



SUSTAINABILITY

6

6.1 Sustainability Strategy Summary

Summary

The sustainability strategy for the new development of the Amethyst Lane is to meet or exceed the highest quality standards including national, regional and local RBC sustainability targets.

The vision for the proposals is a 'triple bottom line' approach which integrates environmental, social and economic sustainability. The proposed development will provide all residents with an opportunity to live a healthy, secure and affordable life. The approach puts people at the centre creating a local area with a distinctive character with communal green spaces. The homes, internal and external spaces and the other facilities will support residents in improving their quality of life and creating a sustainable lifestyle.

The proposals aim to provide residents with warm, sustainable homes with manageable energy costs. This will be achieved through a holistic sustainability framework comprising;

- Achieving Net Zero carbon in operation
- Incorporating Passivhaus design principles: where possible;
 - Building orientation,
 - High fabric performance
 - Low air tightness targets
- Renewable energy sources
- Reduction of the energy use intensity
 - Highly performing systems for heating and hot water
 - On-site renewable energy generation
- Reduced potable water use

Full details of the proposals can be found in the separate submitted reports by HTA;

- Sustainability Statement
- Energy and Overheating Statement

Zero Carbon

The climate emergency demands urgent action to ensure that new buildings deliver net zero whole life carbon. The RIBA 2030 Climate Challenge is used as a best practice guide, and sets additional targets which take into account the latest recommendations from the Green Construction Board for including the following metrics: operational energy, embodied carbons, potable water use, and best practice health metrics such as overheating, daylight and air quality.

- RIBA 2030 Climate Challenge
- LETI Climate Emergency Design Guide
- UKGBC Net Zero Carbon buildings

Operational energy

The operational carbon is arguably the most direct consistent environmental impact that a building has throughout its life cycle. The operational energy and the associated CO₂ emissions are directly related to the ways in which we occupy and interact with buildings. In the context of the climate emergency, there is an urgent need to limit these ongoing impacts. The buildings need to be designed to be highly efficient and to meet the zero carbon standard.

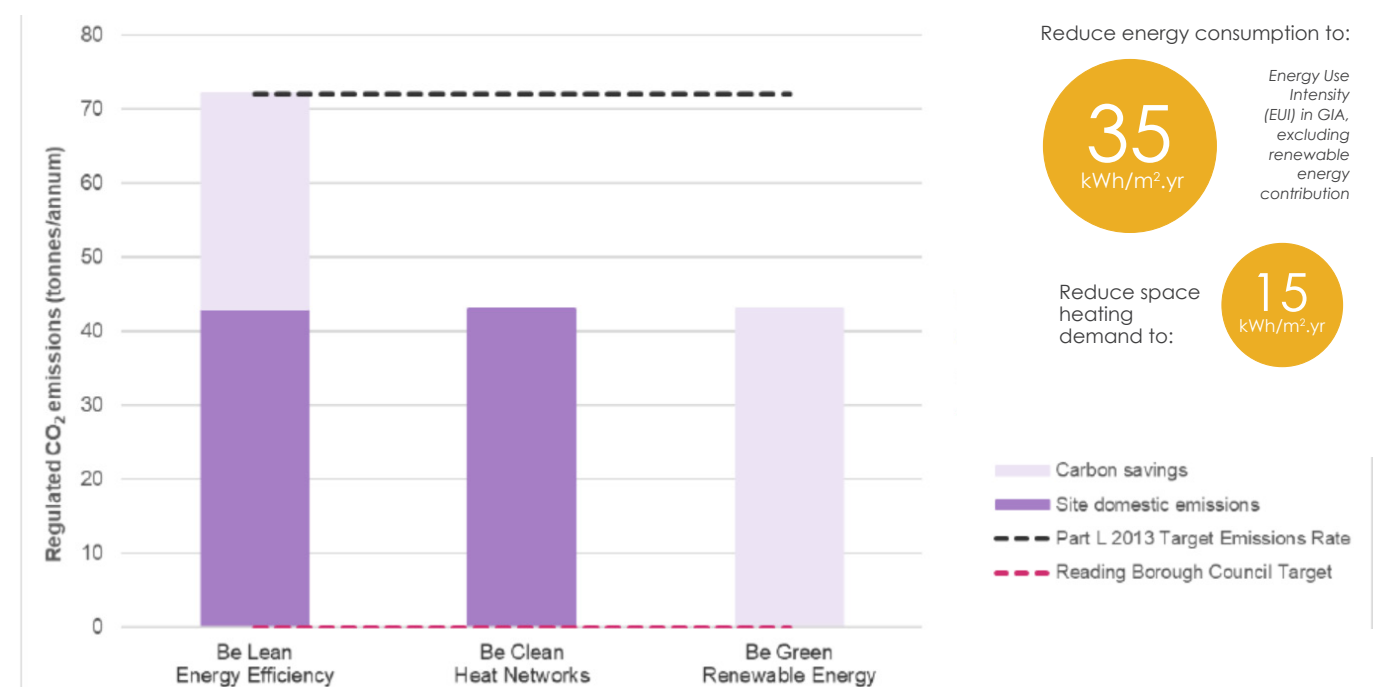
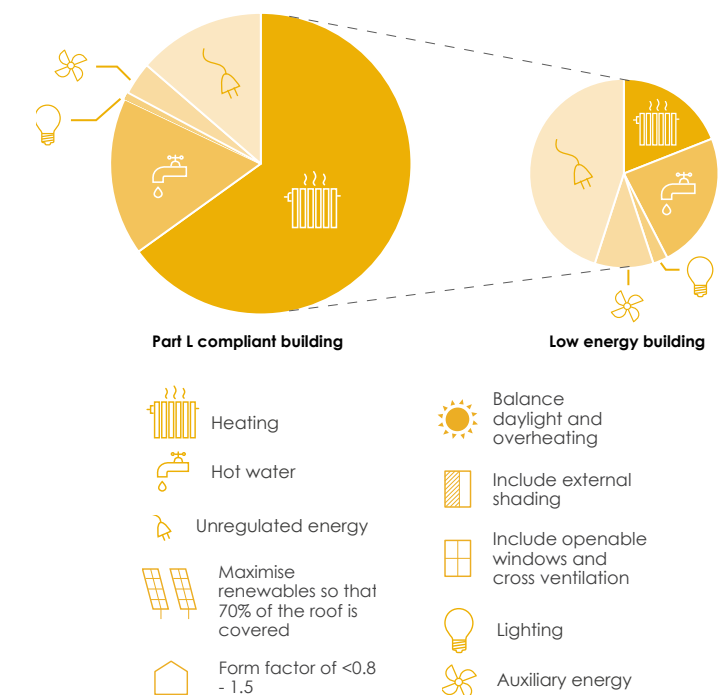
- Orientation
- Passive measures
- Enhance U-values
- Highly performing glazing
- Low air tightness
- Reduction of the energy use intensity

Passivhaus principles

The proposals have followed PassivHaus principles where possible as a best practice guide to achieving net zero. Much of these are addressed in wider targets to achieve net zero but

considerations include;

- Buildings oriented to maximise free heat in winter from solar gains with predominant façades facing south and limited overshadowing
- Create simple building forms for the warm spaces with a low exposed surface area
- High levels of insulation
- An extremely airtight building fabric
- Significantly reduced thermal bridges
- High performance triple glazed windows with window proportions that are based on orientation (to reduce heat loss and maximise solar gain)
- Opening windows for natural purge ventilation, with the ability to cross ventilate
- Efficient background mechanical ventilation with heat recovery (MVHR)



The Energy Hierarchy
Image reference: LETI climate emergency design guide

6.2 Building Fabric Performance

Be Lean, Be Clean, Be Green

Be Lean

The first step addresses reduction in energy use, through the adoption of fabric, servicing improvements and the incorporation of flexibility measures.

The proposed development will incorporate a range of energy efficiency measures including levels of insulation exceeding current Building Regulation requirements, the installation of high performance glazing, energy efficient lighting and efficient MVHR system for general ventilation purposes in all habitable spaces.

Be Clean

The possibility of employing a decentralised energy network was investigated but no current or future decentralized energy schemes were identified within the vicinity of the site.

Be Green

All homes and the Respite Care Facility are proposed to use Air Source Heat Pumps (ASHPs) to provide both hot water heating and heating for an indoor space. The use of ASHP would allow the development to reduce its carbon emissions and contribute to reducing poor air quality. The units will be located as either fully internal units, or with external units located in rear gardens.

Photovoltaic panels (PVs) will be installed on the roof. The full electric HVAC design solutions will be benefited from the future de-carbonisation of the grid. PVs provision has been maximised.

Proposed Specification

Element	Value	Additional information
External walls	0.13 W/m2K	
Sheltered walls	0.18 W/m2K	
Party walls	0.00 W/m2K	Filled cavity with Edge Sealing
Roof	0.11 W/m2K	
Exposed floors	0.10 W/m2K	
Windows	0.8 (g-value 0.5) W/m2K	Triple Glazing low-E hard 0.15
Entrance door	1.00 W/m2K	Solid door
Thermal bridging	Calculated values	
Air permeability	1 m3/hm2 @ 50 Pa	
Heating and Hot Water	Efficiency: 350 Individual ASHP to houses and flats	ASHPs located in rear gardens or integral within the interior of each home.
Water use	< 95 litres/person/day	
Renewable energy	PV panels (1kW per dwelling)	Orientation: varies according to building Elevation: 30 degrees Overshading: modest
MVHR	Heat Recovery 90% SFP	
Lighting	Low Energy LED	

Thermal Bridging - Assumed Values

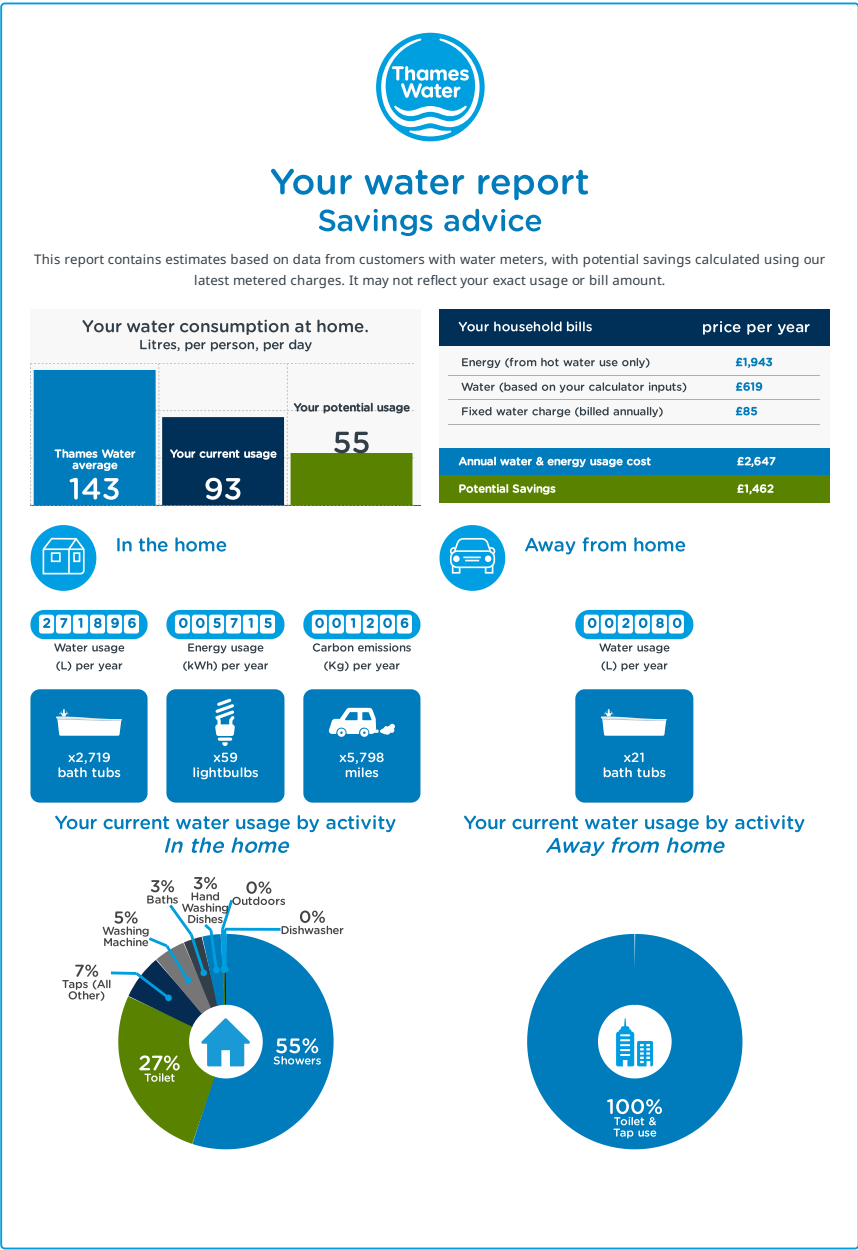
House		Source Type	Psi (W/mK)
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.003
External wall	E3 Sill	Independently assessed	0.020
External wall	E4 Jamb	Independently assessed	0.020
External wall	E5 Ground floor (normal)	Independently assessed	0.268
External wall	E6 Intermediate floor within a dwelling	Table K1 - Default	0.140
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.080
External wall	E18 Party wall between dwellings	Table K1 - Default	0.240
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Table K1 - Default	0.480

6.3 Water Use Estimation

The standard water use is usually estimated at <= 125 litres/person/day. The RIBA 2030 climate challenge suggests that the water use should be reduced to <95 litres/person/day for 2025 targets.

The new dwellings will reduce the use of potable water to below 95 litres/person/day using water efficient fitments. A down pipe is proposed to the rear of every house to provide the opportunity for rainwater collection for gardening purposes.

The adjacent Thames Water report contains estimates based on the estimated inputs into the calculator and suggest a target of <95l per home will be achievable. The inputs are dependent to the occupant's behaviour. It may not reflect the exact usage or bill amount



Water Use Estimation Tool

Your top tips	You selected:	Savings
☒ Use your dishwasher's ECO setting.		Using the eco setting on your dishwasher could save you up to 10 kWh and £4 a year
☒ Wash your car with a bucket & sponge		Washing your car with a bucket & sponge could save you up to 912 litres and £2 a year
☒ Use a watering can in your garden		Using a watering can in your garden could save you up to 270 litres and £1 a year
☒ Reduce the time spent in the shower Your current time in the shower: 15 minutes	4 minutes	Reducing to 4 minutes in the shower could save you 109,824 litres, 3,514 kWh, and £1,445 a year
☒ Cooler wash temperature Your current temperature: 40 degrees	30 degrees	Reducing your wash temperature to 30 degrees could save you 33 kWh and £11 a year
Total estimated savings:		111,006 litres of water, 3,558 kWh of energy, £1,462 per year

6.4 Photovoltaics

The adjacent roof plan demonstrates the implications of the current energy strategy, aligning with Passivhaus principles to provide PV panels equitably across roofs to all homes

Where a roof is flat, and in order to achieve +10% Biodiversity net gain to meet emerging RBC policy, it is proposed that it can be an extensive green roof with PV panels.

Example system - Bauder BioSOLAR, with "Flora 3 Seed Mix"

Roof Key:

- Extensive flat Green roof with PV panels
- Pitched roof with PV panels to one side

- Total Gross PV Area (m²): 793
- Total Net PV Area (m²): 475.8
- Total Peak power generated across the whole site: 9
- Efficiency per PV: 0.2
- Peak power per PV: 0.34 kWp
- PV size=1.6*1.1

Cross-Section through Green Roof with Solar, with extensive substrate buildup acting as ballast to PV's with no roof penetrations

