



Officers' Meadow, Shenfield

Energy Strategy

On behalf of

croudacehomes

Project Ref: 33313522900 | Rev: 02 | Date: September 2023

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Document Control Sheet

Project Name: Officers' Meadow, Shenfield

Project Ref: 33313522900

Report Title: Energy Strategy

Doc Ref: Final

Date: September 2023

Revision	Date	Description	Prepared	Reviewed	Approved
00	August 2023	Draft	CJ	MD	RS
01	August 2023	Issued for client review	CJ	RS	MM
02	September 2023	Final	CJ	RS	MM

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1 Executive Summary

1.1 Introduction

- 1.1.1 This Energy Strategy has been prepared by Stantec on behalf of Croudace Homes Ltd in support of a hybrid planning application for residential-led development at Officers' Meadow, Shenfield.
- 1.1.2 The Site falls within the administrative authority of Brentwood Borough Council (BBC).
- 1.1.3 The hybrid planning application is for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage, and highways infrastructure.
- 1.1.4 The Site forms part of the Strategic Site R03 "Land North of Shenfield" allocated in the adopted Brentwood Local Plan (BLP) (March 2022)ⁱ. The Site is being independently brought forward by the Applicant as part of the Development Framework for the allocation, alongside a consortium of developers.

1.2 Energy Strategy

- 1.2.1 The Energy Strategy adopts the nationally recognised energy hierarchy of:
 - 1) Reducing energy demands in the first instance ('Be Lean');
 - 2) Before using energy efficiently and cleanly ('Be Clean'); and only then,
 - 3) Using renewable and low carbon technologies ('Be Green'), where possible.
- 1.2.2 The fabric energy efficiency of the proposed dwellings has been designed to reduce heat demand and energy needs in line with policy requirements. This includes providing high levels of insulation and low air permeability, with consideration for thermal bridging junctions. The fabric specification exceeds the fabric standards of Part L 2021.
- 1.2.3 The proposed heating strategy adopts an electric-led approach. This includes the use of Air Source Heat Pumps (ASHPs) which are anticipated to become a primary heating strategy in line with the Future Homes Standard, expected to be introduced by 2025.
- 1.2.4 Photovoltaic (PV) panels will be provided on the dwellings of the Proposed Development. Solar PV is to be sized to achieve the requirements of BBC's Policy BE01, which requires development to provide a minimum of 10% of the predicted energy needs of a development from renewable energy.

1.3 Results

- 1.3.1 The Energy Strategy has been prepared using the Design Standard Assessment Procedure (SAP) 10 methodology to calculate predicted energy demand and associated carbon emissions for the dwellings of the Proposed Development. **Table 1.1** shows the overall domestic CO₂ emissions for the baseline scenario (Part L 2021 compliance) and predicted scenarios (the proposed energy strategy).

Table 1.1: Domestic CO₂ emissions for the Proposed Development

Annual Performance Measure		Target	Actual	% Reduction
Part L 2021	CO ₂ emissions (kg CO ₂ /m ²)	10.7	3.8	64%
	Primary Energy (kWh/m ²)	55.9	39.9	29%
	Fabric Energy Efficiency (kWh/m ²)	38.9	36.1	7%

2 Introduction

2.1 Overview

- 2.1.1 This Energy Strategy has been prepared by Stantec on behalf of Croudace Homes Ltd ('the Applicant') in support of a hybrid planning application for the residential-led development on Land at Officers' Meadow, Shenfield ('the Site'). The Site falls within the administrative boundary of Brentwood Borough Council (BBC).
- 2.1.2 This Energy Strategy is prepared for submission as part of a hybrid planning application, demonstrating compliance with Policy BE01 of the Brentwood Local Plan and Part L 2021 of the Building Regulations.

2.2 The Site

- 2.2.1 The Site forms part of the strategic site Policy R03: Land North of Shenfield allocated under the adopted Brentwood Local Plan, which was adopted in March 2022. The Site is the largest parcel of land, comprising an area of approximately 20 hectares (ha), which is being independently brought forward by the Applicant as part of the Masterplan Development Principles for Policy R03 alongside a consortium of developers.
- 2.2.2 The Site is located to the north of Shenfield, a 20-minute walk and 10-minute cycle to the Shenfield town centre. The Site is bound to the north-west by Chelmsford Road, its associated dwellings and their residential curtilages. Beyond Chelmsford Road lies the A12 dual carriageway and open farmland. The eastern boundary of the Site is delineated by Ancient Woodland and a railway line, beyond which lies additional areas of woodland, residential development, and further farmland.
- 2.2.3 The Site is constrained by Ancient Woodland, a Tree Protection Order (TPO) tree belt and a 'critical drainage area'. To the north of the Site lies a Grade II listed Milestone in the northern verge of Chelmsford Road, opposite number 179 Chelmsford Road.

2.3 The Proposed Development

- 2.3.1 The hybrid planning application is made for 344 dwellings (including 35% affordable housing), safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure (the 'Proposed Development'). The Proposed Development's dwellings comprise a range of 1-, 2-, 3- and 4-bedroom dwellings in detached, semi-detached, terraced and apartment typologies. The proposed unit mix is as follows:
- 54 x 1-bed dwellings;
 - 114 x 2-bed dwellings;
 - 87 x 3-bed dwellings; and
 - 89 x 4-bed dwellings.
- 2.3.2 An extract of the Proposed Site Layout Plan is shown in **Figure 2.1**, with the full version shown in **Appendix A**.

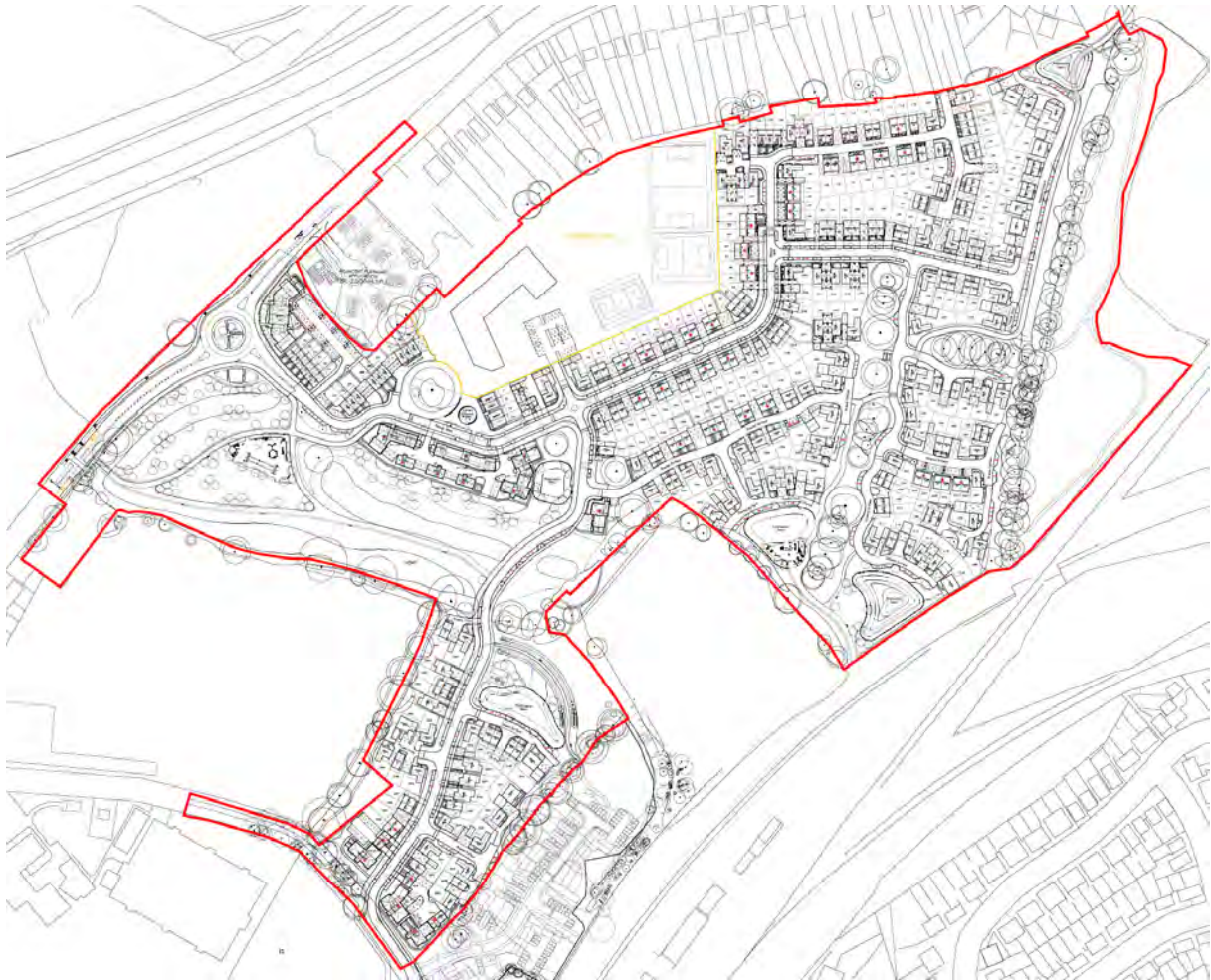


Figure 2.1: Proposed Site Layout Plan

2.4 The Applicant

2.4.1 Croudace Homes is supported by 75 years of housebuilding experience, which they draw upon to deliver their customers with homes that are comfortable, well-designed, and set in well-laid-out, green and pleasant places.

2.4.2 In 2022¹ the Applicant established a set of operational sustainability targets and associated metrics aligned to the United Nations Sustainability Development Goals and the work of the Future Homes Hub². These include:

- providing for a 10% improvement in Biodiversity Net Gain on all sites by the end of 2023;
- complying with the Building for Healthy Life Standard on all new schemes;
- eliminating single-use plastics and reducing the amount of waste sent to landfill;
- designing new homes with a water usage of less than 105 litres per person per day;
- delivering high-quality homes that are zero carbon ready and sustainable by 2025;

¹ Croudace Homes Sustainability Targets - <https://www.croudacehomes.co.uk/Rebrand>

² Future Homes Hub - <https://www.futurehomes.org.uk/>

- creating places and developments that are consistently low carbon, nature rich, resilient, healthy and well designed by 2025;
- introducing production methods that are net zero and sustainable by 2050, with interim targets for 2025 and 2030;
- managing and operating the business with the objective to be net zero by 2050, with a 50% reduction in emissions by 2030; and
- constructing all new homes in line with the Future Homes Standard by 2027.

2.4.3 The above objectives and targets set by the Applicant have informed the design of the Proposed Development, with the Applicant committed to delivering net zero carbon ready homes³ on Site in line with the Future Homes Standard. This commitment is being made ahead of both current Building Regulation standards and the targeted 2027 timeframe. Further detail on how this will be achieved is shown in **Section 5**.

³ The Future Homes Standard (FHS) targets the delivery of new “zero carbon ready” building standards in 2025, this standard is defined as one that enables buildings to become zero carbon without the need for retrofit once the power grid achieves zero carbon supply in 2035.

3 Planning Policy and Regulation Context

3.1 Overview

- 3.1.1 This section presents and summarises the key energy requirements for the Proposed Development, as defined by national policy, regulation, and BBC's planning policies. This is in relation to relevant energy, associated CO₂ emissions and development design policies.
- 3.1.2 The Building Regulations and planning policies relevant to the Proposed Development are summarised in **Table 3.1**. **Appendix B** provides further details on the policy and legislative context of the Proposed Development.

Table 3.1: Planning policy & legislation

Planning Policy/Legislation	Requirements/Targets
National Planning Policy Framework ⁴ (NPPF, 2021)	The NPPF sets out the Government's overarching policy for England. The NPPF requires development to mitigate and adapt to climate change by reducing greenhouse gas emissions and providing a strategy for the use of renewable and low carbon energy sources.
The Climate Change Act 2008 (2050 Target Amendment) Order 2019	In 2019, the Climate Change Act (2008) was amended to include a revision of the previous aim. It now mandates that <i>"the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline."</i>
UK Net Zero Strategy ⁵	The UK Net Zero Strategy states that by 2035, the UK will be powered by clean electricity, subject to security of supply. This brings forward the government's commitment to a decarbonised power system, with measures including the phasing out of the installation of new and replacement gas boilers by 2035.
Building Regulations Approved Document Part L 2021 ⁶	Part L 2021 came into effect on 15th June 2022 as an uplift to energy efficiency standards. For new dwellings, an estimated 30% carbon reduction is required above Part L 2013 standards, albeit this varies on a building-by-building basis. Part L 2021 encourages fabric first principles, the selection of efficient energy sources, and the reduction of regulated carbon emissions by the following targets: • Target Emission Rate (kg CO₂/m²); • Target Fabric Energy Efficiency (kWh/m²); and • Target Primary Energy Rate (kWh/m²).

⁴ National Planning Policy Framework, July 2021. <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁵ Department for Business, Energy and Industrial Strategy. 2022. Build Back Greener: Net Zero Strategy. Available from: <https://www.gov.uk/government/publications/net-zero-strategy>

⁶ [Conservation of fuel and power: Approved Document L - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l-2021)

Planning Policy/Legislation	Requirements/Targets
Future Homes Standard (FHS) ⁷ (in consultation)	The FHS is expected to be introduced by 2025 and will require new homes to be future proofed with low carbon heating and high levels of energy efficiency. It is expected that the FHS will require dwellings to produce 75-80% less emissions than dwellings built to previous Part L 2013 standards.
Brentwood Local Plan 2016-2033 (2022) ⁸	Policy BE01 requires development to achieve a 10% reduction in carbon emissions above the requirements of Part L 2021. Policy BE01 also requires, wherever possible, development to provide a minimum of 10% of the predicted energy needs of a development from renewable energy.

⁷ [The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/the-future-homes-standard)

⁸ [Adopted Local Plan | Brentwood Council](#)

4 Methodology

4.1 Introduction

- 4.1.1 The Energy Strategy has been prepared using Standard Assessment Procedure (SAP) methodology to calculate predicted energy demand and associated carbon emissions for the Proposed Development.

4.2 SAP Methodology

- 4.2.1 The dwellings modelled have been selected as a representative sample of the Proposed Development. The selection of dwellings has been considered to represent the various dwelling typologies, selecting a range of orientations, house types and apartments.
- 4.2.2 Whilst there is land safeguarded for a 2FE school on the Site, the planning application does not cover the building design of the school. Therefore, non-domestic modelling is excluded from the Energy Strategy as limited information is available at this stage.
- 4.2.3 The calculation methodology and information sources that have informed this report are outlined in **Table 4.1**.

Table 4.1: Calculation Information Sources

Information	Source
Geometry	Based on drawings by Finc Architects Ltd.
Building Specification	Based on drawings by Finc Architects Ltd.
Regulated Calculation Methodology	The Government's Standard Assessment Procedure (SAP) for Energy Rating of Dwellings.
Software Used	Elmhurst Energy DESIGN SAP 10.
PV Generation	Solar PV generation modelled on the use of a <i>Jinko Tiger Neo 420W N-Type 54 Cell</i> , sized to meet 10% renewable energy requirement in line with Policy BE01.

- 4.2.4 The purpose of the calculations is to demonstrate compliance with planning policy. The approved calculation methodologies prescribe design parameters for inputs such as occupancy, weather, internal temperatures, and equipment usage. Therefore, the calculations presented in this Energy Strategy should not be taken as a guarantee of predicted energy consumption and CO₂ emissions.

5 Energy Strategy

5.1 Introduction

- 5.1.1 Demand reduction is typically a more cost-effective means of achieving carbon savings than providing low or zero carbon technologies. This is particularly true of passive measures (the architecture), which are simpler and have greater longevity than active systems (the building services).
- 5.1.2 The Proposed Development therefore follows the nationally recognised energy hierarchy of:
- 1) Reducing energy demands in the first instance ('Be Lean');
 - 2) Before using energy efficiently and cleanly ('Be Clean'), and only then;
 - 3) Using renewable and low carbon technologies ('Be Green'), where possible.

5.2 Fabric-First Approach ('Be Lean')

- 5.2.1 The fabric efficiency of the proposed dwellings has been designed to reduce heat demand and energy needs. This includes providing high levels of insulation and low air permeability, with consideration for thermal bridging junctions. The fabric specification exceeds the fabric efficiency requirements of Part L 2021.
- 5.2.2 The full proposed fabric standards are presented in **Appendix C**.

5.3 Use of Energy Efficiently ('Be Clean')

- 5.3.1 The Proposed Development will seek to supply energy efficiently by designing for the use of only electric based heating and hot water systems meaning that the Development will be designed to be fossil fuel-free.
- 5.3.2 The proposed heating strategy adopts an electric-led approach. This includes the use of Air Source Heat Pumps (ASHPs) in line with Part L of the Building Regulations.
- 5.3.3 ASHPs extract heat from the external air and condense this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature which can then be used for space heating and domestic hot water. ASHPs can feed either low-temperature radiators or underfloor heating and often have electric immersion heater back-up for the winter months.
- 5.3.4 The decision to use ASHPs has considered the likely implementation of the Future Homes Standard (FHS). The FHS anticipates that heat pumps will become a primary heating technology for new homes, providing a route to net zero homes once the electricity grid is decarbonised.

5.4 Renewable and Low Carbon Technologies ('Be Green')

- 5.4.1 Following the incorporation of the Be Lean and Be Clean measures, a high-level feasibility study has been carried out to assess potentially viable sources of low carbon technology and renewable energy under the Be Green stage of the energy hierarchy. The results are shown in **Table 5.1**.

Table 5.1: Feasibility of low carbon and renewable technologies

Technology	Appropriate	Comments
Photovoltaic (PV) panels	Yes	There is expected to be suitable roof space to accommodate PV to buildings with South facing roofs.
Heat Recovery	Yes	Heat recovery technology would be appropriate to incorporate into new buildings and can be considered on either the ventilation or wastewater systems.
Heat Pump	Yes	Heat pumps are a suitable technology to meet the hot water and heating demand of new homes and are an appropriate technology to meet the Future Homes Standard.
Battery Storage	Potential	Battery storage at building level could reduce peak electrical demands. Domestic battery storage technology is currently expensive, but this is likely to decrease over the next five to ten years. Further investigation at design stage is required to confirm whether this technology would be appropriate.
Solar Thermal	Potential	There is expected to be roof space available to provide solar thermal technology, however it is considered more appropriate to provide PV instead of solar thermal to meet electricity demand as this is more beneficial to support both EV charging and any heat pumps.
Wind	No	Building-integrated wind turbines and wind turbines sited in urban areas perform poorly due to unfavourable wind microclimate.
Biomass	No	Unlikely to comply with the Future Homes Standard and there may be concerns regarding the delivery of biomass fuel to the residents.

5.4.2 Solar Photovoltaic (PV) panels will be provided to dwellings on the Site. Solar PV will be sized to achieve the requirements of Policy BE01 which requires development to provide at least 10% of the predicted energy needs of a development from renewable energy.

5.4.3 Orientating buildings to be south-facing where possible increases the efficiency of solar PV. The dwellings are designed to reduce occurrences of roof lights, dormer windows, or hipped roofs, which can negatively impact on the potential for solar energy generation.

6 Results

6.1 Introduction

- 6.1.1 Policy BE01 requires development to achieve a 10% reduction in carbon emissions above the requirements of Part L 2021 and provide 10% of predicted energy needs through renewable energy. The energy modelling results demonstrate compliance with Policy BE01 and Part L 2021 for the Proposed Development.
- 6.1.2 **Table 6.1** presents the results of the energy modelling for the Proposed Development. A representative sample of dwellings were modelled using a range of house / apartment types and orientations. The modelling has been scaled up based on the total floor area of the dwellings presented within the accommodation schedule, so it is representative of the overall Proposed Development.

6.2 Results

- 6.2.1 The results for the three stages of the Energy Hierarchy (Be Lean, Be Clean and Be Green) are presented as a single improvement over Part L 2021. The full energy performance specification is shown in **Appendix C**.

Table 6.1: Domestic CO₂ emissions for the Proposed Development

Annual Performance Measure		Target	Actual	% Reduction
Part L 2021	CO ₂ emissions (kg CO ₂ /m ²)	10.7	3.8	64%
	Primary Energy (kWh/m ²)	55.9	39.9	29%
	Fabric Energy Efficiency (kWh/m ²)	38.9	36.1	7%

- 6.2.2 The results demonstrate that the Proposed Development is predicted to achieve a 7% improvement over the Target Fabric Efficiency Rate, a 29% improvement over the Target Primary Energy Rate and a 64% improvement over the Target Emission Rate for Part L 2021.
- 6.2.3 In order to meet the requirements of Policy BE01, Solar PV has been sized accordingly. To meet the 10% requirement, 243 kW of solar output has been modelled which occupies approximately 815 m² of roof space throughout the Site.

7 Conclusion

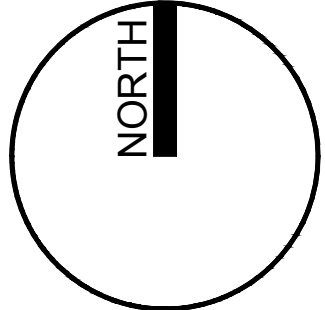
7.1 Summary

- 7.1.1 The Proposed Development has followed the nationally adopted energy hierarchy of reducing energy demands in the first instance, using energy efficiently, and only then, implementing low carbon and renewable sources where appropriate.
- 7.1.2 The fabric efficiency of the proposed dwellings has been designed to reduce heat demand and energy needs in line with policy requirements, with high levels of insulation and low air permeability.
- 7.1.3 The proposed heating strategy is electric led, using ASHPs which are expected to be a primary technology in line with the Future Homes Standard which ensures the Proposed Development is in accordance with the national path to low carbon buildings. Solar PV will be provided and will be sized to meet renewable policy requirements.
- 7.1.4 The proposed electric only strategy will allow the Proposed Development to achieve net zero emissions in operation once the mains grid decarbonises.

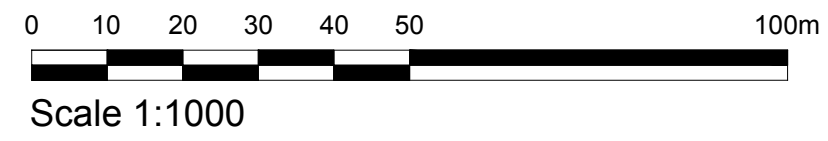
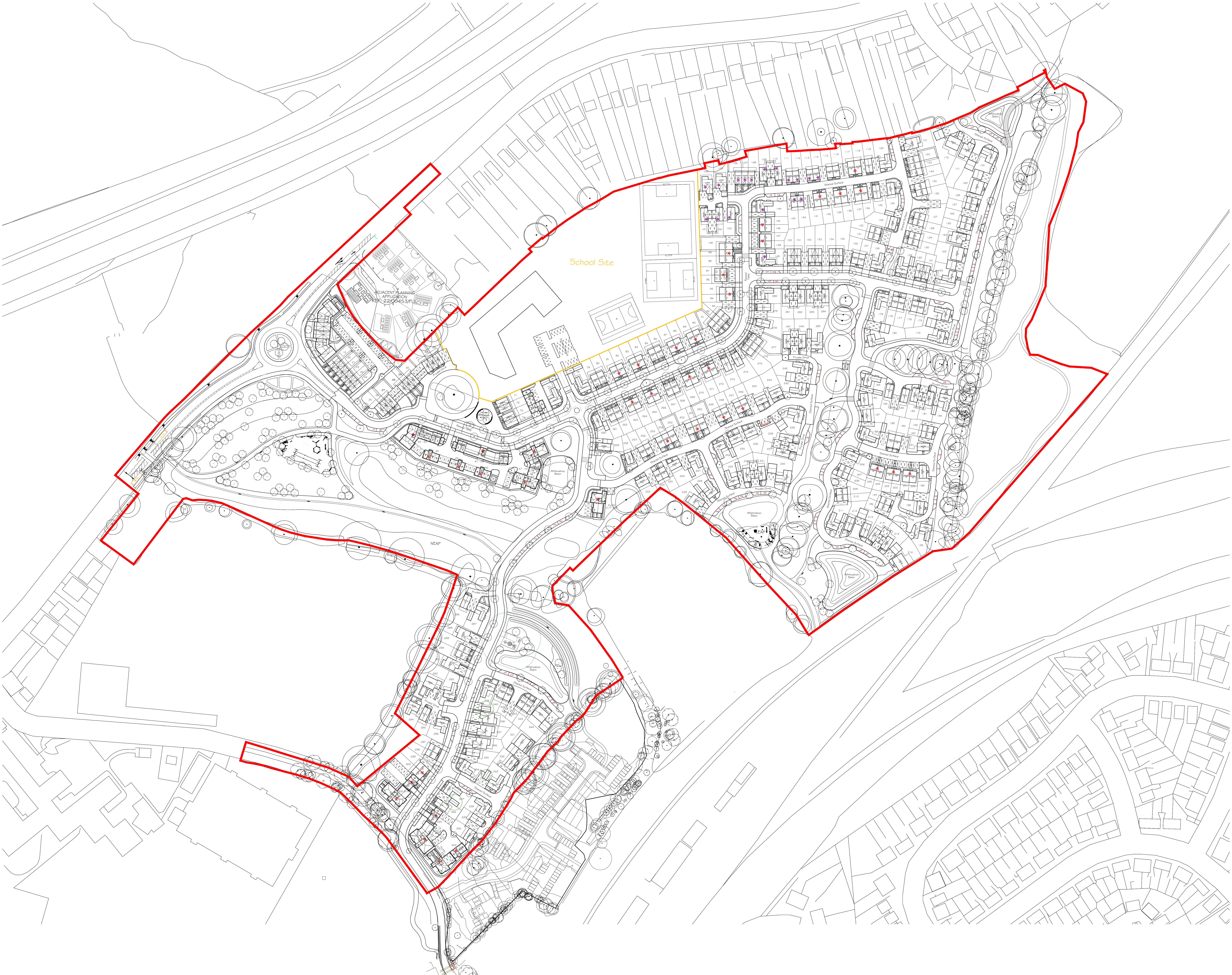
7.2 Results

- 7.2.1 The results demonstrate that the Proposed Development will achieve a 7% improvement over the Target Fabric Efficiency Rate, a 29% improvement over the Target Primary Energy Rate and a 64% improvement over the Target Emission Rate for Part L 2021.
- 7.2.2 The Proposed Development therefore demonstrates compliance with Part L 2021 and Policy BE01 of the Brentwood Local Plan.
- 7.2.3 The 64% improvement over the TER is indicative for the purposes of the planning application. The exact percentage improvement over Part L 2021 will be confirmed after the planning application. However, the commitment to meet Part L 2021 and Policy BE01 will be maintained.

Appendix A Proposed Site Layout Plan



- Site Boundary
- Proposed School Boundary
- Affordable Housing
- Custom Build Houses



P	04-09-2023	Landscape information added	YC
N	24-08-2023	Layout updated with balconies added to Flats	YC
M	08-08-2023	Flat Block size updated	AL
L	04-08-2023	Site layout update for the Flats footprint	LB
K	01-08-2023	Flats footprint adjusted, POI footprint adjusted	YC
J	17-07-2023	Flats footprint adjusted, site entrances amended	SFVC
H	13-07-2023	Pre-app and EORP comments addressed	SF
G	22-05-2023	Mix updated to balance affordable plots	SF
F	14-05-2023	Layout amended to suit pre-app feedback	SF
E	01-02-2023	Housing Mix amended	SF
D	03-02-2023	Layout amended to suit design team comments	SF
C	17-01-2023	Layout amended as per Client's comments	SF
A	28-11-2022	Layout revised to suit tree survey	SF

Project:
OFFICERS' MEADOW
SHENFIELD
Client:
CROUDACE HOMES
Drawing:
PROPOSED SITE LAYOUT
BLOCK PLAN
Drawing no: 1643.100 Rev: P

Scale@A1: 1/1000 Date: JUNE 2022 Drawn: SF Checked: -

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Appendix B Policy Context

Introduction

- B.1.1 This appendix presents the key energy requirements for the Proposed Development, as defined by national policy, regulation, and local planning policies.

National Policy Context – Climate Change

- B.1.2 Climate change is recognised as one of the most immediate global environmental challenges. In May 2019, the Committee on Climate Change published the Net Zero Report, recommending that the UK Government introduce a target of at least a 100% reduction of greenhouse gas (GHG) emissions by 2050.
- B.1.3 In 2019, the Climate Change Act (2008) was amended to include a revision of the previous aim of an 80% reduction of GHG emissions compared to 1990 levels by 2050. The Act now mandates that “the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline”.
- B.1.4 The UK Government’s international commitment, transposes into national and local planning policy. The Government has sought to reduce CO₂ emissions associated with new buildings through energy demand reduction and the incorporation of low and zero carbon technologies to deliver electricity and heat.

Net Zero Strategy

- B.1.5 In October 2021, the UK Government published the Net Zero Strategy, bringing forward the government’s commitment to a fully decarbonised power system. The following key policy objectives are relevant to energy:
- B.1.6 *“To take action so that by 2035, all our electricity will come from low carbon sources, subject to security of supply, bringing forward the government’s commitment to a fully decarbonised power system by 15 years.*
- B.1.7 *Aiming to phase out the installation of new and replacement natural gas boilers by 2035 in line with the natural replacement cycle, once costs of low carbon alternatives have come down, including any hydrogen-ready boilers in areas not converting to hydrogen, to ensure that all heating systems used in 2050 are compatible with net zero”.*

National Planning Policy Framework (2021)

- B.1.8 The National Planning Policy Framework (NPPF, 2021) sets out the Government’s overarching planning policy for England. In order to transpose national legislation into local policy, local planning authorities must take into account the NPPF when developing their planning policies.
- B.1.9 The NPPF maintains the “presumption of sustainable development”. Paragraph 152 of the NPPF explains that the planning system should help to:
- B.1.10 *“Shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience, encourage the reuse of existing resources, including the conversion of existing buildings, and support renewable and low carbon energy and associated infrastructure”.*

- B.1.11 Plans should take a proactive approach to mitigating and adapting to climate change and should be planned for in ways that:
- B.1.12 Can help to reduce greenhouse gas emissions, such as through its location, orientation, and design;
- B.1.13 Provide a positive strategy for renewable and low carbon energy sources, that maximises the potential for sustainable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); and
- B.1.14 Consider suitable areas for renewable and low carbon energy sources, and opportunities for development to draw its energy supply from decentralised, renewable, or low carbon energy supply systems.
- B.1.15 When determining planning applications, local planning authorities should expect new development to comply with any development plan policies on local requirements for decentralised energy supply (unless demonstrated to be unfeasible or unviable). Development should take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

National Building Regulations – Part L (Conservation of Fuel and Power)

- B.1.16 The UK's international commitments are transposed into National Building Regulations. The energy efficiency requirements of the Building Regulations are set out in Part L (Conservation of Fuel and Power) which states that new development is encouraged to reduce carbon emissions in accordance with the energy hierarchy of reducing energy demands in the first instance, supplying energy efficiently, and finally the provision of appropriate renewable and low carbon energy technologies.
- B.1.17 Changes to the Building Regulations Part L include a significant tightening of standards to better equip buildings for a low and zero carbon future with consideration of thermal comfort in modern buildings. This is seen as a stepping stone to zero carbon and the proposed Future Homes Standard.

Updated – 2021 Edition

- B.1.18 Following consultation beginning in October 2019, the new Part L was published on the 15th of December 2021 announcing changes to the Building Regulations which aim to help the UK deliver net zero.
- B.1.19 This approved document took effect on 15th June 2022 for use in England. It does not apply to work subject to a building notice, full plans application or initial notice submitted before that date, provided the work for each building is started before 15th June 2023.
- B.1.20 Key changes include the requirement for all new buildings to meet a new primary energy target and a carbon emissions rate target.
- B.1.21 The changes to Approved Document L enhance the performance requirements for compliance. For new dwellings, 30% carbon reduction is expected for compliant buildings in contrast with Part L 2013. For new non-domestic buildings, on average, 27% carbon reduction is expected for compliant buildings in contrast with the previous Part L 2013.
- B.1.22 As part of the journey to net zero by 2050, the Government has committed to introducing a Future Homes Standard by 2025. They expect that an average home built to the FHS will have 75-80% less carbon emissions than one built to the Part L 2013 energy efficiency requirements.

B.1.23 Therefore, the national target for energy at the Proposed Development is the Part L 2021 Building Regulations. This is subject to further amendments in the future.

Local Policy

Brentwood Local Plan 2016-2033 (2022)

B.1.24 The Brentwood Local Plan 2016-2033 was adopted on 23rd March 2022 and forms part of the statutory development plan. The following policy is relevant to the Energy Strategy.

Strategic Policy BE01: Carbon Reduction and Renewable Energy

1) *"Carbon Reduction and Construction Standards*

Development should meet the minimum standards of sustainable construction and carbon reduction as set out below:

- a) All major development will be required to achieve at least a 10% reduction in carbon dioxide emissions above the requirements of Part L Building Regulations.*

2) *Renewable Energy*

Wherever possible, application of major development will be required to provide a minimum of 10% of the predicted energy needs of the development from renewable energy. Where on-site provision of renewable technologies is not appropriate, or where it is clearly demonstrated that the above target cannot be fully achieved on-site, any shortfall should be provided through:

- a) 'allowable solutions contributions' via Section 106 or CIL. These funds will then be used for energy efficiency and energy generation initiatives or other measure(s) required to offset the environmental impact of the development; or*
- b) off-site provision, provided that an alternative proposal is identified, and the measures can be secured."*

Appendix C Energy Performance Specification

Table A.1: Building Energy Performance Specification

Element or system	Specification	Notes
Climate data		UK average
Size and shape	As designed	Drawings provided by Finc Architects.
Opening areas (windows, roof windows and doors)	As designed	Drawings provided by Finc Architects.
External walls	$U = 0.15 \text{ W/m}^2\text{K}$	Including semi-exposed walls e.g., to garage
Party walls	$U = 0.00 \text{ W/m}^2\text{K}$	Fully insulated cavity
Ground Floors	$U = 0.10 \text{ W/m}^2\text{K}$	
Exposed Floors	$U = 0.10 \text{ W/m}^2\text{K}$	Including semi-exposed floors e.g., over garage
Roofs	$U = 0.10 \text{ W/m}^2\text{K}$	
Opaque door (<30% glazed area)	$U = 1.0 \text{ W/m}^2\text{K}$	
Windows and glazed doors with >60% glazed area	$U = 1.2 \text{ W/m}^2\text{K}$ Frame factor = 0.7 Solar energy transmittance (g-value) = 0.4	Orientation same as designed (actual dwelling) Overshading average or unknown
Thermal mass	Medium (250 kJ/m ² K)	
Allowance for thermal bridging	Calculated based on indicative Local Authority Building Control (LABC) construction details.	
Ventilation system	Mechanical Ventilation Heat Recovery System: Titon HRV2.85 Q Plus Eco	
Air permeability	3.0 m ³ /h.m ² at 50 Pa	
Chimneys	None	
Open flues	None	
Main heating fuel (space and water)	Electricity	
Heating system	Air Source Heat Pump: Daikin Altherma 3 R F – EHVH-UE6V (indicative system).	
Heating system controls	Time and temperature zone control by suitable arrangement of plumbing and electrical services.	
Hot water system	Separate time control for space and water heating	
Hot water cylinder	100L storage.	
Primary water heating losses	Fully insulated primary pipework	

Element or system	Specification	Notes
	Cylinder temperature controlled by thermostat Cylinder in heated space	
Water use limited to 125 litres (per person per day)	Yes	
Secondary space heating	None	
Lighting	100% Low Energy	
Air conditioning	None	
Renewables	No. of Solar PV Panels: ~582 Power Output: ~243 kW Roof occupied by PV: ~815m ² Jinko Tiger Neo 420W N-Type 54 Solar PV Cell	Solar PV sized to achieve 10% policy compliance.