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**St Matthews Court,
Coppetts Road, London**

**Energy and Sustainability
Strategy**

Sustainability Services

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1.0 Executive Summary

The purpose of this document is to provide details on the proposed energy strategy for the planning application for the proposed new residential dwellings to be constructed under Phase 2 of proposals at St Matthews Court, Coppetts Road, London – located within the London Borough of Haringey. The energy strategy has been established following the Energy Hierarchy: Be Lean, Be Clean and Be Green as outlined within the London Borough of Waltham Forest Local Plan and supporting policy documents. One of the key objectives of the strategy is to maximise the reductions in Regulated CO₂ emissions whilst providing a cost-effective and viable approach to servicing the new dwellings.

SAP modelling for the dwellings has been undertaken within certified SAP modelling software in accordance with Building Regulations 2021, as applicable to new build dwellings.

As part of the assessment process, energy efficiency measures (Be Lean) have been considered throughout, including enhanced building fabric; insulation; high performance glazing; low energy lighting; and efficient mechanical ventilation systems. They have enabled the proposed development to exceed the Building Regulations Baseline scenario for dwelling emissions, primary energy demand and fabric energy efficiency.

The Be Clean measures have been carefully examined. However, ultimately no currently available ‘Clean’ technology is applicable to the site.

An extensive range of renewable technologies have been considered to provide ongoing emissions offset and energy use reductions. The installation of a heat pump system to provide domestic hot water only is deemed to be most favourable in reducing emissions and energy use at this stage based on the design and location of the proposed dwellings, with the final technology and emissions offset to be finalised as part of the Detailed Design Process.

Further renewable or low carbon technologies have also been considered as part of the assessment , with roof mounted PV also proposed to provide further emissions offset.

The tables opposite summarise the Regulated CO₂ emission savings for the proposed development. The Be Lean, Be Clean, Be Green combined measures result in a total reduction of ~63% in Regulated CO₂ emissions over the Building Regulations Part L baseline. This meets and exceeds the energy requirements of local and regional policy.

Wider sustainability issues have been addressed as part of the overall site design and layout with water use, ecology, transport, materials and pollution all considered in line with the broader policies applicable to the site.

CO ₂ Emissions after each stage of the Energy Hierarchy	
Stage	Carbon Dioxide Emissions (Tonnes CO ₂ per Annum)
Baseline: Part L 2013 Compliant Development	4.99
After Be Lean Measures	2.88
After Be Clean Measures	2.88
After Be Green Measures	1.83

Table 1: Regulated Carbon Dioxide Savings and the Energy Hierarchy

Regulated Carbon Dioxide Savings		
Stage	tonnes CO ₂ per annum	% Improvement
Be Lean	2.11	42.28
Be Clean	0.00	0.00
Be Green	1.05	21.04
Cumulative savings	3.16	63.33

Table 2: Regulated Carbon Dioxide Savings

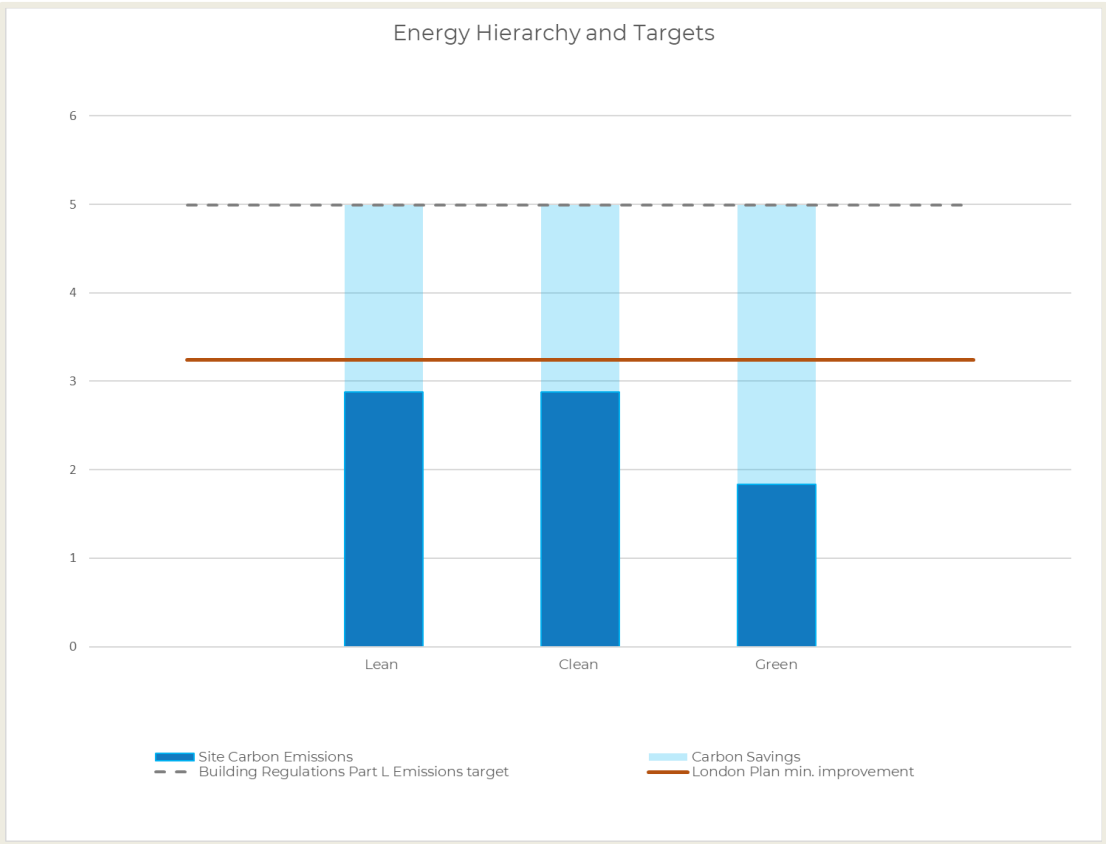


Figure 1: Emissions Reduction at Each Hierarchy Stage



2.0 Introduction

Cooper Homewood Ltd have prepared this Energy and Sustainability Statement for the Client to demonstrate how the Proposed new build dwellings at St Matthews Court, Coppetts Road, London Borough of Haringey will comply with the relevant policies of the Local Authority, as outlined in their Local Plan documents and other supporting policy guidance. This Report outlines the design measures that will reduce energy consumption and CO₂ emissions of this development, in addition to outlining sustainability measures incorporated within the construction and operation of the Proposed new build dwellings.

The Proposed Development consists of the construction of a new building to the rear (west) of the site to provide an additional 6 no.1 bed residential dwellings over 3 floors with undercroft parking.

This building is to be constructed in a similar style to those existing on the site, with parking and bin storage provided within the undercroft parking area.

Energy use and associated CO₂ emissions predictions have been made in accordance with Building Regulations Part L (2021) and the Energy Hierarchy to reduce resultant CO₂ emissions in line with the requirements of local and regional policy. .

Additional, wider sustainability measures outlined within relevant policy have been explored within this report to ensure that the Proposed Development incorporates all relevant measures to minimise impacts on the local and global environment. Items outlined within this report including amongst others:

- Land use and location
- Transport and access
- Materials
- Water use
- Waste strategy
- Pollution
- Ecology

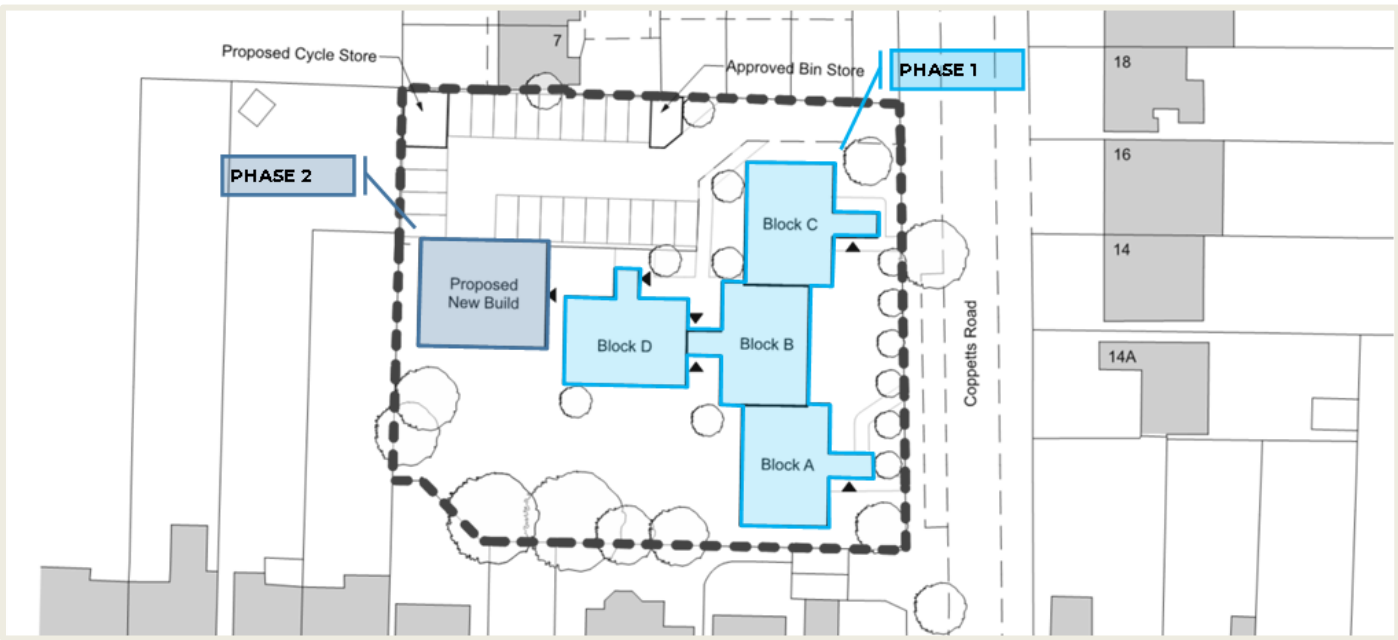


Figure 2: Proposed Site Plan Mark Up



3.0 Planning Policy

Outlined below is a summary of the Planning Policy used to develop the overall sustainability strategy for the Proposed Development, in addition to the Energy Use and CO₂ emissions reduction strategy.

3.1 Local Policy – London Borough of Haringey

Policy SP0: Presumption in Favour of Sustainable Development

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 NPPF). The Council will always work proactively with applicants 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 Haringey. Planning applications that accord with the policies in Haringey's Local Plan (and, where relevant, with policies in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise.

Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision, then the Council will grant permission unless material considerations indicate otherwise taking into account whether:

- *Any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies of the NPPF taken as a whole; or*
- *Specific policies in the NPPF indicate that development should be restricted*

Policy DM21: Sustainable Design, Layout and Construction

A All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should:

- a Apply the energy hierarchy to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide reduction requirements;*
- b Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems;*
- c Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls*
- d Wherever possible, use building materials with high environmental performance ratings; and e Seek opportunities for locally sourced labour.*

B The Council will support appropriate measures to sustainably retrofit existing homes and non residential buildings.

C Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted. D Consideration will be given to the use of carbon offset payments, to be secured by planning obligations, where it can be demonstrated that proposals are unable to meet carbon dioxide emission reduction targets on-site.



4.0 Sustainability Strategy

The following section of this report outlines the broad sustainability strategy with respect to best practice sustainable principles and sustainability criteria as outlined by the Local Authority within their Local Plan and supporting documents.

Unlike the Energy section of this report there is no formal methodology for reporting Sustainability related design considerations, and therefore general best practice has been used to inform the structure and contents of this section.

4.1 Location and Land Use

Situated within the London Borough Haringey, the Proposed Development is located within a predominantly residential location within the eastern-most Ward of the Borough – Fortis Green. Coppetts Road is a residential street which runs north to south and would have originally consisted of c.1930s residential dwellings consisted with the original time of construction. However, over the years elements of the area have been re-generated and redeveloped with more modern housing. As such, the area has a mix of architectural styles.

The building at St Matthews Court itself is estimated to date from the early 1990s.

The Application Site is not located within a conservation area, and is not bound by any additional statutory requirements in terms of building design and outlook. Albeit this has been considered as part of the overall architectural design.



Figure 3: Site Location within LB Haringey Policies Map

The proposed new building will provide a further 6 no. 1 bed residential apartments on the site. All will meet modern space and efficiency standards.

The site at present consists of lightly planted garden spaces with some are of lawn – predominantly on to the south of the site, with the North being a paved carpark for resident use. Boundary planting is in place to the east of the site bordering Coppetts Road, which is to be retained.

To the south of the site on Creighton Avenue the dwellings are typical of the area with large Edwardian and late Victorian villa style detached housing. To the north, more modern and dense housing is present. Therefore this site represents a transition site in terms of urban gran and design.

The area of Muswell Hill is typically characterised within the Haringey Urban Character Study by large housing plots, with large detached and semi-detached houses (Page 225). Therefore the provision of smaller, 1 bed dwellings adds to the variety of the housing stock in the area.

Overall, the proposals are in keeping with immediate surrounding principle land uses and also fit with the wider housing mix, providing smaller accommodation in an urban area typically characterised by larger, family housing.

4.2 Sustainable Design Principles

4.2.1 Circular Economy

Circular economy principles aim to change the principles of the economy from one of ‘Take, Make, Use and Discard’ to a ‘Re-Make and Use-Again’ model of material use. Reusing and repurposing as much material as possible, and then recycling as much of the remainder are the fundamentals of this principle, and the Proposed Development will implement as much of these principles as possible in its design and construction approach.

Whilst a full circular economy statement or whole life carbon assessment is not deemed as necessary for a minor development such as this (less than 10 no. dwellings), materials and construction approaches will be chosen to minimise the overall developments impact on the environment generally, both during material production, home operation, and disposal at the end of use, with as many as possible of the materials specified being re-usable at the end of building life.

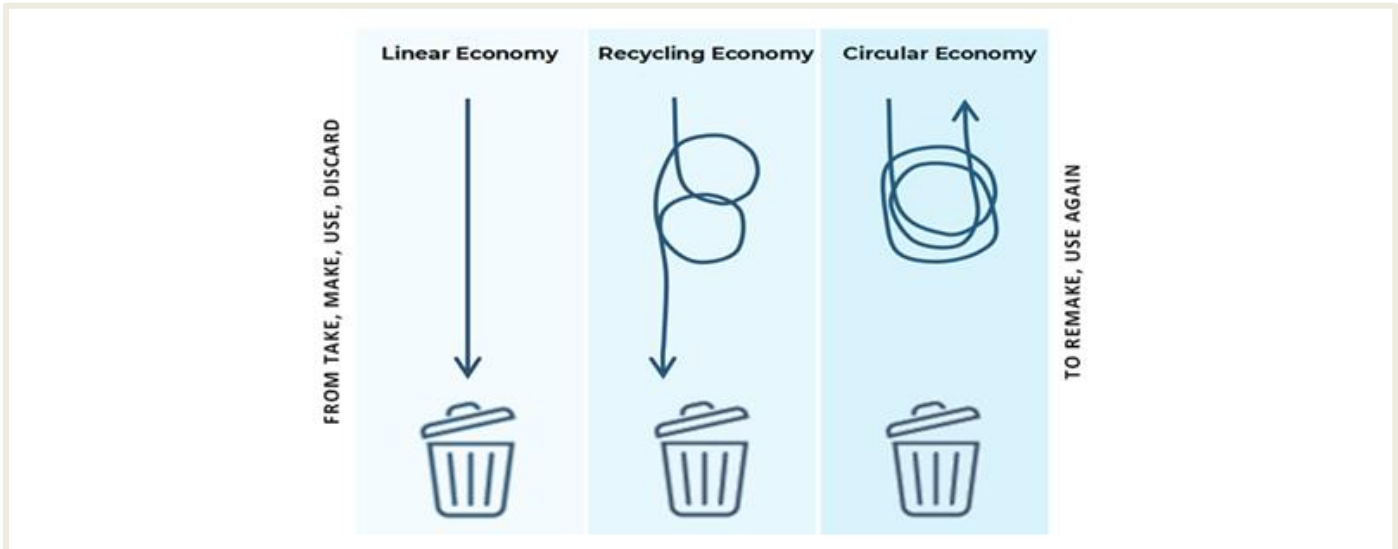


Figure 4: Circular Economy Principles

A licenced contractor will be employed to provide the waste management services on the site and records will be kept to ensure that as much as practicable of the waste generated from the site is diverted from landfill. In line with the London plans targets for waste management, >95% of the waste generated will be diverted from landfill, and this target will be expressed to the management company on appointment.

As part of the site waste management operations, materials currently on site which will be made available through the demolition/dismantling processes will be retained where this is possible, for re-use within the proposed design. The Design Team will conduct an exercise to identify any potential materials that could be reused with the waste management on the site following the waste hierarchy.



4.3 Waste Strategy

Waste will be minimised through the sites construction and operation in line with best practice to ensure the impact on the environment through the disposal of waste and consumption of new materials is minimised.

All waste will be managed in line with the DEFRA Waste Hierarchy as outlined below:



Figure 5: DEFRA Waste Hierarchy

4.3.1 Construction Waste Management.

It is considered that the waste from construction will be managed on site by a licensed external contractor as this will save time and space on what is a constrained site. However, appropriate measures will be put in place by the Contractor(s) for the salvaging and re-use of any materials of interest which would otherwise be disposed of. This could either be from the demolition of elements of the existing building, or spare new materials.

A Construction Management Plan will be implemented by the Contractor to ensure that policies and procedures are put in place for the re-use, recycling, recovery and disposal of waste for the duration of site works.

Waste will be minimised through all site activities through the monitoring and measuring of energy use and water use from the outset of construction, at a minimum of monthly intervals to track consumption, with reduction measures proposed where there are needed and relevant.

It is anticipated that more than 95% of construction waste will be diverted from landfill as a minimum, with a target for all (100%) being diverted from landfill and reused and/or recycled.

4.3.2 Operational Waste

In line with the principles of Policy DM4 of the LB Haringey's Development Management DPD, the development proposals have "considered how to sustainably manage waste arising from the development during the design, construction and occupation phases". This in turn is supplemented by the standards outlined within the "Haringey Waste Management Guidance Note for Residential and Mixed Use Developments"

In summary, the DPD provides the following guidance for waste storage on the site:

- Adequately sized storage
- Provision of appropriate and safe access for occupants and waste collection operatives
- Located and/or screened to prevent nuisance
- Flats to have adequate internal temporary storage space for recyclable waste
- Communal storage for recycling
- Preference for basement servicing over the use of forecourts or internal storage.

Waste storage is proposed to be located in the basement/undercroft area of Phase 2 of the development - Total capacity (based on the drawings below) is estimated to be as follows:

- Phase 2: ~2440 litres (2 no 1100L eurobins & 1 no. 240L wheelie bin)

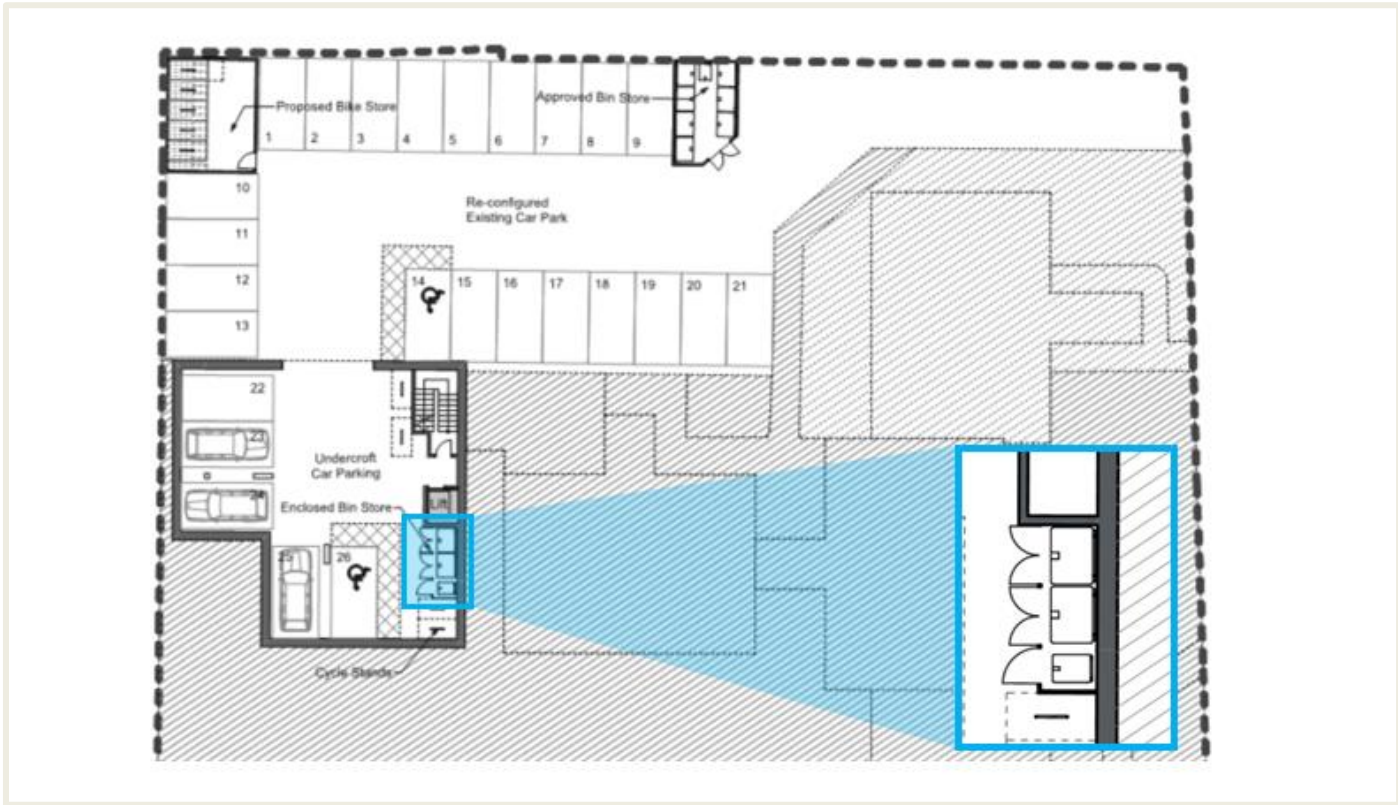


Figure 6: Location and Layout of proposed Bin Storage Areas



4.4 Flood Risk and Surface Water



Figure 7: Flood Risk from Rivers and Seas

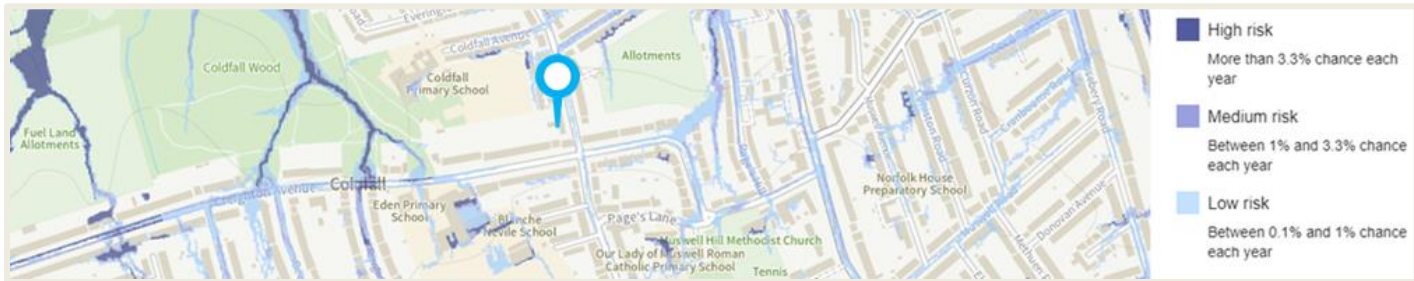


Figure 8: Flood Risk from Surface Water

As indicated above, the Proposed Development is located in an area of low flood risk from rivers and seas.

Some minor evidence of surface water flooding is shown on the maps above, but this is of very low risk and is located on the main road surface and will therefore not impact the application site.

On site drainage is to be retained as part of the development process with the additional flats connected directly to exiting drainage.

Whilst there is a minor increase in the surface area of impermeable surfaces as a result of Phase 2 of the development, this is unlikely to significantly impact the immediate surroundings of the site. Detailed drainage designs will be undertaken post planning with the overall aim to limit peak flow and volume as far as possible using reasonable means.

4.5 Transport and Access

4.5.1 Site Access

Access to the site is provided from the east of the site via Coppetts Road with the access road providing a natural break between the existing buildings on site and the rear gardens of the dwellings to the north.

Access to the new dwellings will be via the vehicular access to the north east of the site. Dwellings here will be accessed through a shared access in the undercroft area, with a lift also present for disabled and goods access.

4.5.2 Public Transport

Being located within London, public transport options are many and varied with the use of sustainable transport options often more convenient than the use of private vehicles.

The nearest tube station is located approximately 1km walk to the south west at East Finchley which provides Northern Line Services south towards central London via Euston, and north to Mill Hill East and High Barnet.

Mainline Rail services are available from Alexandra Palace Railway Station, located c.1500m to the East of the site which provides conventional train services in and out of the Capital as well as connections to the wider National Rail network.

The typical off-peak service in trains per hour is:

- 2 trains per hour to London King's Cross (calls at Finsbury Park only)
- 4 trains per hour to Moorgate (all stations)
- 2 trains per hour to Stevenage via Hertford North
- 2 trains per hour to Welwyn Garden City
- 2 trains per hour to Letchworth Garden City of which 1 continues to Cambridge

Being on such a key route, connections from the local underground station can also be made to the wider national rail network via changes major stations and Termini.

Bus stops are located directly outside the property, with Service 234 providing services between Archway and Barnet. Further stops are available further afield with all services linking to the wider public transport network. .

By road, the site is accessible via Creighton Avenue to the south which leads west to High Road (A1000). From here, the A406 (North Circular) is accessible by travelling north for a further 500m or so. From here, the wider road network is accessible, including national motorway connections including the M25, A1(M) and M1.

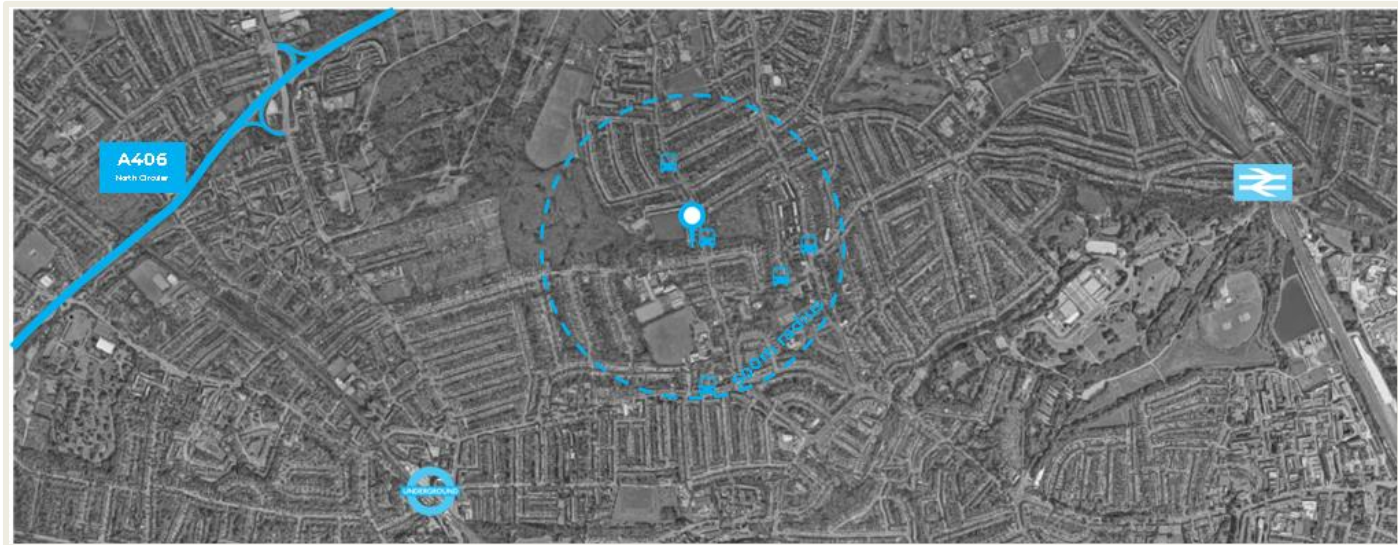


Figure 9: Transport Summary Diagram

Due to the distance of public transport, the PTAL Rating of the site has been calculated as '2' (tfl.gov.uk).

4.5.3 Cycling and Cycle Storage

Cycle parking is provided as part of the proposed development with this being provided to Phase 2 in line with Regional Policy within the London Plan.



The London Plan states that 1 no. cycle parking space should be provided for each 1 bed or studio apartment.

A total of 6 no. additional 1 bed dwellings are to be constructed, requiring a total of 6 no. cycle parking spaces to be provided. As indicated below a total of 8 no. spaces are provided within the undercroft storage area – exceeding the minimum requirements.

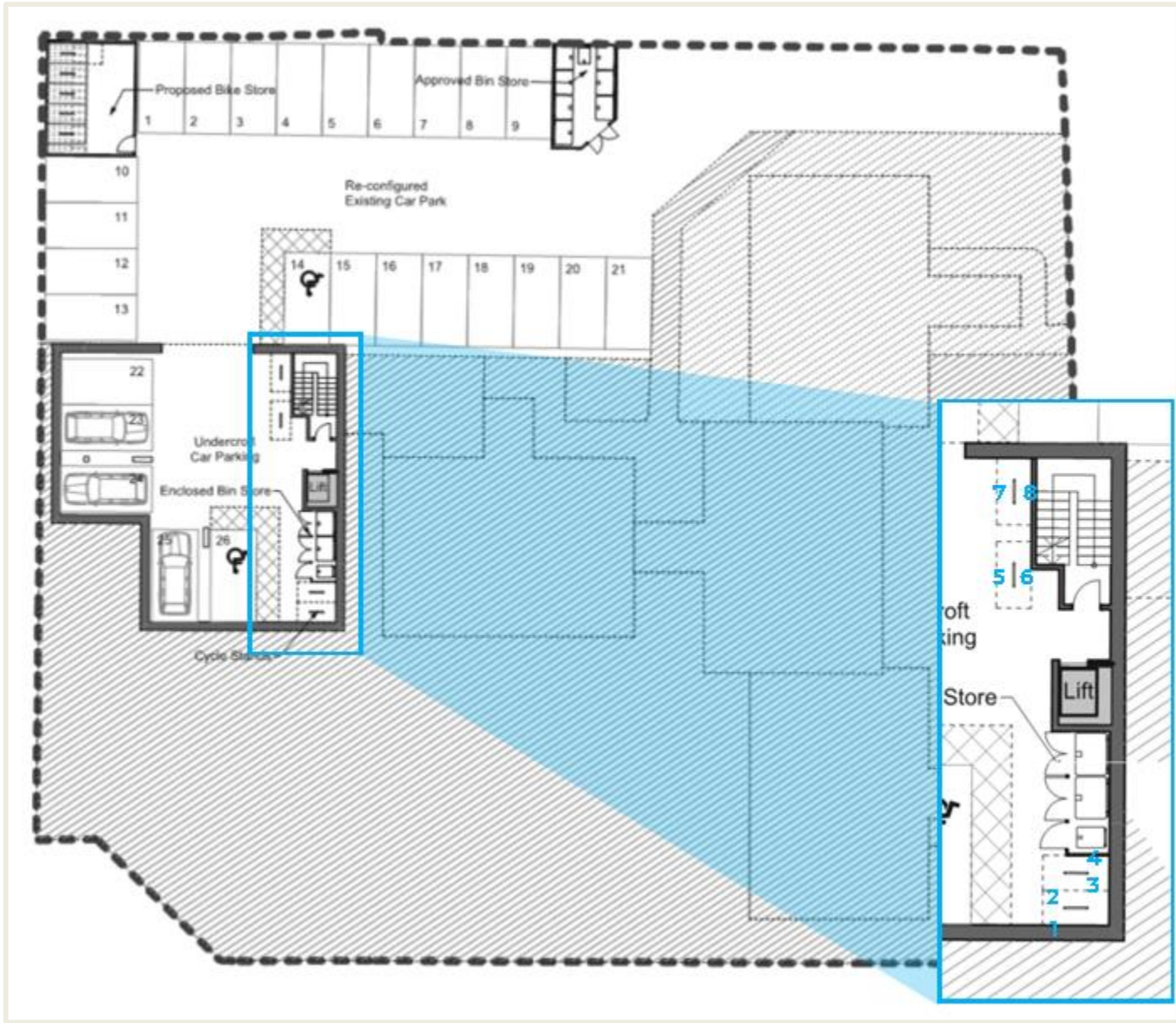


Figure 10: Cycle Parking Layout and Numbers

4.5.4 Vehicle Parking

Vehicle parking is not limited through Haringey Policy, with the London Plan referenced within the Development Management Plan as being the benchmark for parking standards in this area.

With the Public Transport Accessibility Level of the site being low (2), the London Plan, Table 10.3 states that there is a maximum limit of 0.75 spaces per dwelling.

With 6 no new dwellings provided in Phase 2, there is a maximum of 4 no. spaces permitted for this element. 4 no. standard spaces and 1 no. disabled space are provided.

It is therefore deemed that parking provide is not excessive based on regional and local policy requirements, given the public transport access in the area.

4.6 Security and Security Standards

In line with best practice the Proposed Dwelling will be designed to maximise personal safety and minimises the opportunities for crime and anti-social behaviour.

As such, the Proposed Development will make reasonable provision for the resistance of unauthorised access in line with best practice, with newly installed doors and windows certified to PAS 24:2012 (or other similar, suitable standard) to provide the required level of risk mitigation.

It is not believed that Secured by Design Compliance will be sought at this time.

4.7 Pollution

Generally, air pollution within the area is considered as relatively poor due to the urban location and density of heating appliances and traffic in the local area. According to the National Atmospheric Emissions Inventory, the air quality in the specific location of the Proposed Development has high levels of Nitrogen Oxide and Particulate Matter (PM10), which are predominantly associated with high levels of fuel combustion – specifically diesel.

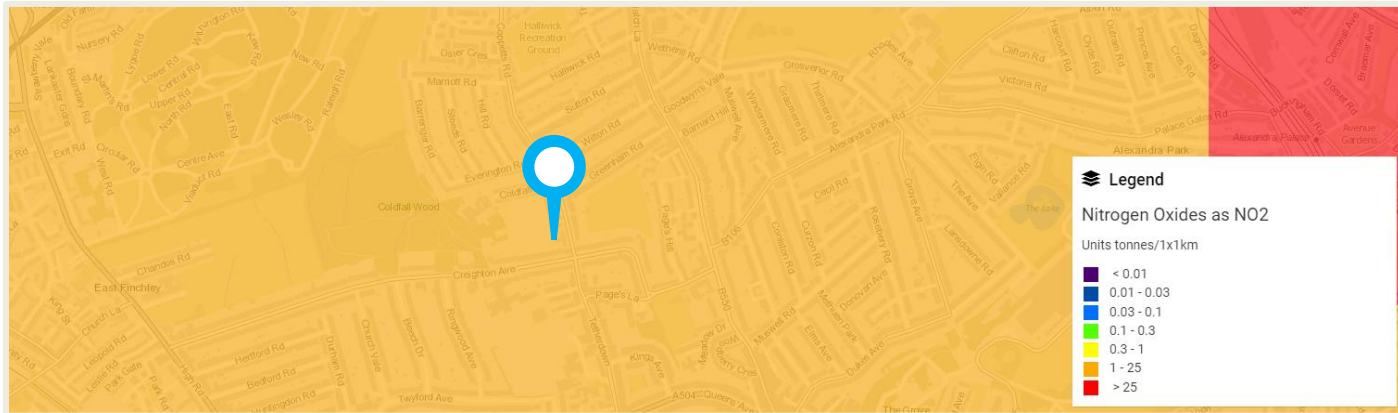


Figure 11: Air Pollution Map - NO_x Emissions (naei.beis.gov.uk/emissionsapp/)

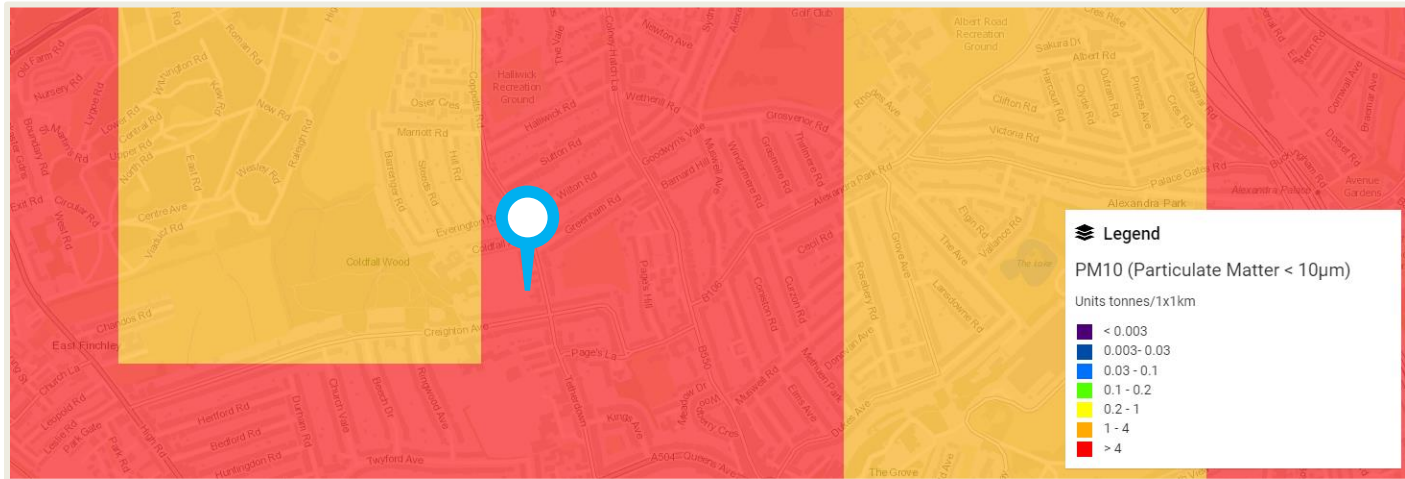


Figure 12: Air Pollution Map – PM10 Emissions (naei.beis.gov.uk/emissionsapp/)

4.7.1 Pollution from Construction

A contractor is yet to be appointed. However, general best practice principles will be adhered to on site to minimise on site pollution and disturbances to other nearby residences.

Pollution will be managed on site through the adoption of best practice in respect of noise and air pollution to ensure that this is minimised and any adverse impacts are mitigated.

Best practice principles for the reduction of pollution from construction works will be implemented on site by the contractor to limit the impact of site works to the local and wider environment. In general, the following principles will be adopted:

- The idling of vehicles will be prohibited.
- Vehicles will meet the highest standard possible in relation to emissions. .
- Spill kits will be available on site for the spillage of any fuels or other pollutants
- The site works layout will be optimised to quicken delivery times and reduce impact on surrounding areas from the movement of machinery and other equipment.
- Construction sites will be kept in general good order to assist in the good outlook of the construction industry as a whole, and improve local relations for the duration of works.
- The use of generators on site will be prohibited unless there is no feasible alternative.
- Skips will be continuously covered.
- Cutting, grinding, sawing and bashing will be appropriately located and timed with due consideration to the surrounding property users.
- Damping and washing down will be undertaken regularly to reduce dust emissions and track-out from vehicles.
- All Non-Road Mobile Machinery will be well maintained to avoid excessive emissions.

4.7.2 Operational Pollution: Air

The Proposed Development is to implement a zero on site emissions strategy through the adoption of an all-electric heating system. Therefore, there are no air pollution impacts anticipated from the operation of the dwelling. See the Energy Assessment below for further information on the technology proposed to limit energy use and emissions on site.

4.7.3 Operational Pollution: Noise

Noise pollution will be minimal due to this being a residential dwelling, with general movements of people and goods in line with that of the surrounding areas and the existing property. At present, heat pumps are proposed for hot water generation only and, with the heat pumps for these units being internally mounted and ducted to external air, external noise generation is expected to be low.

Please see the energy statement section of this report below which outlines the proposed energy systems, and emissions reductions proposed.

4.7.4 Operational Pollution: Light

Light pollution will be managed through the external lighting design whereby fittings will be appropriately positioned to avoid disturbance to neighbours and other surroundings. All fittings will be automatically controlled through PIR and/or daylight/photocell sensors to reduce the chance of lighting being used when it is not required.

The overall strategy will be to provide an external lighting design which compliments the building design and surroundings, and will utilise high efficiency LED fittings throughout.

4.8 Water Use

Potable water is a scarce resource. In 2021 the Environment Agency completed its latest classification of water stressed areas¹ within the United Kingdom of which London and the South of England form the bulk area of concern.

It is therefore critical that water use in dwellings is minimised as far as practicable.

Generally water use within dwellings is restricted through the careful specification of white goods, and the restriction of water outlets to limit flow rates whilst maintaining the user experience.

Whilst the specifics of sanitaryware specification are to be confirmed at this stage, the specification below represents indicative fitting performances which meet the lower Building Regulations Part G standard for internal water use (105 litres/person/day) in accordance with the Local Plan Policy CC3.

- W/C Cisterns: 4/6 litre dual flush
- Baths: Max. 200 litres to overflow
- Basin taps: 4 litres/minute flow
- Kitchen taps: 5 litres/minute flow
- Showers: 7 litres/minute flow
- Washing Machines: <8.17 litres/kg dry load
- Dishwashers: <1.25 litres/place setting

A full calculation sheet is provided in the appendices for reference, and fittings and fixtures will be confirmed at a later date to confirm compliance with these requirements.

4.9 Site Ecology

The site currently consists of hard standing and lawn, both of which are assumed to have low ecological value. Trees and hedgerows are only present at the southern end of the site, which is not being touched as part of the proposals, with all trees and hedgerows being retained. Enhanced gardens are proposed as part of the overall site works to provide better private external facilities.

¹ <https://www.gov.uk/government/publications/water-stressed-areas-2021-classification>



4.10 Sustainability Conclusion

Through a considered and comprehensive approach to the broader elements of sustainability, the development at St Matthews Court, London Borough of Haringey has aimed to reduce its impact on the local and global environment by providing appropriate cycle and bin storage in line with current guidance.

All dwellings constructed will result in lower operational energy use, with modern construction proving more energy efficient, with low carbon technologies implemented as indicated in the supporting Energy Statement below.

Total environmental impact and longevity of materials will be considered as part of the future design process, with impacts of the site works considered by the Contractor and the Client at tender stage, and minimised where they are identified through appropriate site procedures, monitoring and reporting. Water use during building operation will also be reduced through the specification of appropriate fittings.

Resource use will be minimised during construction and operation, with an appropriate waste strategy implemented both during construction and operation to facilitate high levels of re-use and recycling.

Overall, the Proposed Development aims to be as sustainable as possible in its approach to meet the needs of the Client, Planning Policy and residents both now, and into the future.



5.0 Energy Strategy

This section outlines the methodology and standards used to formulate the energy use and CO₂ emissions reduction strategy.

5.1 Energy Hierarchy

All energy strategies are required to be formed on the basis of Energy Hierarchy as outlined in the London Borough of Haringey Local Plan, supporting policy documents and wider London plan policy. Energy and CO₂ emissions reduction factors must be implemented in line with this hierarchy to demonstrate a fabric first approach has been implemented, and energy sources applied in the most environmentally appropriate way possible.

The Energy Hierarchy forms the basis for the Energy Strategy with improvements made to the proposed design through the implementation of emission reduction measures in line with the following process.

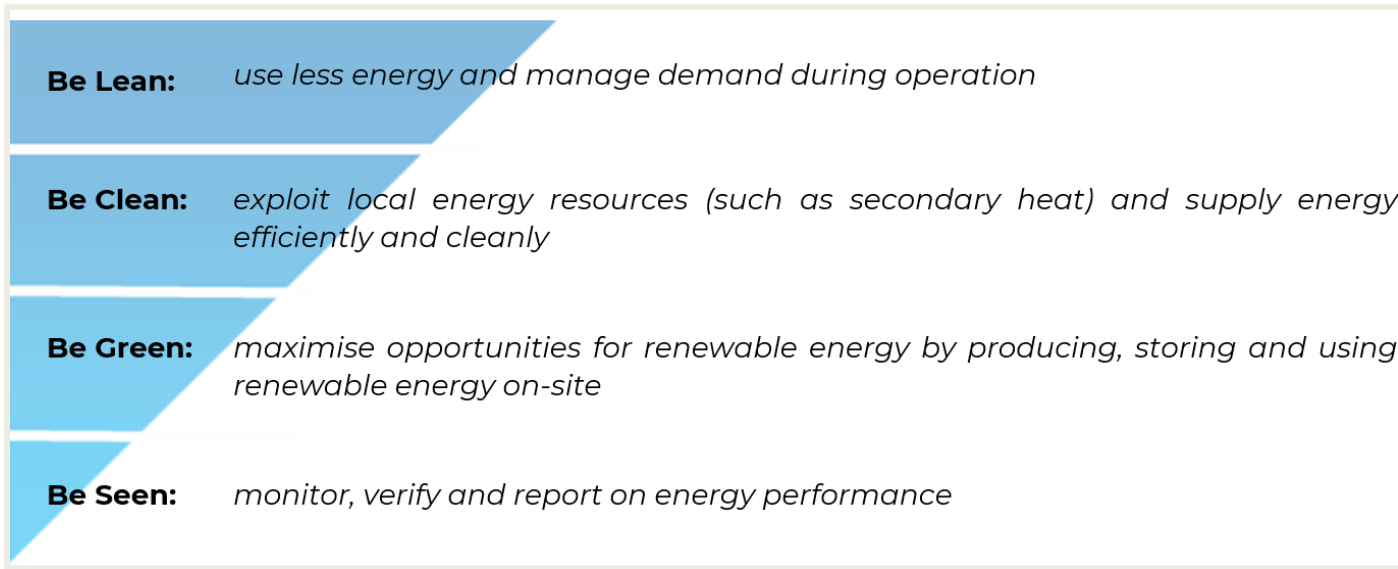


Figure 13: The Energy Hierarchy

5.2 Modelling and Calculations

The Proposed dwellings are a new construction and therefore falls under Building Regulations Part L1a. Consequently, modelling has been undertaken on the Proposed Development with certified SAP software in accordance with Building Regulations Part L1a 2021. Models within the SAP software have been based on the latest drawings from the Architectural Team.

At present, energy modelling has been undertaken on 2 no. sample SAP calculations (end and mid terrace apartments), with the results multiplied up to give a representation of the site wide performance of the proposed new dwellings. The focus of the energy modelling has to allow an appropriate specification to be drawn up which meets and exceeds the building regulations requirements of the site.

Energy calculations have been undertaken on all 6 no. proposed dwellings to inform the overall strategy.

5.3 CO₂ Emissions Reduction Strategy

The following section outlines the emissions reduction strategy employed within the Proposed Development to meet the required Planning Policy Requirements.

All improvements in the performance of the Proposed Development are measured from an energy baseline based on a Building Regulations Part L compliant design.

5.3.1 Baseline Emissions Calculation

The energy baseline forms the basis for which all subsequent improvements are measured and is based on the dimensions and orientation of the Proposed Development, but incorporates the 'Notional Specification' outlined within Approved Document L. To pass Building Regulations requirements, the Proposed Design must outperform the Notional (Target) dwelling on the following 3 metrics:

- **Dwelling Emissions Rate (DER)** – the yearly emissions associated with regulated energy use per m² of GIA
- **Fabric Energy Efficiency (FEE)** – the yearly heat loss through the fabric measured in kWh per m² of GIA
- **Primary Energy Rate (PER)** – the yearly energy required to be generated to supply the dwelling with the required power measured in kWh/m²/year

Calculations undertaken on the Proposed Dwelling shows the following Baseline (Target) figures:

	Site Emissions (tCO ₂ /yr)
BASELINE	4.99

Table 3: Baseline Building Performance



5.4 Demand Reduction Measures (‘Be Lean’)

In line with the Energy Hierarchy, Passive and Active efficiency measures have been prioritised to reduce energy use and associated emissions.

5.4.1 Passive Design Measures

The following indicative U values have been used as the basis for the energy calculations:

Passive Item	Proposed U-Values
External Walls	0.14 W/m²K
Roof	0.10 W/m²K
Heat Loss Floors	0.10 W/m²K
Separating Floors	0.00 W/m²K (to heated spaces below)
Windows and Glazed Doors	1.2 W/m²K (G=0.45)
External Doors	1.4 W/m²K
Party Walls	0.0 W/m²K – min. fully filled and sealed
Air Permeability	3 m³/hr/m²

Table 4: Fabric U-Values Summary

The Proposed Dwellings have been designed to compliment the existing and extended dwellings constructed. Therefore there is little scope for the adjustment of this within the current design. However, all dwellings have been designed with natural ventilation in mind, with openings on opposite elevations providing cross ventilation.

As a whole, the dwellings will be highly insulated to reduce total energy use and associated emissions, with a low building air permeability proposed to reduce heat losses, increase comfort levels, and assist the management of air changes provided by the mechanical ventilation systems.

Construction at this stage is expected to be of a traditional construction type dependent on structural requirements of the site. The development has currently been modelled with a ‘low/medium’ thermal mass representative of these construction types – balancing the management of internal overheating during the summer period, and high response heating in the winter.

Thermal bridging – the passage of heat through construction or geometric bridges – will also be reduced with a reduced bridging value (0.050, default: 0.200) applied to the SAP modelling to represent a reduction in the associated losses. Bridges will be modelled as part of the detailed design to ensure that losses are minimised, with the appropriate values being entered into the calculations when completed.

For domestic properties, the Fabric Energy Efficiency (FEE) measure within the SAP modelling software offers a good indication on the demand reduction measures incorporated on the site, compared to the notional Building Regulations Part L dwelling. Current modelling shows the following:

Target Average Fabric Energy Efficiency (kWh/m2/year)	Design Average Fabric Energy Efficiency (kWh/m2/year)	Improvement
43.52	41.02	5.74%

Table 5: Fabric Energy Efficiency Values

5.4.2 Active Design Measures

Active design measures will also be implemented throughout the site to limit energy using equipment to within acceptable levels – maximising efficiency and minimising waste.

In light of this strategy, energy loads will be reduced through the specification of low energy, LED lighting throughout with a minimum efficacy of 120Lm/W being used. External lighting will be fitted with appropriate controls to prevent inappropriate use, with controls applied based on the intended use utilising PIR and photocell sensors as required.

Heating controls will also be optimised with the use of a centralised heating programmer control and room stats in excess of minimum building regulations requirements for dwellings of this size.

The dwellings will all have mechanical ventilation provided to all areas through the specification of Mechanical Ventilation with Heat Recovery (MVHR). This system will operate continuously, and will extract warm moisture laden air from kitchens and wet-rooms, and supply fresh tempered air to habitable spaces. This will be supplemented with an automatic boost provided via humidistat, and summer bypass to assist in the mitigation of any overheating within the dwelling.

Hot water use is also to be limited through the implementation of a waste water heat recovery system on the showers provided. At present an integrated shower system is assumed, with a System B installation used for the purposes of the calculations made.

The implementation of active and passive measures results in the following emissions reduction.

	Site Emissions (tCO ₂ /yr)
BASELINE	4.99
LEAN	2.88
Improvement Over baseline	42.29%

Table 6: Building Performance at Lean stage



5.5 Active Cooling and the Cooling Hierarchy

An overheating assessment has not been undertaken at this stage to confirm compliance with Building Regulations Part O. However, one will be undertaken as part of further, future design work.

However, in line with best practice, the cooling hierarchy has been utilised at these early stages to minimise internal temperatures and either remove the need for cooling or, where this is to be specified, aid the cooling process, making the system as efficient and effective as possible.

➤ **Reduce the amount of heat entering the building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure:**

Openings are provided on at least 2 differing elevations per apartment to allow cross ventilation whilst not presenting an overlooking risk to the residents of Block D nearby (hence no openings on the eastern elevation). However, all building elements will be highly insulated beyond the requirements of Building Regulations minimum standards to prevent heat transfer and maintain comfortable internal conditions.

Specific solar shading is not proposed and is not currently deemed to be required. However, shading to the dwellings is provided by the building form, glazing reveals, and the careful specification of glazing (G Value of <0.63 used at present), in addition to surrounding buildings and vegetation which all assist in reducing solar gain to the dwellings. All aspects of the shading/overheating strategy should balance the requirement for the provision of daylight and view out, with the need to limit internal gains and therefore reduce overheating potential.

➤ **Minimise internal heat generation through energy efficient design:**

All glazing will be specified with a Low-E coating to reduce solar gain and potential overheating.

High efficiency hot water cylinders will have low standing losses to limit heat gain with all pipe runs highly insulated when both internal and external. The provision of extract ventilation within the store cupboard where the cylinder is located will be investigated to vent excess heat in the summer period and utilise this waste heat in the heating season via the MVHR system also proposed.

➤ **Manage the heat within the building through exposed internal thermal mass and high ceilings:**

A 'low/medium' thermal mass is anticipated at this stage with a timber frame or traditional construction anticipated (TBC). Therefore, exposed thermal mass will be minimal, but potential within wall elements. A light/medium weight structure will be highly responsive to natural ventilation, with little heat retained within the fabric. Stone and ceramic flooring will be investigated at detailed design (in addition to overheating modelling for Part O compliance) to minimise overheating potential.

➤ **Provide Passive Ventilation:**

Passive ventilation will be provided by openings provided to all habitable spaces in excess of Building Regulations requirements. Openings are large to provide maximum ventilation to spaces and allow excess heat to be vented to outside. Openings on opposite elevations provide cross ventilation potential.

➤ **Provide Mechanical Ventilation:**

Mechanical ventilation is to be provided in support of Building Regulations Part L and F compliance through the extraction of polluted air from bathroom and kitchen areas. This is proposed in the form of whole house heat recovery ventilation, with summer by-pass specified to minimise overheating.

➤ **The Provision of Active Cooling:**

An overheating assessment will be required to show compliance with Building Regulations Part O at a future date. However, at this stage, active cooling is not deemed to be required to ensure the health and

well being of residents of the dwelling. However, specification of this will be confirmed at detailed design stage based on the required dynamic overheating modelling.



5.6 Heating Infrastructure (‘Be Clean’)

‘Clean’ energy solutions prioritise the use of available, existing heating networks, community heating and combined heat and power where this is feasible to support and enhance the growing number of heating networks throughout the country.

5.6.1 District Heating Networks & Community Heating

The Proposed Development is located within a residential area and is not close to an existing heat network nor is the site close to any heat transmission routes (either proposed or existing). Heat Network Project Areas are also not evident over the site and there are no existing energy centres or major heat generation sites within the immediate vicinity of the proposed development. Therefore, connection to any district or communal systems is not feasible for this site, and focus is to be placed on efficient, individual systems suitable for a single residential dwelling.

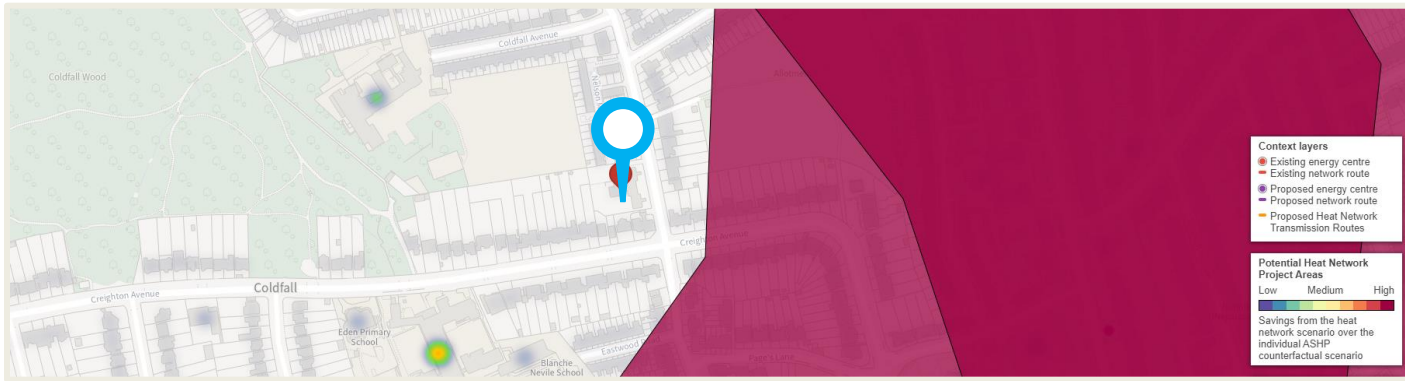


Figure 14: Excerpt from London Heat Map

5.6.2 Co-Generation

The use of co-generation technologies (such as a Combined Heat and Power (CHP) generator) can be used to supply the buildings heat and hot water demand whilst generating electricity which can be exported back to the grid to provide CO₂ emissions offset, and supplementary income based on an export tariff.

Residential buildings constructed to high thermal standards typically have a low heat demand, with the predominant demand being that of domestic hot water. CHP engines work best at 100% load and where cycling (the turning on and off of the engine to meet demand) is minimised. Generally, a low heat demand is not sufficient to keep the CHP running at maximum efficiency.

CHPs typically run on natural gas, and are not as ‘clean’ burning as conventional boilers, especially with regards to NO_x emissions. The London Borough of Waltham Forest has in place an Air Quality Action Plan which focusses on NO_x emissions as a key area of concern. Whilst the Action Plan mainly focusses on emissions from vehicles, it is considered that, on balance, the implementation of any technology that would exacerbate the emissions of the area would be counter to local policy, and also the national direction of travel with regards to reducing the use of gas for domestic heat provision.

The proposed dwellings will be highly energy efficient as outlined above and any additional load is not sufficient to warrant any co-generation systems. In addition, the requirement for a separate, standalone energy centre, and additional communal infrastructure is not financially or technically feasible for this site give the current constraints of space and

Therefore, the use of co-generations technologies has been discounted at this stage.

5.7 Low and Zero Carbon Technologies (‘Be Green’)

This development intends to maximise opportunities in incorporating Low and Zero Carbon (LZC) technologies as part of its energy strategy.

This section outlines the feasibility of a range of renewable energy technologies for the proposed development. The assessment considers each LZC technology for their viability by means of:

- Technical feasibility
- CO₂ savings offered
- Other potential impacts

Local constraints, considerations and restrictions are also considered where these are thought to be relevant to the application of the technology.

5.7.1 Wind Power

The generation of power through the use of wind turbines has the potential to generate a large quantity of electricity and provide high levels of emissions offset. Due to the location of the Proposed Development, the surrounding environment and its low level development, the use of this technology – which would be highly visible - is not considered appropriate.

5.7.2 Biomass

A biomass system would offer a heating system fuelled by plant-based materials such as wood, crops or food waste. A biomass system design for this development would consider generation of space heating and domestic hot water through the combustion of biofuels such as woodchip or wood pellets. These fuels offer a high energy content per unit of volume.

A biomass boiler occupies a larger floor area than a conventional gas-fired boiler with the additional requirement for locations to be provided for fuel storage. The burning of biofuels such as wood pellets expel exhaust gases which contain substantially more NO_x emissions and particulate matter than its gas boiler equivalents, which would have a negative impact on the local air quality and would be contrary to guidance within the borough with regards to the air quality management.

Due to the buildings location, the storage and regular delivery of a biofuel would also be challenging due to lack of local biomass suppliers, and the need for bulk deliveries in this residential area. Based on the above, and the issues highlighted within section 5.6.2, biomass is not considered as a viable LZC technology for this project.

5.7.3 Heat Pumps

Heat pumps use the compression and expansion of a refrigerant to generate useful heat which can be utilised for both space heating and hot water. Some heat pump systems can also be used for cooling where this is required.

The use of heat pumps is becoming increasingly favourable due to reducing costs, and the increasing thermal efficiency of buildings making the application of the technology more viable.

Generally, heat pumps either use air or the ground as the heat source dependant on site limitations.

The Coefficient of Performance of the system is the ratio of heat energy produced, relative to the electrical energy used to operate the heat pump. Typically this is 3:1 or 4:1 and is why heat pumps can be deemed as low carbon/renewable technologies, and how energy use and CO₂ emissions savings are made.

Due to the lower flow and return temperatures delivered through heat pumps, these are best accompanied by oversized radiators and/or underfloor heating to maximise emitter area and ensure sufficient heat is delivered to maintain comfortable internal conditions.



Ground Source Heat Pumps

The site is situated within an urban location with minimal external grounds available for the placement of a ground loop system, and the use of boreholes as part of a GSHP system for a development of this size and location would be financially prohibitive, and most likely not possible due to structural considerations of the current building on site and surrounding structures impacted by any boreholes put in place.

Therefore, the use of GSHP is not considered as viable for this site.

Air Source Heat Pumps

Air Source Heat Pumps work in a similar way to GSHP systems, but with the collector medium being the air. The heat from the air is collected via an external condenser unit which uses a fan (or set of fans) to drive air flow over the collector element. ASHP has the potential to provide heating, hot water, or both through a variety of system types. The technology of ASHP is rapidly developing, and can provide significant savings in emissions and energy use in the majority of applications.

There is a marginal drop in performance when compared to GSHP, but the lower capital costs of installation, and the greater flexibility of plant location and type also make ASHP a feasible option for the site.

Electrical load requirements would also need to be considered to ensure there is sufficient power available for the use of heat pumps, which will be undertaken as part of a more detailed mechanical and electrical review and design process, post planning.

The use of ASHP for a dwelling wide system providing heating and hot water has implications on the overall site design with the positioning of external condensers being a key concern – causing visual and noise impacts on the existing surrounding dwellings and the occupants of the proposed new dwellings also. Therefore, the use of ASHP technology to provide domestic hot water only via a ducted heat pump cylinder is considered an appropriate application of this technology that will provide emissions and energy use reductions, whilst minimising visual impacts and noise issues associated with external ASHP condenser units.

The implementation of an ASHP system at the development to provide **hot water only** would provide the following site-wide performance.

ASHP Coefficient of Performance (CoP)	Predicted CO ₂ emissions (tCO ₂ /yr)	Percentage Reduction over Lean scenario	Percentage Reduction over baseline scenario
1.7 (SAP default)	2.26	21.53%	54.71%

Table 7: Proposed ASHP Performance – emissions reduction

5.7.4 Solar Thermal

The use of solar thermal technology has the potential to provide emissions and energy offset through roof mounted panels. However, unlike PV (discussed below), the maximum limit for solar thermal is based on hot water load, rather than available installation space. Also, with hot water expected to be provided through a heat pump solution, the impact of any savings will be minimal due to the COP of the heat pump for any hot water generation offset. Therefore, at this stage, it is believed the roof is better utilised for PV installations.

5.7.5 Photovoltaic Panels

Photovoltaic (PV) panels are a popular method of harnessing energy from the sun to provide some – if not all – electrical demand through renewable energy generation.

Typically, panels are roof mounted and the proposed development does have elements of south, east and west facing pitched roofs which would be ideal for the location of PV. Generally, PV on north facing roofs should be avoided.

PV panels are available in an array of output sizes, dependant on the emission offset required, electrical requirements, and the budget available for their purchase and installation. A typical panel is of approximately 400W peak output, and measures approx.. 1m x 1.75m in size.

In general, panels are arranged in series and connected back to the dwelling via an export compatible meter system. This allows the PV to provide power to the dwelling where there is demand for it, with excess being exported to the National Grid with payment back to the householder being made by the energy supplier for any exported energy.

At this stage a roof plan has not been provided however an indicative one has been created below to show the approximate available area for PV on the roof of the Phase 2 building.

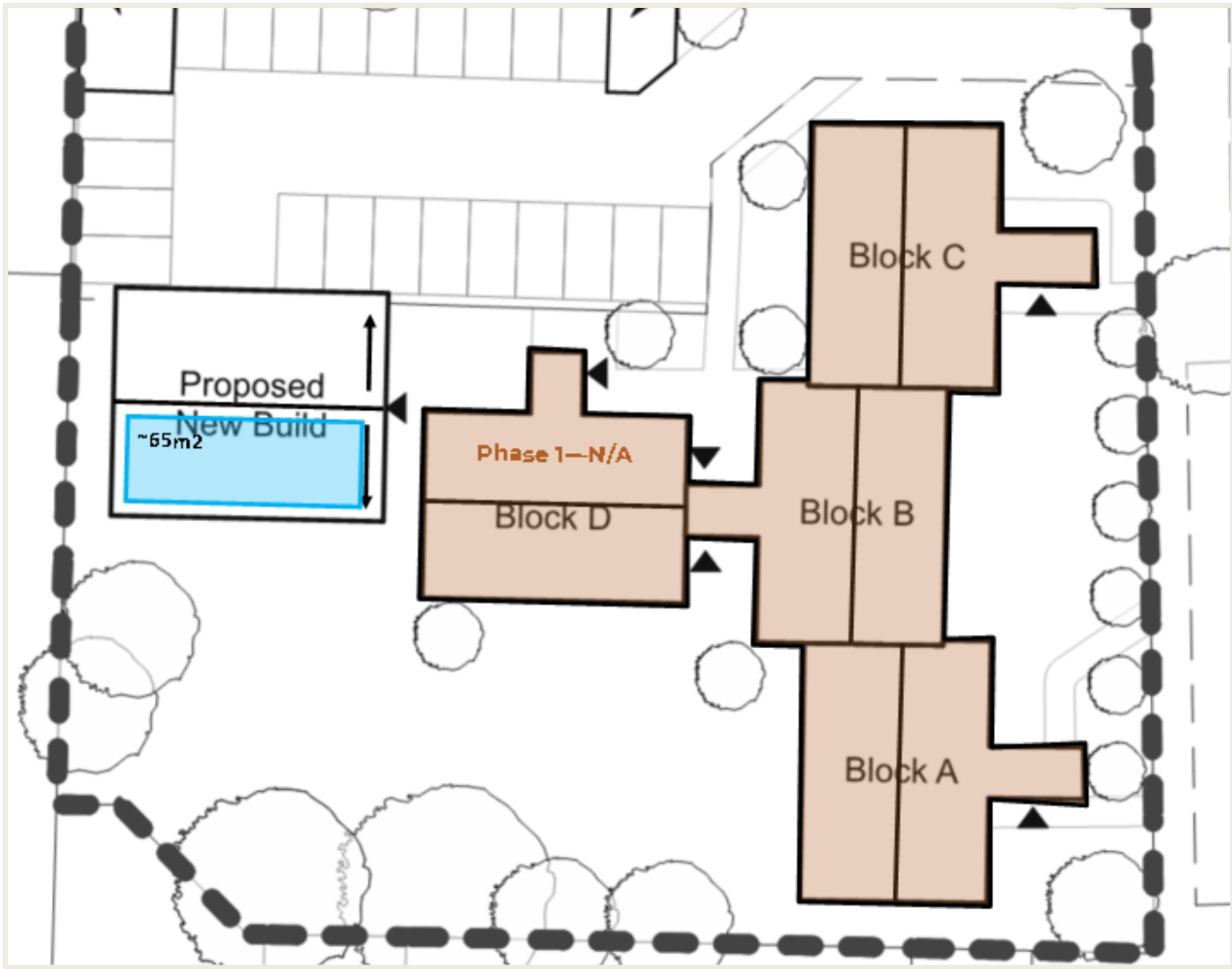


Figure 15: Excerpt from London Heat Map



Allowing some room for edge spacing, the pitched roof has approximately 65m2 of space that could potentially be used for PV.

It should also be considered that soil vent pipes, ventilation outlets and inlets will also limit space available for installation. It is therefore considered at this early stage that of 12 no. panels could be installed on the southern facing roof as a minimum.

Based on a 400W panel, this totals 4.8kWp for all units.

The arrangement and layout of the PV systems for each dwelling is to be confirmed. However, at this stage it is assumed that the PV will be wired to communal supply and allocated per dwelling pro-rata based on floor area. Regardless, the emissions offset of the system will be the same.

All PV has been modelled as 30 degree pitch in the relevant orientation, with modest overshadowing in line with SAP methodology.

	kWp	No. 400W Panels	Orientation	Pitch	Shading	CO2 offset (t/yr)
Proposed PV	4.8	12	South	~30	20%-60% (Modest)	0.43

Table 8: Anticipated PV Array Performance

As indicated above, the allocation of PV to the available pitched roofs has the potential to generate a minimum emissions offset of 1.67 tonnes of CO2 per year, with PV layout to be finalised.

5.8 CO2 Emissions Reduction Summary

The estimated CO2 emissions for the development have been calculated using appropriate SAP modelling software, in accordance with Building Regulations 2021. SAP software has been used to undertake appropriate calculations to demonstrate that the total carbon dioxide emissions from the proposed residential dwellings meet and exceed Building Regulations and Planning Policy Criteria.

Energy efficiency measures have been implemented including enhanced building fabric; insulation; high performance glazing; low energy lighting; and high efficiency ventilation systems. Heating is to be provided via a direct electric option.

A range of low and zero carbon technologies have been considered at the Be Green stage. With ASHP to provide hot water proposed, and additional PV on the roof to provide further emissions and energy offset.

The cumulative Regulated CO2 emissions reduction over the Building Regulations Part L baseline is estimated to be >70%.

CO2 Emissions after each stage of the Energy Hierarchy	
Stage	Carbon Dioxide Emissions (Tonnes CO2 per Annum)
Baseline: Part L 2021 Compliant Development	4.99
After Be Lean Measures	2.88
After Be Clean Measures	2.88
After Be Green Measures	1.83

Table 9: Regulated Carbon Dioxide Savings and the Energy Hierarchy

5.8.1 Zero Carbon Homes

In general, all new homes within London should be zero carbon, with as much as possible of the on site emissions offset through on site measures such as those discussed within this assessment.

Where there are residual emissions these are generally offset through payment to the local boroughs carbon offset fund.

Carbon Offset Payment

Should a payment be requested as part of overall Planning compliance, this is calculated based on a current cost of carbon of £95/tonne over a 30 year time period on any resultant emissions in accordance with the guidance outlined above. Resultant Emissions for the Proposed Development based on these indicative calculations are 0.96 tonnes/year, and therefore any Carbon Offset Payment liable could be as follows, based on the calculations within this document.

Carbon Offset Payment
£5,215.50

Table 10: Carbon Offset Payment



6.0 Conclusion

This document outlines the proposed energy strategy for the proposed development at St Matthews Court, Coppetts Road, London Borough of Haringey. The energy strategy has been established in line with the Energy Hierarchy: Be Lean, Be Clean, Be Green and supporting local Planning Policy – Local Plan and supporting SPD and DPD documents. The strategy focuses on maximising on site reductions in regulated CO₂ emissions with a cost-effective, viable and technically feasible approach.

Calculations for the dwellings have been undertaken within approved SAP software in accordance with Building Regulations 2021 Guidance.

Be Lean Energy efficiency measures have been considered including enhanced building fabric; insulation; high performance glazing; low energy lighting; and high efficiency ventilation systems.

Clean technologies were investigated in line with the Energy Hierarchy but were found to not be suitable at this stage.

A range of low carbon and zero technologies have been considered at the Be Green stage with ASHP Proposed for hot water generation, and additional PV also included to further reduce emissions and provide energy offset.

The cumulative Regulated CO₂ emissions reduction over the Building Regulations Part L baseline is estimated to be >63%.

It has been outlined that the efficiency of the dwellings have been maximised

Wider sustainability issues have also been considered into the design where this is possible given the constraints of the site and overall the construction of a new buildings reacts positively to the sites and surroundings.

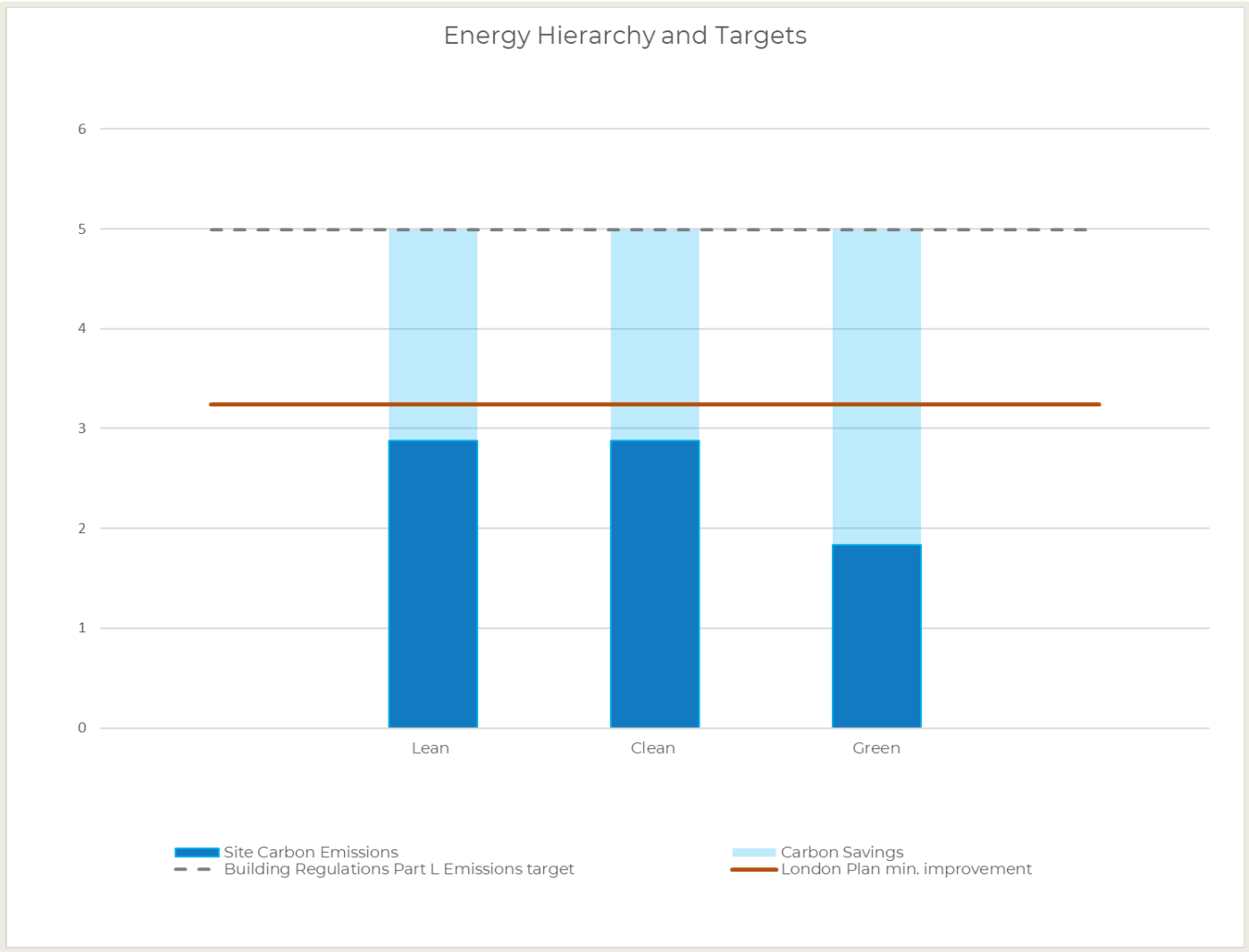


Figure 16: Emissions Reduction at Each Hierarchy Stage

CO ₂ Emissions after each stage of the Energy Hierarchy	
Stage	Carbon Dioxide Emissions (Tonnes CO ₂ per Annum)
Baseline: Part L 2013 Compliant Development	4.99
After Be Lean Measures	2.88
After Be Clean Measures	2.88
After Be Green Measures	1.83

Table 11: Regulated Carbon Dioxide Savings and the Energy Hierarchy

Regulated Carbon Dioxide Savings		
Stage	tonnes CO ₂ per annum	% Improvement
Be Lean	2.11	42.28
Be Clean	0.00	0.00
Be Green	1.05	21.04
Cumulative savings	3.16	63.33

Table 12: Regulated Carbon Dioxide Savings



7.0 Appendix A: SAP Summary Performance Specification

SAP Modelling Specification Summary							COOPERHOMEWOOD SUSTAINABILITY Building a sustainable future					
Document reference: 5547-CHL-ZZ-XX-SP-SUS-0001												
Building Regulations L1A 2013		Rev. P01		Date 31.05.2024								
Project Number & Name: St Mathews Court - Phase 2												
Building Specification												
Element	U Values	Description										
External Wall	0.15	As Per Clients Specification										
Pitch Roof (Joists)	0.11	As Per Clients Specification										
Windows	1.20	As Per Clients Specification (G Value 0.63)										
Heat Loss (Exposed) Floors	0.10	As Per Clients Specification										
Building Services, Performance and Renewables												
Item	Description											
Construction Details (PSI values)	Accredited Construciton Details psi-values have been proposed for all applicable junctions.											
Heating Emitters	direct electric via underfloor or panel type heaters -											
Controls	centralised programmer and room stat.											
Compensation	N/A											
Hot Water Cylinder	ASHP for hot water only - SAP default system used at present - assumed 170 litre cylinder with max. 1.92 litres/24hrs heat loss											
Secondary Heating	N/A											
Mechanical Ventilation	Balanced Mechanical Ventilation with Heat Recovery (Nuaire MRXBOX ECO 3 assumed)											
Lighting	100% Low Energy Lighting - CFL or LED - with min 120 Lm/W											
Renewables	PV on all available roofs as per schedule within report											
Overheating	No Overheating Risk assumed at this stage - dynamic modelling to confirm post planning.											
Air Permeability	<5 m3/hr/m2 - pressure testing required on all new dwellings.											
Additional Notes												
SAP Modelling Results Summary												
	Emissions Rate			Fabric Energy Efficiency			Primary Energy Demand			EPC Rating		
Dwelling/Unit Modelled	Target Emissions Rate (TER)	Dwelling Emissions Rate (DER)	Improvement	Target Fabric Energy Efficiency (TFEE)	Dwelling Fabric Energy Efficiency (DFEE)	Improvement	Target Primary Energy Rate (TPER)	Dwelling Primary Energy Rate (DPER)	Improvement	Score	Rating	
p2-1	15.87	5.68	64%	42.74	39.2	8%	84.05	61.9	26%	74	C	
p2-2	17.2	6.65	61%	48.89	46.5	5%	91.23	71.8	21%	74	C	
p2-3	14.26	4.42	69%	35.5	31.3	12%	75.41	49.3	35%	74	C	
p2-4	15.56	5.34	66%	41.57	38.2	8%	82.42	58.5	29%	74	C	
p2-5	16.14	6.23	61%	44.01	42.9	2%	85.52	67.4	21%	74	C	
p2-6	17.09	6.87	60%	48.42	48.0	1%	90.65	73.9	18%	74	C	



8.0 Appendix B: Internal Water Use Calculations



Part G Water Efficiency Calculations

Project Address

St Matthews Court, Coppetts Road, London

Rev:

PO1

Date

31.05.2024

Document Reference: 5547-CHL-XX-XX-CA-SUS-0001

Building Regulations Part G:

Water efficiency

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).
(2) The requirement referred to in paragraph (1) is either—
(a) 125 litres per person per day; or
(b) 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.
(3) This paragraph applies where the planning permission under which the building work is carried out—
(a) specifies the optional requirement in paragraph (2)(b); and
(b) makes it a condition that that requirement must be complied with.
(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

		Capacity / flow rate	Use factor	Fixed use (litres/ person/ day)	Litres/ person/ day
WC (single flush)	Flush volume (litres)	0	4.42	0.00	0.00
WC (dual flush)	Flush volume (litres)	6	1.46	0.00	8.76
	Part flush volume (litres)	4	2.96	0.00	11.84
WCs (multiple fittings)	Average flush volume (litres)	0	4.42	0.00	0.00
Taps (excluding kitchen / utility)	Flow rate (litres/minute)	4	1.58	1.58	7.90
Bath (where shower also present)	Capacity to overflow (litres)	200	0.11	0.00	22.00
Shower (where bath also present)	Flow rate (litres/minute)	7	4.37	0.00	30.59
Bath only	Capacity to overflow (litres)	0	0.50	0.00	0.00
Shower only	Flow rate (litres/minute)	0	5.60	0.00	0.00
Kitchen/utility room sink taps	Flow rate (litres/minute)	5	0.44	10.36	12.56
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	3.08	0.00	0.00
Water softener	Litres/person/day	0	1.00	0.00	0.00
Total calculated use					115.31
Contribution from greywater (litres/person/day)					0.00
Contribution from rainwater (litres/person/day)					0.00
Normalisation factor					0.91
TOTAL INTERNAL WATER CONSUMPTION litres/person/day					104.93
External water use					5.00
TOTAL WATER CONSUMPTION litres/person/day					109.93

9.0 Appendix C: Proposed Dwelling SAP Block Compliance Sheet

Block Compliance



Block Reference

Default

Issued on Date

05/06/2024

Block Name

Calculation Type

New Build (As Designed)

Assessor Details

Mr. Luke Brehaut

Assessor ID

R047-0001

Client

Block Compliance Report - DER

Block Reference: Default	Block Name:			
Property-Assessment Reference	Floor area (m ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% DER/TER
Phase 2 Plot 1 - 00001_LEAN_ASHP DHW & PV	52.00	5.68	15.87	64.21 %
Phase 2 Plot 2 - 00001_LEAN_ASHP DHW & PV	52.00	6.65	17.20	61.34 %
Phase 2 Plot 3 - 00001_LEAN_ASHP DHW & PV	52.00	4.42	14.26	69.00 %
Phase 2 Plot 4 - 00001_LEAN_ASHP DHW & PV	52.00	5.34	15.56	65.68 %
Phase 2 Plot 5 - 00001_LEAN_ASHP DHW & PV	52.00	6.23	16.14	61.40 %
Phase 2 Plot 6 - 00001_LEAN_ASHP DHW & PV	52.00	6.87	17.09	59.80 %
Totals:	312.00	35.19	96.12	
Average DER = 5.87 kgCO ₂ /m ²	% DER/TER	PASS		
Average TER = 16.02 kgCO ₂ /m ²	63.39 %			

Block Compliance Report - DFEE

Block Reference: Default	Block Name:			
Property-Assessment Reference	Floor area (m ²)	DFEE (kWh/m ² /yr)	TFEE (kWh/m ² /yr)	% DFEE/TFEE
Phase 2 Plot 1 - 00001_LEAN_ASHP DHW & PV	52.00	39.15	42.74	8.39 %
Phase 2 Plot 2 - 00001_LEAN_ASHP DHW & PV	52.00	46.50	48.89	4.90 %
Phase 2 Plot 3 - 00001_LEAN_ASHP DHW & PV	52.00	31.30	35.50	11.84 %
Phase 2 Plot 4 - 00001_LEAN_ASHP DHW & PV	52.00	38.24	41.57	8.02 %
Phase 2 Plot 5 - 00001_LEAN_ASHP DHW & PV	52.00	42.92	44.01	2.47 %
Phase 2 Plot 6 - 00001_LEAN_ASHP DHW & PV	52.00	47.98	48.42	0.92 %
Totals:	312.00	246.08	261.14	
Average DFEE = 41.01 kgCO ₂ /m ²	% DFEE/TFEE	PASS		
Average TFEE = 43.52 kgCO ₂ /m ²	5.76 %			

Block Compliance Report - DPER

Block Reference: Default	Block Name:

SAP 10 Online 2.13.11

Page 1 of 2



Block Compliance				
Property-Assessment Reference	Floor area (m ²)	DPER (kWh/m ² /yr)	TPER (kWh/m ² /yr)	% DPER/TPER
Phase 2 Plot 1 - 00001_LEAN_ASHP DHW & PV	52.00	61.92	84.05	26.33 %
Phase 2 Plot 2 - 00001_LEAN_ASHP DHW & PV	52.00	71.75	91.23	21.35 %
Phase 2 Plot 3 - 00001_LEAN_ASHP DHW & PV	52.00	49.31	75.41	34.61 %
Phase 2 Plot 4 - 00001_LEAN_ASHP DHW & PV	52.00	58.52	82.42	29.00 %
Phase 2 Plot 5 - 00001_LEAN_ASHP DHW & PV	52.00	67.42	85.52	21.16 %
Phase 2 Plot 6 - 00001_LEAN_ASHP DHW & PV	52.00	73.93	90.65	18.44 %
Totals:	312.00	382.85	509.28	
Average DPER = 63.81 kgCO ₂ /m ²	% DPER/TPER	PASS		
Average TPER = 84.88 kgCO ₂ /m ²	24.83 %			