DANSON ROAD CAREBASE, LONDON
SUSTAINABILITY STATEMENT AND RENEWABLE ENERGY STATEMENT
SEPTEMBER 2019

elementa
Member of Integral Group

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DOCUMENT CONTROL

Issue	Description	Date	Prepared By	Signed Off
P1	Preliminary	6th September 2019	Adeel Ahmed	Rob Harris

1 INTRODUCTION

This Sustainability Statement has been prepared by Elementa Consulting for Ryder Architecture, in support of the planning application for the development of a newly proposed Carebase at Danson Road, London.

This document should be read in conjunction with the information provided within all other application documentation submitted as part of the planning application, including, but not limited to:

- Air Quality Assessment
- Design and Access Statement
- Flood Risk Assessment
- Noise Assessment
- Transport Assessment
- Planning Statement
- Planning Drawings
- Energy Strategy Report

1.1 SITE LOCATION AND DESCRIPTION

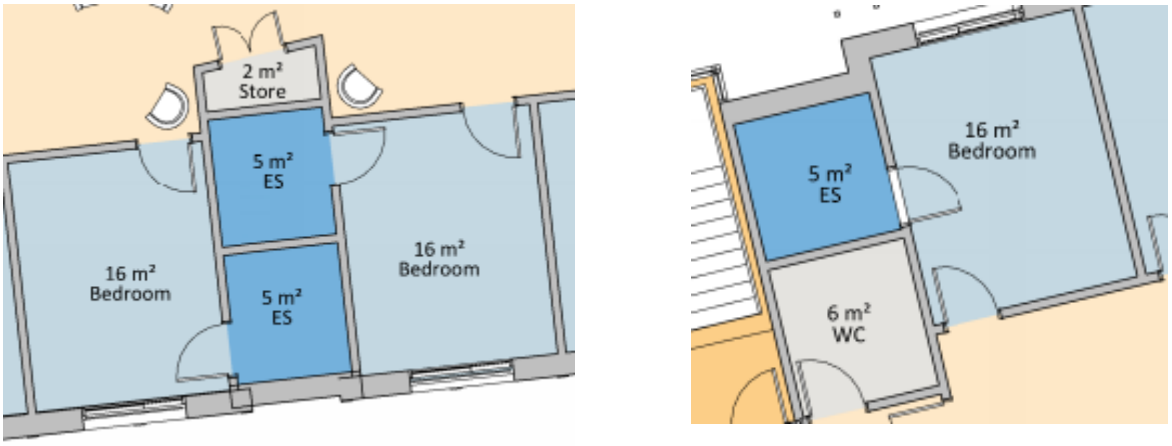
The site is in the south east of London and is governed by the London Borough of Bexley.

The perimeter of the development site is highlighted by the red outline in the site layout plan below.

Site Layout Plan: Danson Road

1.2 THE DEVELOPMENT

The proposed development will comprise of 16 bedrooms at lower ground, 20 bedrooms at ground floor, 20 bedrooms at first floor and 9 bedrooms at second floor level. The reception area will be on ground floor along with dining areas, a salon, cinema and day spaces, and more dining areas and day spaces on the other floors. Toilets and shower facilities will be provided by en-suites for all bedrooms. The typical floor plans for the bedrooms are shown below.



Typical Floor Plans: Ground floor bedrooms

1.3 THE OBJECTIVES

This report provides a summary of design and sustainability strategies proposed as part of the design to:

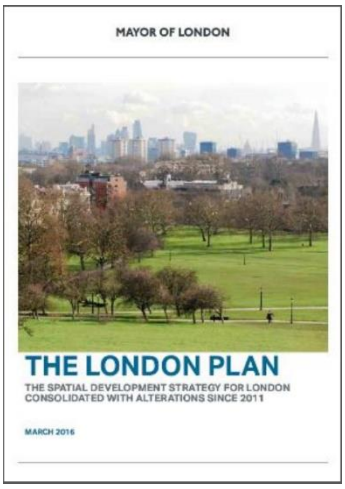
- Meet the requirements of Part L2A of the Building Regulations (2013 edition)
- Satisfy London Plan energy efficiency targets
- Demonstrate how the energy hierarchy has driven the design to maximise carbon emissions reductions
- Demonstrate how the proposed development meets the relevant sustainability standards set out in London Plan

2 PLANNING POLICY

2.1 NATIONAL PLANNING REQUIREMENTS + BUILDING REGULATIONS

In preparing this Sustainability Statement several policy documents have been used to guide and inform the sustainability aspirations for the proposed development.

2.1.1 London Plan



This Spatial Development Strategy for Greater London, includes the Mayor's objectives for the reduction of London's impact on, and exposure to, the effects of climate change.

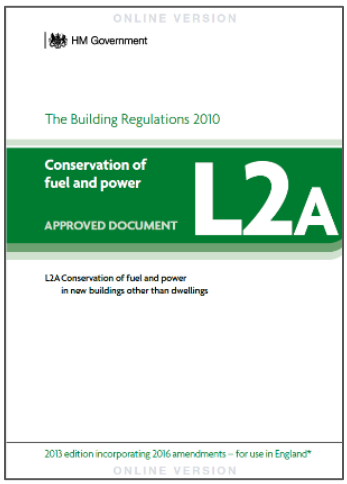
Policy 5.3: Sustainable Design + Construction identifies that the highest levels of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime. With development endeavouring to incorporate the following design principles:

- Minimise carbon dioxide emissions as part of the development
- Reduce the potential for overheating and contributions to the urban heat island effect
- Ensure efficient use of natural resources, such as water
- Minimise pollution from the site
- Reduce the generation of waste, maximising reuse and recycling
- Respond to potential flood risk
- Provide comfortable and secure environment for users

In addition to the main sustainability policy above, the following policies are also relevant to the Energy and Sustainability Strategy:

- Policy 5.2: Minimising Carbon Dioxide Emissions
- Policy 5.6: Decentralised Energy in Development Proposals
- Policy 5.7: Renewable Energy
- Policy 5.8: Innovative Energy Technologies
- Policy 5.11: Green Roofs
- Policy 5.12: Flood Risk Management
- Policy 5.13: Sustainable Drainage
- Policy 5.17: Waste capacity
- Policy 6.9: Cycling
- Policy 6.10: Walking
- Policy 7.2: An Inclusive environment
- Policy 7.4: Local Character
- Policy 7.6: Architecture
- Policy 7.14: Improving Air Quality
- Policy 7.15: Reducing and Managing Noise, improving and Enhancing the Acoustic Environment and Promoting Appropriate Soundscape
- Policy 7.19: Biodiversity and Access to Nature

2.1.2 Building Regulations



Part L2A: Conservation of Fuel and Power in new buildings other than dwellings (2013 edition with 2016 amendments).

This document sets out the Building Regulations Approval requirements with regards to the Energy Performance. This document sets out the methodology for demonstrating how the design of the building will achieve an improved performance over that of the Target Emission Rate (TER).

3 SUSTAINABILITY DRIVERS

Following an integrated design process, the sustainability strategy has been developed to reflect the strategic planning policy requirements and seeks to create a development that will be fit for today and for the future.

This Sustainability Statement has been structured to reflect the objectives identified by the London Plan.

This headline approach provides a holistic vision that allows sustainability issues to be addressed. As such the key sustainability themes for the proposed development are identified as:

- Transport, Movement and Accessibility
- Sustainable Drainage Systems
- Energy
- Recycling & Waste Facilities
- Biodiversity
- Waste and Materials
- Pollution

4 TRANSPORT

The site is well located to public transportation. The development site has pedestrian networks that offer connections to local amenities and public transportation.

The London Plan states that development should not adversely affect safety on the transport network.

A small external bike store is proposed for use by staff.

5 SUSTAINABLE DRAINAGE SYSTEM / WATER

Water consumption in the UK has risen by more than 50% over the last 25-yrs, representing a continuing strain on this natural resource. As such, water demand reductions have been a central part of the Sustainability Strategy.

5.1 WATER EFFICIENCY

London Plan policy:

Development should minimise the use of mains water by incorporating water saving measures and equipment, designing residential development so that mains water consumption would meet a target of 105 litres or less per head per day, and reaching cost-effective minimum leakage levels. This can be achieved with efficient fixtures, fittings, sanitary ware, and appliances.

The amount of energy consumed in water supply should be minimised. Opportunities will be explored to further reduce potable water use as the design continues to develop, with the viability of rainwater harvesting, treatment, and reuse strategies to be considered as the project continues to evolve.

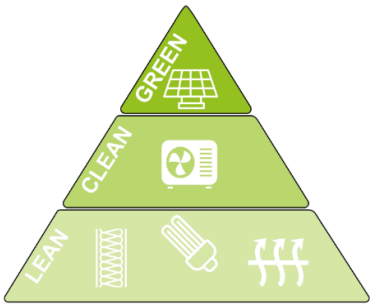
Rainwater harvesting, and greywater re-use systems will be evaluated for their water savings potential, with viability likely to be increased due to a high demand for WC flush and laundry.

5.2 FLOOD RISK

The development is in a flood zone that is defined as having very low annual probability of river or sea flooding.

6 ENERGY

6.1 ENERGY HIERARCHY



The following energy hierarchy, was adopted to help guide decisions about which energy measures are appropriate, and to optimise design solutions to maximise carbon reductions:

Be Lean: using less energy and utilising passive sustainable design measures
Be Clean: supplying energy efficiency, including the use of decentralised energy production
Be Green: using renewable energy where possible to further reduce carbon emissions.

6.2 ENERGY EFFICIENT BUILDING (BE LEAN)

The London Plan sets out a zero-carbon target for new residential builds, with at least 35% on-site reduction beyond Part L 2013 and proposals for making up the shortfall to achieve zero carbon, where required. For non-residential plans the requirement is a 35% reduction beyond Part L 2013. This building is non-residential, so will require a 35% on-site carbon reduction beyond Part L 2013.

The first stage in reducing CO_2 emissions is to reduce the energy required to service the building, through the implementation of passive design and energy efficiency measures.

To ensure that the development is inherently low in energy use, the following passive design measures should be implemented:

- Efficient fabric to reduce heating and cooling demand
- Enhanced airtightness that reduces infiltration heat losses
- Energy efficient heating and cooling systems
- Energy efficient mechanical ventilation
- Energy efficient lighting
- Adequate control of building services systems and lighting systems

The following tables indicate how this development will reduce the baseline energy consumption required, through the implementation of passive design and energy efficient measures (i.e. Be Lean):

Table 1 - Architectural 'Passive Design' Parameters

Element	Part L2A Notional Building	Value Proposed for Development
Wall U-Value (W/m^2.K)	0.26	**0.20**
Ground Floor U-Value (W/m^2.K)	0.22	**0.20**
Roof U-Value (W/m^2.K)	0.18	**0.15**
External Door (pedestrian door) U-Value (W/m^2.K)	2.20	**2.00**
High Usage Entrance Door U-Value (W/m^2.K)	1.50	**1.50**
Window U-Value (W/m^2.K)	1.60	**1.10**
Window G-Value	0.40	**0.40**
Building Air Permeability (m^3/h.m^2)	3	**3**

Internal shadings	-	**Curtains (bedrooms), internal blinds (rooms other than bedrooms)**
External shadings	-	**(Potentially required to meet Part L2A solar gains criteria – will depend on thermal modelling calculations)**

Table 2 - Mechanical Services 'Energy Efficient' Measures

Element	Description
Natural Ventilation	London Plan puts natural ventilation above mechanical ventilation in the cooling hierarchy.
Mechanical Ventilation	London Plan puts mechanical ventilation above active cooling systems in the cooling hierarchy.
Mechanical Cooling	Mechanical cooling to be utilised for where there is an operational need or for areas with high internal gains.
Pumps and Motors	Variable speed, variable frequency, variable voltage drives to be provided on all pumps and motors to reduce energy consumption to minimum on variable flow systems.
Metering and Sub-Metering	Use of water and energy metering and direct sub-metering, together with automatic controls to identify area of unusual energy use and optimum operating times and durations. Out of range monitoring and alarms to be provided via automatic control system.

Table 3 - Mechanical Services 'Energy Efficient' Plant Design Parameters

Element	Part L2A Notional Building	Value Proposed for Development
Heat Generator Seasonal Efficiency Natural Gas (i.e. boiler)	91%	**91%**
Heat Pump Heating (COP)	280%	**400%**
Heat recovery efficiency	70%	**78%**
Cooling efficiency (EER)	320%	**450%**
Specific Fan Power of central system with heating, cooling and heat recovery	1.4	**1.4**
Specific Fan Power of toilets extract	0.5 W/l/s	**0.4 W/l/s**

Table 4 - Electrical Services 'Energy Efficient' System Design Parameters

Element	Part L2A Minimum Requirements	Value Proposed for Development
LED Luminaires	None	Provided throughout
Use of Natural Daylight	None	Average daylight factor to be maximised wherever possible
Daylight Dimming	None	Provided in all rooms with daylight access
Lighting Efficiencies – General Lighting	60 luminaires lumens per circuit Watt	$\geq$80 luminaire lumens per circuit Watt
Power Factor	None	$\geq$0.95

Table 5 – Assumed lighting Efficiency and Lighting Control Measures

Room Name & Reference	Lighting Efficiency (Lamp Lumens per Circuit Watt)	Lighting Control Proposals
Office	**100**	Absence detection & daylight dimming
Reception	**100**	Presence detection & daylight dimming
WC	**80**	Presence detection
Shower	**80**	Presence detection
Store	**80**	Presence detection
Circulation	**80**	Presence detection
Bedrooms	**80**	Manual
Day spaces/dining areas	**80**	Presence detection

6.3 DISTRICT HEATING AND CHP (BE CLEAN)

The availability of district heat and electricity networks within the local area was investigated and it was identified that there are local networks in the vicinity for this development which could potentially provide power and/or heat to the development.

In addition, the opportunity to include the use of a local on-site combined heat and power (CHP) system for the development was considered.

A local CHP is not proposed for the development due to air quality issues. Also, due to the ongoing decarbonisation of the electricity grid (i.e. the reducing carbon dioxide emissions factor), other renewable technologies are considered more suited to the medium-term carbon neutral aspirations of the development. In addition, the additional plant space requirements for this technology are likely to be prohibitive for this development.

6.4 LZC TECHNOLOGIES OPTIONS (BE GREEN)

6.4.1 Overview

Many technologies have been considered, and an air source heat pump and photovoltaic cells have been proposed for use in this building.

6.4.2 Air Source Heat Pumps

An air source heat pump works in a similar manner to a ground source heat pump, except the heat source is ambient air rather than the ground. In lieu of ground loops are fan-assisted heat exchangers, located in locations with a free air supply. Air is driven across the heat exchangers, and heat energy is extracted. Like GSHP's, ASHP's can be reversed to provide cooling during summer operation.

Air source heat pumps providing heating and cooling is proposed for this development.

6.4.3 Photovoltaics

A PV system can be used to generate electricity to contribute towards the development's overall electricity consumption and exported to the grid when not required by the development.

From the site plan it can be concluded that there are no high-rise buildings around the proposed site for new development. Therefore, there is no risk of shadowing that can have a detrimental impact on the photovoltaic yield.

Photovoltaics are recommended to reduce the overall carbon emissions and to contribute to the on-site electricity generation as required by London Plan.

6.5 CONCLUSIONS

Through evaluation of the renewable technologies, it was established that in order to achieve compliance with the carbon and energy reduction requirements, the most suitable and cost effective LZC solution would be to adopt air source heat pumps for heating/cooling and photovoltaics to generate electricity on site.

The table below summarises the development specific suitability of the considered LZC technology options:

Table 6 – Low and Zero Carbon Technologies Considered

Technology	Technically Feasible	Recommended	Notes
CHP	Yes	No	It is envisaged that there will be sufficient year-round heating demand to make CHP a technically viable option. However, due to an ongoing decarbonising electricity grid, other renewable technologies are considered more suited to the medium-term carbon reduction aspirations of the development. In addition, the additional plant space requirements for this technology are likely to be prohibitive for this development.
GSHP	No	No	Not technically and economically feasible for this development.
ASHP	Yes	Yes	Recommended to satisfy the heating and cooling requirements.
Solar Thermal	Yes	No	Roof area utilised by solar thermal panels would be more effectively utilised by PV panels from a carbon reduction perspective.
Biomass	Yes	No	Biomass heating requires additional plant space, with fuel delivery logistics and local air pollution issues to consider.
Wind Power	No	No	Not viable due to the urban nature of the development.
PV	Yes	Yes	Viable and recommended technology for this development to meet planning requirements.

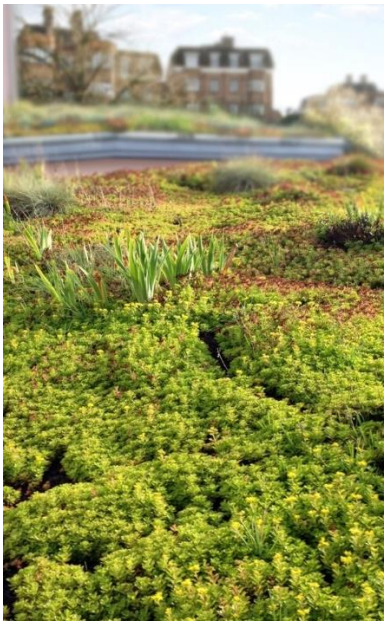
7 RECYCLING AND WASTE

Storage areas with sufficient space will be provided for waste and recycling.

The management of waste will be considered through the lens of the building's lifetime, from design, through construction, in operation, and end of use.

A site waste management plan will be agreed prior to commencement of works, putting in place strategies that will minimise sending waste to landfill, relying on the recycling and reuse of materials.

8 BIODIVERSITY



Development should be designed to minimise any potential adverse impacts on biodiversity, the natural environment and historical assets.

Clearance of any vegetation should be timed to avoid bird nesting season. Any clearance or relevant demolition during the typical bird nesting season should be preceded by a nesting bird check. New bird nesting features, including nest boxes suitable for swift and house sparrow, should be delivered within the proposed scheme.

9 POLLUTION

The proposed development will look to minimise its impact upon on the environment.

Acoustic study will be carried out for the noise assessment.

Impact of refrigerants will be minimised by selecting the refrigerant with low global warming potential.

Light pollution caused by developments can impact upon neighbours and wildlife. Any lighting associated with proposals should be designed following appropriate guidance described in the Institute of Lighting Engineers and Bat Conservation Trust join guidance document for the reduction of obtrusive light. This includes directional lighting, appropriate luminescence and protection from light spill and will ensure that all lighting is designed, operated and maintained under best practice conditions to minimise impact light pollution impact on wildlife.

10 SUSTAINABLE MANAGEMENT

The management of the site during construction is of paramount importance. Putting in place appropriate management strategies the Considerate Constructors scheme will be used to ensure the site is managed in an environmentally and socially acceptable manner, with the contractor responsible and accountable for this good practice.

11 MATERIALS

Materials with a low environmental impact will be specified where viable and available. Guidance documents, such as The Green Guide to Specification, and Environmental Product Declarations (EPDs), can be used to guide the design team in the selection and specification of materials making their environmental impact known. The contractor should implement a procurement plan, allowing the team to monitor and track the sourcing of materials used. Materials with a high recycled content, locally sourced, with a low global warming potential, and low or zero VOCs are to be prioritised.

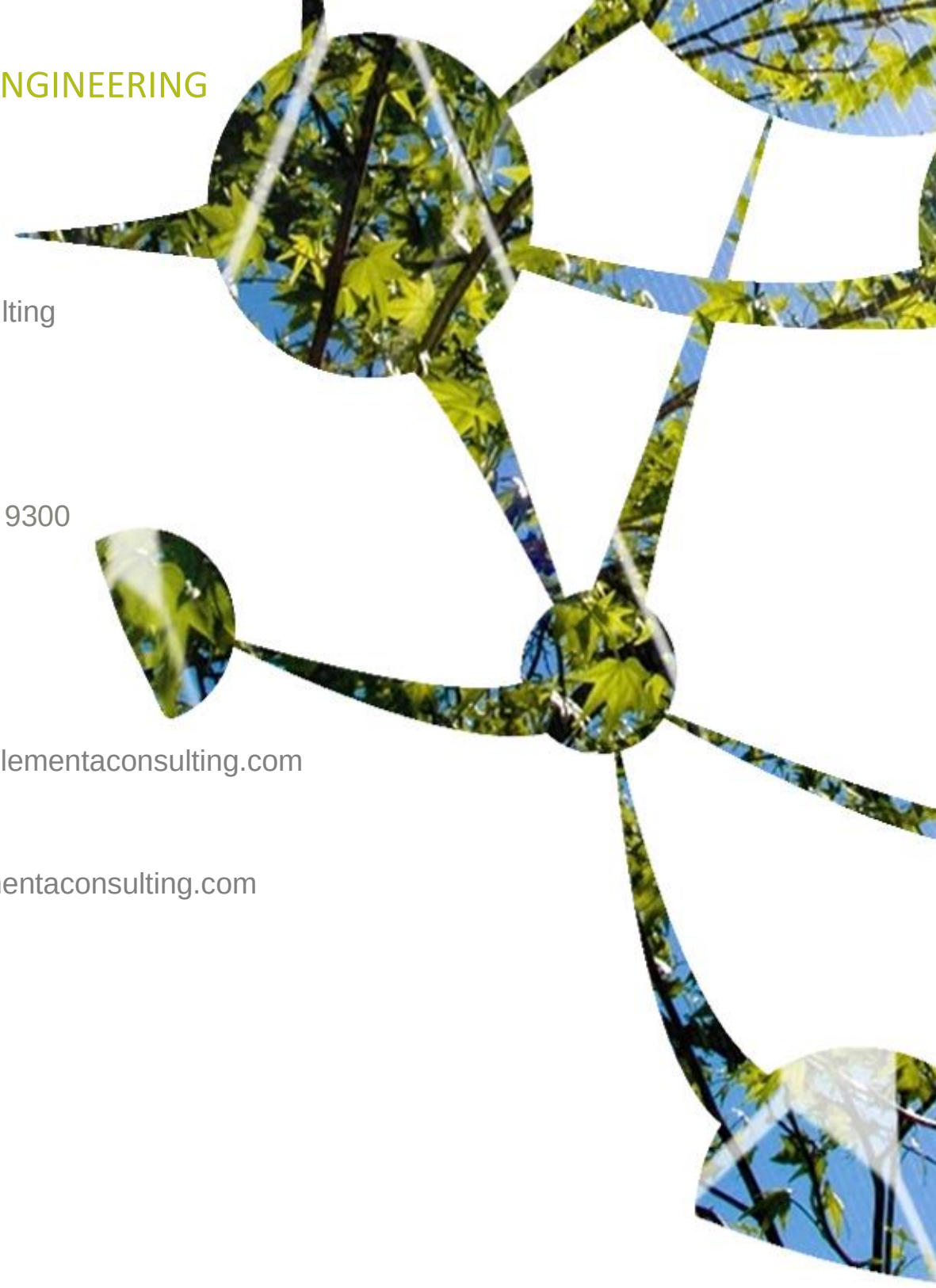
12 CONCLUSIONS

The sustainability measures described in this report will enable the development to:

- **Meet the requirements of Part L2A of the Building Regulations (2013 edition incorporating 2016 amendments).**
- **Satisfy 'London Plan' requirements regarding on-site renewables by installing air source heat pumps and solar photovoltaics.**
- **Meet 'London Plan' carbon reduction target by reducing on-site emissions by 35% beyond Part L 2013 with the use of renewables and energy efficient design.**
- **Satisfy 'London Plan' water consumption requirements with the use of efficient fixtures, fittings, sanitary ware and appliances, and possible use of rainwater harvesting and greywater re-use.**
- **Minimise adverse impact on biodiversity with bird-nesting measures.**
- **Facilitate low carbon transport by providing a bike store for staff.**
- **Minimise the embodied carbon of the building by prioritising low environmental impact and locally sourced building materials.**

DEEP GREEN ENGINEERING

BUILDING SERVICES & ENVIRONMENTAL



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