Notting Hill Genesis

ENERGY STATEMENT

Aylesbury Estate FDS C (Subplots 03 & 04) S.73 Application

MARCH 2022

CONFIDENTIAL

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EXECUTIVE SUMMARY

WSP was commissioned by Notting Hill Genesis to develop an Energy Statement for the proposed development site known as FDS at the Aylesbury Estate in the London Borough of Southwark that would demonstrate how the development will provide heating and power and meet the energy and carbon emission targets set by national and local policy.

This Energy Statement presents the proposed approach for blocks S03 and S04 as part of the First Development Site. Notting Hill Genesis (NHG) are proposing an amendment to the FDS permission, solely concerning Contract C. If approved, the amendment will see a net increase of 60 homes.

The proposed amendment to the application has presented an opportunity for NHG to reduce CO2 emissions, improve air quality and progress the energy strategy so that it is in line with NHG's corporate ambition to move towards net zero. It also presents an opportunity for the amendment to the application to target the New London Plan policy which will see a departure from CHP for future applications within wider the Aylesbury Estate regeneration. In line with the extant permission, the rest of the FDS site will use the CHP as originally planned.

NHG are willing to make an increased capital investment to improve air quality and reduce CO2 emissions compared to the previous strategy which applied to Contract C of FDS.

The Energy Statement is submitted in support of Minor Material Application (S.73) for Proposed Amendments of subplots 03 and 04 (also known as Contract C) of the extant planning permission (ref. 17/AP/3885). The Proposed Amendments relate to (subplots 03 and 04 only) which includes a net 60 residential homes (from 842 to 902).

Energy Hierarchy and Carbon Emission Reduction Measures

Be Lean

Energy efficiency applies to a range of measures which can be applied to a building with the aim of reducing energy consumption. Some of the measures which have been included:

- LED lighting
- Lighting controls
- Ensuring new plant and equipment has high efficiencies or energy ratings
- Mechanical Ventilation and Heat Recovery (S04)

There are multiple elements of the building fabric that have been considered and optimised, including:

- High performance building fabric
- High performance glazing
- Improved air tightness

Be Clean

There are no existing heat networks within close proximity of the development. The networks on the opposite side of the River Thames have been ruled out on the basis of cost and technical feasibility, after correspondence with a network operator. On the basis of the cost, complexity of building the pipe and thermal losses this connection is not proposed.

Be Green

Solar PV has been included as part of the proposed design. The area considered applicable on roofs of apartment buildings amounts to 180m^2 which allows for a 20kWp system to be installed, assuming the use of 280Wp panels.

Air source heat pumps are proposed for use in subplots 03 and 04, the remainder of the FDS will be developed as per the extant permission and be served by a CHP. This will also mean there will be a reduction in air pollution, and the wider benefits that will bring. This compares to the current approved strategy which would have much greater NOx emissions, even more so than a development using only gas boilers. This is considered to be beneficial for existing and new residents, the Borough of Southwark, and the whole of London, in what is an air quality management area.

An additional benefit of the proposed introduction of air source heat pumps is aligning with the changes in Building Regulations Part L (England), which the former strategy would fail to meet, due to having too high CO2 emissions. It will also ensure there will not need to be any expensive retrofits in future, because the whole heating system will be already in line with the proposed Future Homes Standard requirement not to use fossil fuels.

The current proposed solution includes:

- Apartments have Heat Interface Units served by a communal heat pump with efficiency of 320%
- The Heat Interface Units have a heat exchange volume of 20 litres and a measured loss of 0.66 kWh/day
- Maisonettes have their own individual heating systems using heat pumps serving radiators.

Be Seen

The Proposed Amendments (subplots 03 and 04)are committed to recording, monitoring and reporting actual energy consumption figures to help understand the performance gap in more detail.

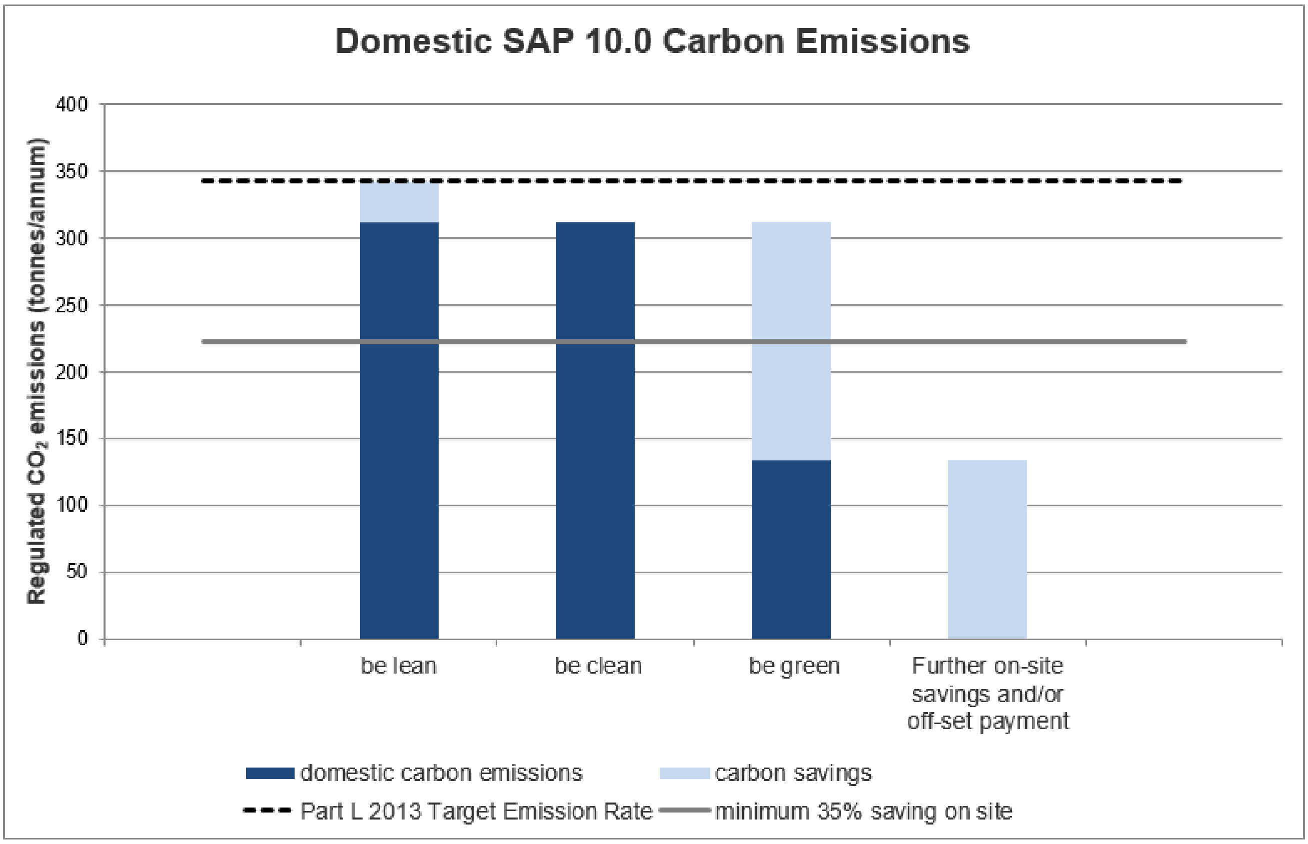
Summary of Proposed Approach

This updated energy strategy achieves a total 61% carbon reduction against the baseline using SAP 10 factors. This energy statement highlights the usage of energy efficiency improvements, heat pumps and solar PV.

In contrast to the energy strategy of the extant permission, air source heat pumps provide high efficiencies, can take advantage of a decarbonising electricity grid and reduce local air pollution. This is beneficial for existing and new residents, the Borough of Southwark, and the whole of London, in what is an air quality management area.

As a result, this is a betterment and more sustainable solution option for the Proposed Amendments (subplots 03 and 04). The graph and table below demonstrates how this new approach meets the required GLA for carbon emission reduction targets.

SAP 10.0 Carbon Emission Reductions Graph



GLA tables for carbon emission reductions

	Carbon dioxide emissions (tonnes CO2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	342.6	4.5
After energy demand reduction (be lean)	311.3	4.5
After heat network connection (be clean)	311.3	4.5
After renewable energy (be green)	134.2	4.5
	Regulated carbon dioxide savings	
	(tonnes CO2 per annum)	**(%)**
Be lean: Savings from energy demand reduction	31.2	9%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	177.1	52%
Cumulative on-site savings	**208.3**	**61%**

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1 INTRODUCTION

1.1 SITE REVIEW

WSP was commissioned by Notting Hill Genesis to develop an Energy Statement for the Proposed Amendments to subplots 03 and 04 (also known as Contract C) of the FDS extant planning permission (ref. 17/AP/3885) at Aylesbury Estate in the London Borough of Southwark that would demonstrate how the development will provide heating and power and meet the energy and carbon emission targets set by national and local policy.

This Energy Statement presents the proposed approach for blocks S03 and S04 as part of the First Development Site. The First Development Site (FDS) permission has been implemented and construction is being carried out within three separate contracts (known as A, B and C). Construction on Contract A is at an advanced stage, with first occupation currently anticipated in October 2021. Contract A will see 239 homes being supplied heating by a temporary energy centre. A further 342 homes will come forward through Contract B of the FDS, with works due to commence imminently. The permanent energy centre will be constructed as part of these works, which upon completion will allow for the temporary energy centre to be decommissioned. The approved Energy Strategy for the FDS is for the whole of the site to be served from a single CHP energy centre to provide heating and hot water.

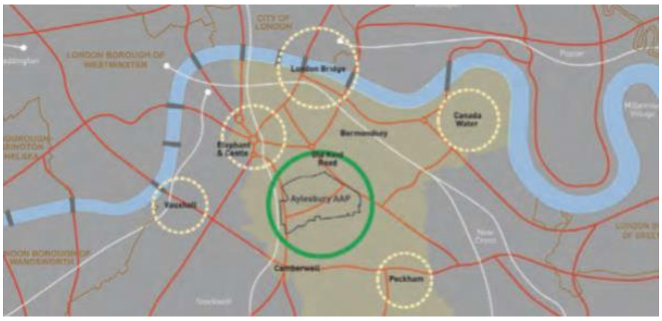
Development on the site has progressed in line with the approved strategy. Under that strategy, good fabric standards, a gas fired combined heat and power led heat network, and rooftop solar was proposed to meet the prevailing policies and Building Regulations.

Notting Hill Genesis (NHG) are proposing an amendment to the FDS permission, solely concerning Contract C, which consists of blocks S03 & S04. If approved, the amendment will see a net increase of 60 homes.

The proposed amendment to the application has presented an opportunity for NHG to reduce CO2 emissions, improve air quality and progress the energy strategy so that it is in line with NHG's corporate ambition to move towards net zero. It also presents an opportunity for the amendment to the application to target the New London Plan policy which will see a departure from CHP for future applications within wider the Aylesbury Estate regeneration.

NHG are willing to make an increased capital investment to improve air quality and reduce CO2 emissions compared to the previous strategy which applied to Contract C of FDS.

Figure 1-1 - Site Location & London Context



The Aylesbury Estate was constructed between 1966 and 1977 and is located south east of Elephant & Castle in the centre of London. The existing wider estate is spread across a 26.54 hectares site, 4.4 hectares of which is the FDS.

The existing buildings have been entirely demolished under the extant consent. FDS A is under construction and nearing completion. Construction on FDS B commenced in November 2021. FDS C will be the final phase.

- FDS A: Started on site March 2019, anticipated completion September 2022.
- FDS B: Started on site November 2021, anticipated completion September 2025.
- FDS C: Anticipated start on site March 2023, completion January 2026 (subject to planning).

This Energy Statement is submitted in of an S.73 planning application to amend the extant permission. The Proposed Amendments relate to subplots 03 and 04 only.

The Proposed Amendments will see a net increase of 60 homes (from 842 to 902 homes). This increase will be provided in subplots 03 and 04 (which increase from 261 homes to 321 homes).

Figure 1-2 - Site Location & Phasing

The total dwellings to be included in FDS S03 & S04 includes;

- 1 bedroom apartments (82),
- 2 bedroom apartments (185),
- 3 bedroom apartments (17),
- 2, 3, 4 bed maisonettes (31), and
- 4, 5 bedroom houses (6).

A full schedule of accommodation can be found in Appendix B.

2 POLICY

The Mayor of London has declared a climate emergency, setting out plans for London to become net zero. The London Plan 2021 identifies space for over 52,000 new homes per year, targets 50% to be “genuinely affordable” and requires all new major developments to play their role towards achieving net zero. Developments that deliver 35% affordable housing are fast tracked. The net zero carbon target for residential developments has applied since October 2016. There are minimum requirements for on-site carbon reductions and any carbon shortfalls must be paid as a cash-in-lieu contribution to the local authority’s carbon offset fund. The recommended offset price is £95 per tonne of CO2, but Boroughs can set their own using local evidence or agree that the developer offsets the carbon shortfall with mitigation measures installed off-site. Reductions are expected “to be achieved as far as possible on-site" with shortfall payments only once it is demonstrated that no further on-site savings can be made. The Plan also seeks to develop circular economies by encouraging designs that minimise waste and maximise the re-use of materials.

The London Plan requires all major development proposals to submit a detailed energy assessment to show how the zero-carbon target will be met within the framework of the energy hierarchy and the Mayor monitors progress against this. Proposed mitigation measures must comply with London Plan energy policies. The energy assessment needs to outline CO2 savings and the measures put in place to reduce energy demand. The intention of the London Plan is to ensure that carbon reduction remains an integral part of a development’s design and evolution.

A ‘be seen’ policy was introduced in 2020 alongside lean, clean and green. This means that monitoring and reporting on energy performance post-construction is now expected alongside less energy use (lean), energy efficiency (clean) and renewable energy (green). This report discusses the implications to lean, clean, green and seen in detailed sections below.

The policy context relevant to FDS is as follows:

2.1 PART L OF BUILDING REGULATIONS 2013

Part L of the Building Regulations relates to the conservation of fuel and power and applies to both new and existing buildings. The current edition covers the energy efficiency requirements of the building regulations as set out in Part L of Schedule 1 to the Building Regulations. Technical guidance is contained in four Part L Approved Documents and two building services compliance guides.

2.1.1 THE TARGET FABRIC ENERGY EFFICIENCY (TFEE)

The TFEE is calculated by SAP software (kWh/m2/yr). This effectively requires a minimum level of building fabric energy efficiency for compliance and is detailed as thermal demand kWh/m2/year. The TER (Target Emission Rate) as calculated by SAP software (kg/CO2/m2/yr). The Target Emissions Rate is a limit of kg CO2 per m2 based on regulated loads of building.

2.1.2 APPROVED DOCUMENT L1A:2013

This provides the methodology for new build, domestic buildings to meet current energy efficiency standards, including backstop U-values, carbon dioxide emissions calculations and minimising the risk of overheating. Carbon dioxide emissions reductions are prescribed for 'regulated' emissions only, and relate to heating, hot water, lighting, auxiliary and cooling (where specified). Emissions from domestic appliances (cooking, for example) are considered to be unregulated emissions, and are excluded from the analysis.

2.1.2.1 Domestic Building Services Compliance Guide

This provides minimum building services efficiencies for domestic buildings.

2.2 NATIONAL PLANNING POLICY FRAMEWORK

The Department for Communities and Local Government determines national policies on different aspects of planning and the rules that govern the operation of the system. Accordingly, the National Planning Policy Framework (NPPF), which came into force in March 2012 and was updated in July 2021, aims to strengthen local decision making.

2.3 THE LONDON PLAN 2021

The London Plan 2021 is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth.

2.3.1 POLICY OF SUSTAINABLE INFRASTRUCTURE 2: MINIMISING GREENHOUSE GAS EMISSIONS

"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:

- *Be lean: Use less energy and manage demand during operation.*
- *Be clean: Exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly*
- *Be green: Maximise opportunities for renewable energy by producing, storing and using renewable energy on-site*
- *Be seen: Monitor, verify and report on energy performance."*

2.3.1.1 Energy Strategy

This part of the London Plan discusses Energy Strategies:

"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.

A minimum on-site reduction of at least 35% beyond Building Regulations is required for major development. Residential development should achieve 10%, and non-residential development should achieve 15% through energy efficiency measures.

Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved onsite, 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.

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.

Boroughs should ensure that all developments maximise opportunities for on-site electricity and heat production from solar technologies (photovoltaic and thermal) and use innovative building materials and smart technologies.

To meet the zero-carbon target, an on-site reduction of at least 35% beyond the baseline of Part L of the current Building Regulations is required."

2.4 GLA GUIDANCE ON PREPARING ENERGY ASSESSMENTS AS PART OF PLANNING APPLICATIONS DRAFT (APRIL 2020)

The April 2020 draft revision to the GLA guidance on preparing energy statements confirms the calculation methodology for new developments. It sets the expectation that SAP 10 emission factors should be used. It also clarifies the carbon emission targets for new developments.

The draft 2020 guidance confirms the New London Plan energy efficiency targets which require new referable developments to achieve 10% improvement on 2013 Part L requirements from energy efficiency for residential developments.

2.5 SOUTHWARK PLAN 2022

The Southwark Plan has superseded the Save Southwark Plan Policies and the Aylesbury Area Action Plan (AAAP) which previously formed the key policy component of the Development Plan for the Aylesbury Estate.

The requirements of Southwark Plan 2022 are similar to those detailed in London Plan in that energy efficiency is prioritised; however, policy requires that once the savings are maximised then onsite renewable energy should be incorporated.

In Southwark, 84% of carbon dioxide emissions come from heating, cooling and powering buildings. Developments and refurbishments over 500sqm must achieve a BREEAM rating of 'Excellent'. Developments designed with the highest environmental standards will guarantee long term benefits for Southwark residents, immediately addressing environmental impacts and reducing future expense and disruption.

Relevant aims of the Southwark Local Plan which relate to energy strategy include:

- P69: Sustainability Standards
- P70: Energy

Major development must reduce carbon dioxide emissions on site by:

1. 100% on 2013 Building Regulations Part L standards for residential development; and
2. A minimum of 40% on site reduction on 2013 Buildings Regulations Part L and zero carbon (100%) for non-residential developments.
3. Any shortfall against carbon emissions reduction requirements must be secured off site through planning obligations or as a financial contribution.

The Southwark Local Plan also includes a provision for new developments to be Future Ready by incorporating decentralised energy within their design:

1. Connect to an existing or planned decentralised energy network; then
2. Be future-proofed to connect to a planned decentralised energy network; or

3. Implement a site-wide low carbon communal heating system; and

4. Explore and evaluate the potential to oversize the communal heating system for connection and supply to adjacent sites and, where feasible be implemented.

2.6 SITE TARGETS

First Development Phase:

- Meet TFEE and TER requirements of Part L of Building Regulations.
- Minimise energy consumption through energy efficiency.
- Provide a contribution to emissions reductions from on-site renewables, with an indicative target of a 10% contribution.
- Achieve a 35% improvement on TER.

3 SITE DEMAND, BASELINE & EMISSIONS

3.1 BASELINE EMISSIONS

In line with London Plan guidance, the first stage in an energy assessment is to ascertain baseline site energy consumption and related emissions.

This was calculated using SAP accredited software (elmhurst) for the dwelling types planned for inclusion at blocks 3 & 4 at the site. The SAP models were based on site layouts received which detailed dimensions of dwellings.

The baseline model for each home type was developed using values of a notional 2013 building as detailed in SAP 2012. These specifications are used as a guide to achieve both Target Emissions Rate (TER) and Target Fabric Energy Efficiency (TFEE), and thus compliance with Part L of Building Regulations 2013.

Baseline regulated and unregulated emissions (using SAP 10 emission factors) for each dwelling type were extrapolated for the number of each type present, generating the SAP summary reports which are included in Appendix C. The blocks have been combined to give total site emissions from the units modelled.

Table 3-1 – Baseline emissions calculation, SAP 10 factors

	Carbon Dioxide Emissions for residential buildings (tonnes CO2 per annum)	
	Regulated energy	Unregulated energy
Baseline	342.6	4.5

4 BE LEAN EMISSIONS

We have allowed for the inclusion of a number of efficiency measures in the design of dwellings that goes beyond specifications detailed for a notional building within Part L of Building Regulations.

Energy efficiency applies to a range of measures which can be applied to a building with the aim of reducing energy consumption. Some of the measures which have been included:

- LED lighting
- Lighting controls
- Ensuring new plant and equipment has high efficiencies or energy ratings
- Mechanical Ventilation and Heat Recovery (S04)

There are multiple elements of the building fabric that have been considered and optimised, including:

- High performance building fabric
- High performance glazing
- Improved air tightness.

4.1 OVERHEATING AND COOLING

The overheating assessment has been carried out in a separate report, which has been submitted as part of the planning submission. A summary is included below.

4.1.1 OVERHEATING ASSESSMENT

An overheating assessment has been completed for the blocks S03 & S04 (the subject of the Proposed Amendments) of Aylesbury Estate First Development Site (FDS). This is to determine the comfort levels in the main residential habitable rooms (bedrooms, common living rooms and kitchens). The overheating assessment has been carried out in line with CIBSE TM59 criteria for the predominantly naturally ventilated spaces (Block S03) following the CIBSE TM49 (2014) guidance. CIBSE Guide A was used for the predominantly mechanically ventilated spaces (Block S04).

- CIBSE TM59: CIBSE has published TM59 "Design methodology for the assessment of overheating risk in homes" in May 2017. The guidance replaces the TM52 to be used in residential buildings. TM59 provides designers with a standardised approach to predicting overheating risk for residential building designs using dynamic thermal analysis.
- CIBSE Guide A has been implemented to assess the predominantly mechanically ventilated rooms.

4.1.2 CIBSE TM59 OVERHEATING CRITERIA

CIBSE TM59 sets out that all rooms must pass Criterion 1, which is the same criterion used by CIBSE TM52, while all bedrooms should also pass Criterion 2.

- Criterion 1 (All rooms): The number of hours in which the difference between the actual operative temperature in a room and the maximum acceptable temperature is greater than or equal to one degree during the period May to September inclusive shall not be more than 3% of occupied hours.

- Criterion 2 (Bedrooms Only): To guarantee comfort during the sleeping hours, the operative temperature in the bedrooms from 10pm to 7am shall not exceed 26oC for more than 1% of annual hours

TM59 requires all units to comply with the relevant criteria when assessed against the Design Summer Year (DSY1) weather data file most appropriate to the site location, describing a moderately warm summer, for the 2020s, high emissions, 50% percentile scenario.

4.1.3 RESULTS

Due to the size of the buildings, a sample of apartments was selected representing all possible typologies and considering the apartments with the highest risk of overheating.

In summary:

- Based on the modelling completed, S03 has a quarter of kitchens and bedrooms which are failing Criterion 1, while 4 bedrooms (c.8%) are failing Criterion 2.
- For S04, all the rooms that were assessed are failing to meet the CIBSE Guide A.

In all cases, mitigations measures will be proposed in the full overheating report and will be considered by the Design Team in Stage 3.

4.2 RESULTS

Table 4-1 – Be Lean emissions calculation, SAP 10 factors

Be Lean	**Regulated Emissions Savings (tonnes CO2 per annum)**	
	Regulated energy	% reduction
Savings from energy demand reduction	31.2	9%

Table 4-2 – Be Lean fabric efficiency calculations

	Target Fabric Energy Efficiency (kWh/m²)	**Dwelling Fabric Energy Efficiency (kWh/m²)**	**Improvement (%)**
Development total	41.75	37.34	11%

5 BE CLEAN EMISSIONS

Following the application of efficiency measures (Be Lean) the next step is to consider which technologies can provide further improvement in CO_2 emissions. The recommended hierarchy is:

- Prioritise connection to existing heat networks
- Allow for connection to planned networks
- Include a site wide heat network

5.1.1 EXISTING HEAT NETWORKS

The existing heat network at the FDS site does not have a decarbonisation strategy, or a plan for one, and therefore, in line with the London Plan guidance (9.4.1), we will not connect to it because of its high GHG emissions and air pollution.

It is evident from Figure 5-1, that there are no existing heat networks within close proximity of the development. There is one heat network south of the Thames located on the Greenwich Peninsular. Figure 5-2 indicates a proposed heat network represented by the orange lines. Red lines represent existing heat networks. The red dots represent proposed communal boilers, none of this infrastructure has yet been constructed.

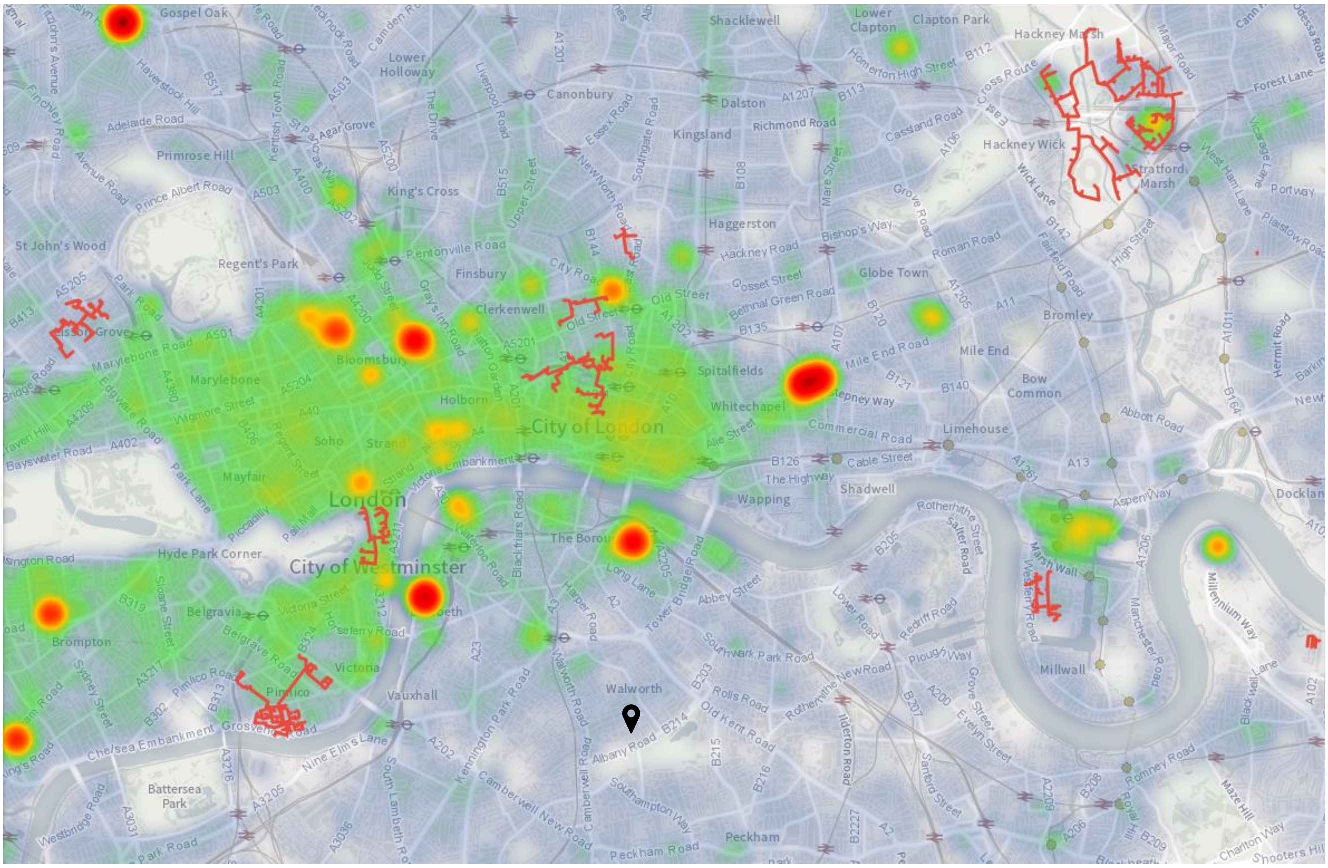


Figure 5-1 - Existing Heat Networks, and Site location, London Heat Map

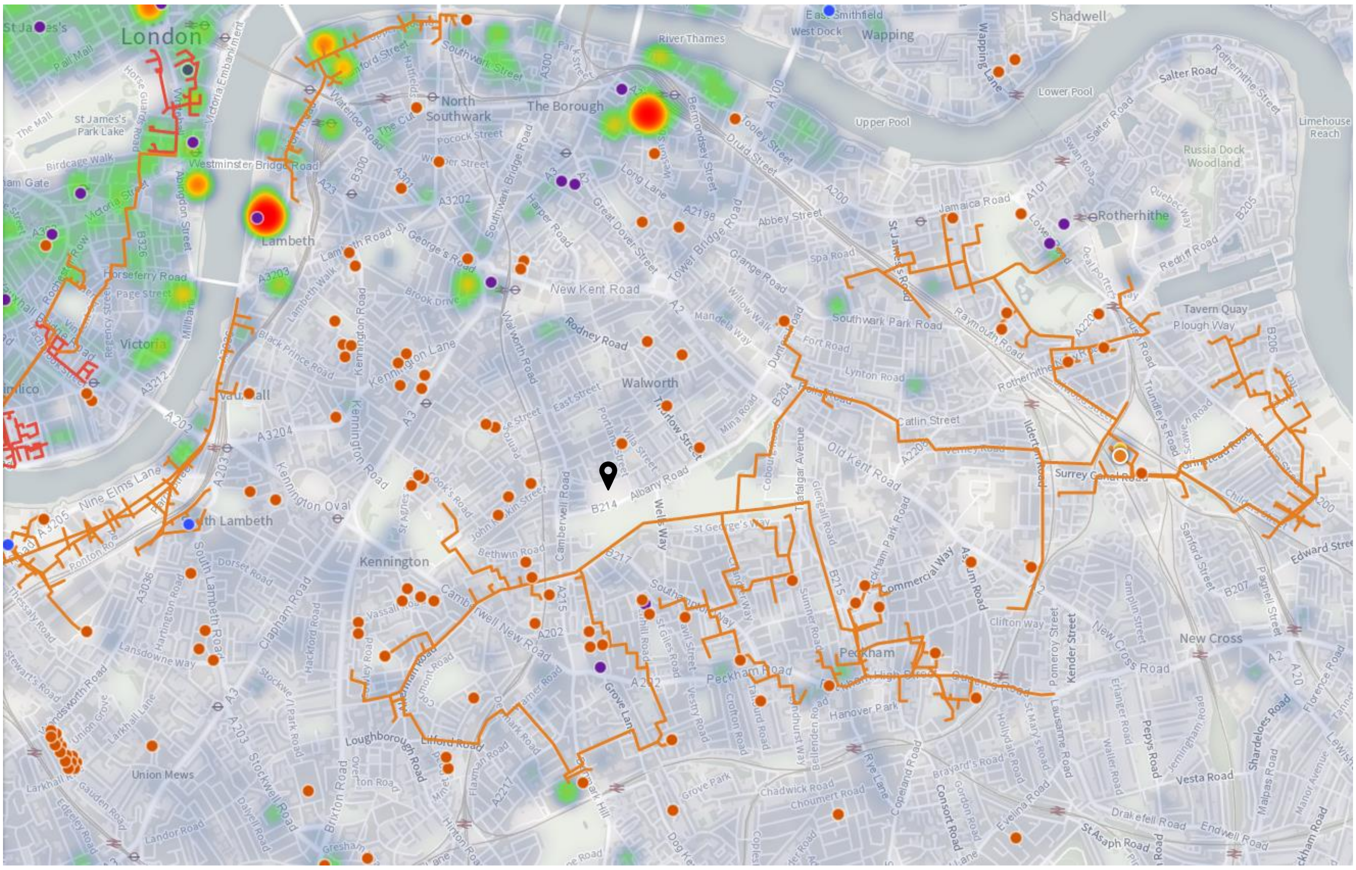


Figure 5-2 – Existing and Proposed Heat Networks, and Site location, London Heat Map

The London Heat Map shown above indicates that the Pimlico and SEL CHP networks are closest to the site, however they are approximately 3km from the site. The networks on the opposite side of the River Thames have been ruled out on the basis of cost and technical feasibility, after correspondence with a network. The SELCHP facility in Greenwich is 3.7km from the site by road. Calculations indicate the cost of running a heating connection from there to the site would result in a cost of around £6m and have thermal losses of 33% for the FDS and 9% once the whole site is built.

The estimated cost of connecting to the SELCHP network is £1,600/m based on discussions with the Pimlico DHN.

On the basis of the cost, complexity of building the pipe, thermal losses, this connection is not proposed.

6 BE GREEN EMISSIONS

Renewable energy technologies have been considered to provide a reduction in expected carbon dioxide emissions. There are several options which have been reviewed in the table. The viable options have been assessed in detail below

Table 6-1 – Table of renewable energy sources and their viability for this development

Measure	Viable?	Reasoning
Air Source Heat Pumps	Y	Size of ASHPs makes them suitable to be incorporated into planned development and can supply blocks with energy using higher efficiencies than electric heaters.
Ground Source Heat Pumps	N	While GSHP typically offer better efficiencies than ASHP, the capacity will be limited by the number and depth of the boreholes. Installation of a GSHPs would require a high capital cost, may not have viable borehole locations and would impact the construction programme.
Biomass Heating	N	This technology is not recommended due to additional air quality concerns involved when including this technology in an urban area. The additional burden of fuel storage and delivery would also hamper development.
Solar PV	Y	Roof space allows for deployment of solar PV panels to meet some electrical demand on site.
Solar Thermal	N	These systems can require a lot of maintenance in comparison to solar PV systems, which tend to be simpler and require only yearly electrical checks and a clean. Therefore, solar thermal has not be considered in depth for this development given the inclusion of solar PV.
Wind	N	Wind turbines are not recommended for inclusion at the development given the low and wind resource in the area and due to the lack of clear space.
Energy Storage	N	Energy storage is still expensive unless a site-specific use can be identified, which has not been the case for these buildings.

6.1.1 SOLAR PHOTOVOLTAIC (PV) PANELS

Solar Photovoltaics use roof-mounted solar panels to generate DC electricity which is converted to AC electricity to be used within a building or exported to the electricity grid. Their price has decreased continually over the past ten years as the panels and inverters have been manufactured at a larger scale and installations have become larger.

The expected electricity consumption of the building would make the installation of PV panels appropriate for the scheme. The buildings could benefit from a solar PV system to offset remaining energy usage. It is seen as best practice by multiple advisory organisations (such as the UK Green Building Council[1] and LETI[2]) to maximise onsite renewable energy installations when trying to minimise a building's CO_2 emissions.

6.1.2 AIR SOURCE HEAT PUMP (ASHP)

Heat pumps are used to generate heat from the air using electricity in a way which is more efficient that standard electric heaters. Their efficiencies are often in the region of 250-350%. They can help to reduce energy consumption and, as a result, electricity bills. As the electricity grid continues to decarbonise in the UK, the electricity used by the ASHPs will become less carbon intensive. All electric buildings are often proposed as part of a net zero building strategy for this reason.

This will also mean there will be a reduction in air pollution, and the wider benefits that will bring. This compares to the current approved strategy which would have much greater NOx emissions, even more so than a development using only gas boilers. This is considered to be beneficial for existing and new residents, the Borough of Southwark, and the whole of London, in what is an air quality management area.

An additional benefit of the proposed introduction of air source heat pumps is aligning with the changes in Building Regulations Part L (England), which the former strategy would fail to meet, due to having too high CO2 emissions. It will also ensure there will not need to be any expensive retrofits in future, because the whole heating system will be already in line with the proposed Future Homes Standard requirement not to use fossil fuels.

ASHPs are suitable here due to the space available for the equipment and will be used in a communal way to further ensure efficiencies of equipment.

6.2 PROPOSED DESIGN

6.2.1 SOLAR PV

Appendix C shows the area considered applicable for photovoltaic development. The panels located on these roofs could be orientated due south or as same average orientation as buildings, assumed to be south east. As the scope of this Energy Statement applied to plots 3 & 4, only these plots have been considered here. These locations are considered to be largely free of shading.

The majority of roof space in FDS has been highlighted for the inclusion of both intensive and extensive green roofs in line with local policy.

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[1] UKGBC, 2019, Net Zero Carbon Buildings: A Framework Definition. Available online at: https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-a-framework-definition/
[2] LETI, 2020, Climate Emergency Design Guide. Available online at: https://www.leti.london/cedg

The area considered applicable on roofs of apartment buildings amounts to 180m^2 which allows for a 20kWp system to be installed, assuming the use of 280Wp panels. Drawings detailing these areas can be found in Appendix C.

The indicative system size of 20kWp is estimated to generate 17.7MWh/yr. This is based on data sourced from PVGIS that indicates a potential average generation of 886kWh/kWp within London assuming panels are orientated to south east and at an inclination of 10 degrees.

6.2.2 AIR SOURCE HEAT PUMPS

The heat pumps that will be used at this development have yet to be chosen, however for the purposes of this Energy Statement, the below has been used for the calculations. This is representative of the solution which will be defined during the next design stage:

- Apartments have Heat Interface Units served by a communal heat pump with efficiency of 320%
- The Heat Interface Units have a heat exchange volume of 20 litres and a measured loss of 0.66 kWh/day
- Maisonettes have their own individual heating systems using heat pumps serving radiators.

6.3 BE GREEN RESULTS

Table 6-2 – Be Green emissions calculation, SAP 10 factors

Be Lean	**Regulated Emissions Savings (tonnes CO2 per annum)**	
	Regulated energy	% reduction
Be Lean Savings	31.2	9%
Be Clean Savings	0.0	0%
Be Green Savings	177.1	52%

7 BE SEEN

7.1 'BE SEEN' ENERGY MONITORING

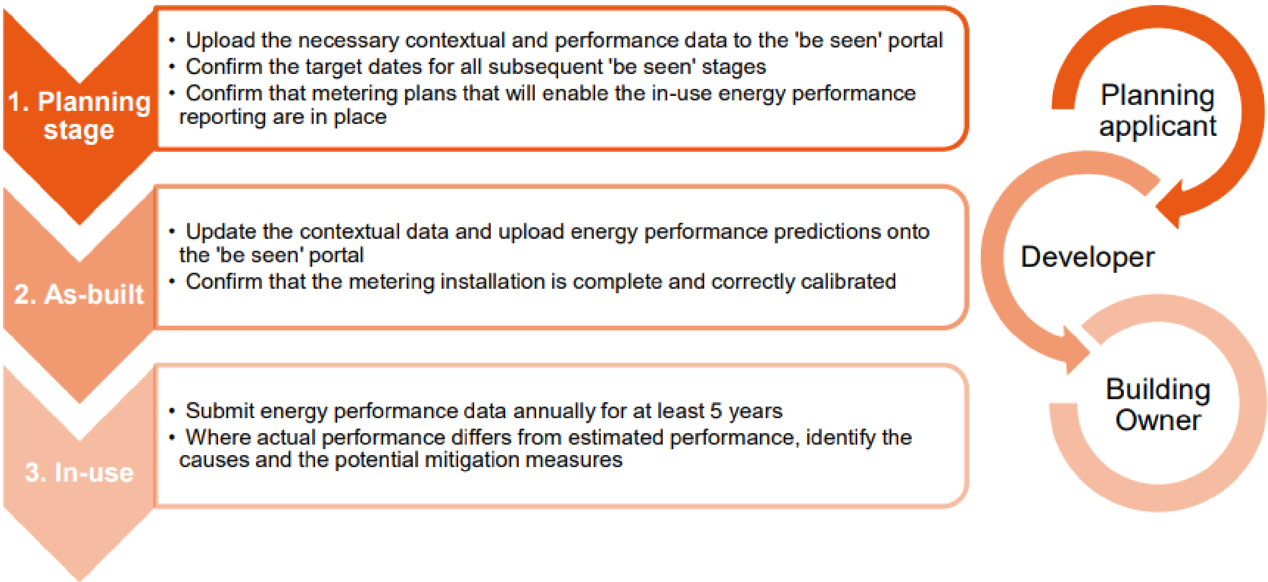
The 'be seen' aspect of the energy hierarchy, introduced in the London Plan Policy SI 2, requires all major development proposals to monitor and report on their estimated and actual operational energy performance for at least five years post construction. The 'be seen' policy will help the GLA, owners and operators to understand the performance gap and identify ways of closing it while ensuring compliance with London's net zero-carbon target.

The GLA's guidance sets out what each responsible party needs to do to comply with the policy through the three reporting stages: planning, as-built and in-use. It provides information on the 'be seen' reporting and monitoring web portal and explains how, when and what performance indicators to report to the GLA.

The guidance has been developed with technical expertise from Verco and through engagement with a wide range of stakeholders, including developers and industry experts. Planning applicants (and other stakeholders) are expected to use the 'be seen' energy monitoring guidance as a minimum standard and the GLA encourages the consideration of additional best practice guidelines, such as DEC, NABERS or BREEAM. Developments are split into 'reportable units' (RU) for granularity of data whilst ensuring data protection.

Local authorities will secure the as-built and in-use stage data through a legal agreement with the applicant and some local authorities may choose to adopt additional enforcement or remediation mechanisms. If building ownership changes inside the five-year reporting window it is expected that the previous owner makes the new owner aware of their reporting responsibilities.

Figure 7-1 - 'Be seen' process and responsibilities - from GLA guide



The proposed development is committed to recording, monitoring and reporting actual energy consumption figures to help understand the performance gap in more detail. Under the requirements of the GLA Plan, Figure 7-1 details the reporting responsibilities at the different stages.

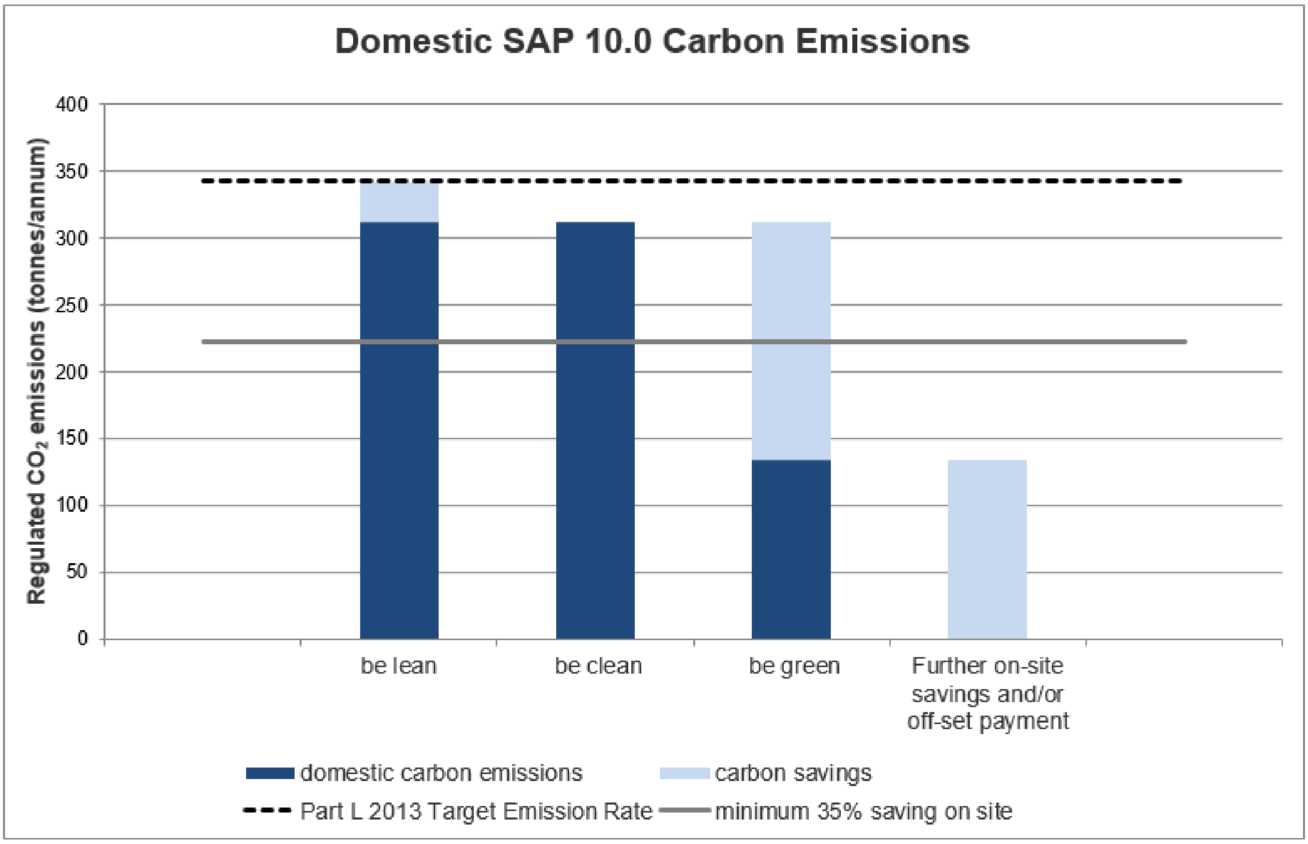
8 RESULTS

This updated energy strategy achieves a total 61% carbon reduction against the baseline using SAP 10 factors. This energy statement highlights the usage of energy efficiency improvements, heat pumps and solar PV.

In contrast to the energy strategy of the extant permission, air source heat pumps provide high efficiencies, can take advantage of a decarbonising electricity grid and reduce local air pollution. This is beneficial for existing and new residents, the Borough of Southwark, and the whole of London, in what is an air quality management area.

As a result, this is a betterment and more sustainable solution option for the Proposed Amendments (subplots 03 and 04). The graph in Figure 8-1 demonstrates that this development meets the required GLA targets for carbon emission reduction.

Figure 8-1 - SAP 10.0 Carbon Emission Reductions Graph



The recommended approach for adhering to London Plan targets for FDS is a combination of 'Be Lean', 'Be Clean', 'Be Green' and 'Be Seen' measures. 'Be Seen' measures are not calculated.

- A range of efficiency measures have been detailed that allow for a 9% saving in 'be lean' emissions.
- Following this we have outlined the feasibility of including communal heat pumps with 320% efficiency, each apartment having a heat interface unit. Maisonettes will have their own heat pumps.

- $180m^2$ of roof space has been considered feasible for the inclusion of photovoltaic panels.
- The combination of energy efficiency savings, solar PV and air source heat pumps, has resulted in a cumulative 61% reduction in regulated carbon dioxide savings over the baseline for S03 & S04 of FDS at the Aylesbury Estate.

Table 8-1 – GLA tables for carbon emission reductions

	Carbon dioxide emissions (tonnes CO2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	342.6	4.5
After energy demand reduction (be lean)	311.3	4.5
After heat network connection (be clean)	311.3	4.5
After renewable energy (be green)	134.2	4.5
	Regulated carbon dioxide savings	
	(tonnes CO2 per annum)	**(%)**
Be lean: Savings from energy demand reduction	31.2	9%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	177.1	52%
Cumulative on-site savings	**208.3**	**61%**
Carbon shortfall	134.2	-
	(tonnes CO2)	
Cumulative savings for offset payments	**4,026**	
Cash-in-lieu contribution	**382,485**	

Appendix A

FDS CONTRACT C AREA FOR PROPOSED AMENDMENT

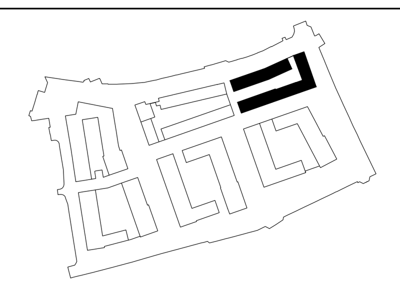
Rev	Date	Drawn	Description
A	20.01.22	YOE	Existing Context Updated

Notes:
Do not scale from drawings unless by agreement with HTA. Use figured dimensions only. Check all dimensions on site prior to commencing the works. Drawing to be read in conjunction with other relevant consultant information.

Drawing to be read in conjunction with specification.

Legend

Site Planning Boundary



Site Planning Boundary
drawing title

NHG-FDS_HTA-A_S03_DR_1000
drawing number

A
revision

Notting Hill Genesis
Aylesbury FDS S03
client / project

1:500
scale @ A1

NHG-FDS-S03
project number

YOE
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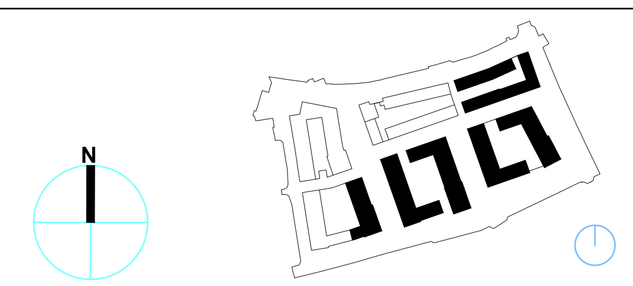
status

Rev	Date	Drawn	Description
A	25.09.20	YOE	Phase 3 Contract Area Added

Notes:
Do not scale from drawings unless by agreement with HTA. Use figured dimensions only. Check all dimensions on site prior to commencing the works. Drawing to be read in conjunction with other relevant consultant information.

Legend

- Boundary of Contract A (Covered by previous submission)
- Boundary of Contract B
- Boundary of Contract C



Contract Phasing Plan
drawing title

NHG-FDS_HTA-A_S03_DR_1002 A
drawing number revision

Notting Hill Genesis
Aylesbury FDS S03
client / project

1:500
scale @ A1

NHG-FDS-S03
project number

YOE
originated by

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status

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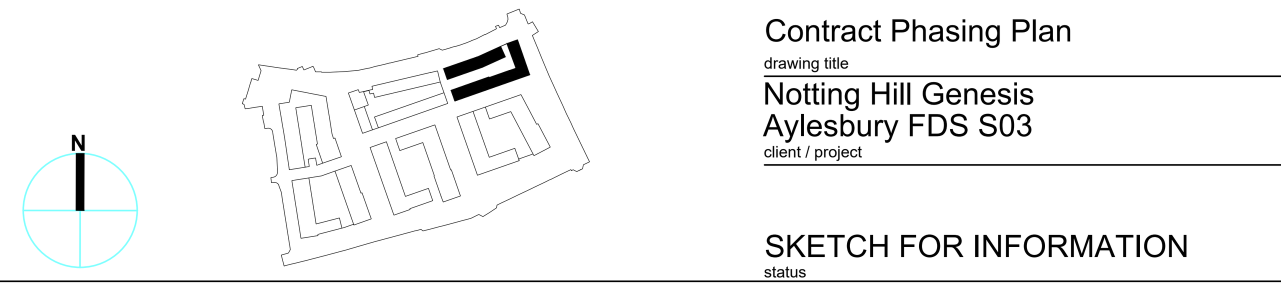
Rev	Date	Drawn	Description
A	25.09.20	YOE	Phase 3 Contract Area Added
B	22.10.21	YOE	Phase 1 and 2 Contract Area Removed

Notes:
Do not scale from drawings unless by agreement with HTA. Use figured dimensions only. Check all dimensions on site prior to commencing the works. Drawing to be read in conjunction with other relevant consultant information.

Legend

Boundary of Contract C



Contract Phasing Plan
drawing title

NHG-FDS_HTA-A_S03_DR_1002 B
drawing number / revision

Notting Hill Genesis
Aylesbury FDS S03
client / project

1:500
scale @ A1

NHG-FDS-S03
project number

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SKETCH FOR INFORMATION
status

Appendix B

SCHEDULE OF ACCOMODATION - FDS

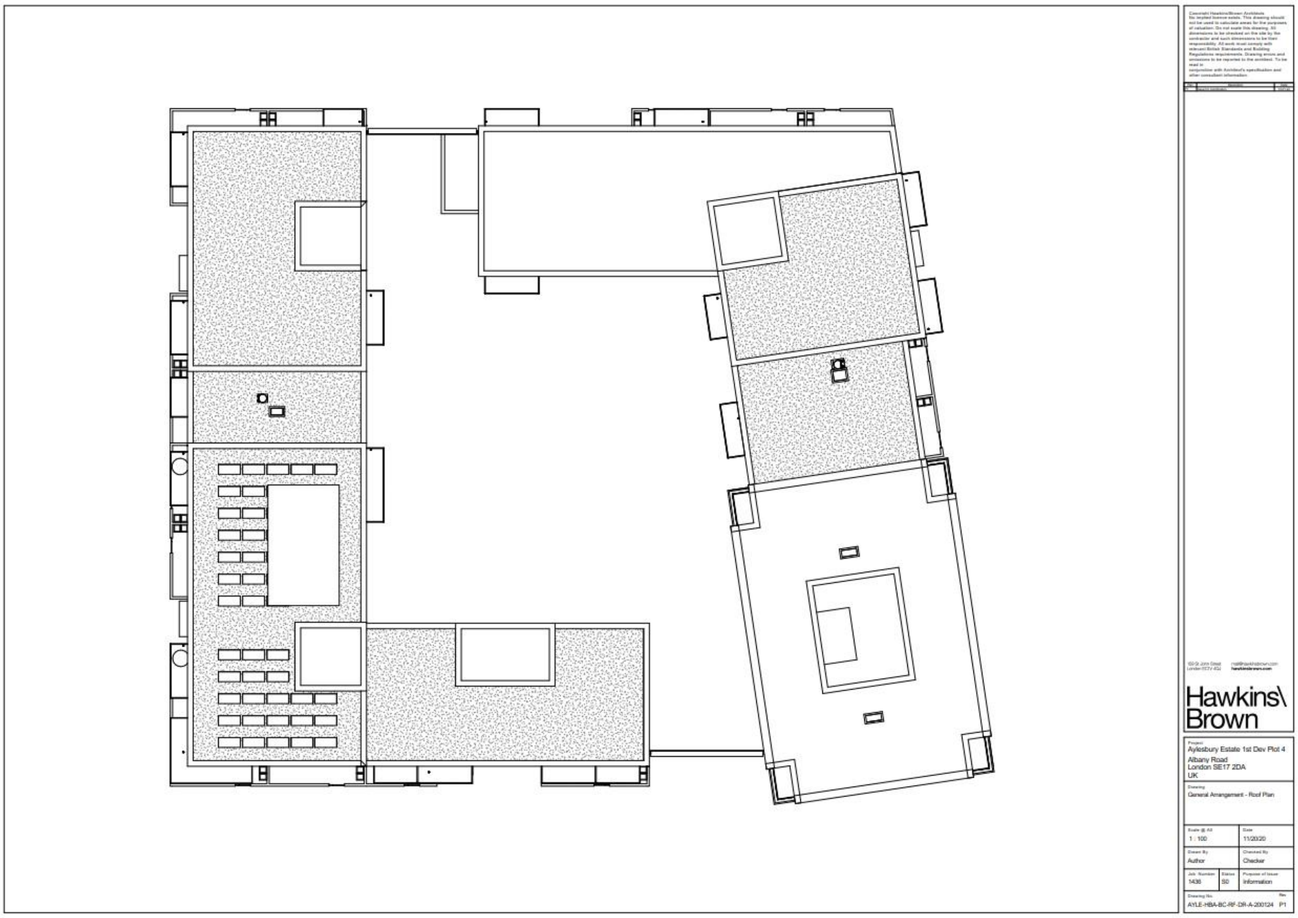
Schedule of accommodation – S03 & S04

						FLATS								MAISONETTE & DUPLEX					HOUSES	
						1B	2B3P	2B3P +	2B4P	3B4P	3B5P +3B6P	4B6P	4B7P	2B3P(M) 2B4P(M)	3B4P (M)	3B5P (M) 3B6P (M)	4B6P (M)	4B7P (M)	4B6P (H)	5B7P (H)
CONTRAC	BLOCK		TENURE	UNITS	HR	2	3	4	4	5	5	6	6	4	5	5	6	6	6	7
	S0-3																			
C	3A	Maisonettes & Flats	Private	11	32	3	6	0	2	0	0	0	0	0	0	0	0	0	0	0
	3B & 3C	Houses & Maisonettes	SR	20	109	0	0	0	0	0	0	0	0	0	0	11	3	0	6	0
	3B & 3C	Flats to Upper levels	S/O	30	81	14	11	0	5	0	0	0	0	0	0	0	0	0	0	0
	SUB PLOT 3 TOTAL			61	222	17	17	0	7	0	0	0	0	0	0	11	3	0	6	0
	S0-4																			
C	4A	23 storey	Private	129	343	44	85	0	0	0	0	0	0	0	0	0	0	0	0	0
	4B	6/10storey	Market Rent	50	174	0	35	0	5	0	3	0	0	1	0	6	0	0	0	0
	4C	7 storey	S/O	26	83	12	0	3	7	0	0	0	0	1	0	3	0	0	0	0
	4D	Ground Floor Maisonettes	SO	1	4									1	0	0				
	4D	10 storey	SR	35	157	0	0	16	2	0	14	0	0	0	0	3	0	0	0	0
	4E	Ground Floor Maisonettes	SR	1	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	4E	6 storey	S/O	18	55	9	0	8	0	0	0	0	0	0	0	1	0	0	0	0
	SUB PLOT 4 TOTAL			260	821	65	120	27	14	0	17	0	0	3	0	14	0	0	0	0
				0																

Appendix C

PV AREA

PV Area – Block 4



Appendix D

BLOCK 3 - SAP SUMMARY INFORMATION

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	FLATS	Issued on Date	07/03/2022
Assessment Reference	Be Green	Prop Type Ref	
Property	Aylesbury Estate, Westmoreland Road, London, SW17 2AY		

SAP Rating	81 B	DER	15.34	TER	28.21
Environmental	90 B	% DER<TER	45.62		
CO_2 Emissions (t/year)	0.69	DFEE	44.33	TFEE	51.21
General Requirements Compliance	Pass	% DFEE<TFEE	13.43		

Assessor Details	Mr. Stephen White, Stephen White, Tel: , stephen.white@wsp.com	Assessor ID	U865-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	14.60 m	51.91 m²	2.55 m

7.0 Living Area 14.60 m²

8.0 Thermal Mass Parameter Precise calculation

Thermal Mass 94.23 kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	37.23	23.34

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	38.76

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.12	9.00	51.91	51.91

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	51.91

12.0 Opening Types

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Window+patio Door	Manufacturer	Window	Double Low-E Hard 0.2			0.50		0.80	1.20
Door	Manufacturer	Solid Door							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Opening 1	Window	[1] External Wall 1	South West	None	0.00					9.45	
Opening 2	Solid Door	[1] External Wall 1	North East							2.40	
Opening 3	Window	[1] External Wall 1	North East	None	0.00					2.04	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging User Input

17.1 List of Bridges

Bridge Type	Length	Imported
E2 Other lintels (including other steel lintels)	6.72	Yes
E3 Sill	4.72	No
E4 Jamb	21.30	Yes
E7 Party floor between dwellings (in blocks of flats)	14.60	Yes
E9 Balcony between dwellings, wall insulation continuous	11.30	No
E15 Flat roof with parapet	14.60	Yes
E18 Party wall between dwellings	10.20	Yes

Y-value	0.150	W/m²K
Description	tbc	

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - centralised
MV Reference Number	500295
Configuration	2
Manufacturer SFP	0.15
Duct Type	Rigid
Wet Rooms	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System | No

22.0 Lighting

Internal

Total number of light fittings	5	
Total number of L.E.L. fittings	5	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted | No

23.0 Electricity Tariff | 7 Hour Off Peak

24.0 Main Heating 1 | None

26.0 Community Heating

Community Heating	Space and Water Combined
Space Community Heating	
PCDF Index	n/a
Distribution Loss	Piping system >= 1991, pre-insulated, low temp, variable flow
Controls	CCC Flat rate charging, programmer and TRVs
SAP Code	2305
PCDF Index	n/a

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical
Heat Source 1	Heat pump	Electricity	Space and Water	320.00	100.00%			

28.0 Water Heating	HWP From main heating 1
Water Heating	Community Heating
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901

29.0 Hot Water Cylinder	HIU	
Insulation Type	Measured Loss	
Cylinder Volume	20.00	L
Loss	0.66	kWh/day

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	CORNER FLATS	**Issued on Date**	07/03/2022
Assessment Reference	Be Green	**Prop Type Ref**	
Property	Aylesbury Estate, Westmoreland Road, London, SW17 2AY		

SAP Rating	81 B	**DER**	14.95	**TER**	26.01
Environmental	89 B	**% DER<TER**	42.51		
CO_2 Emissions (t/year)	0.84	**DFEE**	49.02	**TFEE**	48.95
General Requirements Compliance	Fail	**% DFEE<TFEE**	-0.15		

Assessor Details	Mr. Stephen White, Stephen White, Tel: , stephen.white@wsp.com	**Assessor ID**	U865-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	South
Property Tenure	Rented (social)
Transaction Type	Rental
Terrain Type	Urban
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	25.10 m	66.20 m²	2.55 m

7.0 Living Area 39.60 m²

8.0 Thermal Mass Parameter Precise calculation

Thermal Mass 119.98 kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1 West	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	77.81	48.45

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	26.45

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	159.96

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings 1	Precast concrete planks floor, screed, carpeted	30.00	66.20

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Other	40.00	66.20

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Window	Manufacturer	Window	Double Low-E Hard 0.2			0.50		0.80	1.20
Door	Manufacturer	Solid Door							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Above Front Door	Window	[1] External Wall 1 West	South East	None	0.00					0.50	
Front Door	Solid Door	[1] External Wall 1 West	South East							1.95	
2 Windows wall 3	Window	[1] External Wall 1 West	South West	None	0.00					4.59	
3 windows wall 4	Window	[1] External Wall 1 West	North West	None	0.00					12.96	
2Baclony Doors wall5	Window	[1] External Wall 1 West	North East	None	0.00					9.36	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging User Input

17.1 List of Bridges

Bridge Type	Length	Imported
E2 Other lintels (including other steel lintels)	14.70	Yes
E3 Sill	12.00	No
E4 Jamb	34.30	Yes
E7 Party floor between dwellings (in blocks of flats)	33.20	Yes
E9 Balcony between dwellings, wall insulation continuous	12.22	No
E16 Corner (normal)	6.20	Yes
E18 Party wall between dwellings	8.00	No

Y-value	0.150	W/m²K
Description	tbc	

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes

Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - centralised
MV Reference Number	500295
Configuration	2
Manufacturer SFP	0.15
Duct Type	Rigid
Wet Rooms	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System No

22.0 Lighting

Internal

Total number of light fittings	1	
Total number of L.E.L. fittings	1	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff 7 Hour Off Peak

24.0 Main Heating 1 None

26.0 Community Heating

Community Heating	Space and Water Combined

Space Community Heating

PCDF Index	n/a
Distribution Loss	Piping system >= 1991, pre-insulated, low temp, variable flow
Controls	CCC Flat rate charging, programmer and TRVs
SAP Code	2305

Water Community Heating

PCDF Index	n/a

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical
Heat Source 1	Heat pump	Electricity	Space and Water	320.00	100.00%			

28.0 Water Heating HWP From main heating 1

Water Heating	Community Heating
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No

Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
29.0 Hot Water Cylinder	HIU	
Insulation Type	Measured Loss	
Cylinder Volume	20.00	L
Loss	0.66	kWh/day

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	MAISONETTES	**Issued on Date**	07/03/2022
Assessment Reference	Be Green	**Prop Type Ref**	
Property	Aylesbury Estate, Westmoreland Road, London, SW17 2AY		

SAP Rating	85 B	**DER**	15.52	**TER**	22.91
Environmental	87 B	**% DER<TER**	32.27		
CO_2 Emissions (t/year)	1.32	**DFEE**	40.34	**TFEE**	46.80
General Requirements Compliance	Pass	**% DFEE<TFEE**	13.80		

Assessor Details	Mr. Stephen White, Stephen White, Tel: , stephen.white@wsp.com	**Assessor ID**	U865-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North West
Property Tenure	Rented (social)
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	29.31 m	48.53 m²	2.70 m
1st Storey:	31.26 m	52.75 m²	3.10 m

7.0 Living Area	19.63	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	137.01	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Front door Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	34.57	20.53
Back wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	14.99	1.76

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	24.57
Party Wall 2	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	24.57

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall - ground floor	Plasterboard on timber frame	9.00	106.57
Internal Wall 1st Floor	Plasterboard on timber frame	9.00	120.58

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings 1	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	52.75

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	48.50

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Heat Loss Floor 1	Ground Floor - Solid	Slab on ground, screed over insulation	0.14	110.00	48.53

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	52.75

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Window	Manufacturer	Window	Double Low-E Hard 0.2			0.50		0.80	1.20
Back Door	Manufacturer	Window	Double Low-E Hard 0.2			0.50		0.80	1.30
Front Door	Manufacturer	Solid Door							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
1st F above door	Window	[1] Front door Wall	North West	None	0.00					4.64	
1st F Window 1	Window	[1] Front door Wall	North West	None	0.00					3.32	
Ground by door	Window	[1] Front door Wall	North West	None	0.00					3.04	
Back Door	Window	[2] Back wall	South East	None	0.00					6.48	
Front door	Solid Door	[1] Front door Wall	North West							2.15	
Side orietation Win	Window	[1] Front door Wall	West	None	0.00					0.37	
Small Above F'Door	Window	[1] Front door Wall	North West	None	0.00					0.52	
Window Ground	Window	[2] Back wall	South East	None	0.00					2.07	
Window 1st	Window	[2] Back wall	South East	None	0.00					3.84	
smol window 1st	Window	[2] Back wall	South East	None	0.00					0.84	

14.0 Conservatory: None

15.0 Draught Proofing: 100 %

16.0 Draught Lobby: No

17.0 Thermal Bridging: User Input

17.1 List of Bridges

Bridge Type	Length	Imported
E2 Other lintels (including other steel lintels)	13.64	Yes
E3 Sill	10.82	No
E4 Jamb	36.86	Yes
E5 Ground floor (normal)	29.31	Yes
E20 Exposed floor (normal)	8.17	No
E6 Intermediate floor within a dwelling	31.26	Yes
E16 Corner (normal)	2.55	No
E18 Party wall between dwellings	23.20	Yes

Y-value: 0.150 W/m²K

Description: tbc

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - centralised
MV Reference Number	500295
Configuration	3
Manufacturer SFP	0.17
Duct Type	Rigid
Wet Rooms	3

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No

22.0 Lighting

Internal

Total number of light fittings	1	
Total number of L.E.L. fittings	1	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff	Standard

24.0 Main Heating 1	Database	
Description	TBC	
Percentage of Heat	100	%
Database Ref. No.	100051	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	299.8	
In Summer	187.5	
Controls	CHD Time and temperature zone control	

PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Only Heating Hot Water	No	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.60	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Appendix E

BLOCK 4 - SAP SUMMARY INFORMATION

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	FLAT	**Issued on Date**	07/03/2022
Assessment Reference	Be Green	**Prop Type Ref**	
Property	Aylesbury Estate, Westmoreland Road, London, SW17 2AY		

SAP Rating	84 B	**DER**	11.07	**TER**	22.45
Environmental	92 A	**% DER<TER**	50.68		
CO_2 Emissions (t/year)	0.69	**DFEE**	34.79	**TFEE**	39.22
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.29		

Assessor Details	Mr. Stephen White, Stephen White, Tel: , stephen.white@wsp.com	**Assessor ID**	U865-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Rented (social)
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	35.95 m	75.00 m²	3.10 m

7.0 Living Area 39.92 m²

8.0 Thermal Mass Parameter Precise calculation

Thermal Mass 162.02 kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	35.34	21.34

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall to Corridor	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	55.71
Party Wall to Party wall	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	20.40

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	81.18

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings 1	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	75.00

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	In-situ concrete slab supported by profiled metal deck, carpeted	64.00	75.00

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
window	Manufacturer	Window	Double Low-E Hard 0.2			0.35		0.80	1.20
door	Manufacturer	Solid Door							1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Balcony doors	Window	[1] External Wall 1	West	None	0.00					6.33	
2 Windows	Window	[1] External Wall 1	West	None	0.00					5.57	
Front Door	Solid Door	[1] External Wall 1	East							2.10	

14.0 Conservatory None

15.0 Draught Proofing 100 %

16.0 Draught Lobby No

17.0 Thermal Bridging User Input

17.1 List of Bridges

Bridge Type	Length	Imported
E1 Steel lintel with perforated steel base plate	6.93	Yes
E3 Sill	4.12	No
E4 Jamb	15.80	Yes
E7 Party floor between dwellings (in blocks of flats)	35.95	Yes
E18 Party wall between dwellings	6.58	No

Y-value: 0.150 W/m²K

Description: TBC

18.0 Pressure Testing Yes

Designed AP_{50}: 4.00 m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP_{50}: m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather: Windows half open

Cross ventilation possible: Yes

Night Ventilation: Yes

Air change rate: 3.00

Mechanical Ventilation

Mechanical Ventilation System Present: Yes

Approved Installation: Yes

Mechanical Ventilation data Type: Database

Type: Balanced mechanical ventilation with heat recovery

MV Reference Number: 500140

Configuration: 1

MVHR Duct Insulated: Yes

Manufacturer SFP: 0.76

Duct Type	Rigid
MVHR Efficiency	91.00
Wet Rooms	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No

22.0 Lighting

Internal

Total number of light fittings	1	
Total number of L.E.L. fittings	1	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff	Standard
24.0 Main Heating 1	None

26.0 Community Heating

Community Heating	Space and Water Combined

Space Community Heating

PCDF Index	n/a
Distribution Loss	Piping system >= 1991, pre-insulated, medium temp, variable flow
Controls	CCJ Charging system linked to use of community heating, TRVs
SAP Code	2310
PCDF Index	n/a

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat Power Ratio	Electrical
Heat Source 1	Heat pump	Electricity	Space and Water	320.00	100.00%		

28.0 Water Heating	HWP From main heating 1
Water Heating	Community Heating
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901

29.0 Hot Water Cylinder	HIU

Insulation Type	Measured Loss	
Cylinder Volume	20.00	L
Loss	0.66	kWh/day
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	65.98	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP elmhurst energy

Property Reference	S04 Maisonettes	Issued on Date	09/03/2022
Assessment Reference	Be Green	Prop Type Ref	
Property	Aylesbury Estate, Westmoreland Road, London, SW17 2AY		

SAP Rating	84 B	DER	15.88	TER	23.16
Environmental	86 B	% DER<TER	31.42		
CO_2 Emissions (t/year)	1.44	DFEE	47.35	TFEE	50.19
General Requirements Compliance	Pass	% DFEE<TFEE	5.66		

Assessor Details	Mr. Stephen White, Stephen White, Tel: , stephen.white@wsp.com	Assessor ID	U865-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North West
Property Tenure	Rented (social)
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	25.72 m	39.90 m²	3.20 m
1st Storey:	34.79 m	71.23 m²	3.15 m

7.0 Living Area 20.97 m²

8.0 Thermal Mass Parameter Precise calculation

Thermal Mass 142.59 kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.15	14.00	97.43	67.44

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	94.49

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall - ground floor	Plasterboard on timber frame	9.00	291.96

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings 1	In-situ concrete slab supported by profiled metal deck, carpeted	90.00	71.23

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	39.90

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Heat Loss Floor 1	Ground Floor - Solid	Slab on ground, screed over insulation	0.14	110.00	15.91
Heat Loss Floor 2	Exposed Floor - Solid	Other	0.14	110.00	23.99

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	39.90

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Window	Manufacturer	Window	Double Low-E Hard 0.2			0.35		0.80	1.20
Patio Door	Manufacturer	Window	Double Low-E Hard 0.2			0.35		0.80	1.30
Door	Manufacturer	Solid Door							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
South Windows	Window	[1] External Wall	South	None	0.00					13.46	
West Windows	Window	[1] External Wall	West	None	0.00					12.42	
West Side	Window	[1] External Wall	West	None	0.00					4.11	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging User Input

17.1 List of Bridges

Bridge Type	Length	Imported
E2 Other lintels (including other steel lintels)	17.04	Yes
E3 Sill	15.29	No
E4 Jamb	35.44	Yes
E5 Ground floor (normal)	25.72	Yes
E20 Exposed floor (normal)	14.20	No
E6 Intermediate floor within a dwelling	34.79	Yes
E16 Corner (normal)	12.70	Yes
E18 Party wall between dwellings	12.70	Yes
P6 Party wall - Ground floor (inverted)	6.60	No

Y-value	0.150	W/m²K
Description	tbc	

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather: Windows half open

Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500140
Configuration	2
MVHR Duct Insulated	Yes
Manufacturer SFP	0.88
Duct Type	Rigid
MVHR Efficiency	91.00
Wet Rooms	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No

22.0 Lighting

Internal

Total number of light fittings	1	
Total number of L.E.L. fittings	1	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff	Standard

24.0 Main Heating 1	Database	
Description	TBC	
Percentage of Heat	100	%
Database Ref. No.	100051	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	
In Winter	299.9	
In Summer	187.5	
Controls	CHD Time and temperature zone control	
PCDF Controls	0	
Sap Code	2207	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	

25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
Immersion Only Heating Hot Water	No	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.60	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	65.98	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

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