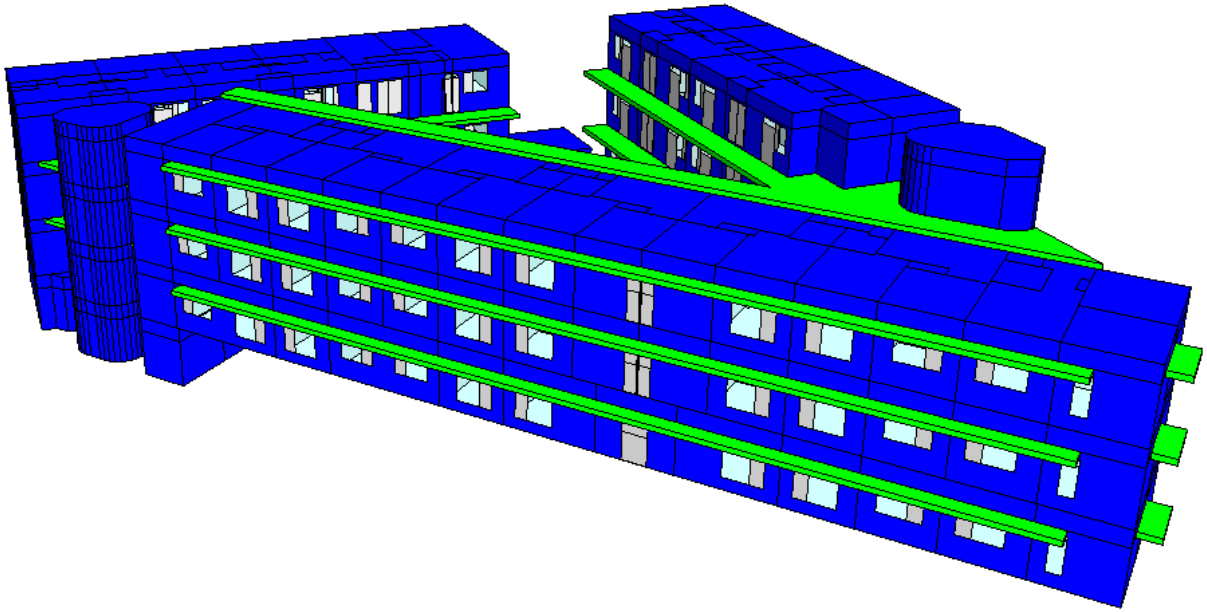
Anderson Green

building services consultants



Chester Road
London
Part L / Energy Statement

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Chester Road
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Part L / Energy Statement

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P01	DESIGN STAGE	CS	AG	S2	11.12.23
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P04	DESIGN STAGE	CS	AG	S3	14.06.24
P05	DESIGN STAGE – PART L 2013	CS	AG	S3	17.06.24

Contents

1.0 Executive Summary

This Part L / Energy Statement has been prepared on behalf of Morgan Sindall to assess the carbon benchmarks and the potential renewable energy sources for the proposed development at Chester Road, London.

SAP & SBEM analyses has been carried out on the schemes to determine a specific dwelling/building emissions rate (DER/BER) requirement for each respective area within the scheme.

Chester Road has 50 No. domestic units assessed under Part L1A & 1 No. communal unit assessed under Part L2A

Following the analysis, all areas achieve Part L compliance based upon the proposed design. This is being achieved under a fabric first approach which is to be high efficiency and exceeds the minimum Part L1A/L2A standards.

1.1 Planning

This assessment has been carried out in line with the Greater London Authority, London Plan (Policy SI 2). The requirements of the plan are for new development to meet a 100% carbon reduction above minimum L1A compliance achieving a zero-carbon design, with an on-site reduction target of at least 35% above baseline.

In order to meet this target, it has been determined that the most appropriate service strategy for the scheme would be via a fabric first approach, hybrid VRF heating & cooling and heat pumps supplying communal hot water to the schemes with additional photovoltaics included.

1.2 Building Regulations Part L1A 2013

The assessed dwellings are complying with Part L1A 2013 with a dwelling emissions rate (DER) and Fabric energy efficiency (DFEE), all demonstrating overall compliance against the notional building targets.

Based on the current design – The scheme currently achieves:

- Average carbon reduction (TER/DER) – 56.68%.
- Average fabric energy efficiency reduction (TFEE/DFEE) – 25.54%.

1.3 Building Regulations Part L2A 2013

The commercial area is complying with Part L2A 2013 with a building emissions rate (BER) demonstrating overall compliance against the notional building targets.

Based on the current design – The scheme currently achieves:

- Average carbon reduction (TER/BER) – 80.1%.

2.0 Introduction

This design stage energy statement has been compiled to provide an understanding of the potential building design and renewable technologies which could be incorporated within this development to provide a high efficiency design which meets or exceeds the requirements of Part L1A/L2A 2013 and the London Plan.

2.1 Software

Domestic: Carbon benchmarking has been produced using Elmhurst Design SAP 2012.

Commercial: Carbon benchmarking has been produced using IESVE 2023.1.0.0.

2.2 Local planning guidance

This assessment has been carried out in line with the Greater London Authority, London Plan (Policy SI 2). The requirements of the plan are for new development to meet a 100% carbon reduction above minimum L1A compliance achieving a zero-carbon design, with an on-site reduction target of at least 35% above baseline.

In order to meet this target, it has been determined that the most appropriate service strategy for the scheme would be via a fabric first approach, hybrid VRF heating & cooling and heat pumps supplying communal hot water to the schemes with additional photovoltaics included.

2.3 Methodology

This report details the following analysis:

a) SAP and SBEM analysis of respective building to benchmark the carbon emissions requirement.
b) High level renewable energy analysis of available technologies.
c) Determine best method of carbon reduction.
d) Assess the feasibility and cost of selected technology.
e) Assess the carbon offset costs.
f) Summarise the most appropriate option.

3.0 Site Details

3.1 Site Specifics

Chester Road has 50 No. domestic units assessed under Part L1A & 1 No. communal unit assessed under Part L2A

The domestic units are a variety of studio, one bedroom, two bedroom and accessible apartments. All comprising of bedrooms, kitchens/living areas and bathrooms.

The communal areas comprise of offices, circulation and ancillary areas.

The total conditioned internal floor area of domestic each property type ranges from approximately 24-58m².

The conditioned floor area of the commercial area is 428m².

3.2 Site Location & Weather File

As per the SAP/SBEM conventions, the location selected for the site is: Thames Valley / London.

The projects is to be built at Chester Road, London

Chester Road:

4.0 Planning Requirements

This section summarises the work undertaken that has informed the strategy and building design in accordance energy & sustainability requirements.

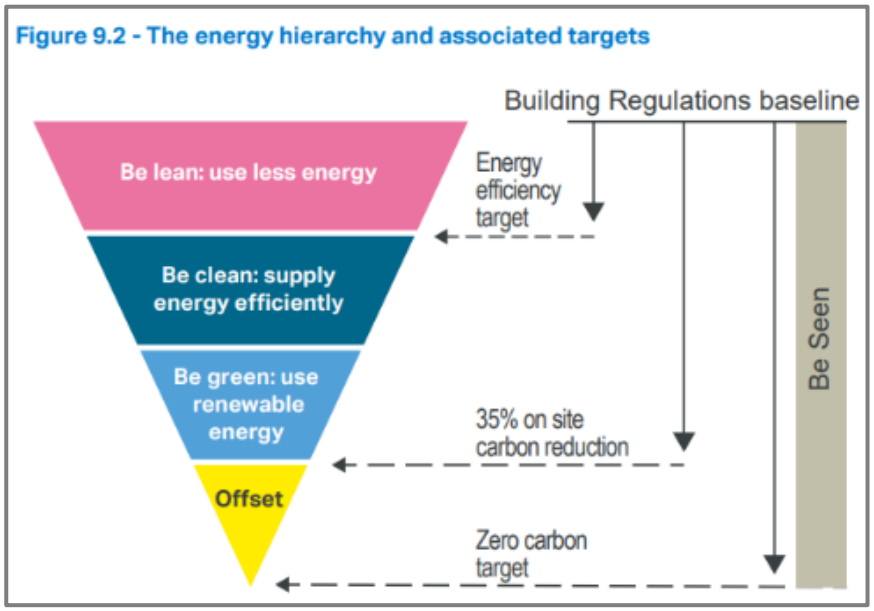
This section reviews:

- Demand Reduction (Be Lean) to achieve compliance with Building Regulations Part L1A and L2A 2013 through active energy efficiency measures alone.
- Heating Infrastructure including CHP (Be Clean) review of the potential to connect to existing district heating networks and the feasibility of the inclusion of combined heat and power (CHP) – Discounted as not feasible.
- Renewable Energy (Be Green) consideration of renewable technologies utilising PV.

The proposed design achieves the following:

- Part L1A 2013 Compliance – >35% carbon reduction
- Part L2A 2013 Compliance – >35% carbon reduction
- Be clean measures are unavailable or deemed not appropriate for the project.
- The scheme has the potential for green measures and this has been reviewed and incorporated into the design.

Figure 9.2 - The energy hierarchy and associated targets



4.1 Energy Hierarchy Details

Details of the CO_2 emissions reductions are shown in the tables adjacent. These demonstrate that the proposed building achieves the L1A and L2A targets as required by planning.

L1A 2013 – The site achieves a 56.68% carbon reduction above minimum L1A compliance with an on-site reduction target of at least 35% above baseline. Achieving a minimum 15% reduction through energy efficiency measures alone.

L2A 2013 – On-site reduction target of at least 35% above baseline.

Clean measures including possibility of district heating and CHP to provide heating and domestic hot water (DHW) have been reviewed:

- There is no existing district heating scheme that it would be feasible to connect to.
- Use of CHP is considered inefficient due to low peak demand and the annual demand hours are expected to be much less than the recommended minimum of 4500.

4.2 Building Fabric

CONSTRUCTION U-VALUES W/M²k	Part L 2013	PROPOSED
ROOF	0.2	0.1
EXTERNAL WALL	0.3	0.13
GROUND FLOOR	0.25	0.11
PARTITIONS	0	-
WINDOWS	2	1.2
GLAZED DOORS	2	1.2
PEDESTRIAN DOORS	1	-
AIR PERMEABILITY	10	2.5
GLAZING PROPERTIES	**G-VALUE**	
WINDOWS	0.63	0.4
FRAME FACTOR	0.7	0.7

4.3 Building Services

HEATING	MODEL	EFFICIENCY %	AREA
Electric UFH & Hybrid VRF	TBC	100%	Domestic
VRF	PURY-EM200/250YNW-A1	3.44 / 3.33	Communal - Chester Road
DHW	**LITRES**	**EFFICIENCY %**	**AREA**
Communal Heat Pump	993L	430%	Chester Road
VENTILATION	**HR %**	**SFP (W/l/s)**	**AREA**
MVHR	80%	0.70	Domestic
MVHR	80%	1.60	Communal
LIGHTING	**LIGHTING EFFICIENCY**	**LOCATION**	**AREA**
All Areas	76 - 134 Lm/W	Variable	Domestic / Communal

4.4 Thermal Bridging

Accredited Construction Details (ACDs) for Part L compliance are standard junction details which have been designed to reduce heat loss at junctions and increase overall energy efficiency of a building. ACDs have been specified on this project and the relevant details should therefore be downloaded (www.planningportal.gov.uk) and followed throughout the construction phase.

5.0 LZC Technology

The following summary provides a high-level assessment of the potential renewable technologies which could be incorporated in the scheme.

Those technologies which are not considered functionally viable are discounted at this stage. Technologies which are suitable for the project are included in the detailed analysis.

LZC TECHNOLOGY	OVERVIEW	APPLICATION	SITE SPECIFIC	INCLUDED
PHOTOVOLTAICS	Converts sunlight to DC electrical power. Requires inverter to convert to DC. Ideally located south facing roof. Wide range of building types.	Wide range of building types, schools, offices, hotels etc. Site with good access to solar radiation.	Roof space available for required PV installation	YES
AIR SOURCE HEAT PUMP (ELEC)	A heat exchanger extracts heat from the air. The heat pump raises the temperature of refrigerant via the compression cycle and reverse for cooling. Used for space heating, hot water and cooling.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Heating and cooling required to scheme. Sufficient external space required for condensers.	YES
COMMUNITY HEATING	Utilises waste heat from process such as large scale power generation where the majority of heating comes from waste heat.	Hotels, hospitals, leisure centres, some industrial premises.	No local system available	NO
CHP - NATURAL GAS	Generates both electricity and heat using fossil or renewable fuels.	Hotels, hospitals, leisure centres, some industrial premises.	Changes to carbon emissions factors make the gas fired CHP options unviable	NO
SOLAR HOT WATER HEATING	Solar collectors (flat plate or tube) transfer energy into transfer liquid to a closed loop twin coil hot water cylinder. Ideally located south facing roof.	Domestic and commercial applications with high hot water load; leisure centres, canteens, washrooms.	Sufficient roof space, although fairly low hot water demand. Further consideration required depending on end user demand.	NO

LZC TECHNOLOGY	OVERVIEW	APPLICATION	SITE SPECIFIC	INCLUDED
AIR SOURCE HEAT PUMP (GAS)	As electric heat pump using gas as fuel for the compressor. Relatively carbon efficient in comparison with gas fired boiler.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Heating only required to scheme. Sufficient external space required for condensers. Typical system efficiencies relatively low compared with electric.	NO
GROUND SOURCE HEAT PUMP (ELEC)	Takes up heat from the ground and releases it at high temperatures. Heat can be used for space heating and domestic hot water.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Heating and cooling required to scheme. Insufficient external space required for vertical bore holes or ground loop.	NO
WATER SOURCE HEAT PUMP (ELEC)	Takes up heat from a local water source, lake or river and releases it at relatively low temperatures. Heat can be used for space heating and domestic hot water	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating	Heating only required to scheme. Insufficient water course on site.	NO
GEOTHERMAL HEAT PUMP (ELEC)	Takes up heat from a local geothermal underground courses. Heat can be used for space heating and domestic hot water.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	No local geothermal activity.	NO
SMALL SCALE HYDRO POWER, TIDAL POWER, WAVE POWER	Small scale turbines in fast flowing rivers provide electrical power. Tidal wave platform movement generates energy.	Rural and costal situations required.	No access to fast flowing rivers and site located inland.	NO
WIND TURBINE	Turbine/generator converts wind energy to electrical power. Turbines available with outputs from 600W to 2MW	Large sized turbines in non-urban or off-shore locations will be more effective	Suburban area not suitable for large turbine.	NO
BIOMASS HEATING	Uses plant-derived organic material. Can produce heat or biogas depending on technology	Buildings with sufficient access for storage	Insufficient storage space and access for delivery.	NO
FUEL CELLS	Hydrogen fuel cells used to store energy from any renewable technologies.	All buildings where energy is produced on site.	Insufficient installation/ storage space Relatively low heating requirement.	NO

6.0 Renewable and Energy Offset Analysis

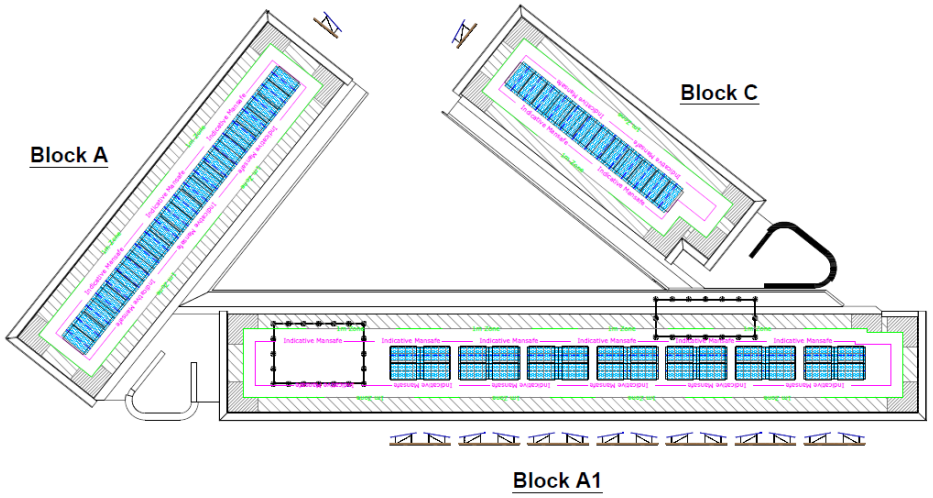
6.1 Photo-Voltaic (solar PV)

The development benefits from flat roofs which lie on South, East & West orientations, each of which are suitable for PV arrays. The adjacent and below images demonstrate the currently proposed PV arrays to each scheme.

Chester Road has a proposed array of 60 panels / 117m2 / 25.8Wp.

All PV has been specified on the proposed orietnation at 30° pitch and with minimal overshading <20%.

Chester Road:



6.2 Carbon Benchmark

Based upon the assumption of a fabric first approach, hybrid heating & cooling and heat pumps supplying communal hot water to the schemes with additional photovoltaics - The scheme is achieving Part L compliance and exceeds the GLA targets as below.

Below are the summary tables from the GLA reporting sheet:

Chester Road – L1A:

	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Savings from energy demand reduction	4	10%
Savings from heat network / CHP	2	4%
Savings from renewable energy	11	31%
Cumulative on site savings	**16**	**45%**

SAP10:

	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Savings from energy demand reduction	4	13%
Savings from heat network / CHP	14	43%
Savings from renewable energy	5	16%
Cumulative on site savings	**23**	**72%**

Chester Road – L2A:

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Savings from energy demand reduction	0	5%
Savings from heat network / CHP	-1	-20%
Savings from renewable energy	1	32%
Total Cumulative Savings	**1**	**17%**

SAP10:

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Savings from energy demand reduction	0	6%
Savings from heat network / CHP	0	16%
Savings from renewable energy	1	28%
Total Cumulative Savings	**1**	**50%**

6.3 Criterion 1- TER/DER

This building PASSES the Part L1/2A 2021 compliance assessment confirming that the Building/Dwelling Emission Rate (BER/DER) is less than or equivalent to the carbon emissions of the notional building set by the Target Emissions Rating (TER).

6.4 Criterion 2 – TFEE/DFEE

To achieve compliance with the regulations the Dwelling Fabric Energy Efficiency (DFEE) which is derived from the performance of the building fabric, u-value and air permeability should be less than or equivalent to the Target Fabric Energy Efficiency (TFEE) as set by the notional building

This building PASSES the Fabric Energy Efficiency check as detailed in the Part L Compliance Sheet. The calculated figure achieves compliance with Part L as they are no worse than the design limits.

7.0 Conclusion

This report includes a high-level review of both the potential renewable technologies and Part L compliance for the scheme at Chester Road, London.

The carbon reductions have been assessed to provide guidance on the most appropriate method of reducing carbon in line with the local authority guidelines, planning targets and meeting Part L compliance for building regulations requirements.

The scheme falls under the London Plan (Policy SI 2). The requirements of the plan are for new development to meet a 100% carbon reduction above minimum L1/2A compliance achieving a zero-carbon design, with an on-site reduction target of at least 35% above baseline, achieving a minimum 15% reduction through energy efficiency measures alone.

In order to meet this target, it has been determined that the most appropriate service strategy for the scheme would be via a fabric first approach, hybrid heating & VRF cooling and heat pumps supplying communal hot water to the scheme with the addition of a photovoltaic arrays to the site.

The PV for the scheme has been designed with a total 25.80kWp to Chester Road.

Based on the current proposal, the scheme would meet/exceed the minimum planning targets as set out by the GLA and meet Part L1/2A 2013 compliance.

8.0 Appendices

Appendix A. Drawings

Chester Road:

Drawing Name/Number	Author	Date
123007-WGI-CH-01-DR-A-2101_Ground Floor GA Plan_S3 - Delivery Team Review_P02_0	WGI	Sep-23
123007-WGI-CH-02-DR-A-2102_First Floor GA Plan_S3 - Delivery Team Review_P02_0	WGI	Sep-23
123007-WGI-CH-03-DR-A-2103_Second Floor GA Plan_S3 - Delivery Team Review_P02_0	WGI	Sep-23
23007-WGI-CH-LG-DR-A-2100_Lower Ground Floor GA Plan_S3 - Delivery Team Review_P02_	WGI	Sep-23
123007-WGI-CH-RF-DR-A-2105_Roof GA Plan_S3 - Delivery Team Review_P02_0	WGI	Sep-23
123007-WGI-CH-ZZ-DR-A-2200_South West Elevation_S3 - Delivery Team Review_P01	WGI	Sep-23
123007-WGI-CH-ZZ-DR-A-2201_North Elevation_S3 - Delivery Team Review_P01_0	WGI	Sep-23
123007-WGI-CH-ZZ-DR-A-2202_East Elevation_S3 - Delivery Team Review_P01_0	WGI	Sep-23
123007-WGI-CH-ZZ-DR-A-3205_Window Elevations Part 1_S3 - Delivery Team Review_P02	WGI	Sep-23
123007-WGI-CH-ZZ-DR-A-3206_Windows Elevations Part 2_S3 - Delivery Team Review_P02	WGI	Sep-23

Appendix B. Chester Road – BRUKL

The following BRUKL document outlines the overall compliance figures for the L2A aspect of the scheme.

Appendix C. Chester Road – Block Compliance

The following block compliance document outline the overall compliance figures for the L1A aspect of the scheme.