



Energy & Sustainability Statement

Guildens, Courtenay Avenue, London N6 4LP

July 2022

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DOCUMENT CONTROL

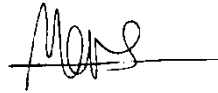
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Revision History

Revision	Date	Details
-	04/07/2022	First issue

Disclaimer

This report has been prepared for the exclusive use and benefit of Carnell Warren Associates and solely for the purpose for which it is provided. Unless we provide express prior written consent, no part of this report should be reproduced, distributed or communicated to any third party.

This report has been produced to demonstrate compliance with Part L of the Building Regulations and Local/regional policies relating to sustainability. How this impacts upon other aspects of the Building Regulations will need to be checked and confirmed by a suitably qualified professional.

1. EXECUTIVE SUMMARY

- 1.1. This Energy and Sustainability Statement has been prepared in support of a planning application at Guildens, Courtenay Avenue, N6 4LP. The application consists of a replacement dwelling with accommodation at basement, ground, first floor and roof levels. Together with associated parking and landscaping to front and rear gardens.
- 1.2. This report outlines the predicted energy demand and resultant carbon emissions from the proposed dwelling. It also shows how the proposal has incorporated energy efficiency measures and given consideration to low carbon and renewable technologies.
- 1.3. Part L1A compliant SAP Calculations have been prepared for the dwelling. The calculations have been completed using the methodology set out in The Greater London Authorities Energy Assessment Guidance (April 2020) and accompanying guidance note dated 15th June 2022. Calculations have been performed using the energy hierarchy, Be Lean, Be Clean and Be Green.
- 1.4. The CO₂ emissions extrapolated from the SAP calculations have been converted to SAP 10 emission factors using the GLA carbon emissions reporting spreadsheet. The SAP 10 emissions factors for electricity are 0.233 kgCO₂/kWh and for mains gas 0.21 kgCO₂/kWh. All carbon emissions referenced in this report are based on the SAP 10 emissions factors.
- 1.5. The development is classed as major, and the relevant sustainability targets from the London Plan and Haringey Local Plan (2017) have been examined. These equate to a 35% improvement over the Building Regulations Target Emission Rate (TER) and ensuring at least a 20% reduction in CO₂ directly through renewable technology. Any remaining carbon emissions will be negated through an offset payment to ensure a zero-carbon development.
- 1.6. The Energy Assessment Guidance note introduces an interim target of a 50% improvement over the TER which this proposal will strive to achieve.
- 1.7. At the be Lean stage the dwelling has achieved a reduction in CO₂ emissions of 19% against the Target Emission Rate (TER) through energy efficiency measures. This exceeds the 10% target outlined in the London Plan Policy SI 2
- 1.8. The dwellings fabric energy efficiency (DFEE) has improved upon the target fabric energy efficiency (TFEE) by a margin of 17%. This improvement demonstrates that the proposed dwelling has a highly efficient building fabric.
- 1.9. At the Be Clean Stage, the effectiveness of a district heating connection has been evaluated. Following consultation with the London Heat Map it has been identified there are no readily available, current or proposed district heating networks available. The dwelling will be located outside of any heat network priority areas, for these reasons a heat network connection is not possible.
- 1.10. At the Be Green Stage a ground source heat pump (GSHP) using boreholes has been specified to provide heating and hot water to the dwelling. The GSHP used in these calculations has a specified efficiency of 500%.
- 1.11. At this early stage in the design a specific ground source heat pump has not yet been selected. On systems of this type a 500% efficiency is comfortably achievable. The heat pump will be sized to meet the full heat load of the dwelling.

- 1.12. In addition to the GSHP there will be mains gas boilers for a backup only. To represent these within the SAP calculations they have been assumed to meet 10% of the yearly heat demand. This allows us to demonstrate compliance with the emissions targets whilst accounting for the negative impact on the SAP calculations of a gas boiler. As the GSHP will be sized to meet the full heat load, the gas boilers may not be utilised and in that event this report demonstrates compliance with an overestimation of energy demand from gas boilers.
- 1.13. At the Be Green Stage the dwelling demonstrates a 69% reduction in CO₂ emissions over the TER, of this figure 51% is achieved directly through renewable or low zero carbon technologies.
- 1.14. This has been deemed adequate to satisfy Part L1A of the Building Regulations, Haringey Local Plan Policy SP4 and the London Plan emissions reduction targets. A summary of the dwelling emissions at each stage of the energy hierarchy is shown below.

1.15. Dwelling Carbon dioxide emissions

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	21.9	3.6
After energy demand reduction (be lean)	17.9	3.6
After heat network connection (be clean)	17.9	3.6
After renewable energy (be green)	6.7	3.6

1.16.Domestic Regulated carbon dioxide savings

	Regulated domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: Savings from energy demand reduction	4.1	19%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	11.2	51%
Cumulative on site savings	15.2	69%
Annual savings from off-set payment	6.7	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	201	-
Cash in-lieu contribution (£)	19,075	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

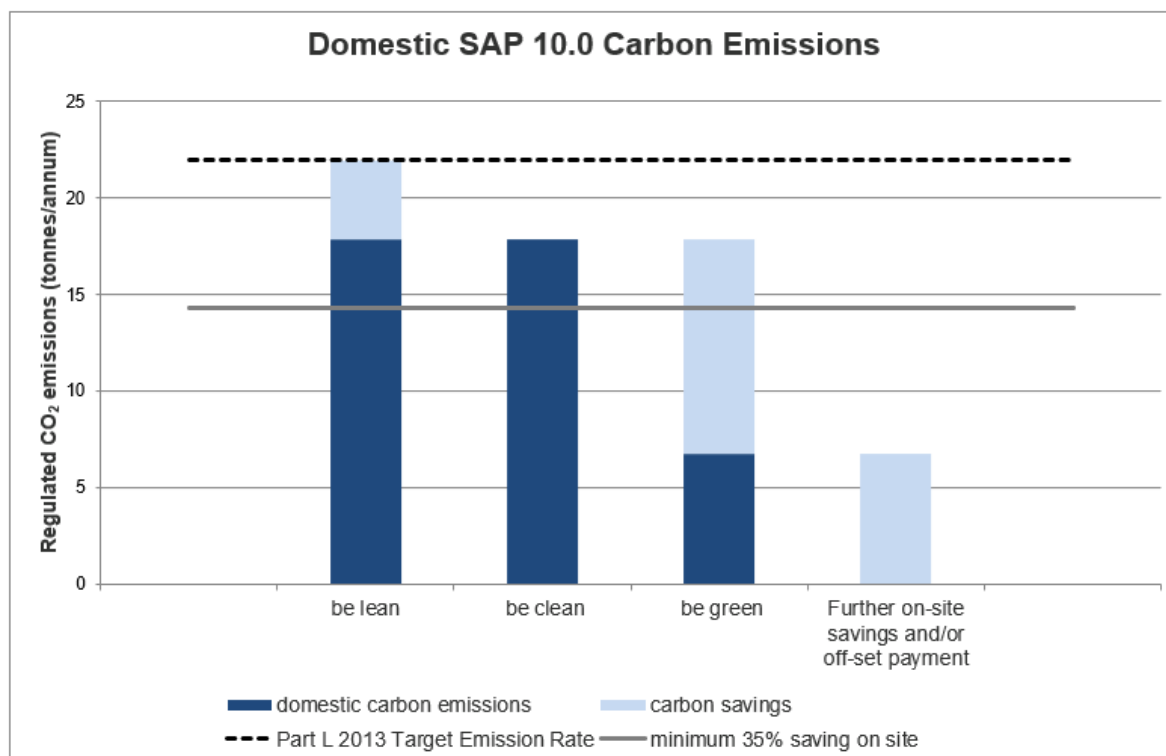


Figure 1: Summary of Domestic emissions

2. INTRODUCTION

- 2.1. E & S Bristol have prepared this energy statement on behalf of Carnell Warren Associates Ltd in support of a planning application at Guildens, Courtenay Avenue, N6 4LP. The application consists of a replacement dwelling with accommodation at basement, ground, first floor and roof levels. Together with associated parking and landscaping to front and rear gardens.
- 2.2. The following statement outlines how the proposed development complies with the National Planning Policy Framework with regards to achieving a sustainable development. The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own need.
- 2.3. This statement sets out the approach to satisfying the environmental objectives of planning policy. This will be achieved by contributing to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change.
- 2.4. The following documents have been used and referred to in this statement in order to deliver compliance with National, Regional and Local Policy;
- The National Planning Policy Framework (2021)
 - The London Plan (2021)
 - The Greater London Authorities (GLA) Energy Assessment Guidance (April 2020)
 - The Greater London Authorities (GLA) Energy Assessment Guidance Cover Note (June 2022)
 - The Greater London Authorities (GLA) Carbon Emissions Reporting Spreadsheet
 - Haringey Local Plan: Strategic Policies (2017)
 - Part L1A Conservation of Fuel and Power in New Dwellings (2013, Incorporating 2016 amendments)
- 2.5. Consideration has been given to the current and future intentions of the building regulations and planning policy for sustainable development.

3. POLICY REVIEW

3.1. London Plan Chapter 9 Sustainable Infrastructure

3.1.1. This report has been designed to show compliance with the relevant policies of Sustainable Infrastructure contained within Chapter 9 of the London Plan 2021. This report has been produced following the London Plan Energy Assessment Guidance April 2020.

3.1.2. The core policy which this document relates to is Policy SI 2 Minimising greenhouse gas emissions which is detailed below;

A Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

1) be lean: use less energy and manage demand during operation

2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly

3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site

4) be seen: monitor, verify and report on energy performance.

B Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

C A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:*

1) through a cash in lieu contribution to the borough's carbon offset fund, or

2) off-site provided that an alternative proposal is identified and delivery is certain.

D Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

E Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.

F Development proposals referable to the Mayor should calculate whole lifecycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

3.2. Energy Assessments Guidance Updates – Part L 2021 of Building Regulations

3.2.1. Relevant extracts from the energy assessment guidance update have been included below

...As the accompanying Part L 2021 software is not yet available, planning applicants should continue to use the 2020 guidance, spreadsheet and the Part L 2013 methodology until the software is available, expected to be 31st July 2022. Once the software is available, the updated guidance and spreadsheet should be used for all Stage 1 application submissions.

The Mayor's net zero carbon target for major developments

As of 15 June 2022, all major developments in London must continue to meet the London Plan net zero carbon target by following the energy hierarchy (Policy SI 2), the heating hierarchy (Policy SI 3) and by maximising on-site carbon reductions. Planning applicants will be expected to demonstrate that at each stage of the energy hierarchy they have maximised opportunities for carbon reduction to achieve as close to zero as possible. An on-site carbon reduction of at least 35 per cent beyond Part L 2021 of building regulations should be achieved. Once it has been demonstrated that carbon reductions have been maximised, any remaining emissions to zero should be offset by a contribution to the relevant borough's carbon offset fund. Applicants should also continue to meet the energy efficiency targets (Policy SI 2) and undertake dynamic modelling as part their energy strategy to reduce the risk of overheating (Policy SI 4).

Applying London Plan policy

- *Achieving on-site carbon reductions: the on-site carbon reductions that can normally be achieved over Part L 2021 will vary for different development types:*

o Residential developments are expected to be able to achieve on-site savings beyond the minimum 35 per cent improvement, so we have introduced an additional percentage improvement benchmark of 50 per cent plus which these developments should be aiming to achieve. Meeting the energy efficiency target may now be more challenging initially, but it is essential that planning applicants reduce energy demand as far as possible to avoid high energy bills for occupants.

3.3. Haringey Local Plan Policy SP4 Working Towards a Low Carbon Haringey

3.3.1. Haringey Local Plan Policy SP4

The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.

- 1. In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:*
 - a. From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO2 emissions in line with Code for Sustainable Homes Level 4 energy standards, and should aim to achieve Level 6. All new residential development shall be zero carbon from 2016 onwards; and*
 - b. From 2011 onwards all new non-residential development shall be built to at least BREEAM “very good” standard and should aim to achieve BREEAM “excellent” or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.*
- 2. The Council will promote low- and zero-carbon energy generation through the following measures:*
 - a. Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;*
 - b. Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;*
 - c. Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area; and*
 - d. All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.*

4. METHODOLOGY

- 4.1. This energy assessment will be calculated in line with the methodologies as outlined in The Greater London Authority Energy Assessment Guidance (April 2020). In order to calculate the CO₂ emissions, the domestic element dwelling has been modelled using Stroma FSAP 2012 software.
- 4.2. The energy demand and emissions figures taken from the project key results file generated through the FSAP software and have been manually entered in the GLA emissions reporting spreadsheet.
- 4.3. Due to the complexity of modelling the heating system for a dwelling of this size within the SAP software, at each stage of the energy hierarchy a community system will be used. The use of a community heating system allows the manufacturer declared efficiency of the heating system to be entered manually as opposed to the use of SAP default efficiencies. As commercial size plant is required for a dwelling of this size, the products contained within the residential databases in SAP would not be suitable and the default efficiencies would not accurately reflect in use performance.
- 4.4. There is adequate justification for this approach as the heating system will be serving the main dwelling and the staff living quarters. The staff living quarters can be occupied independently of the main dwelling and have their own external access door. In addition, the community heating system accounts for losses in the heat distribution system which are relevant in a proposal of this size.

5. THE ENERGY HIERARCHY

- 5.1. As required by the London Borough of Haringey and Policy SI2 of the London Plan the development has been designed in line with the principles of the energy hierarchy.
- 5.2. Subsequently the regulated emissions will be calculated at the Be Lean, Be Clean, Be Green stages of the energy Hierarchy following the outcome of investigation at these stages.
- 5.3. At the Be Lean stage sustainable design principles will be implemented to go beyond the Part L Building Regulations using efficient design and building services. At the Be Clean stage the feasibility of decentralised energy supply will be examined, including districting heating and CHP. Finally, at the Be Green stage a feasibility study for renewable technologies will be undertaken and depending upon the results renewable technologies will be implemented.

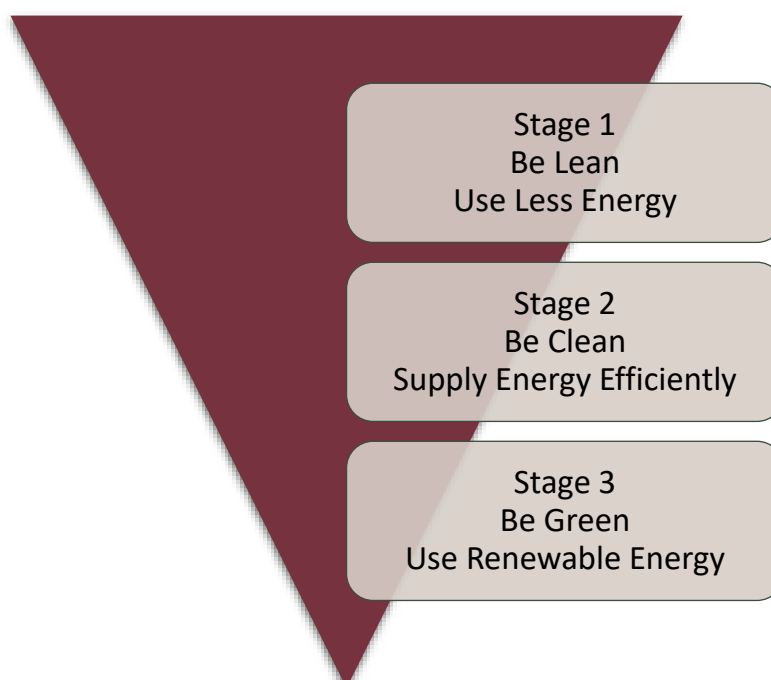


Figure 2: The Energy Hierarchy

6. BASELINE

- 6.1. This energy assessment will first establish the dwellings baseline energy demand and subsequent CO₂ emissions.
- 6.2. SAP calculations will be carried out on the dwelling, incorporating a gas boiler (recorded as community heating) to meet the heating and hot water demand, the TER will be used as the baseline energy demand and CO₂ Emissions.
- 6.3. The Target CO₂ emission rate (TER) sets a minimum allowable standard for the energy performance of a building to comply with Part L of the Building Regulations and is defined by the annual CO₂ emissions of a notional building of same type, size and shape to the proposed building. TER is expressed in annual kg of CO₂ per m².
- 6.4. The Baseline dwelling summary for CO₂ emissions and energy demand is shown in Tables 1 & 2 below.

Unit Reference	Total Floor Area (m ²)	Target Emission Rate kgCO ₂ /m ² /Year	Total Emissions kgCO ₂ /Year
Guildens	1,737	12.6	21,934

Table 1: Summary of dwelling emissions (regulated) Building Regulations Baseline assessment

Unit Reference	Space Heating (kWh/Year)	Hot Water (kWh/Year)	Lighting (kWh/Year)	Auxiliary (kWh/Year)	Total (kWh/Year)
Guildens	90,438	3,398	2,279	75	104,190

Table 2: Summary of dwelling energy demand

- 6.5. The baseline emissions are predicted to **21,934 kgCO₂** per year.
- 6.6. The dwellings baseline energy demand is predicted to be **104,190 kWh/year**.

7. BE LEAN (USE LESS ENERGY)

- 7.1. From the outset a high standard of sustainable design and construction has been incorporated into the design of the proposal. To reduce CO₂ emissions high levels and high-performance insulation will be specified. At this early design stage some target U values will be used with the final specification to be confirmed at a later date. Through increased thickness and an improved thermal conductivity of the insulation the U-Values for the thermal elements will meet exceed Building Regulations Part L standards. These high levels of insulation will help to contain heat within the dwelling therefore reducing demand on the heating and associated CO₂ emissions.
- 7.2. During construction, efforts will be taken to overlap all insulation and effectually seal joints where air leakage and thermal bridging could occur. The accredited construction details (ACDs) will be implemented. Alongside the ACDs once the insulation manufacturer has been confirmed appropriate calculated Psi values will also be implemented where possible.
- 7.3. The orientation of the proposed development has been restricted by the existing street scene. With the front of the building facing west, the majority of glazing occurs on the East and West elevations, with few openings on the North & South elevations.
- 7.4. The main ventilation strategy consists of will consists of system 4, with multiple mechanical supply and extract units with heat recovery. The system works by removing excess humidity from wet rooms, this warm air then passes over a heat exchanger which transfers a high proportion of the heat to the incoming (fresh) air which is then distributed to occupied rooms. The low specific fan power of the units specified means that the system requires reduced amounts of energy to run effectively.
- 7.5. The MVHR will serve the basement and ground floor levels, with localised extract fans to upper floors. As the MVHR is serving both kitchens and the majority of the floor area this is the ventilation system recorded in the SAP calculation.
- 7.6. An air pressure test score of 3.0 m³/hm² has been targeted.
- 7.7. Complimentary to the MVHR, passive measures will be implemented to assist with cooling. These include openable windows, high ceilings and the effective use of thermal mass.
- 7.8. An overheating assessment has been considered within the SAP calculation. The overheating risk is deemed 'not significant'. Active cooling has been included at the Be Lean stage (accounting for 0.39% of the total energy demand). Although at the Be Green stage, this cooling will be supplied from the ground source heat pump. It should be noted that at the Be Green stage, with the inclusion of cooling the system proposed is a full heat recovery system. Meaning that the use of the cooling system will limit the requirement for back up heating to generate hot water in the summer months.
- 7.9. In line with the GLA guidance the active cooling has been excluded when assessing overheating within SAP. Without active cooling the overheating risk is deemed 'not significant' this is also without the use of specifying blinds to windows. This means that overheating compliance within SAP has been achieved through passive measures and the ventilation strategy rather than active cooling.
- 7.10. The lighting used will be low energy through defined as having an efficiency greater than 45 Lumens/circuit Watt. The large area of windows to the living rooms and bedrooms will also improve levels of natural daylighting reducing electrical demand from light fittings.

7.11. Due to the early stage of this assessment, the detailed design has not been finalised. Target U-Values have been used for each of the thermal elements and will be achieved on site upon completion.

7.12. Table 3 below provides a summary of the energy efficient and carbon reducing design characteristics incorporated within the dwelling.

Thermal Element	Specification	U-Value
Basement Floor	Target U Value – Specification to be confirmed	0.13 W/m ² k
Lower Ground Floor	Target U Value – Specification to be confirmed	0.13 W/m ² k
Ground Floor	Target U Value – Specification to be confirmed	0.13 W/m ² k
Floor Over Garage	Target U Value – Specification to be confirmed	0.13 W/m ² k
Basement/ Retaining Wall	Target U Value – Specification to be confirmed	0.15 W/m ² k
Main External Wall	Target U Value – Specification to be confirmed	0.15 W/m ² k
Wall to Garage	Target U Value – Specification to be confirmed	0.15 W/m ² k
Stud Wall to Eaves	Target U Value – Specification to be confirmed	0.15 W/m ² k
Dormer Cheeks and Face	Target U Value – Specification to be confirmed	0.15 W/m ² k
Green Roof	Target U Value – Specification to be confirmed	0.15 W/m ² k
Lower GF Flat Roof	Target U Value – Specification to be confirmed	0.13 W/m ² k
Ceiling to Garage	Target U Value – Specification to be confirmed	0.13 W/m ² k
1F Ceiling to Terrace	Target U Value – Specification to be confirmed	0.13 W/m ² k
2F Ceiling to Eaves	Target U Value – Specification to be confirmed	0.13 W/m ² k
Bed 5 Ceiling	Target U Value – Specification to be confirmed	0.13 W/m ² k
Dormer Roof	Target U Value – Specification to be confirmed	0.13 W/m ² k
Room in Roof Flat Roof	Target U Value – Specification to be confirmed	0.13 W/m ² k
Warm Pitch Roof	Target U Value – Specification to be confirmed	0.13 W/m ² k
Windows, Fully Glazed Doors & Rooflights	Double glazed, Argon filled glass with lowE coating, aluminium frames with thermal break	1.40 W/m ² k
External Doors	Insulated doors achieving U Value of 1.6	1.60 W/m ² k
Controlled Service	Details	
Air Permeability	Air test score target of 3.0 m ³ /hm ²	
Thermal Bridging	Accredited construction details to be implemented	
Thermal Mass	Medium	
Ventilation	Vent Axia Sentinel Kinetic Plus BS MVHR with insulated ductwork, each unit serving up to 4 extracts	
Heating System	Community mains gas boiler 96% efficient linked to underfloor heating with pipes in screed	
Heating Controls	Flat rate charging, programmer, and multiple thermostats	
Heating distribution	Pre-insulated piping, low temp, variable flow	
Hot Water	800L hot water storage with loss factor no greater than 4.5 kWh/day, cylinder in heater space, fully insulated pipework on separate timer with thermostat	
Cooling	Split/multiple systems, energy label Class A with variable speed compressors.	
Lighting	100% Low Energy lighting throughout	

Table 3: Be Lean Specification

7.13. Incorporating the energy efficient design features results in the emissions and energy demand outlined in Table 3, the resulting CO₂ emissions and energy demand are shown in Tables 4 & 5.

Unit Reference	Total Floor Area (m ²)	Target Emission Rate kgCO ₂ /m ² /Year	Total Emissions kgCO ₂ /Year	Dwelling Emission Rate (DER/BER)	Proposed CO ₂ Emissions kgCO ₂ /Year
Guildens	1,737	12.60	21,934	10.30	17,857

Table 4: Summary of dwelling regulated emissions at the Be Lean Stage

Unit Reference	Space Heating (kWh/Year)	Hot Water (kWh/Year)	Lighting (kWh/Year)	Auxiliary (kWh/Year)	Cooling (kWh/Year)	Total (kWh/Year)
Guildens	70,483	4,574	2,213	6,521	257	84,047

Table 5: Summary of dwelling energy demand at the Be Lean Stage

7.14. The total dwelling emissions are summarised below:

Target CO ₂ emissions (TER x Floor Area)	21,934 KgCO ₂ /Year
Be Lean CO ₂ emissions (DER x Floor area)	17,857 KgCO ₂ /Year

7.15. The dwelling Be Lean emissions improve upon the Target Emission Rate by **19%**. This satisfies the London plan targets of a 10% improvement. This has been achieved through energy efficient design and specification of high efficiency services.

7.16. The dwelling Be Lean energy demand is predicted to be **84,047 kWh/year**.

7.17. Table 6 below outlines the average dwellings fabric energy efficiency (DFEE) against the target fabric energy efficiency (TFEE). This shows a **17%** improvement showcasing that the designed dwelling has a highly efficient building fabric.

Target Fabric Energy Efficiency	Dwelling Fabric Energy Efficiency	Percentage Improvement
64.60	53.40	17%

Table 6: Summary of fabric efficiency at the Be Lean Stage

8. BE CLEAN STAGE (USE ENERGY EFFICIENTLY)

8.1. District Heating

- 8.1.1. Policy SI 3 of the London Plan encourage developments to move to decentralised generation of heat and power seeking to reduce the losses and inefficiencies of reliance upon a centralised system. The mayor has set a target of 25% to be generated through localised decentralised energy systems by 2025.
- 8.1.2. The London heat map has been consulted to establish if there are any existing or proposed heating networks in the vicinity of the development. With the results shown in Figure 3 below.

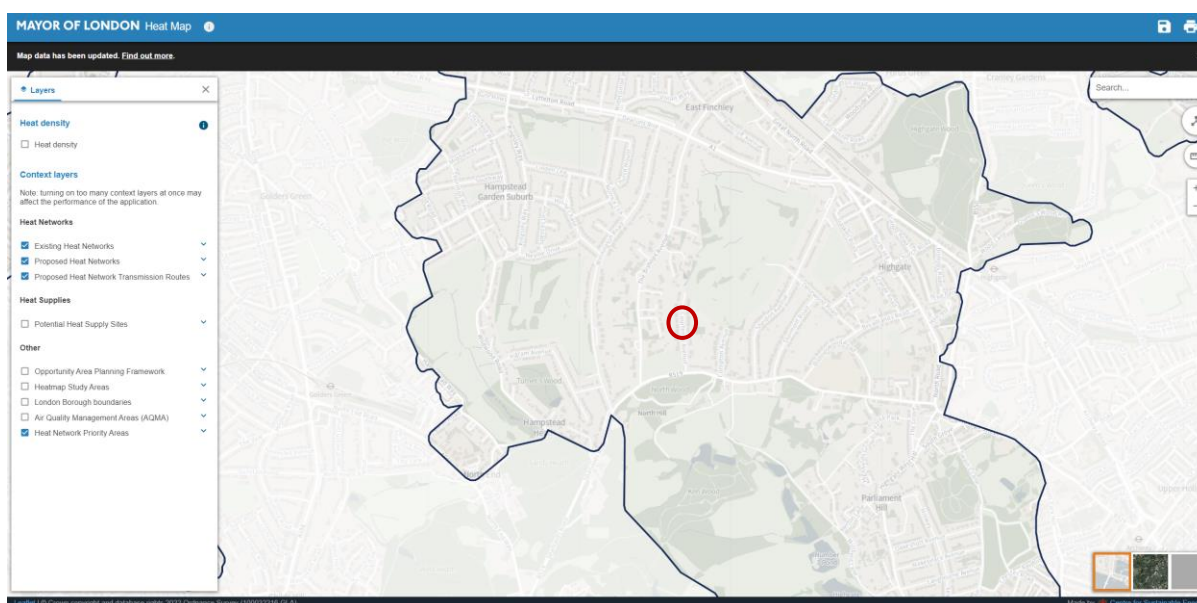


Figure 3: London Heat Map

- 8.1.3. After consulting the London heat map its evident that the development falls under scenario 3 In GLA energy statement guidance. This is development in areas where an area wide heat network is not proposed, and which is not within an area of decentralised potential. The dwelling also falls outside of the areas identified as having heat network opportunities.
- 8.1.4. Scenario 3 typically represents areas with low density semi/detached housing, in addition the proposal is surrounded by existing residential dwellings. This coupled with the development being on a private road means that it would be unlikely to receive a heat network. For this reason, a district connection will not be considered further at this time.

8.2. Combined Heat and Power

- 8.2.1. Following the release of the new Carbon Emission Factors for SAP 10, in the new energy Statement guidance in October 2018, The Greater London Authority have made it clear there is a required shift away from gas fired CHP in favour of other low zero carbon technologies.
- 8.2.2. As the electricity grid decarbonises from increased local renewable energy generation the carbon savings achieved from gas-engine CHP will decrease which for future proofing provides opportunity for other low carbon technologies.

- 8.2.3. For small-medium residential developments it is generally not economic to install CHP, as the installed plant tends to have lower electrical efficiencies and therefore higher carbon emissions. In addition, due to the small landlord electricity demand, CHP installed to meet the base heat load would require the export of electricity to the grid.
- 8.2.4. There are also growing concerns about the air quality impacts of gas-engine CHP at this scale. The development falls within an air quality management area (AQMA). The installation of a gas fired CHP could exacerbate the problem.
- 8.2.5. Considering all the above CHP will not be proposed for this development.

9. BE GREEN (USING RENEWABLE ENERGY)

9.1. The following sections discuss the renewable energy generation measures that have been considered, and those which will be implemented at the development. Renewable technologies harness energy from the environment and convert this to a useful form. Many renewable technologies are available. However, not all of these are commercially viable and suitable for all proposals.

9.2. Technologies considered for the development include:

- Photovoltaics
- Solar Thermal
- Wind turbines
- Heat Pumps (ground-source / air-source)
- Biomass boilers

Photovoltaics

The development has an area of flat roof which could accommodate a solar PV system. The panels can be located either horizontally or at a low inclination. The panels would supply electricity to the dwelling with any excess being exported to the grid. Consideration would need to be given to the potential visual impact of the panels.

As PV systems have no moving parts, generate no noise or pollution, this is an attractive option. If designed and properly installed, they require minimal maintenance and have long service lifetimes.

Recommended Technology: Yes

Solar Thermal

Solar thermal systems would not be a feasible technology for use in the development, although there is a flat roof area. However, the extended pipework runs to the plant room in the basement would reduce efficiency. Solar thermal provides limited emissions savings as they can only cover a proportion of the hot water load. For higher emissions savings they would need to be linked with other low carbon or renewable systems to meet the emission reduction targets.

Recommended Technology: No

Wind turbines

For a wind turbine to be feasible the average wind speed needs to be at least 6m/s. According to Rensmart¹ Postcode N6 4LP has a windspeed of 5.8 m/s at 10m above ground level, 6.5 m/s at 25m above ground level and 6.9m/s at 45m above ground level.

Based on this data, the wind turbine would need a hub height of greater than 25m above ground. A turbine of this size will require a substantial amount of consultation and planning as it will have a significant visual impact on the local environment. The costs associated with a 25m turbine would be disproportionate to the cost of the development. The risk of noise, light flicker to adjacent areas and threat to wildlife alongside cost, contribute to turbines not being feasible.

¹ <https://www.rensmart.com/Maps>

Recommended Technology: No

Air Source Heat Pump

An ASHP would be suitable for the proposal as there is external space required for the outdoor units, and a separate plant room within the basement for the indoor units. This type of low temperature heat also lends itself to the proposed underfloor heating and high levels of insulation specified. The heat pump would also supply the hot water and depending on the model specified could also supply cooling to the dwelling.

Recommended Technology: Yes

Ground Source Heat Pump

For the same reasons as air source heat pumps being suitable to provide low temperature heating a ground source heat pump would also be suitable.

The installation of a boreholes to extract heat from the ground would be suitable for the proposal as there is adequate external space.

Recommended Technology: Yes

Biomass

Biomass boilers could be considered as an alternative to mains gas, but biomass heating has a number of significant disadvantages. The combustion in small scale biomass boilers and associated fuel transport are likely to have significant adverse impacts on air quality in an area which is exposed to elevated NOx and particulate emissions and already exceeds the current legislative targets. The need for a solid fuel store also increases the space requirements, further basement excavation would be required at a significant carbon and financial cost. Biomass pellets are also expensive compared to other fuels.

Recommended Technology: No

- 9.3. Within the above study, solar PV and heat pumps have been identified as suitable for the dwelling. Although suitable for the proposal it has been chosen at this stage to proceed without PV and install a high efficiency ground source heat pump which will extract heat from boreholes within the site.
- 9.4. The ground source heat pump will be designed to have a minimum coefficient of performance of 5.00 (Efficiency 500%).
- 9.5. In addition to the GSHP there will be mains gas boilers for a backup only. To represent these within the SAP calculation they have been assumed to meet 10% of the yearly heat demand. This allows us to demonstrate compliance with the emissions targets whilst accounting for the negative impact on the SAP calculations of a gas boiler. As the GSHP will be sized to meet the full heat load in reality the gas boilers may not be utilised and in that event this report demonstrates compliance with an overestimation of energy demand from gas boilers.
- 9.6. An update to the Be Lean Building services from table 3 following the renewable feasibility study is included overleaf.

Controlled Service	Details
Main Heating System	GSHP 500% efficient linked to underfloor heating (recorded as community system)
Back Up Heating System	Mains gas boiler 96% efficient linked to underfloor heating
Heating Controls	Flat rate charging, programmer and multiple thermostats
Heating distribution	Pre-insulated piping, low temp, variable flow
Hot Water	800L hot water storage with loss factor no greater than 4.5 kWh/day, cylinder in heater space, fully insulated pipework on separate timer with thermostat
Cooling	Split/multiple systems, energy label Class A with variable speed compressors.
Renewables	Ground Source Heat Pump

Table 7: Revised building services following renewable feasibility study

- 9.7. The resultant CO₂ emissions and energy demand after the incorporation of the ground source heat pump with back up gas boiler are shown in Tables 8 & 9.

Unit Reference	Total Floor Area (m ²)	Target Emission Rate kgCO ₂ /m ² /Year	Total Emissions kgCO ₂ /Year	Dwelling Emission Rate (DER/BER)	Proposed CO ₂ Emissions kgCO ₂ /Year
Guildens	1,737	12.60	21,934	3.90	6,693

Table 8: Summary of regulated dwelling emissions at the Be Green Stage

Unit Reference	Space Heating (kWh/Year)	Hot Water (kWh/Year)	Lighting (kWh/Year)	Auxiliary (kWh/Year)	Cooling (kWh/Year)	Total (kWh/Year)
Guildens	19,228	1,248	2,212	6,521	257	29,465

Table 9: Summary of dwelling energy demand at the Be Green Stage

- 9.8. The total emissions are summarised below:

Target CO ₂ emissions (TER x Floor Area)	21,934 KgCO ₂ /Year
Be Green CO ₂ emissions (DER x Floor area)	6,693 KgCO ₂ /Year

- 9.9. The Be Green emissions improve upon the Be Lean stage by **51%**. This has been achieved through the inclusion of the ground source heat pump supplying 90% of the heating and hot water demand. This satisfies Policy SP4 of the Haringey Local Plan as more than a 20% reduction in CO₂ emissions has been achieved directly through the use of renewable technologies.

- 9.10. When compared with the Target Emission Rate the dwelling has improved upon CO₂ emissions by a margin of **69%**. This is adequate to satisfy policy SI 2 of the London Plan as a reduction in CO₂ emissions of greater than 35% has been achieved.

- 9.11. The site wide Be Green energy demand is predicted to be **29,465 kWh/year**.

10. SUSTAINABLE DESIGN

Green Roofs

- 10.1. Consideration will be given to green and living roofs. A green roof is currently proposed for the first-floor flat roof area.

Waste and Recycling

- 10.2. The successful site contractors will be encouraged to operate an environmental management policy, also as a mandatory requirement provide a Resource Management Plan (RMP) detailing the strategy of avoiding the use of landfill and recycling by sorting waste streams.
- 10.3. The appointed site contractors will be encouraged to manage recycling and waste efficiently. The principles of the waste hierarchy will be followed, by that, emphasis is placed on re-use followed by recycling and composting before energy recovery and disposal is considered. The aim is to reduce the waste arising from the start and encouraging waste to be diverted from landfill.

Materials

- 10.4. The contractor will be encouraged to operate an environmental materials policy for sourcing of construction products.
- 10.5. Wherever possible all materials will be locally sourced, this will help minimise the environmental impact of transport to the site.
- 10.6. For all materials used in the scheme, consideration will be given in respect of the responsible sourcing certification level they achieve. All timber specified will be sourced in line with the UK governments timber procurement policy and be specified from sustainable sources such as FSC- or PEFC-certified whenever possible.
- 10.7. Where feasible any existing materials will be reused. All new materials on site will be considered for re-use and future recycling. The level of new aggregates used shall be minimised through use of recycled aggregates and waste minimisation. The Brick rubble arising from demolition could be crushed on site and utilised as pilling matt. The existing roof tiles will be recycled through a reclamation business.

Be Seen Energy Monitoring

- 10.8. Next generation digital Smart Meters shall be used to provide accurate information to the users to identify patterns and trends of use and seasonal fluctuations, this will aid the user to make adjustments in order to reduce energy use.
- 10.9. A commitment will be made to uploading energy data to the Mayor' Be Seen monitoring portal in line with the requirements Be Seen Energy Monitoring Guidance. The planning stage Be Seen data has been collated and included within Appendix A ready for uploading to the Portal.

Water Use

- 10.10. A full set of Part G water use calculations will be provided as part of the building regulations submission that the internal water consumption meets the targets of 105 litres per person per day (this excludes the allowance of 5 litres per day external water use). This will be achieved through water efficient white goods where provided, low volume toilet flushes and flow restrictors in taps and showers.
- 10.11. A sample of how the target will be achieved is provided below.

Installation Type	Unit of Measure	Capacity/ Flow Rate	Use Factor	Fixed Use	Litres/Pers on/Day
WC's (single Flush)	Flush Volume (litres)	0.00	4.42	0.00	0.00
WC's (Dual Flush)	(Full Flush)	4.00	1.46	0.00	5.84
	(Part Flush)	2.60	2.96	0.00	7.70
Taps (excl. kitchen/utility room)	Flow rate (litres / minute)	4.00	1.58	1.58	7.90
Bath (Shower Present)	Capacity to overflow (litres)	170.00	0.11	0.00	18.70
Shower (Bath Present)	Flow rate (litres / minute)	8.00	4.37	0.00	34.96
Kitchen/Utility Taps	Flow rate (litres / minute)	6.00	0.44	10.36	13.00
Washing Machine*	Litres / kg dry load	8.17	2.10	0.00	17.16
Dishwasher*	Litres / place setting	1.25	3.60	0.00	4.50
Waste Disposal Unit*	Litres / use	0.00	3.08	0.00	0.00
Water Softener*	Litres / person / day	0.00	1.00	0.00	0.00
Contribution from Grey Water					N/A
Contribution from Rain Water					N/A
*Not specified, so default values used		Calculated Water Usage			109.753
		Normalisation Factor			$\Sigma \times 0.91$
		External Water Usage			5
		Total Part G Water Consumption			104.88

Usage is less than 110 l/p/d, dwelling is compliant With London Plan Targets

11. CONCLUSIONS

- 11.1. E & S Bristol has explored the options for reducing the energy demands and CO₂ emissions for the proposed development at Guildens, Courtenay Avenue. This Energy & Sustainability Statement has identified a set of deliverable energy strategy solutions that when adopted would ensure the development complied with relevant national planning policy, the London Plan and the London Borough of Haringey policies relating to energy and climate change.
- 11.2. Energy strategy options were assessed according to the Mayor's Energy Hierarchy and the resulting savings calculated against a Building Regulations target assessment following the GLA guidelines. The strategy set out meets CO₂ emission savings targets and other related policies applicable to the site and enable each step of the Mayor of London's energy hierarchy to be addressed. This statement has shown the proposal is fully compliant with the Haringey Local Plan Policy SP4 and the London Plan Chapter 9 Policy SI 2.
- 11.3. The energy hierarchy has been followed, improving upon the Baseline requirements at the Be Lean stage through high levels of insulation and energy efficient services and fixings. It has been demonstrated that dwelling has achieved an 19% reduction in CO₂ emissions.
- 11.4. At the Be Clean stage district heating was not found to be favourable for this proposal due the lack of existing and proposed future networks and being located outside of a heat network priority area.
- 11.5. For the third stage, Be Green, a feasibility study evaluating the suitability of various renewable technologies was undertaken. The decision was to proceed with ground source heat pumps. The proposed ground source heat pumps will have a minimum coefficient of performance of 5.0 (efficiency 500%) to meet the dwellings heating and hot water demand. At this stage a backup gas boiler has been included and estimated to supply 10% of the annual heating and hot water demand, to cover a worst-case scenario in relation to emissions.
- 11.6. To comply with policy SI 2 of the London Plan a reduction in CO₂ emissions of **69%** has been achieved against the Target Emission Rate. Of this figure there is a **51%** improvement in emissions directly through the use of on-site renewable technologies to satisfy policy SP4 of the Haringey Local Plan
- 11.7. This sustainability statement concludes that the proposed development at Guildens, Courtenay Avenue, has met the requirements of Part L of the Building Regulations, the relevant parts of the London Plan and Policy SP4.
- 11.8. Further Details are shown in the summary tables and graph overleaf.

12. SUMMARY TABLES

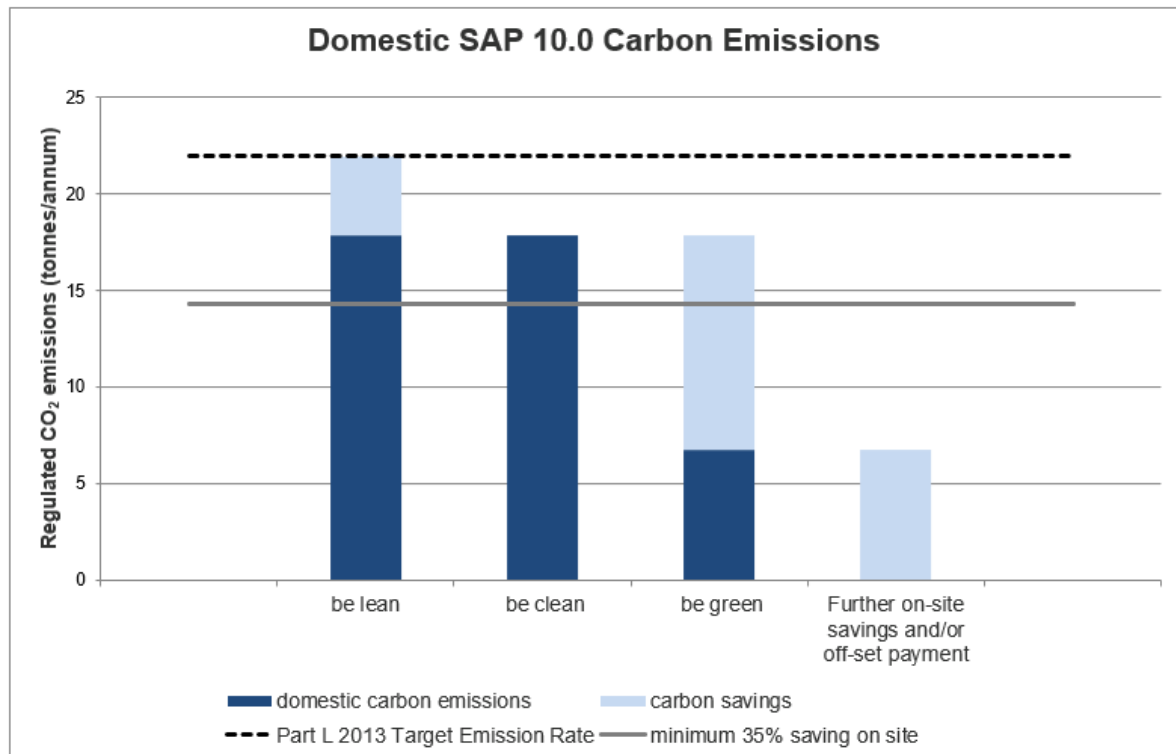
Dwelling Carbon dioxide emissions

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	21.9	3.6
After energy demand reduction (be lean)	17.9	3.6
After heat network connection (be clean)	17.9	3.6
After renewable energy (be green)	6.7	3.6

Dwelling Regulated carbon dioxide savings

	Regulated domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: Savings from energy demand reduction	4.1	19%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	11.2	51%
Cumulative on site savings	15.2	69%
Annual savings from off-set payment	6.7	-
	(Tonnes CO₂)	
Cumulative savings for off-set payment	201	-
Cash in-lieu contribution (£)	19,075	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab



APPENDIX A

Be Seen Emissions (Planning Stage)

MAYOR OF LONDON

OVERALL PROGRESS

100%



CURRENT REPORTING STAGE ----->>

Planning

*

CONTEXTUAL DATA

Progress: 100%



+ ORGANISATION & CONTACT DETAILS

ORGANISATION DETAILS

Organisation Name

E & S Bristol Ltd

*

Organisation Address

62 Belmont Street

*

CONTACT DETAILS

Contact Name

Graham Suttill

*

Email

graham@eandsbristol.co.uk

*

Additional Email(s)

Telephone No.

07517 339991

*

Mobile No.

07517 339991

+ DEVELOPMENT INFORMATION

OVERALL DEVELOPMENT DETAILS

Planning Reference Number

—

*

Name of Whole Development

Guildens, Courtenay Avenue N6 4LP

*

DEVELOPMENT LOCATION

Development Address

Address Line 1

Guildens

*

Address Line 2

Courtenay Avenue

Address Line 3

Address Line 4

London

London Borough	Haringey	*
Postcode	N6 4LP	*
Ordnance Survey Reference		
Development UPRN (if available)	—	
Geo-Location Coordinates		
Latitude (to 6 decimal places)	51.575	
Longitude (to 6 decimal places, +ve or -ve)	-0.168	

DEVELOPMENT TOTAL AREA BREAKDOWN

Residential

Total Residential Floor Area	GIA m2	1,737	*
Dwelling Counts			
Flats	number	0	*
House	number	1	*

Non-Residential

Non-Residential Floor Area Breakdown		<i>Please include complete non-resi details below</i>	
Landlord Circulation (in Residential Blocks)	GIA m2	0	*
General office (A2, B1, B8, D1 planning classes)	GIA m2	0	*
High street agency (A2 planning classes)	GIA m2	0	*
General retail (A1, SG planning classes)	GIA m2	0	*
Large non-food shop (A1 planning classes)	GIA m2	0	*
Small food store	GIA m2	0	*
Large food store	GIA m2	0	*
Restaurant (A3, A5 planning classes)	GIA m2	0	*
Bar, pub or licensed club (A4 planning classes)	GIA m2	0	*
Hotel (C1 planning classes)	GIA m2	0	*
Cultural Activities	GIA m2	0	*
Entertainment halls (D2 planning classes)	GIA m2	0	*
Swimming pool centre	GIA m2	0	*
Fitness and health centre	GIA m2	0	*
Dry sports and leisure facility (D2 planning classes)	GIA m2	0	*
Covered car park	GIA m2	0	*
Public buildings with light usage (D1, SG planning classes)	GIA m2	0	*

Schools and seasonal public buildings (D1, D2 planning classes)	GIA m2	0	*
University campus	GIA m2	0	*
Clinic (D1 planning classes)	GIA m2	0	*
Hospital (clinical and research)	GIA m2	0	*
Long term residential (C1, C2, C2A planning classes)	GIA m2	0	*
General accommodation (C1, C2, C3 planning classes)	GIA m2	0	*
Emergency services (SG planning classes)	GIA m2	0	*
Laboratory or operating theatre	GIA m2	0	*
Public waiting or circulation (SG planning classes)	GIA m2	0	*
Terminal (B8 planning classes)	GIA m2	0	*
Workshop (B1, B2 planning classes)	GIA m2	0	*
Storage Facility (B8 planning classes)	GIA m2	0	*
Cold Storage (B8 planning classes)	GIA m2	0	*
Overall Development Summary			
Total Development Floor Area			
Residential	GIA m2	1,737	
Non-Residential	GIA m2	0	
Total	GIA m2	1,737	
Total Non-Residential Uses		There is no non-domestic floor area.	

+ SUPPLEMENTARY FILES AND UPCOMING REPORTING STAGES

SUPPLEMENTARY FILES

Site Plan

Does the development have a site plan?	Yes	*
What is the site plan filename?	1802-PL 200s_Proposed New Build_Combined	*

Best Practice Documents

Does the development have a predicted DEC?	No	*
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ANTICIPATED DATES FOR UPCOMING REPORTING STAGES

As-Built Stage	4 Jul 2025	*
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Operational Year 1 End

4 Jul 2026

*

DEVELOPMENT PERFORMANCE AND EMISSIONS

Progress: 100%



+ DEVELOPMENT PERFORMANCE

DEVELOPMENT OVERALL PREDICTED PERFORMANCE

Predicted Performance Calculation Details

Fuel Carbon Intensity Source (aligned with planning energy statemen

SAP 10.0

*

Residential Elements of the development

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use kWh/yr

21,960

*

Annual Gas Use kWh/yr

7,506

*

Annual Oil Use (if applicable) kWh/yr

0

*

Annual Biomass Use (if applicable) kWh/yr

0

*

Annual District Htg Use (if applicable) kWh/yr

0

*

Annual District Clg Use (if applicable) kWh/yr

0

*

Elec Generation, Gross (if applicable) kWh/yr

0

*

Solar Thermal Generation (if applicable) kWh/yr

0

*

Predicted Annual Carbon Emissions tCO2/yr

7

*

Non-Residential Elements of the development (Part L Calculation)

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use kWh/yr

0

*

Annual Gas Use kWh/yr

0

*

Annual Oil Use (if applicable) kWh/yr

0

*

Annual Biomass Use (if applicable) kWh/yr

0

*

Annual District Htg Use (if applicable) kWh/yr

0

*

Annual District Clg Use (if applicable) kWh/yr

0

*

Elec Generation, Gross (if applicable) kWh/yr

0

*

Solar Thermal Generation (if applicable) kWh/yr

0

*

Predicted Annual Carbon Emissions tCO2/yr

0

*

Non-Residential Elements of the development (TM54 Calculation)

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use	kWh/yr	0	*
Annual Gas Use	kWh/yr	0	*
Annual Oil Use (if applicable)	kWh/yr	0	*
Annual Biomass Use (if applicable)	kWh/yr	0	*
Annual District Htg Use (if applicable)	kWh/yr	0	*
Annual District Clg Use (if applicable)	kWh/yr	0	*
Elec Generation, Gross (if applicable)	kWh/yr	0	*
Solar Thermal Generation (if applicable)	kWh/yr	0	*
Predicted Annual Carbon Emissions	tCO2/yr	0	*

CARBON OFFSETTING

Predicted Carbon Shortfall (aligned with planning energy st tCO2		201	*
Total Committed Carbon Offset	£	19,075	*

END