floor surface
- All ramp or step lighting will illuminate only the ramp deck or tread.
- All lighting to offer warm lighting [3000K], with a maximum illuminance of <500Lux
- Lighting controls to be dusk to down with a timer to limit the usage.
- Lighting to be fitted with a master switch to allow all external lighting to be switched off when the site is not occupied
- All windows to be fitted with curtains/shades to reduce light pollution

Sustainable materials

Responsible sourcing of materials

Whilst not a component of UK planning or building regulations legislation, material choice can have a significant effect on the carbon footprint of a development.

The applicant is committed to minimising the developments environmental impact through best practice procurement management.

All timber products will be sourced from FSC or PEFC sources, with all other materials to be purchased from suppliers/manufacturers that have an accredited Environmental Management System [EMS] [BES6001, ISO14001 OR BS8555] for the extraction and manufacturing process of the proposed material.

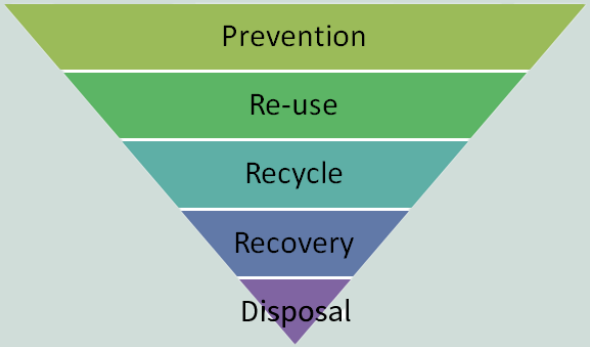
Green Guide rated materials

All construction materials will be considered to maximise the selection of materials with low embodied energy that score highly in the Building Research Establishment (BRE) Green Guide for Building Specification. It is anticipated most of the materials will achieve an A+ and A rating.

Waste management

Reduce, reuse, recycle

Waste reduction and recycling is another key challenge of sustainable development. The Waste Hierarchy [Figure 02] illustrates the priorities waste management should follow to reduce impact on the environment.



Household waste management

The applicant is committed to following the above waste hierarchy to help reduce waste sent to landfill.

Suitable internal storage containers for household waste will be provided in each dwelling, containers will allow for waste and recycling separation to encourage sustainable recycling habits by the occupants.

Adequate storage is to be provided at each new dwelling for both recyclable and non-recyclable waste in accordance with Tandridge District Council waste collection service.

Composting

Managing green waste through onsite composting allows some kitchen and garden waste to be re-used to enrich the soil, whilst also reducing CO_2 emissions by limiting the need to transport waste from site. It is proposed to include composting bins in the private gardens.

An internal 8l caddy bin will also be provided in each new dwelling along with an information leaflet outlining what should and should not be composted.

Build Quality

Security

The applicant is committed to ensuring the development is safe & secure for the residents, which will reduce the fear of crimes being committed and the risk and associated costs of crime.

Sound insulation

To reduce the likelihood of noise complaints and to ensure a high-quality development is created, the development will be aiming to achieve airborne sound insulation values that will improve upon the performance standards outlined in Building Regulation Approved Document Part E.

Inclusive design

Whilst this remains an outline planning application, the new dwellings will be designed in-line with Approved Document M4[2] standards. These standards will ensure accessible and adaptable accommodation for everyone, regardless of age, mobility, or disability.

This will ensure flexibility, and futureproofing i.e., the accommodation will be adaptable and able to respond to changing technological and environmental conditions.

Recent global events have highlighted the need for new homes to offer the flexibility for the homeowner to work remotely from home, either on a part time or a more permanent basis.

The proposed development design will include for a suitable position for a home working, with the provision of additional power sockets and good WIFI connectivity [in Approved Document Part R].

Daylight & Sunlight

The promotion of good daylighting levels contributes to sustainability through improving the occupant's quality of life and reducing the building's energy consumption by minimising the need for artificial lighting.

Where possible, the layout of the Proposed Development will be carefully designed to optimise the daylight and sunlight quality within the home.

Health & Wellbeing

Internal air quality

Air quality in modern homes is becoming a bigger consideration in new development design. The reality is that poor air quality will impact on the homeowner's health, leading to respiratory illnesses.

All internal and external finishes within the development will aim to have low volatile organic compound [VOC] content.

Amenity space

Providing private and public amenity space is a key consideration in modern development. Flexible external space is important to allow fitness and leisure activities to take place, which will encourage health and wellbeing.

Private

Each new house will benefit from either its own private garden or a shared garden which can be accessed from the dwelling through a level threshold door.

The private gardens will allow the homeowner to undertake a range of activities such as growing their own vegetables, play & exercise space, and outdoor cooking, within a secure and safe environment.

Public

The proposed development includes open woodland space, providing space for relaxing, exercise, picnicking, etc.

FIGURE 04 – SITE PLAN [ECE ARCHITECTURE]

Ecology

Existing Ecological value

The client has appointed Urban Edge to undertake a preliminary Ecological Appraisal of the site.

The report has highlighted a number of ecological constraints and opportunities, which have been addressed with the following proposed measures to protect any ecological features:

- Ancient woodland is located 10m south-west of the southern boundary of the survey area. A minimum 15m undeveloped buffer area is recommended to protect the woodland.
- Tree protection fencing will be installed at the construction zone perimeter for the duration of the work to protect Ancient woodlands.
- Priority habitats providing habitats for a range of protected species are to be retained where possible, with any loss being offset by replanting hedgerows.
- Disruptive work to nesting bird habits should be undertaken outside of nesting season [1 March to 31 August] to minimise disturbance.
- The use of external lighting will be avoided or minimised to prevent impact to nocturnal species such as bats.
- Small access gaps will be provisioned at the based of new fence boundaries to enable continued dispersal of small mammals across the site.

Enhancing Ecological value

The applicant has committed to improving the ecological value of the site by following the recommendations set out in the Ecological Appraisal in association with the proposed landscape design.

This will include:

- The installation of bird & bat boxes on new buildings and retained trees.
- Active management of the retained woodland with improve structure and native species composition.
- Buffers of less intensively managed vegetation [e.g. course grasses and wildflowers] will be created within soft landscaping to maintain & enhance ecological connectivity.
- Maintained or new hedgerows will use a range of native fruit, seed, nut and nectar bearing shrub species to encourage bees, butterflies, moths, insects and other wildlife.
- Habitat piles for amphibians, invertebrates and reptiles will be created within areas of retained woodland and hedgerows.

Reducing construction impact

Minimising the impact of the development on the neighbouring community is key to ensuring the scheme becomes fully integrated into the area.

Monitoring construction site impact

During the construction phase, control procedures will be put in place to minimise noise, dust pollution, and keep roads clean and clear of debris. The management systems will generally comprise procedures and working methods that are approved by the development team together with commercial agreements to ensure compliance.

Additional measures will be adopted to minimise the impact on the local area during construction. This will include the limiting of air & water pollution in accordance with best practise.

Construction traffic noise will be reduced through restricted delivery and arrival times to manage potential impact on existing and future neighbouring occupants. Work will be limited to appropriate hours to be agreed with the council, and suppressors will be used to reduce noise from machinery in line with the Considerate Contractor scheme.

Construction waste

Construction waste is a key element to be considered in achieving a reduction in all waste. It is estimated that 40% of all waste is construction related. There are two key considerations to assist in reducing the amount of construction waste sent to landfill:

- Appropriate construction methods of effective management
- Re-use and recycling of materials on site

The applicant is committed to reduce waste during construction phase through the incorporation of a Site Waste Management Plan [SWMP], which will set targets for waste minimisation through efficient material ordering and outline proposals to segregation waste into the following different streams.

Site waste segregation streams

- Mix construction, and demolition waste – EWC code 17-09-04
- Mixed concrete, brick, tiles and ceramics (INERT) – EWC code 17-01-07
- Mixed metal – EWC code 17-04-07
- Plasterboard – EWC code 17-08-02
- Hazardous – EWC code 08-01-12
- Soil and Stone – EWC code 17-05-04
- Waste paint and varnish – EWC code 08-01-21
- Wooden packaging – EWC code 15-01-03
- Plastics – EWC code 17-02-03
- Paper/cardboard – EWC code 15-01-01

Conclusion

The purpose of this Energy & Sustainability strategy is to demonstrate that the proposed development on land at Mount Avenue, Chaldon is a sustainable development, as measured against relevant local and national planning policies.

The applicant is applying for Outline planning permission for the erection of up to 30 dwellings [including 50% affordable] including provision of vehicular and pedestrian access, landscaping [incorporating SUDS] and other associated infrastructure provision. All matters reserved except access.

Whilst this remains an outline planning application, this report demonstrates the applicant's commitment to deliver a sustainable development through the incorporation of sustainable design and construction methods, energy and water saving measures, sustainable transport methods, waste reduction techniques, and measures to enhance the ecological value of the site, a high quality and sustainable development is proposed.

Through early consideration to an energy efficient design and specification, the proposed development will satisfy the requirements of national and local Planning Policies CSP 14, CSP 15, CSP 17, DP1 and Building Regulation Part L1 2021 requirements.

When compared to the current policy requirements for a Code for Sustainable Homes Level 3 development, the proposals will see a 43-47% carbon reduction beyond this minimum standard.

KEY FEATURES

- Low carbon heating & hot water systems throughout
- Maximum internal water consumption of 110l/pp/day
- Segregated bins for refuse, and recycling.
- Use of materials with low environmental impact
- Dwellings designed to meet Part M4[2] to create an accessible, inclusive development
- Provision of cycle storage and electric vehicle charging points for all units
- Enhanced ecology through compensatory planting, wildlife friendly measures.
- Site impacts monitored throughout construction programme

Appendix 01 -Planning policy and drivers

- Tandridge District Council Planning Policy

- Building Regulations

Appendix 01 – Tandridge District Council

Policy CSP 14: Sustainable construction

The Council will encourage all residential development (either new build or conversion) to meet Code level 3 as set out in the published Code for Sustainable Homes. Commercial* development with a floor area of 500m2 or greater will be encouraged to meet the BREEAM "Very Good" standard. All new residential development (either new build or conversion) and commercial* development with a floor area of 500m2 or greater will be required to reach a minimum percentage saving in CO2 emissions through the incorporation of on-site renewable energy (as set out in the table below). The requirement varies according to the type of development and in the case of dwellings, the size of development.

Reduction in emissions via renewable technologies are as below:

- 1-9 Units: 10%
- 10+ Units: 20%**
- Commercial *(500m^2): 10%

Development over 5000m2 will be expected to incorporate combined heat and power or similar technology.

Small scale renewable energy projects will be permitted except where there are overriding environmental, heritage, landscape, amenity or other constraints.

* Commercial includes all forms of non-residential development, for example social and leisure related development.

**Only where a developer can satisfy the Council why the higher target of 20% cannot be achieved will the lower target of 10% be applied.

Policy CSP 15: Environmental quality

In order to promote a high quality, flexible, safe living environment and to minimise the impact on natural resources the Council will:

a) require the design and layout of new development to be safe and secure, by the inclusion of measures to address crime and disorder and where possible meet "Secured by Design" Standards;

b) require all commercial and community development, including conversions, to be designed to be accessible to meet the needs of those with disabilities, including occupiers, employees and visitors;

c) require Sustainable Drainage Systems (SuDS) to be included where necessary;

d) encourage new dwellings to be designed to include "Lifetime Homes" principles so that they can be readily adapted to meet the needs of those with disabilities and the elderly;

e) encourage the reuse of buildings before redevelopment;

f) encourage innovative construction methods, such as "green roofs" to impede the flow of surface water run-off;

g) encourage all development to make provision for grey water recycling and/or require the separate disposal of surface and foul water to adoptable standards, including the provision of improvements to local sewer networks/treatment works where necessary;

h) encourage new development to include cabling and other technical resources to allow for the installation of information/communication technology.

Design and Access Statements should demonstrate how the above matters have been addressed or conversely, why it is not practicable or appropriate to do so.

Policy CSP 17: Biodiversity

Development proposals should protect biodiversity and provide for the maintenance, enhancement, restoration and, if possible, expansion of biodiversity, by aiming to restore or create suitable semi-natural habitats and ecological networks to sustain wildlife in accordance with the aims of the Surrey Biodiversity Action Plan.

The Council will seek to enhance biodiversity by supporting the work of the Downlands Countryside Management Project and by supporting Local Nature Reserves and Community Wildlife Areas.

DP1: Sustainable development

A. When considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

B. Planning applications that accord with the policies in this Local Plan (and, where relevant, with polices in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise.

C. Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then permission will be granted unless material considerations indicate otherwise – taking into account whether:

1. Any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or

2. Specific policies in that Framework indicate that development should be restricted.

Appendices 01 – Building Regulations

Approved Document L

Approved Document Part L [2021, England edition], referred to ADL2021, is the Building Regulation relating to the conservation of fuel and power in buildings. Part L1 relates to dwellings, and Part L2 related to buildings other than dwellings.

ADL2021 is driving the reduction in the regulated CO_2 emissions new build, refurbishment and change of use. There are four performance metrics:

- Primary energy target [DPER / TPER]
- CO_2 emissions targets [DER / TER]
- Fabric Energy Efficiency targets [DFEE / TFEE]
- Minimum standards for fabric and fixed building services

Approved Document O

Approved Document Part O [2021, England edition], referred to ADO2021, is the Building Regulation is the standard for overheating in new residential buildings.

ADO2021 sets out guidance on overheating risk assessment and mitigation. The sim of the regulation is to protect the health and wellbeing of occupants of the building by reducing the occurrence of high indoor temperatures.

The building should be design and constructed to limit unwanted solar gain in the summer and provide adequate means to remove excess heat from the indoor environment.

Compliance can be demonstrated by using one of the following methods:

- The simplified method for limiting solar gain
- Dynamic thermal modelling method

The simplified method has limitations, so the designed building is required to meet certain criteria to allow for this method to be used. If these criteria is not met, then dynamic thermal modelling method must be followed in line with TM59 requirements.

Approved Document F

Approved Document Part F [2021, England edition], referred to ADF2021, is the Building Regulation relating to Means of ventilation within buildings.

Key considerations are:

- F1 [1]. There shall be adequate means of ventilation provided for people in the building.
- F1 [2]. Fixed systems for mechanical ventilation and any
  associated controls must be commissioned by testing and adjusting as necessary to secure that the objective referred to in sub-paragraph (1) is met.

Limits on application

Requirement F1 does not apply to a building or space within a building:

- into which people do not normally go; or
- which is used solely for storage; or
- which is a garage used solely in connection with a single dwelling

Approved Document G

Approved Document Part G [2015 with 2016 and 2024 amendments, England edition], referred to ADG2021, is the Building Regulation relating to Sanitation, hot water safety and water efficiency within buildings.

Key considerations:

- G2. Reasonable provision must be made by the installation of fittings and fixed appliances that use water efficiently for the prevention of undue consumption of water.

Water efficiency of new dwellings

- 36.(1) The potential consumption of wholesome water by persons occupying a new dwelling must not exceed the requirement in paragraph (2).
- 36.(2) The requirement referred to in paragraph (1) is either—

i. 125 litres per person per day; or

ii. in a case to which paragraph (3) applies, the optional requirement of 110 litres per person per day, as measured in either case in accordance with a methodology approved by the Secretary of State.

36.(3) This paragraph applies where the planning permission under which the building work is carried out—

i. specifies the optional requirement in paragraph (2)(b); and

ii. makes it a condition that that requirement must be complied with.

36. (4) In this Part, “new dwelling” does not include a dwelling that is formed by a material change of use of a building within the meaning of regulation 5(g)

NUPLANET

nuplanet.co.uk
info@nuplanet.co.uk
—
NuHub 99 Sackville Road,
Hove, BN3 3WF