Carob Tree Extension

Highgate Road, Camden

Energy, Water & Ecohomes Summary Statement

Hyder Consulting (UK) Limited
5th Floor
The Pithay
All Saints Street
Bristol BS1 2NL
United Kingdom
Tel: +44 (0)870 000 3003
Fax: +44 (0)870 000 3903
www.hyderconsulting.com

Carob Tree Extension

Highgate Road, Camden

Energy, Water & Ecohomes Summary Statement

Author	Adrian Price	
Checker	Riaan Olivier	
Approver	Tony Curson	

Report No

Date 20th November 2009

This report has been prepared in accordance with the planning requirements for this type of development with regards to energy and water use on the development.

CONTENTS

Appendices

Appendix A
Ecohomes Pre-Assessment Tool (BRE COPY)

1 Summary Energy Statement Introduction

1.1 Introduction

The summary statement makes an initial assessment of the overall energy requirements of the development and the associated carbon dioxide emissions.

The calculation is carried out utilising standard solutions set by the London Renewables Toolkit. It proposes suitable energy savings and renewable energy measures in relation to key policies and guidance to mitigate the associated CO^2 emissions.

The aspirations of the development are to provide green renewable solutions to meet the 2010 GLA reductions and to also try and facilitate future improvements on this target towards the 20% target of 2020.

It is anticipated that the development will achieve a Very Good Ecohomes rating; however, the aspirations of the development are to aim for an Excellent Ecohomes Rating.

1.2 Relevant Policies

The key policy local to the site:

Government policy set out their requirement within Planning Policy Statement (PPS 22): Renewable Energy
London GLA Renewables Policy
Merton Rule

The PPS sets out the Government's objectives in relation to renewable energy. The Government is aiming for the UK to cut its carbon dioxide emissions by some 60% by 2050, and to maintain reliable and competitive energy supply. The Government has set targets to generate 10% of UK electricity from renewable energy sources by 2010, and 20% by 2020.

Increased development of renewable energy resources is seen as vital to deliver the Government's commitments on climate change and renewable energy, and to contribute to the Government's sustainable development strategy.

This energy statement is structured in 4 sections:

1.3 Greater London Authority Recommended Renewable Technologies

The London GLA has recommended the following renewable technologies as suitable for London and has produced a toolkit to aid developers in submission in planning applications to provide a basis for evaluation of different systems.

Renewable energy technologies suitable for London from GLA toolkit:

These include:

- Solar heating, using solar energy to heat water

- Solar power, using light energy such as daylight to generate electricity
- Wind, using wind energy to generate electricity
- Biomass heating, stoves or boilers running on wood or other biomass
- Biomass Combined Heat and Power plant, simultaneously generating electricity and heat, using biomass as fuel
- Ground sourced heat pumps, transferring and 'concentrating' heat from the ground to provide space and hot water heating
- Ground sourced, or borehole, cooling, using the ground or groundwater for cooling of offices and other non-domestic buildings.

The recommended system and the toolkit has been utilised in the summary energy statement for the development. The feasibility of proposed options is noted in section 3.0.

2 Summary Energy Statement - Site Analysis and Services Proposals

The proposed development is for a residential development comprising five dwellings. The development is located above a restaurant and will have its own entrance and services. The project does have the benefit of having a good southerly aspect and also a flat roof. This provides an advantage for the use of solar panels for water heating and/or flat PV (photovoltaic) systems.

Thermal standards set out in Part L of the Approved Documents of the Building Regulations 2006 will include for loft insulation and sealed double glazing.

In addition to this, the properties will benefit from an element of renewable energy to meet the GLA, Camden Borough Council and Government requirements for 2010 targets.

It is proposed to install at least 75% low energy lighting throughout (obtaining Ecohomes credits) and for the inclusion of solar collectors for solar hot water heating in the quantities estimated in table 2 and table 3. It is also proposed that a study of solar PV possibilities be allowed for in the scheme to facilitate future addition of the system to serve flats or communal distribution board.

Established Government figures for domestic buildings sets out guidance rates on Carbon Emissions Benchmarks for Domestic Buildings. The GLA have published emissions guidance rates for developments (GLA Renewables Toolkit) and this guidance has been used to estimate the size of plant.

The proposed dwelling being a suburban multi – occupancy type located in a medium density housing environment will equate to a benchmark figure of 9.04 kg/C/m²/year according to the GLA Renewables toolkit. Based on a floor area of 359.85m² gross for the residential areas of the development, this can be used to estimate emissions of (kg C0²) of 3,253 kg Carbon. The target saving of 10% is therefore established at 325.3 kgC/year. A figure of 12% is being allowed for system losses associated with the solar water heating choice of renewable technology for this development and the allowance of 12% is utilised in the table 3, section 5.0 of this report.

Utilising known manufacturers' technical data for solar collectors (e.g. Genersys 1000), collectors for the south-east or south-west orientation will provide a total Annual Carbon Benefit above this level in order to provide an installation to comply with the aspirations of the GLA and Camden Borough Council requirements.

The results of this analysis are given in section 5.0 and provide the summary of the options open to the development.

In addition, each dwelling aspires to be fitted with energy efficient lights and A+ rated white good appliances, so as to reduce electrical demand. As confirmed by the BRE, these measures will reduce electrical demand by 10%.

The proposed main source of heating is proposed to be an air source heat pump system served from the local electrical distribution for each flat. The heat pump will serve the domestic water and heating requirements and be linked to the solar panel system located on the roof to provide a complete efficient system. The system will include an interface with the solar water collectors and incorporate the technology into the control of water temperature in domestic hot water storage cylinders located in cupboards in each flat.

A sustainable approach to the water supply to each flat is also proposed and appliances and fittings to encourage low water use are to be specified. A water reclamation system is an aspiration of the development and will be proposed to be situated to suit the down pipes from the roof.

The development is also to include a form of green roof matting that will improve the ecology of the development and assist in the Ecohomes aspirations of the development. The green roof will have the following benefits:

1. Attracts Wildlife
A food source for butterflies, bees and many other insects
A safe place for mini-beasts to live and to overwinter
Birds feed on insects and seed heads
Dead stalks/flower stems are used by birds as nesting material
Helps to increase biodiversity

2. Drought Tolerant
Sedum plants need minimal watering
Containers etc can safely be left untended while you are on holiday

3. Low Maintenance
No need for mowing or dead-heading - saves time and mower fuel
Feed only once a year - saves time and money, no excess nutrients to leach into water courses

4. Absorbs Carbon Dioxide
Helps reduce global warming
Improves air quality by releasing oxygen

5. Filters dust and pollutants from the air

The green roof will assist in surface run off and reduce the run off to the public system in times of peak capacity.

3 Renewables Options – Feasibility

The following renewable energy sources are considered within GLA's Renewables Toolkit to have the potential to be employed on developments within the London region.

Stand Alone Wind Turbines.
Roof Mounted Wind Turbines.
Solar Photovoltaic (PV) panels.
Solar Thermal Systems.
Ground Source Heating.
Ground Sourced Cooling.
Biomass Heating.
Fuel Cells.

There are various location and physical factors particular to the site at the Carob Tree which will influence the choice of renewable technologies which need to be considered, these include, but are not limited to:-

The compact or 'tight' nature of the site.
It is a suburban development of medium density flats/apartments
Budget cost limitations.
The close proximity of other premises.

Feasibility of Ground Source Heating and Cooling Systems

The dwellings development at Carob Tree does not have a cooling load, which makes ground source heating and cooling unfeasible because a balanced heating and cooling load does not exist. Therefore, a ground source heat pump system is not proposed for this development. The GLA Toolkit does not preclude this from the options available to the building reference type and as such it is not considered in the toolkit assessment table 3 in section 5.0. It is however, noted in GLA policy that ground source should be restricted to commercial developments in the toolkit guidance. The costs of the system when weighed against the other options are not commercially viable. There is also the problem of designing a borehole into the existing ground floor restaurant that is outside the parameters of the dwellings development and also the lack available land for running pipe work, slinkies in the ground or a space for a suitable pump house.

Feasibility of Stand Alone and Roof Mounted Wind Turbines

The average wind speed on the site is not sufficient for the application of this technology. Stand alone wind turbines would also increase the noise levels of the development which would not be acceptable to the Environmental Health Department perhaps. The close proximity of dwellings adjacent to a suitable roof site is also concerning and this is the main reason to not consider this system as viable. Therefore, this technology is not proposed for this development.

The costs are also noted as attractive as noted in table 3. The prime use could be for landlord/freeholder areas; however, the loads in these areas are not large enough to justify the costs of wind turbine technology

Feasibility of Fuel Cells

The majority of fuel cell applications are in the US, Australia and Japan with very few installations currently within the UK of which these are only pilot demonstration projects. It is considered that due to the lack of expertise in the UK and lack of available spare parts and local labour with expertise on these systems then the risks are too high to use on this development. This situation with this particular technology and in particular Australian companies are marketing the technology in the UK.

Feasibility of Solar Photovoltaic (PV) Panels

The integration of roof mounted PV panels would deliver a reduction in the total annual carbon dioxide emission for the development.

The extent of the roof mounted PV panels required to achieve minimal reduction is estimated in the table in section 5.0 and is a feasible option. It would require careful consideration to integrate them into the development. Due to the relatively low amounts of landlord areas and services, there is limited opportunity to make used of this technology, without significantly complicating the design and apportioning areas of PV panels to individual flats. There is a limited amount of roof space available for building services and this available space is insufficient for PV panels alongside the proposed Solar Thermal systems. The capital cost of each system has been estimated in accordance with GLA Renewables toolkit guidance.

Feasibility of Biomass Heating

A biomass boiler would be a potential method of achieving a CO^2 reduction through the use of renewable technology, however due to onsite constraints (space for fuel storage) and site location within London (logistics for regular fuel deliveries) this is not considered a viable option for the development. A space for suitable store for a small community system is not allowed for on plans. A management company would need to be employed and for such a small application of just five flats this is not considered as commercially viable.

Feasibility of Solar Thermal Systems

Approximately $2m^2$ of solar hot water heating panels is proposed to be installed for each flat on the first and second floors and $4m^2$ for the third floor larger flat. Panels are proposed to be located on the roof of the building. This will reduce the development total carbon dioxide emission as estimated in the results of section 4.0. With a good selection of equipment some manufacturers are stating that 1 tonne CO^2 is possible in savings for a 2 bed household, however, a more realistic estimate is made in the toolkit and the results.

Space needs to be provided for safe access onto the roof and around the solar collector panels for installation and maintenance. All panels are proposed to be of the evacuated tube type, orientated south and at an angle of 30º to the horizontal. It has been assumed for the purpose of this report, that there would be minimal (<20%) shading from surrounding environment.

Should the installation deviate away from any of these parameters, then the area of solar panels will need to be re-calculated to ensure the required energy contribution (CO^2 saving) is still achieved.

The inclusion of solar hot water generation will be proposed for this development and it has been advised that this should be incorporated into an integrated heat pump system serving the heating and hot water requirements only of the flats. No cooling is recommended to be served from such heat pump technology on this development to the dwellings.

4 Calculations to ascertain development carbon emissions and 10% target.

The building emissions have been calculated from the recommended rates set down in the GLA toolkit guidance.

The London Renewables Toolkit indicates that the benchmark most suited for this development is for London Toolkit reference 151F and this emissions rate has been used to estimate the carbon footprint of the development. The summary table confirms that the minimum annual carbon saving required to meet the benchmark GLA requirements 325.5kgC/year.

Table 1

Dwelling Type	Floor Area	Benchmark Emissions (London Renewables Toolkit Target Rate	Total Expected Annual Dwelling Emissions
FF 2 Bed – 1a	68.3 m²	0.00904 tonnesC/m²	0.617 tonnes C
FF 2 Bed – 1b	62.3 m²	0.00904 tonnesC/m²	0.563 tonnes C
Second 2 Bed – 2a	61.2 m²	0.00904 tonnesC/m²	0.553 tonnes C
Second 2 Bed – 2b	62.3 m²	0.00904 tonnesC/m²	0.563 tonnes C
Roof – Penthouse - 3	105.75 m²	0.00904 tonnesC/m²	0.956 tonnes C
Total Gross Floor Area (GIFA)	359.85 m²		3.253 tonnes C

Low or Zero Carbon Energy Technologies chosen for this development

The following table for the estimated solar water heating load is base are based on technology supplier information for flat plate solar collectors (Genersys '1000'). Many systems are available, however, the minimum requirements are now given in the table and these must be adhered to when selecting the solar panels when the system is specified.

Solar Panel Summary – Table 2

Technology	Dwelling	Panel rating minimum (tonnes Carbon) –Benchmark Estimates – based on dwelling areas for a 12% saving	Anticipated area of panels (to be confirmed by installer) – for cost estimate in toolkit table
Solar Hot Water Collectors	First Floor – 1a	0.074 tonnes C/year	2 m²
Solar Hot Water Collectors	First Floor – 1b	0.067 tonnes C/year	2 m²
Solar Hot Water Collectors	Second Floor – 2a	0.066 tonnes C/year	2 m²
Solar Hot Water Collectors	Second Floor – 2b	0.067 tonnes C/year	2 m²
Solar Hot Water Collectors	Third Floor - 3	0.114 tonnes C/year	4 m²

5 Outline of technology selected and how 10% carbon savings will be achieved in accordance with the London Plan Merton Rule.

Table 3 – London Plan Toolkit Summary of Scenarios (Red – not preferred/not feasible, Green – Renewable System Recommended, Amber – Possible)

RES Options	Reference Development		Renewable Energy Systems						Scenario Summary		
	Annual Carbon Use (kgC/ m²)	Build Cost Rate	Size	Annual Carbon Saving		Capex rate (extra)		End use demand (met)	% Increase on base build	System size per dwelling	Total Cost
				KgC/ m² GIFA	%	£/kW	£ / m²	(%)	%	kW	£
a. Ground Source Heat Pumps	9.04	£1,100	0.033 kW/m2 GIFA	1.32	14.6%	1000 £/kW		peak SH (50%), annual SH+DHW (85%)	£15,000 of £395,835 = 3.78%	3.0kW	£410,835
c. Biomass Heating	9.04	£1,100	0.145 kW/m2 GIFA	4.49	49.7%	200 £/kW		annual SH+DHW (100%)	£8,000 of £395,835 = 2.02%	8kW	£403,835
e. Solar Water Heating	9.04	£1,100	0.035 m2/m2 GIFA	1.08	12.0%		400 £/m²	Annual DHW (50%)	£4,800 of £395,835 = 1.21%	2 m² for 1a,1b,2a,2b, 4 m² for flat 3	£400,635
fi. PV Rooftop	9.04	£1,100	0.040 m2/m2 GIFA	0.45	5.0%		850 £/m²	Elect.	£12,750 of £395,835 = 3.3%	2.5 m² for 1a, 1b, 2a,2b, 5 m² for flat 3	£408,585
	9.04	£1,100	0.08 m2/m2 GIFA	0.90	10.0%		850 £/m²	Elect.	£23,630 of £395,835 = 5.9%	4.8 m² for 1a,1b,2a,2b, 8.6 m² for flat 3	£419,465
	9.04	£1,100	0.120 m2/m2 GIFA	1.36	15.0%		850 £/m²	Elect.	£35,190 of £395,835 = 8.89%	7.2 m² for 1c,1b,2a,2b, 12.6 m² for flat 3	£431,025
g. Wind	9.04	£1,100	0.0016 kW/m2 GIFA	0.45	5.0%	2000 £/kW		Elect.	£1150 of £395,835 = 0.2%	575 W overall,115 W per flat	£396,985
	9.04	£1,100	0.0031 kW/m2 GIFA	0.90	10.0%	2000 £/kW		Elect.	£2300 of £395,835 = 0.58%	1115 W overall, 223W per flat	£398,135
	9.04	£1,100	0.0047 kW/m2 GIFA	1.36	15.0%	2000 £/kW		Elect.	£3382 of £395,835	1691W overall, 338W per flat	£399,217

Scenario Description (To be read in conjunction with the table):

Medium density suburban development probably with a mix of individual houses and low-rise multi-residential and row houses.

Notes to the table:

1 Both renewable energy system data and reference development costs are quoted on the basis of Gross Internal Floor Area (GIFA)

2 Biomass heating – system costs does not allow for distribution from a central boiler – individual systems per dwelling only

3 PV: Several different types of PV are available with varying costs and performance characteristics. Site specific costs will depend on system selection.

4 Wind: The use of wind generators will require detailed site analysis

5 Wind: It is assumed that private wire is not practical due to market regulations so power generated is exported to the grid. However, renewable energy generated from sources within the curtilage of the site can be included in calculations of carbon emission reductions.

6. The budget cost estimates are as indicated from the GLA Renewables toolkit and are for comparison purposes only. The final budgets for the project are subject to confirmation by the developer. The budgets offer guidelines that the GLA expect to be quite accurate for estimation purposes and provide a tool for early evaluation of renewable options of a project and offer a guide as to how a project value will vary when considering different scenarios.

6 Sustainable Water Use

It is proposed that the Ecohome Water credits are sought as a sustainable benchmark for the development.

A summary of the proposed requirements for dwellings consumption is given below:

Table 4 - Ecohomes Guidance on Water Use (Highlighted proposal for Carob Tree dwellings) Note – Blue highlights proposed consumption:

Reference	Estimated Water Consumption	Daily Equivalent	Credit
WAT1 – Internal Water Use	Less than or equal to 52 m³ per bedspace per year	142.5 litres/person	1.5
WAT1 – Internal Water Use	Less than or equal to 47 m³ per bedspace per year	128.8 litres/person	3.33
WAT1 – Internal Water Use	Less than or equal to 42 m³ per bedspace per year	115.0 litres/person	5.0
WAT1 – Internal Water Use	Less than or equal to 37 m³ per bedspace per	101.4 litres/person	6.66
WAT1 – Internal Water Use	Less than or equal to 32 m³ per bedspace per year	87.7 litres/person	8.33
WAT2 External Potable Water Use	Rain water collection system for watering gardens and landscaped areas	Applicable for only 2 flats	1.67

The Ecohomes Assessment was replaced with the Code for Sustainable Homes (for new dwellings only in England); however the Ecohomes XB remains to evaluate the existing stock in England. Guidance in the Code for Sustainable Homes, however, will assist in meeting the sustainable water use aspirations on the Carob Tree Development.

From the lowest Ecohomes criteria it is seen that in order to meet a scoring criteria then a maximum of 104 m³ for a 2 bedspace apartment is required. This gives a daily consumption rate of 142.5 litres/person/day. It can be seen from the Code for Sustainable Homes summary table that this would not obtain a score for this code. It is proposed that the water services specification should meet Ecohomes 3.33 credits minimum and meet Code for Sustainable Homes Code Level 1 and 2 criteria.

Code Level 1 and 2 is proposed to be utilised as a specification recommendation and this gives an annual consumption of 43.2 m³ per bedspace per year and meets the Ecohomes credit criteria for 3.33 credits.

Table 5 Code for Sustainable Homes Specified Guidance (Note - highlighted blue is proposal for Carob Tree dwellings):

Code Level	Estimated Water Consumption litres/person/day	Specification	Code Points
1 and 2	120	1 or 2 no × 6/4 litre flush toilets 4 × taps with flow regulators 1 × shower 6 to 9 litres/min 1 × standard bath (80 litres per use) 1 × standard washing machine** 1 × standard dishwasher**	1.5
3 and 4	105	As above, except: 1 × 8 litres/min in shower 1 × smaller shaped bath 1 or 2 no × 4/2.5 litre flush toilets	4.5
5 and 6 Apartments	80	As above, except: add communal greywater recycling or rainwater harvesting system (30% reuse)	7.5

7 Ecohomes Summary Statement

Table 6 is a summary of the pre-assessment document for reference that will be utilised to obtain a VERY GOOD rating of 58 credits for the Carob Tree dwellings. The development aspires to be EXCELLENT with 70 credits. (A BRE actual copy of the document is included in Appendix A)

The assessment indicates the outstanding information that will be needed to obtain the credits on appointment of a registered assessor. These documents are to be submitted to the BRE by a registered assessor and are presented in the evidence column of Table 6

Table 6 Ecohomes Pre-Assessment (Note Green – can be awarded, Red – no credit achievable, evidence highlighted amber indicates outstanding deliverables

Issue	Description	Target	Credit Aim	Evidence
Ene 1	Dwelling Emission Rate	Less than or equal to 9.04 kg/m2/yr (as noted in the London Renewables Toolkit)		SAP Calculations to be submitted to the registered assessor.
Ene 2	Building envelope performance	Where the HLP (heat loss parameter) is less than or equal to 2.2 W/m2K		Calculations to be submitted to the assessor.
Ene 3	Drying Space	Included on plans		A drying/airing cupboard is included in each dwelling and will include hot water cylinder also for heat.
Ene 4	Eco Labelled white goods	All washing machines, and dishwashers where supplied, with an A rating and washer dryers and tumble dryers with a rating of B or higher. & All fridges, freezers, fridge-freezers with an A+ rating		A specification will be provided to the registered assessor.
Ene 5	Internal Lighting	Where 75% dedicated low energy lights have been specified.		A specification will be provided to the registered assessor.
Ene 6	External Lighting	All space lighting is specifically designed to accommodate only compact fluorescent lamps (CFL)		Specification to be provided.
Ene 6	External Lighting	All intruder lighting to be 150 watts maximum and be fitted with PIR and day light sensor and all other type of security lighting to accommodate CFLs or fluorescent strips only and be fitted with dawn to dusk sensors or timers		Specification to be provided.

Issue	Description	Target	Credit Aim	Evidence
Tra 1	Public Transport - Urban and suburban areas	80% of the development within: 1000m of a 30 min peak and an hourly off peak service		100% of the development is within 50m of 30 minute peak bus services and 900m of Gospel Oak Station
Tra 2	Cycle storage	Provision of cycle storage for: 95% of dwellings		A two tier 6 bike storage rack is indicated on plans in communal hallway.
Tra 3	Local Amenities	Proximity to local amenities: Within 500m of a food shop and post box Within 1000m of 5 of the following: food shop* postal facility, bank/ cash machine, pharmacy, primary school, medical centre, leisure centre, community centre, public house, children's play area, place of worship, outdoor open access public area. Safe pedestrian routes to the local amenities		The development is within 100m of Hampstead Heath park, within 50m of a pharmacy, the dwellings are above a licensed restaurant, within 50m of a post box, within 100m of a church.
Tra 4	Home office	Provision or space for a home office - not included	NIL	
Pol 1	Insulation ODP and GWP	Specifying insulating materials, that avoid the use of ozone depleting substances and have a global warming potential (GWP) of less than 5 or more (and an ODP of zero), in either manufacture or composition, for the following elements: Roof (incl. loft hatch), Wall – internal and external (incl. all doors, lintels and all acoustic insulation). Hot water cylinder (incl. pipe insulation and other thermal store)		The architect is to specify suitable components for the building construction. Lagging specification to the hot water specification is to ensure it meets this criteria.

Issue	Description	Target	Credit Aim	Evidence
Pol 2	NOx emissions	95% of dwellings throughout the development must be served by heating and hot water systems with an average NOx emission rate of less than or equal to the levels listed below.	NIL	Main form of heating derived from electricity (heat pump technology)
Pol 3	Reduction of surface runoff	Where rainwater holding facilities and/or sustainable drainage techniques are used to provide attenuation of water run off to either natural watercourses and/or municipal drainage systems, by 50%* in areas of low probability of flooding, 75%* in areas of medium flood risk and 100%* in areas of high flood risk, at peak times from: Hard surface runoff Roof surface	NIL	No systems specified
Pol 4	Renewable and Low Emission Energy Source	Where evidence provided demonstrates that a feasibility study considering renewable and low emission energy has been carried out and the results implemented. AND Where evidence provided demonstrates that the first credit has been achieved and 10% of total energy demand for the development is supplied from local renewable, or low emission energy, sources OR Where evidence provided demonstrates that the first credit has been achieved and 15% of total energy demand for the development is supplied from local renewable, or low emission energy, sources		The energy statement recommendations contained in this report are to be implemented in order to obtain these credits.

Issue	Description	Target	Credit Aim	Evidence
Pol 5	Flood Risk Mitigation	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding.		The development is not located in the flood plain according to the latest Environmental Agency Flood Map.
Mat 1	Environmental Impact of Materials	The following elements obtaining an A rating from the Green Guide for Housing: Internal Partitions Windows		Other elements are based on the existing construction and cannot be awarded. Specifications on the noted elements will need to be passed to the registered assessor.
Mat 2	Responsible sourcing of Materials: Basic Building Elements	Where the majority of materials in the following basic building elements are responsibly sourced. 1. Frame 2. Ground Floor 3. Upper floors (including any loft boarding) 4. Roof (structure and cladding) 5. External walls (including external cladding) 6. Internal walls (including internal partitions) 7. Foundations/substructure 8. Staircase (including the tread, rises and stringers)	NIL	The building is based on the existing structure (materials). The possibilities of responsible resourcing will be further evaluated for each new building item and BREEAM multi-dwelling guidance will be sought on possible new components.

Issue	Description	Target	Credit Aim	Evidence
Mat 3	Responsible sourcing of Materials: Finishing Elements	Where the majority of materials in the following secondary building and finishing elements are responsibly sourced*: 1. Stair (including handrails, balustrades, banisters, other guarding/rails (excluding staircase)) 2. Window (including sub-frames, frames, boards, sills) 3. External & internal door: (including sub-frames, frames, linings, door) 4. Skirting (including architrave, skirting board & rails) 5. Panelling (including any other trim) 6. Furniture (including fitted; kitchen, bedroom, and bathroom) 7. Facias (soffit boards, bargeboards, gutter boards, others) 8. Any other significant use		The specifications for items will be presented to the registered assessor
Mat 4	Recycling Facilities	Recycling of Household waste Provision of Internal Storage		Internal refuse storage is indicated on plans specifically for the flats
Wat 1	Internal Potable Water Use	Less than or equal to 47 m3 per bedspace per year		This is the target for sustainable water as noted in the sustainable use of water section of this report. The specification for suitable appliances will need to be submitted together with supporting calculations to the registered assessor.
Wat 2	External Potable Water Use	Rain water collection system for watering gardens and landscaped areas		The possibility of a suitable system is to be evaluated in the detail design.

Issue	Description	Target	Credit Aim	Evidence
Eco 1	Ecological value of site	Building on land which is inherently of low ecological value		As the building works are above an existing pub then this credit should be awarded by default.
Eco 2	Ecological enhancement	Enhancing the ecological value of the site through consultation with an accredited expert		An Ecological Expert will need to advise on the anticipated additional flora and fauna. The enhancements provided by the green roof are expected to be high.
Eco 3	Protection of ecological features	Ensuring the protection of any existing ecological features on the site		The contract documentation will require clauses to ensure local fauna and fauna are protected. The developer will need to check the buildings for any nesting animals or birds and ensure these are not affected.
Issue	Description	Target	Credit Aim	Evidence
Eco 4	Change of ecological value of site	A change of between –9 and –3 species A change of between –3 and +3 species A change between +3 and +9 species A change of greater than +9 species		As the development does not have a detrimental effect on the ecology and is built on an existing brown site then this credit is expected to be awarded. The green roof will also add numerous species to the building. An Ecological Expert will need to advise the registered assessor, however, additional species are anticipated as greater than 9.

Issue	Description	Target	Credit Aim	Evidence
Eco 5	Building Footprint	Where the total combined Floor area: Footprint ratio for all houses on the site is greater than 2.5:1		The flats footprint is c2.75:1 according to areas on plans submitted
Hea 1	Daylighting	Provision of adequate daylighting, according to BS 8206:pt2 in: In the kitchen In living rooms, dining rooms and studies View of sky in all above rooms		No room depth is greater than 8m and therefore table 1 of BS8206-2-2008 is complied with as more than 20% of external wall area is indicated on sections and plans as a window area. A view of the sky is also available in all rooms. All credits should be awarded in this category.
Hea 2	Sound Insulation	1.75, 3.5, 5.25 or 7.00* where pre-completion testing is carried out to comply or improve on performance standards in Approved Document E (2003 Edition, Building Regulations England and Wales). * BREEAM guidance will need to be sought.		Sound tests will need to be submitted to the registered assessor. Evidence on building regulations compliance will need to be presented.
Issue	Description	Target	Credit Aim	Evidence
Hea 3	Private space	Provision of private or semi private space	NIL	Less than 50% of dwellings have balconies.

Issue	Description	Target	Credit Aim	Evidence
Man 1	Home User Guide	Where evidence can be provided to demonstrate that there is provision, in each home, of a simple guide that covers information to the 'non-technical' tenant/occupant on: The environmental performance of their home Information relating to the site and surroundings		BREEAM Ecohomes requirements on the documents will need to be submitted to the assessor to achieve these credits.
Man 2	Considerate Contractors	Demonstrate a commitment to comply with best practice site management principles		One credit where there is a commitment to achieve a CCS score between 24 and 31.5. Contract documents are to require contractors are members of the scheme.

Issue	Description	Target	Credit Aim	Evidence
Man 3	Construction Site Impacts	Evidence that demonstrates a commitment and a strategy to monitor, sort and recycle construction waste on site. AND Evidence that demonstrates that 2 or more of a-f listed below is achieved. OR Evidence that demonstrates that 4 or more of a-f are achieved: a. monitor and report CO2 or energy arising from site activities b. monitor and report on CO2 or energy arising from transport to and from site c. monitor water consumption from site activities d. adopt best practice policies in respect of air (dust) pollution arising from the site e. adopt best practice policies in respect of water (ground and surface) pollution occurring on the site f. 80% of site timber is reclaimed, reused or responsibly sourced.		The commitment and strategy are to be written into contract requirements. It is intended a,c,d and e should be requested of a considerate contractor
Man 4	Security	Commitment to work with an Architectural Liaison Officer and achieve Secured by Design award. Security standards for external doors and windows, to achieve a minimum of either: - LPS1175SR1 (All doors and windows) OR - PAS24-1 (All external pedestrian door-sets falling within scope of PAS24-1) AND BS7950 (All windows falling into the scope of BS7950)		The Architect is to write to the local authority to organise a meeting with the Officer to review the security. Specifications are to include one of the options

Appendix A

Ecohomes Pre-Assessment Tool (BRE COPY)

EcoHomes Pre Assessment Estimator				
Issue		**% of total score**	**Dwelling**	**Location**
			% of total score achieved	
Energy				
Ene 1	**Dwelling Emission Rate**			
	Credits are awarded to achieve SAP 2005 CO2 emissions as follows:			
	· Less than or equal to 40 kg/m2/yr	0.92		
	or			
	· Less than or equal to 35 kg/m2/yr	1.83		
	or			
	· Less than or equal to 32 kg/m2/yr	2.75		
	or			
	· Less than or equal to 30 kg/m2/yr	3.67		
	or			
	· Less than or equal to 28 kg/m2/yr	4.58		
	or			
	· Less than or equal to 26 kg/m2/yr	5.5		
	or			
	· Less than or equal to 24 kg/m2/yr	6.42		
	or			
	· Less than or equal to 22 kg/m2/yr	7.33		
	or			
	· Less than or equal to 20 kg/m2/yr	8.25		
	or			
	· Less than or equal to 18 kg/m2/yr	9.17		
	or			
	· Less than or equal to 15 kg/m2/yr	10.08		
	or			
	· Less than or equal to 10 kg/m2/yr	11.00		
	or			
	· Less than or equal to 5 kg/m2/yr	11.92		
	or			
	· Less than or equal to 0 kg/m2/yr	12.83		
	or			
	· Less than or equal to -10 kg/m2/yr	13.75		
			0	
	Note: -10kg CO2/m2 allows for recognition of 'true zero' carbon solutions.		(max 13.75)	
Ene 2	**Building envelope performance**			
	Either 0.92 or 1.83 awarded where thermal performance based on the Heat Loss Parameter (HLP) method meets the following requirements:			
	For new build:			
	· where the HLP is less than or equal to 1.3 W/m2K	0.92		
	or			
	· where the HLP is less than or equal to 1.1 W/m2K	1.83		

	For refurbishment:			
	· where the HLP is less than or equal to 2.2 W/m2K	0.92		
	or			
	· where the HLP is less than or equal to 1.75 W/m2K	1.83		
			0	
			(max 1.83)	
Ene 3	**Drying space**			
	Provision of drying space	0.92		
			0	
			(max 0.92)	
Ene 4	**Eco Labelled white goods**			
	Provision of eco labelled white goods with the following energy ratings:			
	· All fridges, freezers, fridge-freezers with an A+ rating	0.92		
	· All washing machines, and dishwashers where supplied, with an A rating and washer dryers and tumble dryers with a rating of B or higher	0.92		
	or			
	· No white goods provided but info on Eco labelling	0.92		
			0	
			(max 1.83)	
Ene 5	**Internal Lighting**			
	· Where 40% dedicated low energy lights have been specified.	0.92		
	or			
	· Where 75% dedicated low energy lights have been specified.	1.83		
			0	
			(max 1.83)	
Ene 6	**External Lighting**			
	Space lighting			
	· all space lighting is specifically designed to accommodate only compact fluorescent lamps (CFL)	0.92		
	Security lighting			
	· all intruder lighting to be 150 watts maximum and be fitted with PIR and day light sensor and	0.92		
	· all other type of security lighting to accommodate CFLs or fluorescent strips only and be fitted with dawn to dusk sensors or timers			
			0	
			(max 1.83)	
Total Number of Energy Credits Achieved			0	
			(max 22.00)	

Transport				
Tra 1	**Public Transport**			
	Urban and suburban areas			
	80% of the development within:			
	· 1000m of a 30 min peak and an hourly off peak service	1.00		
	or			
	· 500m of a 15 min peak and a half hourly off peak service	2.00		
	Rural areas			
	80% of the development within:			
	· 1000m of an hourly service	1.00		
	or			
	· 500m of an hourly service OR a community bus service	2.00		
				0
				(max 2.00)
Tra 2	**Cycle storage**			
	Provision of cycle storage for:			
	· 50% of dwellings	1.00		
	or			
	· 95% or dwellings	2.00		
			0	
			(max 2.00)	
Tra 3	**Local Amenities**			
	Proximity to local amenities:			
	· Within 500m of a food shop and post box	1.00		
	· Within 1000m of 5 of the following: food shop* postal facility, bank/ cash machine, pharmacy, primary school, medical centre, leisure centre, community centre, public house, children's play area, place of worship, outdoor open access public area	1.00		
	· Safe pedestrian routes to the local amenities	1.00		
				0
	* if not used for the 1st credit			(max 3.00)
Tra 4	**Home office**			
	Provision of space, and services, for a home office	1.00		
			0	
			(max 1.00)	
Total Number of Transport Credits Achieved			0	0
			(max 8.00)	

Pollution				
Pol 1	**Insulation ODP and GWP**			
	Specifying insulating materials, that avoid the use of ozone depleting substances and have a global warming potential (GWP) of less than 5 or more (and an ODP of zero), in either manufacture or composition, for the following elements:			
	· Roof (incl. loft hatch)			
	· Wall – internal and external (incl. all doors, lintels and all acoustic insulation).			
	· Floor (incl. foundations)			
	· Hot water cylinder (incl. pipe insulation and other thermal store)	0.91		
			0	
			(max 0.91)	
Pol 2	**NOx emissions**			
	95% of dwellings throughout the development must be served by heating and hot water systems with an average NOx emission rate of less than or equal to the levels listed below.			
	· Less than or equal to 100 NOx mg/kWh	0.91		
	or			
	· Less than or equal to 70 NOx mg/kWh	1.82		
	or			
	· Less than or equal to 40 NOx mg/kWh	2.73		
			0	
			(max 2.73)	
Pol 3	**Reduction of surface runoff**			
	Where rainwater holding facilities and/or sustainable drainage techniques are used to provide attenuation of water run off to either natural watercourses and/or municipal drainage systems, by 50%* in areas of low probability of flooding, 75%* in areas of medium flood risk and 100%* in areas of high flood risk, at peak times from:			
	· Hard surface runoff	0.91		
	· Roof runoff	0.91		
			0	
	* Where a statutory body requires a greater attenuation then the higher requirement should be met in order to achieve these credits.			
			(max 1.82)	
Pol 4	**Renewable and Low Emission Energy Source**			
	· Where evidence provided demonstrates that a feasibility study considering renewable and low emission energy has been carried out and the results implemented	0.91		
	and			

	· Where evidence provided demonstrates that the first credit has been achieved and 10% of total energy demand for the development is supplied from local renewable, or low emission energy, sources*	0.91		
	or			
	· Where evidence provided demonstrates that the first credit has been achieved and 15% of total energy demand for the development is supplied from local renewable, or low emission energy, sources*.	1.82		
			0	
	* In line with the recommendations of the feasibility study.		(max 2.73)	
Pol 5	**Flood Risk Mitigation**			
	· Where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding.	1.82		
	or			
	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium annual probability of flooding and the ground level of the building, car parking and access is above the design flood level for the site's location.	0.91		
			0	
			(max 1.82)	
Total Number of Pollution Credits Achieved			0	
			(max 10.00)	

Materials				
Mat 1	**Environmental Impact of Materials**			
	The following elements obtaining an A rating from the Green Guide for Housing:			
	· Roof	1.35		
	· External walls	1.35		
	· Internal walls - party walls and internal partitions	1.35		
	· Floors	1.35		
	· Windows	0.9		
	· External surfacing	0.45		
	· Boundary protection	0.45		
			0	
			(max 7.23)	
Mat 2	**Responsible sourcing of Materials: Basic Building Elements**			
	Where the majority of materials in the following basic building elements are responsibly sourced*:			
	1. Frame 2. Ground Floor 3. Upper floors (including any loft boarding) 4. Roof (structure and cladding) 5. External walls (including external cladding) 6. Internal walls (including internal partitions) 7. Foundations/substructure 8. Staircase (including the tread, rises and stringers)	0.90, 1.35, 1.8 or 2.71		
			0	
	*It is recommended that the Breeam's guidance is consulted if you wish to claim this credit		(max 2.71)	
Mat 3	**Responsible sourcing of Materials: Finishing Elements**			
	Where the majority of materials in the following secondary building and finishing elements are responsibly sourced*: 1. Stair (including handrails, balustrades, banisters, other guarding/rails (excluding staircase)) 2. Window (including sub-frames, frames, boards, sills) 3. External & internal door: (including sub-frames, frames, linings, door) 4. Skirting (including architrave, skirting board & rails) 5. Panelling (including any other trim) 6. Furniture (including fitted; kitchen, bedroom, and bathroom) 7. Facias (soffit boards, bargeboards, gutter boards, others) 8. Any other significant use	0.90 or 1.35		
			0	
	*It is recommended that the Breeam's guidance is consulted if you wish to claim this credit		(max 1.35)	
Mat 4	**Recycling Facilities**			
	Recycling of Household waste			
	· Provision of internal storage only	0.9		
	or			
	· Provision of external storage (or LA collection) only	0.9		
	or			

	Provision of internal AND external storage (or LA collection)	2.71		
			0	
			(max 2.71)	
Total Number of Materials Credits Achieved			0	
			(max 14.00)	

Water				
Wat 1	**Internal Potable Water Use**			
	· Less than or 52 m3 per bedspace per year	1.67		
	or			
	· Less than or equal to 47 m3 per bedspace per year	3.33		
	or			
	· Less than or equal to 42 m3 per bedspace per year	5.00		
	or			
	· Less than or equal to 37 m3 per bedspace per year	6.66		
	or			
	· Less than or equal to 32 m3 per bedspace per year	8.33		
			0	
			(max 8.33)	
Wat 2	**External Potable Water Use**			
	Rain water collection system for watering gardens and landscaped areas	1.67		
			0	
			(max 1.67)	
Total Number of Water Credits Achieved			0	
			(max 10.00)	

Land Use and Ecology				
Eco1	**Ecological value of site**			
	· Building on land which is inherently of low ecological value	1.33		
				0
				(max 1.33)
Eco2	**Ecological enhancement**			
	· Enhancing the ecological value of the site through consultation with an accredited expert	1.33		
				0
				(max 1.33)
Eco3	**Protection of ecological features**			
	· Ensuring the protection of any existing ecological features on the site	1.33		
				0
				(max 1.33)
Eco4	**Change of ecological value of site**			
	· A change of between –9 and –3 species	1.33		
	or			
	· A change of between –3 and +3 species	2.67		
	or			
	· A change between +3 and +9 species	4.00		
	or			
	· A change of greater than +9 species	5.33		
				0
				(max 5.33)
Eco5	**Building footprint**			
	· Where the total combined Floor area: Footprint ratio for all houses on the site is greater than 2.5:1			
	and	1.33		
	· Where the total combined Floor area: Footprint ratio for all flats on the site is greater than 3.5:1			
	or			
	· Where the total combined Floor area: Footprint ratio for all dwellings on the site is greater than 3.5:1	2.67		
			0	
			(max 2.67)	
Total Number of Land Use and Ecology Credits Achieved			0	0
			(max 12.00)	

Health and Well Being				
Hea1	**Daylighting**			
	Provision of adequate daylighting, according to BS 8206:pt2 in:			
	· In the kitchen	1.75		
	· In living rooms, dining rooms and studies	1.75		
	· View of sky in all above rooms	1.75		
			0	
			(max 5.25)	
Hea 2	**Sound Insulation**			
	1.75, 3.5, 5.25 or 7.00* where pre-completion testing is carried out to comply or improve on performance standards in Approved Document E (2003 Edition, Building Regulations England and Wales).	1.75, 3.5, 5.25 or 7.00		
			0	
	*It is recommended that the Breeam's guidance is consulted if you wish to claim this credit		(max 7.00)	
Hea3	**Private space**			
	Provision of private or semi private space	1.75		
			0	
			(max 1.75)	
Total Number of Health and Well Being Credits Achieved			0	
			(max 14.00)	

Management				
Man 1	**Home User Guide**			
	Where evidence can be provided to demonstrate that there is provision, in each home, of a simple guide that covers information to the 'non-technical' tenant/occupant on:			
	· The environmental performance of their home	2.00		
	· Information relating to the site and surroundings	1.00		
			0	
			(max 3.00)	
Man 2	**Considerate Constructors**			
	· Demonstrate a commitment to comply with best practice site management principles	1.00		
	or			
	· Demonstrate a commitment to go significantly beyond best practice site management principles.	2.00		
				0
				(max 2.00)
Man 3	**Construction Site Impacts**			
	Evidence that demonstrates a commitment and a strategy to monitor, sort and recycle construction waste on site.	1.00		
	and			
	· Evidence that demonstrates that 2 or more of a-f listed below are achieved.	1.00		
	or			
	· Evidence that demonstrates that 4 or more of a-f are achieved:	2.00		
	a. monitor and report CO2 or energy arising from site activities b. monitor and report on CO2 or energy arising from transport to and from site c. monitor water consumption from site activities d. adopt best practice policies in respect of air (dust) pollution arising from the site e. adopt best practice policies in respect of water (ground and surface) pollution occurring on the site f. 80% of site timber is reclaimed, reused or responsibly sourced.			
				0
				(max 3.00)

Man 4	**Security**			
	· Commitment to work with an Architectural Liaison Officer and achieve Secured by Design award.	1.00		
	· Security standards for external doors and windows, to achieve a minimum of either:			
	- LPS1175SR1 (All doors and windows) OR - PAS24-1 (All external pedestrian door-sets falling within scope of PAS24-1) AND BS7950 (All windows falling into the scope of BS7950)	1.00		
			0	
			(max 2.00)	
Total Number of Management Credits Achieved			0	0