CUNDALL
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GLOUCESTER AVENUE

Camden, NW1

Sustainability Statement

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Revisions table

DATE	COMPANY	INITIALS	COMMENT	REVISION NO
26/09/2011	Cundall	RP	Draft Issued for comments	01
29/09/2011	Cundall	RP	Ground floor image updated	02

Contents

Executive Summary

This Sustainability Statement outlines the development's sustainability, energy efficiency and renewable energy strategies for meeting the sustainability targets set out by the London Borough of Camden and the GLA.

To benchmark this process, the Building Research Establishment (BRE) methodologies have been used. They consider the broad environmental concerns of climate change, pollution, impact on occupants and the wider community. They balance these with the need for a high quality, safe and healthy internal environment. These standards go beyond the requirements of the Building Regulations.

A preliminary BREEAM assessment has been undertaken for the office indicating that a "Very Good" rating is likely to be achieved with the residence predicted to achieve a Ecohomes "Very Good" rating.

Good practice sustainability measures have been incorporated in the design, including:

- Heating and cooling demand will be satisfied by high efficient air source variable refrigerant flow (VRF) heat pump system, which is predicted to achieve a 7.4% reduction in office's annual CO_2 emissions
- Thermal insulation levels will be improved to the Building Regulation standards to prevent excessive heat loss.
- The proposed scheme will have good natural lighting within all occupied areas, which will improve comfort and reduce the requirement for artificial lighting
- Good solar control will be provided by the selection of glazing/shading so as to avoid overheating in summer and increase passive gains in winter
- The development will use low energy lighting together with daylight linked dimming, where appropriate
- Energy efficient appliances will be installed in order to reduce the energy and water demands of the development
- All insulation materials used within the proposed development will be selected to ensure they are CFC free both in manufacture and through their composition
- Building materials where possible will be sourced locally to reduce transportation pollution & support the local economy.
- All timber will be purchased from responsible forest sources
- Recycling facilities will be provided on site for construction and operational waste
- Water consumption will be reduced through the use of low volume flow fittings
- Water metering and leak detection alarms will be installed to monitor and minimise wastage
- The construction site will be managed in an environmentally sound manner in terms of resource use, storage, waste management, pollution. A Site Waste management Plan (SWMP) will be in produced for the works.
- Surface water run-off will be reduced through the provision of green roofs

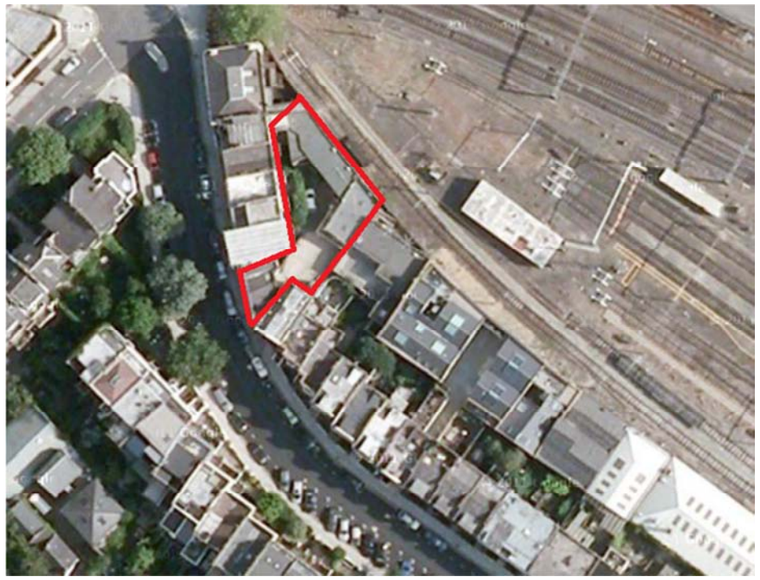


Figure 1.0.1 – Proposed Site Location

Figure 1.0.2 – Proposed Ground Floor Plan

1.0 Introduction

The London Borough of Camden set out their approach to sustainable development through their Core Strategy, Development Policies and Supplementary Planning Documents. Core Strategy Policy 13 sets out the overarching approach to sustainability in the borough, with the aims of mitigating and adapting to climate change, promoting local energy generation, managing water resources and reducing carbon dioxide emissions.

The Development Policies provide further detail as to how the Core Strategy policies can be achieved. In this instance *"Development Policy 22 – Promoting Sustainable Design and Construction"* provides the details as to how the targets of CS13 will be meet. The Supplementary Planning Document *"Camden Planning Guidance 3 – Sustainability"* provides greater detail on the targets for developments and the approach that should be adopted in meeting these targets.

As energy use in buildings accounts for nearly 80% of carbon dioxide (CO_2) emissions within the London Borough of Camden, this report outlines the proposed sustainability and energy strategy for the proposed development. Each of the proposed initiatives has been assessed on the relative sustainability potential, in addition to a "rule of thumb" financial pay back implication, and suitability to the site.

The principal objectives are to reduce the site's contribution to the cause of climate change by minimising the emissions of CO_2, by reducing the site's needs for energy and by providing some of the requirement by renewable/sustainable means. Issues such as water and waste, biodiversity, etc. have also been addressed in the present study. The Sustainability Statement will aim to address the aspirations of both the London Borough of Camden and the GLA.

The GLA London Plan and GLA Energy Strategy are considered to be the benchmark for local planning regulation. Together they provide a useful tool against which to undertake energy and sustainability assessment. For the purpose of this assessment they have been used in an advisory nature secondary to the requirements of the London Borough Of Camden, to help incorporate a number of energy efficiency measures into the proposed development.

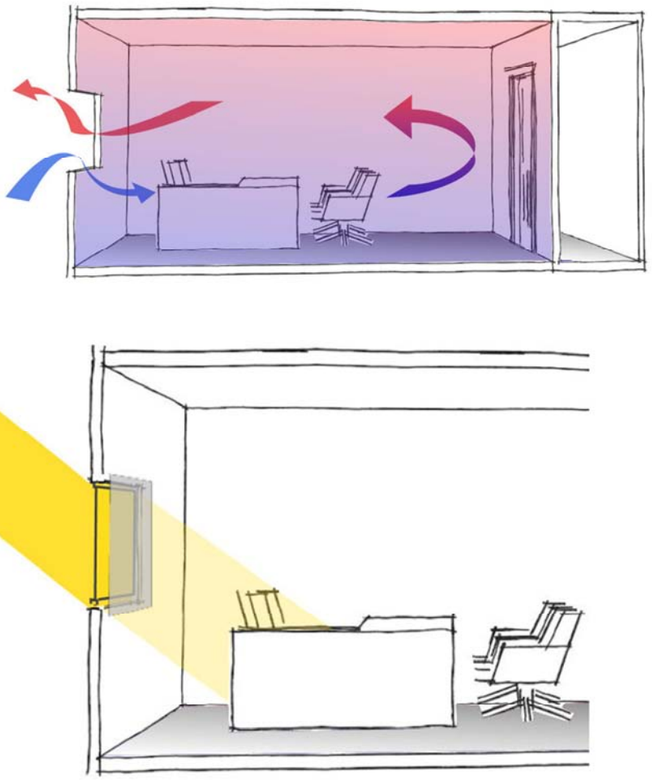
In line with Camden's Policy, to guide and benchmark this process, the Building Research Establishment's Environmental Assessment Method (BREEAM) and Ecohomes has also been used to assess the commercial and residential elements of the development respectively. A preliminary assessment indicates that as a "Very Good" rating can be achieved for the commercial part of the development and a Ecohomes rating of "Very Good" is predicted for the residential part.

BREEAM and Ecohomes consider the broad environmental concerns of climate change, pollution, impact on residents and the wider community. They balance these with the need for high-quality, safe and healthy internal living and working environment. These standards go beyond the requirements of the Building Regulations.

1.1 Description of Development

The site is located on Gloucester Avenue in the Primrose Hill area of the London Borough of Camden. It is bounded to the north by the rail lines that serves London Euston station and to the east and west by adjoining properties.

The proposal is to completely refurbish the existing building with the creation of commercial office space and a separate 4 bedroom residence. For the purposes of the energy assessment a gross internal floor area of 244m^2 for the commercial office space and 375m^2 for the residence has been used.



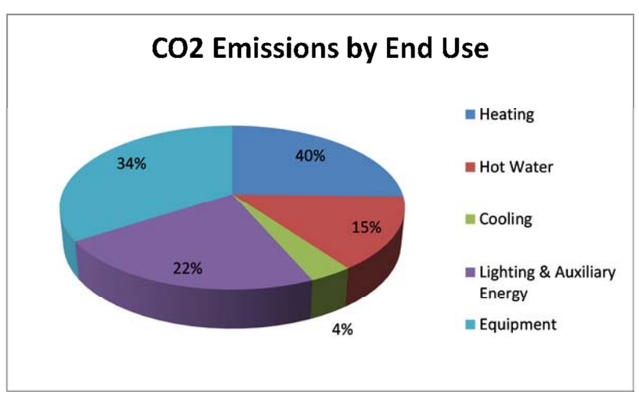


Figure 2.3.1 –Annual CO_2 Emissions

2.0 Energy

An energy assessment has been undertaken, in order to determine the estimated energy consumption and associated CO_2 emissions of the proposed development. Incorporating a number of energy efficient measures (and is set out in detail in the accompanying Energy Assessment).

2.1 Passive Design

Substantial reductions in energy usage for the scheme will be achieved through consideration of the passive elements of the design, together with improved occupancy comfort. The aim for the design of the proposed development is to optimise the passive building elements where possible and hence reduce the energy consumption associated with the mechanical systems.

Passive Solar Design
The opportunities for passive solar design are limited within this developed due to it being a refurbishment of an existing building.

Natural Daylighting
Natural daylighting will be provided to both part of the development through the use of glazing and rooflights. These will ensure that high levels of daylight are achieved whilst maintaining the uniformity across the working plane.

Solar Control
Solar control will be achieved for the development through the use of glazing with a g-value of 0.51. This coupled with the proximity of nearby buildings to the south means the solar gain to occupied spaces will not be excessive.

Building Envelope
The building envelope will be upgraded to meet the design limits of the approved documents, as a minimum.

Air Permeability
The air permeability of the development will be improved as part of the refurbishment. An air permeability of $5m^3/hr/m^2$ will be targeted for completion.

2.2 Energy Efficiency

After maximising the contribution of the passive elements to the overall energy balance, the aim will be to further reduce carbon emissions by selecting efficient mechanical & electrical systems, and efficient controls to manage the energy used during operation.

- Low-Energy Lighting
- HVAC Plant Efficiencies.
- Variable Speed Pumps and Drives
- Controls
- Building Energy Management System (BEMS)
- Energy metering
- Commissioning

2.3 Estimated Energy Consumption

In accordance with the London Borough of Camden's and the Mayor's Energy Hierarchy the estimated energy consumption for the development has been based on the National Calculation Methodology (NCM). The office element of the development has been modelled using approved dynamic simulation software and the residential element is based on the results of similar properties. The table below gives the energy demand for both parts of the development.

	Residential	Office
Heating	33.0 kWh/m2	50.0 kWh/m2
Hot Water	34.0 kWh/m2	5.2 kWh/m2
Cooling	0.0 kWh/m2	5.3 kWh/m2
Lighting/Auxiliary	9.4 kWh/m2	19.6 kWh/m2
Equipment	9.0 kWh/m2	37.7 kWh/m2
Total	**85.4 kWh/m2**	**117.8 kWh/m2**

The results from the analysis including the small power loads are shown in figure 2.3.1. These demonstrate that the most significant end uses, in terms of carbon dioxide emissions, is a combination of lighting, auxiliary energy and equipment representing 56% of the total emissions. Heating is single greatest contributor to the emissions as it constitutes 40% of the total.

2.4 Site Wide Emission Rates and Renewables Target

The proposed development will be required to meet the planning requirements of both the London Borough of Camden and the GLA. The table below gives the emissions for the site.

Grid supplied electricity	11478 kgCO2/year
Natural gas	7640 kgCO2/year
Total Annual CO2 Emissions	19118 kgCO2/year
CO2 Emissions per m2	30.9 KkgCO2/m2/year
Renewables Target	3824 kgCO2/year

The London Plan Policy 5.7 and the Camden's SPD suggests that all developments should target a reduction of at least 20% in the carbon dioxide emissions. Therefore the estimated annual emissions rate for the development have been used to generate a "Renewables" Target of 3,824kgCO_2 per annum.

2.5 Renewable and Low Carbon Energy Sources

The Mayor's London Plan and the London Renewables Toolkit consider the following renewable and low carbon technologies as being acceptable for supplying a proportion of a site's energy demand. These are considered to potentially be the most likely options for developments in London:

District Heating Networks

A review of the London Heat Map (www.londonheatmap.org.uk) has identified that there are no district energy networks in the vicinity of the site and that that there are no proposals to install one. Therefore, connection to a district heating network is not possible.

Combined Heat & Power (CHP)

CHP is the on-site generation of electricity and the recovery of the normally wasted heat produced during this process

The operation of CHP plant can offer significant CO_2 emission rates when compared to conventional methods of energy generation and use.

The application of a single 30kWe/44kWth natural gas-fired CHP engine, which is ENER-G's smallest CHP engine, has been assessed. This assessment has identified that there is insufficient load for the system to run. Therefore it is not proposed to include CHP as part of the development.

Wind Turbines

The output from wind turbines are highly sensitive to wind speed. Hence it is essential that turbines should be sited away from obstructions, with a clear exposure or fetch for the prevailing wind.

In urban environments it is difficult to achieve high wind speeds that would make the operation of turbines viable, unless they are located at a site where there is locally high wind speed or located on the roof of tall buildings, where obstructions and surrounding buildings would not interfere with the wind flow.

Additionally the site's location and layout means that it will be difficult to site the turbines clear of any turbulence. Hence, it is not proposed to pursue this option any further.

Solar Thermal

Solar thermal collectors utilise solar radiation to heat water for use in water heating of a building. The radiation is converted using a solar collector, of which there are two main types available: Flat Plate and Evacuated Tube collectors. Evacuated tube systems occupy a smaller area and are more efficient, but also generally more expensive. Flat plate systems are cheaper to install but generally less efficient.

An initial study into the feasibility of incorporating a solar thermal collector system onto the roof of the proposed building in order to meet a proportion of the development's domestic hot water requirement has been undertaken.

The analysis indicates that a 6.6% carbon dioxide emissions reduction can be achieved with a $10m^2$ collector array serving the residence. However, the proximity and height of adjacent buildings means the roof of the development will suffer from significant overshading that will reduce the effectiveness of any solar thermal collectors installed. In addition much of the available roof space is covered with a green roof. For these reasons it is not proposed to install solar thermal collectors, although further consideration will be given to their inclusion as the design develops if a suitable location can be identified.

Photovoltaics

Photovoltaic solar cells convert solar energy directly into electricity. The cells consist of two layers of silicon with a chemical layer between. The incoming solar energy charges the electrons held within the chemical. The energised electrons move through the cell into a wire creating an electrical current.

A study into the feasibility of onsite electricity generation using Photovoltaic cells to meet a proportion of the development's electricity demand has been undertaken as detailed below.

- $10m^2$ of Yingli Solar Panels would provide a 3.2% reduction in the site's carbon dioxide emissions.
- Once photovoltaic cells are installed they require minimal maintenance over their operational life and have no primary fuel requirements

The development will suffer from significant over shading from adjacent buildings that will reduce the effectiveness of any photovoltaic array installed. This coupled with the limited area of roof space available for siting the array means that it is not currently proposed that they be installed.

Biomass Heating

Biomass is a collective term for all plant and animal material. A number of different forms of biomass can be burned or digested to produce energy. Examples include wood, straw, poultry litter and energy crops such as willow and poplar grown on short rotation coppice and miscanthus.

Biomass in the form of logs, wood chips and wood pellets are classified as renewable source of energy due to the fact that the carbon dioxide emitted when the biomass is burned has been taken out of the atmosphere by the growing plants. Even allowing for emissions of fossil carbon dioxide in planting, harvesting, processing and transporting the fuel, replacing fossil fuel with biomass fuel will typically reduce net CO_2 emissions by over 90%.

A number of biomass heating options have been analysed for the proposed development:

- Biomass boilers are unsuitable for applications that have large fluctuations in thermal loads and so the option of replacing natural gas completely (100%) does not appear to be feasible for this development.

- Biomass boilers operate most efficiently when run at a constant rate with no or little throttling down of the output, and hence a biomass boiler sized to deliver a base heat load appears to be the most viable biomass heating option.

The analysis indicates that a 15kW biomass boiler could potentially satisfy up to 77% of the residence's annual heating and domestic hot water requirement, resulting in a potential site wide annual emissions reduction of up to 18%.

Biomass boilers are the least preferred renewable energy technology in Camden due to the poor air quality in the area. For this reason, coupled with the difficulty in fuel delivery, it is not proposed to include biomass boilers within the development.

Air Source Heat Pumps – VRF

Air source heat pumps exchanges heat between the outside air and a building to provide space heating in winter and cooling in the summer months.

The main advantage of air source heat pumps is their compact design, limited or no requirement for the internal plant room space and high efficiency which enables to save portion of CO_2 emissions when compared with conventional plant.

VRF system transfer heat from one location another using refrigerant. The volume or flow rate of refrigerant is accurately matched to the required heating or cooling loads thereby saving energy and providing more accurate control.

The advantage of VRF systems is that energy can be transferred within the building, allowing cooling some areas of the building to providing heating in other areas. This enables the use of simultaneous heating and cooling from the system, meaning that the VRF can meet 100% of the development's heating and cooling requirements.

The analysis indicates that a VRF system with a seasonal cooling efficiency (SEER) of 4.5 and heating seasonal efficiency (CSoP) of 4.5 could achieve 7.4% reduction in office's annual CO_2 emissions, when satisfying all of the office's heating and cooling requirements.

Furthermore, if the VRF system was design to generate hot water for the office, the potential CO_2 reduction could increase to 7.8%. However, heat pumps work most effectively when generating water at 40°C -45°C, if this increased to 60°C for use in the DHW system the efficiency substantially reduces.

The use of the VRF system to meet the heating of cooling loads of the office is proposed and expected to provide a carbon dioxide emission reduction of 7.4%.

Ground Source Heat Pumps – Closed Loop

Ground source heat pumps extract heat from the ground and pump it into a building to provide space heating and to pre-heat domestic hot water. In the summer months this process can be reversed, rejecting heat to the ground, to meet the cooling requirements of a building. The technology relies on the stable temperature of the ground of between 10-14°C.

The viability of closed loop heat pumps systems dependent on a number of issues:

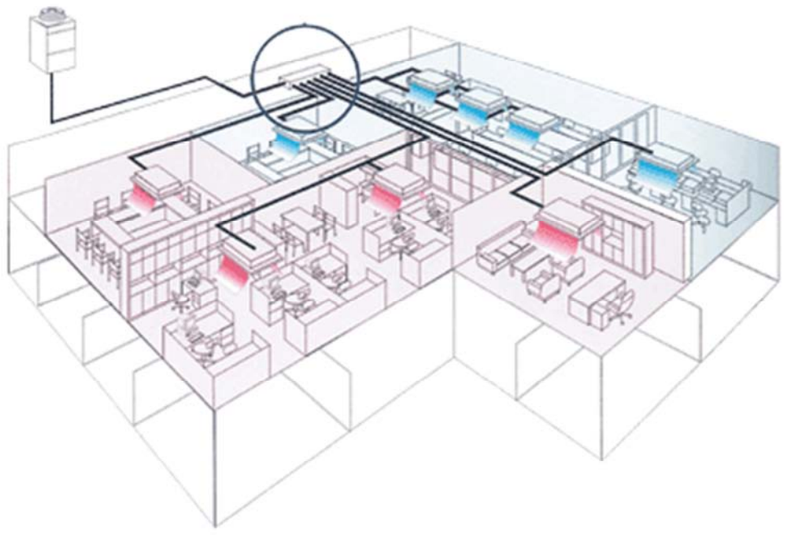
- Demand for heating/cooling.
- Cost/carbon emissions of gas/electricity being offset.
- Ground area available for boreholes/horizontal loops.

The refurbishment of the existing building and the confines of the site does not provide an opportunity to install a ground collector array as part of the works. For this reason it is not proposed to include ground source heat pumps within the development.

Aquifer thermal energy storage (ATES)

Aquifer thermal energy storage (ATES) is a low-temperature geothermal energy source. ATES has been used successfully around the world for the seasonal storage of heat and cold energy for the purpose of heating and cooling buildings. Aquifer thermal energy storage uses underground water reserves called aquifers. There are two wells, one well is for heat rejection ('hot' well) and the other one is for heat extraction ('cold' well). In the winter, ground water is extracted from the 'warm' well with energy recovered by a plate heat exchanger, and the heat pump raises the temperature for heating purposes. In summer, the process is reversed and cold water from the 'cold' well is used for cooling purposes.

The refurbishment of the existing building and the confines of the site does not provide an opportunity to install the necessary boreholes as part of the works. For this reason it is not proposed to include an ATES system within the development.



2.5 Proposed Energy Strategy

Of the renewable energy sources reviewed a VRF air sourced heat pump system appears the most viable solution to reducing the development's annual CO_2 emissions.

The analysis indicates that a VRF system could achieve 7.4% reduction in building's annual CO_2 emissions, when satisfying all of the office's heating and cooling requirements.

Summary of Improvements

The proposed VRF system could potential reduce the building's annual CO_2 emissions by 7.4% if it provides all of the office's heating and cooling requirements.

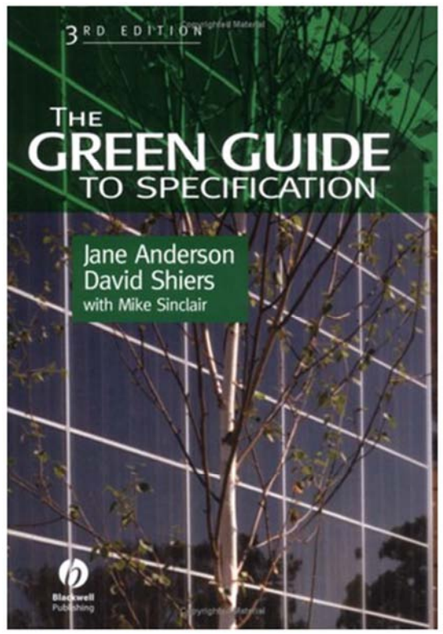
3.0 Materials

Building and construction activities worldwide consume 3 billion tons of raw material each year, which account for approximately 50% of total global consumption. Using green/sustainable building materials and products promotes conservation of dwindling non-renewable resources. In addition, integrating sustainable building materials into building projects can help reduce the environmental impacts associated with the extraction, transport, processing, fabrication, installation, reuse, recycling, and disposal of these source materials.

The aim for the proposed development will be for its overall environmental impact to be minimised through the specification of sustainable materials and components.

3.1 Environmental Impact of Materials

Materials with low overall environmental impact, in line with the requirements of BREEAM, will be selected using guidance from the 'Green Guide to Specification'. The Green Guide rates the environmental impact of different materials and components, taking into account factors like toxicity, ozone depletion, ease of recycling, waste disposal etc. Where viable, at least 80% (by area) of the main elements in the building should be specified to achieve the best performing "A" / "A+" rating from the Green Guide.



3.2 Sustainable Timber

All timber used for basic or finishing building elements in the scheme will be sourced from responsibly managed and sustainable forests or plantations. Such timber products are the only truly renewable construction material in common use and growing trees also absorb and fix CO_2.

Forests can also provide the habitat for a wide variety of plant and animal life, preserving important ecology and promoting biodiversity.

3.3 Locally Sustainable Materials

A building that is truly sustainable must be constructed using locally sourced, sustainable materials i.e. materials that can be supplied without any adverse effect on the environment. Therefore, where practicable, materials should be sourced from local suppliers, reducing the environment impacts and CO_2 emissions associated with transportation to the site.

3.4 Recycled Materials

Scope for increased recycling will be incorporated by specifying recycled materials where possible and ensuring that even where new materials are used, as much as possible can be recycled at the end of the buildings' life. Some typical building materials that can contain a high percentage of recycled material include reinforcing and framing steel, concrete masonry units, gypsum wallboard and facing paper, acoustic ceiling panels and their suspension system.

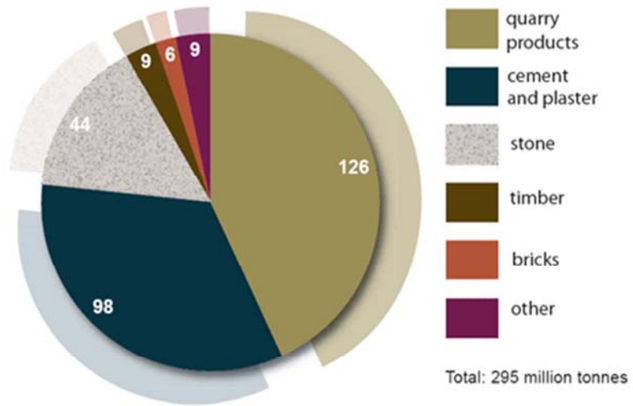
Specifying materials with a high-recycled content is also another method of saving processing or manufacturing energy. The recycled content of a material can be described as either post-consumer or post-industrial to indicate at what point in the life cycle a material is reclaimed.

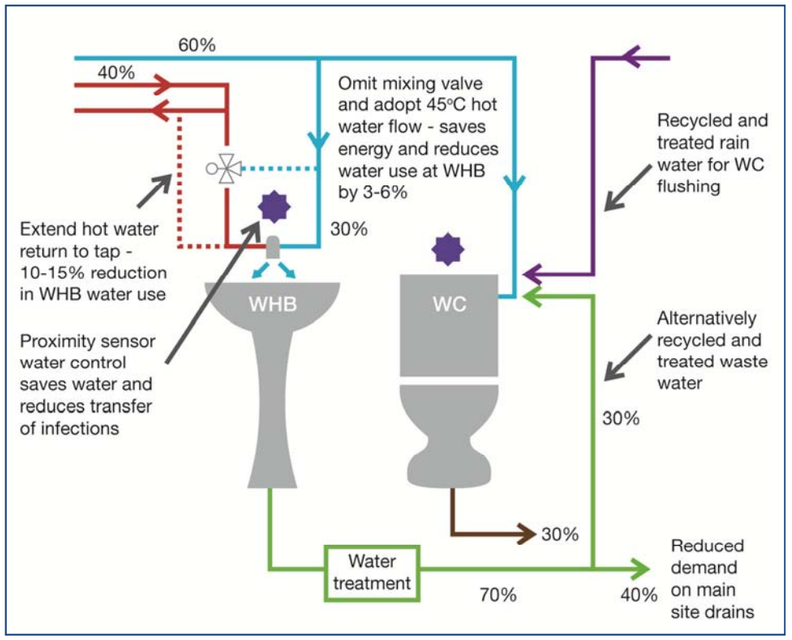
3.5 Ozone Depletion and Global Warming

CFCs and HCFCs, compounds commonly used in insulation materials and refrigerants, can cause long-term damage to the Earth's stratospheric ozone layer, exposing living organisms to harmful radiation from the sun. They also significantly increase global-warming if they leak into the atmosphere. Following the Montreal Protocol, production and use of CFCs is no longer permitted and EC regulations will require phasing out of HCFCs by 2015. However, products that replace these gases are often still potent global warming contributors.

All insulation materials specified for the proposed scheme will have zero Ozone Depleting Potential and low Global Warming Potential, (GWP<5) in either manufacture or composition in line with the BREEAM requirements. This will include insulation for building elements (roof, internal & external walls, floor – including foundations) as well as insulation for hot water vessels and pipe or ductwork.

Construction related UK consumption of primary resources (2006)





4.0 Water Conservation

Water consumption in the UK has risen by 70% over the last 30 years. Trying to meet the increasing demand by locating new sources of water supply is both expensive and damaging to the environment. Therefore, the design team have focused on reducing the demand for water and managing the existing resources.

4.1 Demand Reduction and Water Efficiency

The aim is to minimise internal and external potable water use within the development. Good water management can contribute to reducing the overall level of water consumption maintaining a vital resource and having environmental as well as cost benefits in the life-cycle of the building. The following water saving measures are being considered for a range of areas in line with the BREEAM requirements.

PIR Controlled Flushing - PIR controls to flush WCs or urinals in communal toilet blocks are an efficient and hygienic method that reduces water wastage. These are being considered for all areas of the development.

Dual Flush Cisterns on WC's - These units have the ability to provide a single flush of 3L and/or a full flush of 6L. It is proposed that these are used throughout the development in order to minimise water consumption. These should be fitted with tamper resistant cover plates, where appropriate.

PIR Controlled Wash Basin Taps – These taps provide a level of vandal resistance (depending on type used) and the self-closing characteristics prevent water wastage.

Flow Restrictors to Taps - Flow restrictors reduce the volume of water discharging from the tap. Spray taps have a similar effect and are recommended to reduce both hot and cold-water consumption.

Push Taps - The average screw head tap will deliver approx 12ltrs of water per minute when turned partially on. On average a screw head tap is left on for 15 seconds. Where as a self-closing taps can be adjusted to run at 4ltrs per minute and the time on can be reduced to between 3 and 11 seconds. The biggest benefit however is that the push tap cannot be left running, as it self closes.

Low flow taps, in one of the above forms will be installed throughout the development with a maximum flow rate of 5 litre / minute, so as to comply with the BREEAM/Ecohomes mandatory requirements in the Water section.

Water Meters - In 1995 approximately 33,200 million litres of water a day were abstracted in England and Wales, this increased to 44,130 million litres/day in 2000, and much of this was for domestic water supply. To reduce this figure, accurate information on usage is required for management of a building's consumption. Water meters will be specified on all main supplies, at the entry to building and the boundary of the site in line with the BREEAM requirements.

Low Flow Showers - The average shower uses 15 litres of water a minute, by restricting the output of the showers in the development to a maximum of 9 litres/ min a 40% water saving can be achieved. Flow rate can be reduced down to 6 litres/ min without comprising on water pressure and hence should be considered.

Water Leak Detection - Water leaks can result in significant losses and costs and have the potential to cause major damage. Therefore, leak detection systems will be considered for installation around the site linked to the site wide Building Management System, in line with the BREEAM requirements.

Sanitary supply shut-off – Occupant-sensor-controlled solenoid valves will be installed on the water supply to the toilet area int eh office in line with the BREEAM requirements so that the flow of water through that supply is controlled by a link to either:

- Infra-red movement detectors within each toilet facility
- Sensors placed at or on entry doors to each facility.

Rainwater Harvesting - The inclusion of a rainwater harvesting system will be considered for the development.

5.0 Sustainable Drainage

The site is currently completely impermeable with hard landscaping and building areas, the main aim for the redevelopment will be to improve the water retention of the site. This will be achieved through the provision of green roofs within the development

6.0 Waste Management

Buildings and building sites produce a significant amount of waste per year. Most of the waste produced in the UK is disposed in landfill sites and only a small percentage of it is recycled or reused.

6.1 Waste Targets

Under new EU legislation the UK will have to ensure that less than a third of its waste is sent for burial in landfill sites by 2020 and the figure at present is about 80%. To achieve this target a number of measures are implemented, including landfill tax, aiming to discourage disposal of waste to landfill. Good waste management is a key component of sustainable development. Reducing waste is an important means of:

- Reducing unnecessary expenditure
- Reducing the amount of natural resources used for production of new materials
- Reducing energy for waste disposal
- Reducing levels of contamination and pollution arising from waste disposal

The proposed development will minimise the impact of waste in the environment.

6.1 Demolition & Construction

During the construction phase, a large amount of waste material can be generated through construction, demolition, and land clearing procedures. In building construction, the primary waste products in descending percentages are: wood, asphalt/concrete/masonry, drywall, roofing, metals, and paper products.

Prior to commencement on site the Delivery Partner will prepare a Site Waste Management Plan (SWMP) that complies with the requirements of current legislation and partner policies. This plan will identify the local waste haulers and recyclers, determine the local salvage material market, identify and clearly label site spaces for various waste material storage, and require a reporting system that will quantify the results and set targets. As a minimum the SWMP will contain:

a. The target benchmark for resource efficiency e.g. m^3 of waste per $100m^2$ or tonnes of waste per $100m^2$;
b. Procedures and commitments for minimising non-hazardous waste in line with the benchmark;
c. Procedures for minimising hazardous waste;
d. Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste;
e. Procedures for sorting, reusing and recycling construction waste into defined waste groups either on site or through a licensed external contractor;
f. The name or job title of the individual responsible for implementing the above.

6.3 Waste Management & Reporting in Operation

The design phase will identify the potential waste streams that the facility will produce. As a minimum, plans will be formulated to handle the separation, collection, and storage of common recyclable materials such as paper, glass, plastics, and metals. The collection points will be easily accessible to all of the occupants.

The main aim will be to recycle as much waste as possible; this will be achieved by making sure that waste recycling facilities are strategically placed in convenient locations.

Dedicated storage space for recyclable materials generated by the site during occupation, will include the following:

- Be clearly labelled for recycling
- Be placed within accessible reach of the buildings
- Be in a location with good vehicular access to facilitate collections.

Encouraging re-cycling at source

All relevant internal areas should be provided with colour-coded waste recycling bins referred to as recycling hubs. The sizes of the spaces allocated will be adequate to store the likely volume of recyclable materials generated by the site.

7.0 Environmental Management

7.1 Construction

Construction sites are responsible for significant impacts, especially at a local level. These arise from noise, potential sources of pollution and waste and other disturbances. Impacts such as increased energy and water use are also significant. Therefore, attention is being given to site-related parameters with the aim to protect and enhance the existing site & its ecology.

The aim is to have a construction site managed in an environmentally sound manner in terms of resource use, storage, waste management, pollution and good neighbourliness. To achieve this, there will be a commitment to comply with the Considerate Constructors Scheme and get a formal certification under the scheme in line with the BREEAM requirements. As a minimum a score of greater than 32 of out 40 will be achieved with a aspiration to exceed 36, with no individual section achieving a score of less than 3.

Areas that can be taken into consideration in order to minimise the impact of the construction site on its surroundings and the global environment as outlined in the BREEAM methodology:

- Monitor, report and set targets for CO_2 or energy use arising from site activities
- Monitor, report and set targets for CO_2 or energy use arising from transport to and from site
- Monitor, report and set targets for water consumption arising from site activities
- Monitor construction waste on site, sorting and recycling construction waste where applicable
- Adopt best practice policies in respect of air and water pollution arising from site activities
- Adopt an environmental materials policy, used for sourcing of construction materials to be utilised on site
- Operates an Environmental Management System
- Additionally, all timber used on site should be responsibly sourced

7.2 Operation

ISO 14001: 2004 “Environmental Management Systems – Specification with Guidance for Use” specifies requirements for an environmental management system to enable an organisation to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organisation subscribes, and information about significant environmental aspects.

It applies to those environmental aspects that the organisation identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria. ISO 14001:2004 is applicable to any organization that wishes to establish, implement, maintain and improve an environmental management system, to assure itself of conformity with its stated environmental policy, and to demonstrate conformity with ISO 14001:2004 by:

1. making a self-determination and self-declaration, or
2. seeking confirmation of its conformance by parties having an interest in the organization, such as customers, or
3. seeking confirmation of its self-declaration by a party external to the organization, or
4. seeking certification/registration of its environmental management system by an external organization.

All the requirements in ISO 14001:2004 are intended to be incorporated into any environmental management system. The extent of the application will depend on factors such as the environmental policy of the organization, the nature of its activities, products and services and the location where and the conditions in which it functions

8.0 Land Use and Ecology

The site currently comprises of existing buildings and hard landscaping, with no ecological value to the site.

New planted area will be included where possible, to increase the ecological value of the site and help protect local plant and animal species. Green roofs will also be included to enhance the biodiversity of the site.

9.0 Green Transport

The transport of people between buildings is the second largest source of CO_2 emissions in the UK after energy use in buildings, and remains the main source of many local pollutants. Energy use and emissions from transport are growing at 4% per year, and at the same time, the effects of climate change are becoming more severe; there will be greater pressure to control CO_2 emissions from transport and sites without good access to public transport will be at much greater risk from these controls.

9.1 Site location

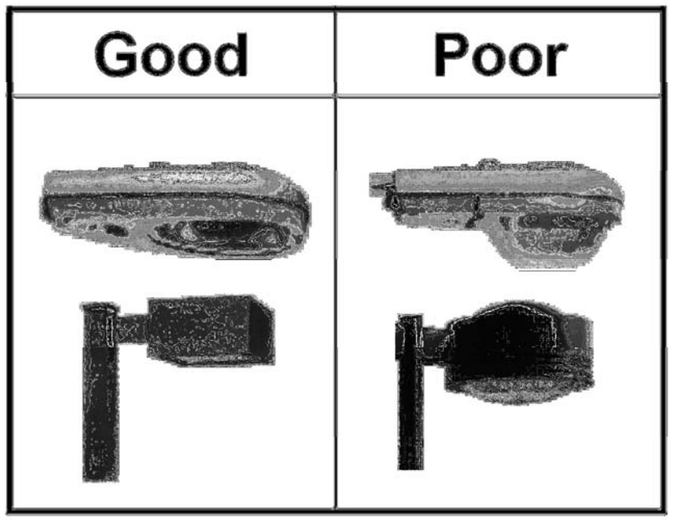
The site for the development is located near the centre of Camden and as such has good connections to the underground and local bus services.

9.2 Cycling facilities

Secure cycling spaces will be provided for the office space in order to encourage the occupants to use this carbon-free mode of transport.

9.3 Car Parking Spaces

Car parking spaces are limited due to the confines of the site, this will help to encourage the occupants to use the public transport facilities available locally.



10.0 Pollution

Global concern for environmental pollution has risen in recent years, and concentrations of harmful pollutants in the atmosphere are increasing. Buildings have the potential for major pollution both from their construction and from operation, largely through pollution to the air (dust emissions, NOx emissions, ozone depletion & global warming) but also through pollution to watercourses and ground water. The proposed development will aim to minimise the above impacts, both at the design stage and onsite.

10.1 Ozone Depletion

CFCs and HCFCs, compounds commonly used in insulation materials and refrigerants, can cause long-term damage to the Earth's stratospheric ozone layer, exposing living organisms to harmful radiation from the sun. They also significantly increase global-warming if they leak into the atmosphere. Following the Montreal Protocol, production and use of CFCs is no longer permitted and EC regulations will require phasing out of HCFCs by 2015. However, products that replace these gases are often still potent global warming contributors. Where refrigerants are used for air-conditioning and comfort cooling they will be CFC and HCFC-free.

10.2 Internal pollutants

Volatile organic compounds (VOCs) are emitted as gases (commonly referred to as offgassing) from certain solids or liquids. VOCs include a variety of chemicals, some of which are known to have short-term and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors.

VOCs are emitted by a wide array of products numbering in the thousands. Examples include: paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, glues and adhesives, Urea-formaldehyde foam insulation (UFFI), pressed wood products (hardwood plywood wall panelling, particleboard, fibreboard) and furniture made with these pressed wood products.

'No' or 'low' VOC paints are available from most standard mainstream paint manufacturers. There 'eco-friendly' paints are made from organic plant sources and also powdered milk based products.

The design team will seek to select internal finishes and fittings with low or no emissions of volatile organic compounds (VOCs). All internal finishes and fittings will comply with the relevant European Standards and be tested in line with the relevant standards.

10.3 NOx emissions from boilers

Nitrous oxides (NOx) are emitted from the burning of fossil fuels and contribute to both acid rain and to global warming in the upper atmosphere. At ground level, they react to form ozone, a serious pollutant and irritant at low level. Burners in heating systems are a significant source of low-level NOx, while power stations (and therefore electric heating) are a significant source of NOx in the upper atmosphere.

The amount of NOx emissions varies between products. New gas boilers vary from 40 NOx/kWh to <70mg NOx/kWh (class 5). The proposed high efficiency gas boilers will be specified to have less than 70 NOx/kWh.

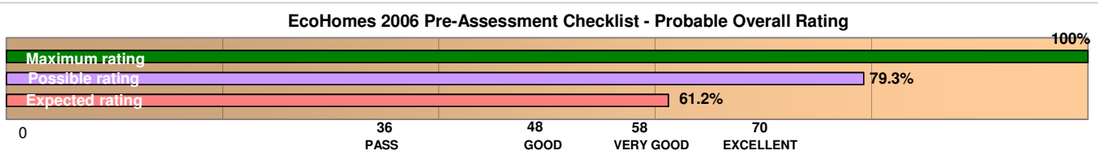
10.4 Night Sky Pollution

External lighting encompasses vehicle and pedestrian access lighting, security lighting, facility illumination and general feature lighting and will be designed on a site wide basis to meet the mandatory requirements and aesthetic considerations. The strategy is to provide a balance between adequate external lighting for safe and secure operation of the site without unnecessary illumination or power consumption.

The intention is to be a good neighbour and not to introduce nuisance glare or light pollution of the night sky from miss directed or unnecessary lighting. The proposed road lighting will be designed and specified to utilise luminaires that do not have any upward light component, Feature lighting, where required, will be focussed to the task/subject. Where necessary luminaires will be further screened in cases where there may be an issue of close proximity and light spill to the adjacent neighbouring residential areas, although the intention is to avoid this situation arising wherever possible from the outset. The external lighting design will take into consideration the relevant guidance from the British Standards and other recommended documents including the following Standards and Design Guides:

- CIBSE Lighting Guide for the Outdoor Environment
- CIBSE Lighting Design Guides, generally
- BS5489 Code of Practice for the Design of Road Lighting
- BS EN 13201-1 Road Lighting, Selection of Lighting Classes
- BSEN 13201-2 Road Lighting, Performance requirements
- Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light

APPENDIX A – PRELIMINARY ECOHOMES ASSESSMENT



	Criteria for Assessment	Available Points		Issue Score		Y(Yes), N(No), or P(Possible) in the middle
Energy						
Ene1	**CO_2 emissions**					
	Credits are awarded to achieve CO_2 emissions as follows (based on SAP 2005 calculations):					
	Less than or equal to 40 kg/m^2/yr	1			max 15	
	Less than or equal to 35 kg/m^2/yr	2				
	Less than or equal to 32 kg/m^2/yr	3				
	Less than or equal to 30 kg/m^2/yr	4				
	Less than or equal to 28 kg/m^2/yr	5				
	Less than or equal to 26 kg/m^2/yr	6				
	Less than or equal to 24 kg/m^2/yr	7				
	Less than or equal to 22 kg/m^2/yr	8				
	Less than or equal to 20 kg/m^2/yr	9				
	Less than or equal to 18 kg/m^2/yr	10	Y	10		
	Less than or equal to 15 kg/m^2/yr	11				
	Less than or equal to 10 kg/m^2/yr	12				
	Less than or equal to 5 kg/m^2/yr	13				
	Less than or equal to 0 kg/m^2/yr	14				
	Less than or equal to -10 kg/m^2/yr	15				
Ene2	**Building Envelope Performance**					
	Average heat loss parameter (HLP) across the whole site (from SAP 2005 calculations)					
	New build					
	<= 1.3	1			max 2	
	<= 1.1	2		1		
	or				**or**	
	Refurbishment					
	<= 2.2	1	Y	1	max 2	
	<= 1.75	2				
	1.35-1.5	2				
Ene3	**Drying Space**					
	Provision of drying space	1	Y	1	max 1	
Ene4	**Eco Labelled White Goods**					
	Provision of eco labelled white goods with the following energy ratings:					
	All fridges, freezers, fridge-freezers with an A+ rating	1	Y	1	max 2	
	All washing machines and dishwashers where supplied, with an A rating and washer dyers and dryers with a rating of B or higher	1	Y	1		
	or					
	If no white goods are provided, but information on purchasing energy efficient white goods is provided	1				
Ene5	**Internal Lighting**					
	40% of fixed internal light fittings are dedicated energy efficient fittings	1				
	75% of fixed internal light fittings are dedicated energy efficient fittings	2	Y	2		
Ene6	**External Lighting**					
	Space lighting					
	All out building lighting and feature external lighting to accommodate CFLs or fluorescent strips only	1	Y	1	max 1	
	Security/intruder lighting					
	All intruder lighting to be 150 Watts maximum and be fitted with PIR and day light sensor	1	Y	1	max 1	
	All security/safety lighting to accommodate CFLs or fluorescent strips only and be fitted with dawn to dusk sensors or timers					
	Total Credits this section (expected)	**24**		18		
	Total Credits this section (possible)			0		
	Issue score expected (%)	**100%**		75%		
	Issue score possible (%)			0%		

Transport						
Tra1	**Public Transport**					
	Urban and suburban areas					
	80% of the development within 500m (safe walking route) of transport node, with a service to local centre, town, city, at 15mins frequency peak, 30mins off-peak service	2	Y	2	max 2	
	80% of the development within 1000m (safe walking route) of transport node, with a service to local centre, town, city, at 30mins frequency peak, hourly off-peak service	1				
	Rural areas				**or**	
	1000m of an hourly service	2			max 2	
	500m of an hourly service OR a community bus service	1				
Tra2	**Cycle Storage**					
	Provision of cycle storage for:					
	50% of dwelling (number of cycle spaces depending on number of bedrooms in dwellings)	1	P	1	max 2	
	95% of dwelling	2		1		
Tra3	**Local Amenities**					
	Proximity to local amenities:					
	Within 500m of a food shop and post box	1	Y	1	max 3	
	Within 1000m of 5 of the following: food shop*, post office, bank/cash machine, pharmacy, primary school, medical centre, leisure centre, community centre, public house, childrens play area, outdoor open access public area (*unless if claimed in the first credit)	1	Y	1		
	Safe pedestrian routes to the local amenities	1	Y	1		
Tra4	**Home Office**					
	Provision of space, and services, for a home office	1	Y	1	max 1	
	Total Credits this section (expected)	**8**		6		
	Total Credits this section (possible)			1		
	Issue score expected (%)	**100%**		75%		
	Issue score possible (%)			13%		
Pollution						
Pol1	**Insulation GWP**					
	Specifying insulation materials that have a GWP<5 in manufacture or composition (and avoid the use of OD substances), for the following elements:					
	Roof (inc. loft hatch), Wall - internal/external (inc. doors and window lintels) and floor (inc. foundations), hot water cylinder (incl. pipe insulation and other thermal store)	1	Y	1	max 1	
Pol2	**NOx Emissions**					
	95% of dwellings must be served by heating/hot water systems with average NOx emission rate as below:					
	Less than or equal to 100 NOx mg/kWh	1			max 3	
	Less than or equal to 70 NOx mg/kWh	2	Y	2		
	Less than or equal to 40 NOx mg/kWh	3				
Pol3	**Reduction of surface runoff**					
	Reducing peak surface runoff rates to either natural/municipal 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 (e.g. drives & other surfaces with vehicular access, communal car parking, patios etc)	1	P	1	max 2	
	Roof runoff (e.g. soakaways, ponds, green roofs etc)	1	P	1		
Pol4	**Zero Emission Energy Source**					
	Where evidence that there is a a feasibility study considering renewable and low emissions energy and the results implemented OR	1	Y	1	max 3	
	Where the first credit is achieved and evidence provided that at least 10% percent of the total energy demand is supplied from local renewable or low emission sources OR	2				
	Where the first credit is achieved and evidence provided that at least 15% percent of the total energy demand is supplied from local renewable or low emission sources	3				
Pol5	**Flood risk**					
	Where evidence that the assessed development is in a zone defined as having a low annual probability of flooding OR	2	N	0	max 2	
	Where evidence that the assessed development is 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	1	P	1		
	Total Credits this section (expected)	**11**		4		
	Total Credits this section (possible)			3		
	Issue score expected (%)	**100%**		36%		
	Issue score possible (%)			27%		

Materials						
Mat1	**Environmental Impact of Materials**					
	The following elements obtaining an A rating from the Green Guide for Housing:					
	Roof	3	Y	3	max 16	
	External Walls	3	**P**	3		
	Internal Walls - party walls and internal partitions	3	**Y**	3		
	Floors (upper and ground floor)	3	N	0		
	Windows	2	N	0		
	External surfacing	1	**P**	1		
	Boundary protection	1	**P**	1		
Mat2	**Responsible sourcing of materials: Basic Building Elements**					
	Up to 6 credits where materials are sourced from best practice sources as follows:					
	Timber - based on CPET analysis of timber certification schemes					
	Other materials - based on compliance accreditation under EMS and credible/verifiable Chain of Custody records.	6	**P**	6		
	Key building elements are: 1. Frame 2. Ground floor 3. Upper floors 4. Roof 4. External walls 6. Internal walls 7. Foundation/substructure 8. Staircase					
Mat3	**Responsible sourcing of materials: Finishing Building Elements**					
	Up to 3 credits where materials are sourced from best practice sources as follows:					
	Timber - based on CPET analysis of timber certification schemes					
	Other materials - based on compliance accreditation under EMS and credible/verifiable Chain of Custody records.	3	**P**	3		
	Secondary building elements are: 1. Stairs 2. Windows 3. External & internal doors 4. Skirting 4. Panelling 6. Furniture 7. Facias 8. any other significant use					
Mat4	**Recyclable Materials**					
	Storage of recyclable waste:					
	Provision of internal and external storage	6	Y	6	max 6	
	If internal storage only (3 bins, min.60ls total capacity, no bin <15ls, all bins in dedicated position)	2				
	Provision of external storage (or LA collection) only	2				
	Total Credits this section (expected)	**31**		12		
	Total Credits this section (possible)			14		
	Issue score expected (%)	**100%**		39%		
	Issue score possible (%)			45%		

Water consumption						
Wat1	**Internal Water Use**					
	Less than 52m³ per bedspace per year	1			max 5	
	Less than 47m³ per bedspace per year	2				
	Less than 42m³ per bedspace per year	3	Y	3		
	Less than 37m³ per bedspace per year	4				
	Less than 32m³ per bedspace per year	5				
Wat2	**External Water Use**					
	Rain water collection system for watering gardens and landscaped areas	1	Y	1	max 1	
	Total Credits this section (expected)	**6**		4		
	Total Credits this section (possible)			0		
	Issue score expected (%)	**100%**		67%		
	Issue score possible (%)			0%		

Land Use and Ecology						
Eco1	**Ecological Value of site**					
	Building on land which is of low ecological value	1	Y	1	max 1	
Eco2	**Ecological Enhancement**					
	Enhancing the ecological value of the site through consultation with a "suitably qualified ecologist"	1	**Y**	1	max 1	
Eco3	**Protection of Ecological Features**					
	Ensuring the protection of any existing ecological features on the site	1	Y	1	max 1	
Eco4	**Change of Ecological Value of Site**					
	A change of between -9 and -3 natural species	1			max 4	
	A change of between -3 and +3 natural species	2				
	A change of between +3 and +9 natural species	3	**Y**	3		
	A change of greater than 9+ natural species	4				
Eco5	**Building Footprint**					
	Making effective use of the building footprint:					
	Where the total combined Floor area:Footprint ratio for all houses on the whole site is > 2.5:1 AND	1			max 2	
	Where the total combined Floor area:Footprint ratio for all block of flats on the whole site is > 3.5:1 OR					
	Where the total combined Floor area:Footprint ratio for both houses and block of flats on the whole site is > 3.5:1	2				
	Total Credits this section (expected)	**9**		6		
	Total Credits this section (possible)			0		
	Issue score expected (%)	**100%**		67%		
	Issue score possible (%)			0%		

Health and Well-being						
Hea1	**Daylighting**					
	Provision of adequate daylighting according to BS 8206, Pt2:					
	In the kitchen: Daylight Factor 2%	1	**P**	1	max 3	
	In living rooms, dining rooms and studies: Daylight Factor 1.5%	1	**P**	1		
	View of sky in all above rooms	1	**P**	1		
Hea2	**Sound Installation**					
	Pre-completion testing to comply or improve on performance standards in Approved Document E (2003 Edition):					
	Pre-completion testing - frequency as in Table 2, column A AND Achieve Part E (2003) standards	1			max 4	
	Pre-completion testing - frequency as in Table 2, column B AND Achieve Part E standards	2				
	Pre-completion testing - frequency as in Table 2, column B AND Achieve 3dB higher airborne and 3dB lower impact insulation than Part E standards	3	Y	3		
	Pre-completion testing - frequency as in Table 2, column B AND Achieve 5dB higher airborne and 5dB lower impact insulation than Part E standards	4	**P**	1		
Hea3	**Private Space**					
	Provision of private or semi private space	1	Y	1	max 1	
	Total Credits this section (expected)	**8**		4		
	Total Credits this section (possible)			4		
	Issue score expected (%)	**100%**		50.0%		
	Issue score possible (%)			50.0%		

Management						
Man1	**Home User Guide**					
	Provision in each home of a simple guide that covers informationrelevant to the non-technical tenant/occupant on the operation and environmental performance of their home. Information to be included on: environmental strategy/design and features, energy, water use, recycling & waste, sustainable DIY, emergency information, links, references etc.	2	Y	2	max 3	
	In addition, one credit if the guide also covers information relating to the site and its surroundings: recycling & waste, public transport, local amenities, responsible purchasing, emergency information, links, references etc.	1	Y	1		
Man2	**Considerate Constructors**					
	Commitment to comply/get certification under the Considerate Constructors Scheme (average score)	1			max 2	
	Commitment to comply and get certification under the Considerate Constructors Scheme, with higher than the average score	2	Y	2		
Man3	**Construction Site Impacts**					
	1 credit for commitment and strategy to monitor, sort and recycle construction waste AND	1	Y	1	max 3	
	1 credit for 2 or more of items a-f to be achieved OR	1	Y	1		
	2 credits for 4 or more of items a-f to be achieved	2				
	a. monitor & report CO_2 or energy from site activities b. monitor & report CO_2 or energy from transport to and from site c. monitor and report water consumption from site activities d. adopt best practice policies in respect of air pollution arising from the site e. adopt best practice policies in respect of water (ground & surface) pollution arising from the site f. 80% of site timber is reclaimed, reused or sustainably sourced					
Man4	**Security**					
	Commitment to work with an Architectural Liaison Officer to achieve the Secured by Design Award	1	P	1	max 2	
	Security standards for external doors and windows to achieve a minimum of either					
	- LPS1175 SR1 (all doors and windows) OR	1	Y	1		
	- PAS24-1 (incl.all external pedestrian doorsets) AND BS7950 (incl.all windows)					
	Total Credits this section (expected)	**10**		8		
	Total Credits this section (possible)			1		
	Issue score expected (%)	**100%**		80.0%		
	Issue score possible (%)			10.0%		
OVERALL EcoHomes 2006 Expected Score		**100%**		**61.2%**		**VERY GOOD**
OVERALL Ecohomes 2006 Possible Score				**79.3%**		**EXCELLENT**

APPENDIX B – PRELIMINARY BREEAM ASSESSMENT – OFFICE

BREEAM Offices 2008

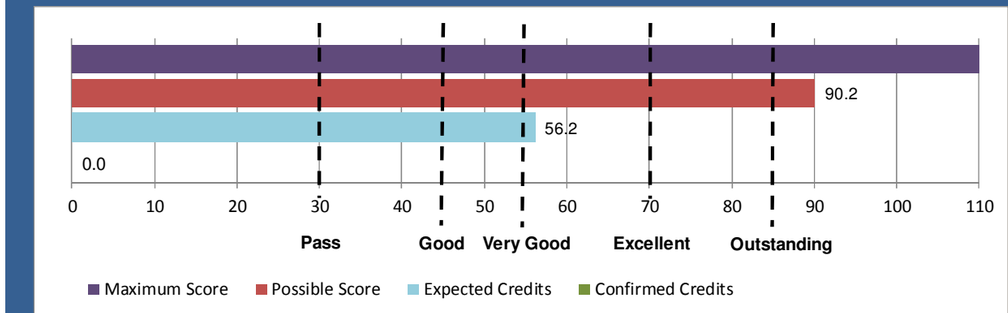
Job Number: *1004401*
Building Name: *Office*
BREEAM Ref No:
Assessor: *RP*
Issue: *01 (Sept 11)*

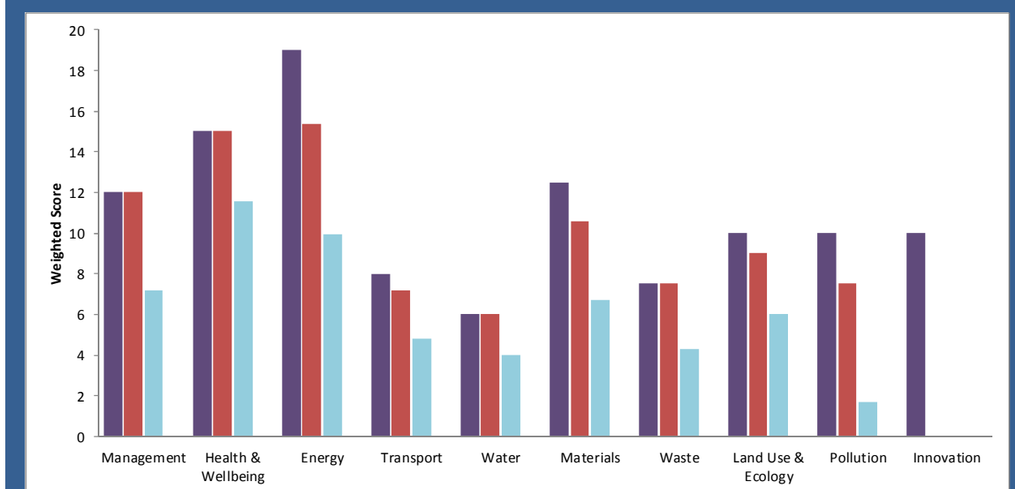
BREEAM RATINGS

Rating	Score
Pass	30%
Good	45%
Very Good	55%
Excellent	70%
Outstanding	85%

WEIGHTED SCORE

Category	Maximum Score	Possible Score	Expected Credits	Confirmed Credits
Management	12	12	7	0
Health & Wellbeing	15	15	12	0
Energy	19	15	10	0
Transport	8	7	5	0
Water	6	6	4	0
Materials	13	11	7	0
Waste	8	8	4	0
Land Use & Ecology	10	9	6	0
Pollution	10	8	2	0
Innovation	10	0	0	0
TOTAL POINTS	**110.0**	**90.2**	**56.2**	**0.0**





Ref	Title	Credit Criteria	BREEAM credits available	Credits confirmed - evidence received	Credits expected - awaiting evidence	Possible credits - design team to confirm	Mandatory Credits: Pass	Good	Very Good	Excellent	Outstanding	RIBA Stage
Management			**12%**									
Man 1	Commissioning	One credit where an appropriate project team member has been appointed to monitor commissioning to ensure commissioning will be carried out in line with current best practice.	**1**		**1**		1	1	1	1	1	D
		One credit where, in addition to the above, seasonal commissioning will be carried out during the first year of occupation, post construction (or post fit out).	**1**			**1**	-	-	-	-	1	D
Man 2	Considerate Constructors	One credit where there is a commitment to comply with best practice site management principles. i.e. Considerate Constructors Scheme score of between 24 and 31.5	**1**		**1**		-	-	-	1	1	H
		One credit where, in addition to the above, there is a commitment to go beyond best practice site management principles. i.e. Considerate Constructors Scheme score of between 32 and 35.5	**1**			**1**	-	-	-	-	1	H
Man 3	Construction Site Impacts	One credit where 2 or more of items a-g (listed below) are achieved. a. Monitor, report and set targets for CO2 or energy arising from site activities b. Monitor, report and set targets for CO2 or energy arising from transport to and from site c. Monitor, report and set targets for water consumption arising from site activities d. Implement best practice policies in respect of air (dust) pollution arising from the site e. Implement best practice policies in respect of water (ground and surface) pollution occurring on the site f. Main contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site g. Main contractor operates an Environmental Management System.	**1**		**1**		-	-	-	-	-	H
		Two credits where 4 or more of items a-g are achieved.	**1**		**1**		-	-	-	-	-	H
		Three credits where 6 or more of items a-g are achieved:	**1**			**1**	-	-	-	-	-	H
		One additional credit where at least 80% of site timber is responsibly sourced and 100% is legally sourced.	**1**		**1**		-	-	-	-	-	H
Man 3	Construction Site Impacts - Fit out	One credit where the fit-out contractor adopts best practice policies in respect of air (dust) pollution arising from the site.	**0**				-	-	-	-	-	H
		One credit where the fit-out contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site.	**0**				-	-	-	-	-	H
		One credit where the fit-out contractor operates an Environmental Management System.	**0**				-	-	-	-	-	H
Man 4	Building user guide	One credit for the provision of a simple guide that covers information relevant to the tenant/occupants and non-technical building manager on the operation and environmental performance of the building.	**1**		**1**		-	-	-	1	1	F
Man 8	Security	One credit where an Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the local police force has been consulted at the design stage and their recommendations incorporated into the design of the building and its parking facilities	**1**			**1**	-	-	-	-	-	C
		Total Credits	**10**	**0**	**6**	**10**						
		Category Score		**0%**	**60%**	**100%**						
		Weighted Points	**1.2** per credit	**0.0**	**7.2**	**12.0**						

Health & Wellbeing

15%

Hea 1	Daylighting	One credit where at least 80% of floor area in each occupied space is adequately daylit. i.e. an average daylight factor of 2% or more plus a uniformity ratio of at least 0.4 or the room depth criterion is satisfied.	1			1	-	-	-	-	-	D
Hea 2	View Out	One credit where that all relevant building areas have an adequate view out. i.e. max. 7m radius from a window ; where the window is ≥20% of the total inside wall area	1		1		-	-	-	-	-	D
Hea 3	Glare Control	One credit where an occupant-controlled shading system (e.g. internal or external blinds) is fitted in relevant building areas.	1		1		-	-	-	-	-	D
Hea 4	High frequency lighting	One credit where high frequency ballasts are installed on all fluorescent and compact fluorescent lamps.	1		1		1	1	1	1	1	D
Hea 5	Internal and external lighting levels	One credit where all internal & external lighting is specified in accordance with the appropriate maintained illuminance levels (in lux) recommended by CIBSE (CIBSE Lighting Guide 6 & 7, Code of Lighting 2004).	1		1		-	-	-	-	-	D
Hea 6	Lighting zones & controls	One credit where in all relevant building areas, lighting is appropriately zoned and occupant controllable. i.e. zones of no more than 4 work stations and zoned for circulation/perimeter/atria areas	1		1		-	-	-	-	-	D
Hea 7	Potential for natural ventilation	One credit where fresh air is capable of being delivered to the occupied spaces of the building via a natural ventilation strategy, and there is sufficient user-control of the supply of fresh air. i.e. openable area should be a minimum of 5% of the floor area, and less than 7m deep.	1		1		-	-	-	-	-	D
Hea 8	Indoor air quality	One credit where air intakes serving occupied areas avoid major sources of external pollution and recirculation of exhaust air. i.e. air inlets / exhausts at least 10m apart, inlets over 20m of sources of external pollution (ac buildings), windows at least 10m away from sources of external pollution (nv buildings)	1			1	-	-	-	-	-	D
Hea 9	Volatile Organic Compounds	One credit where the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels.	1			1	-	-	-	-	-	D
Hea 10	Thermal comfort	One credit where thermal comfort levels in occupied spaces of the building are assessed at the design stage to evaluate appropriate servicing options, ensuring appropriate thermal comfort levels are achieved.	1		1		-	-	-	-	-	D
Hea 11	Thermal zoning	One credit where evidence provided demonstrates that local occupant control is available for temperature adjustment in each occupied space to	1		1		-	-	-	-	-	D
Hea 12	Microbial contamination	One credit where the risk of waterborne and airborne legionella contamination has been minimised AND there is no humidification or steam only humidification	1		1		1	1	1	1	1	D
Hea 13	Acoustic Performance	One credit where the building achieves appropriate indoor ambient noise levels in offices areas. In addition, for fully fitted buildings only: Appropriate airborne sound insulation levels are achieved between acoustically sensitive spaces and occupied spaces, sufficient to ensure adequate privacy.	1		1		-	-	-	-	-	D
		Total Credits	13	0	10	13						
		Category Score		0%	77%	100%						
		Weighted Points	1.2 per credit	0.0	11.5	15.0						

Energy

19%

Ene 1	Reduction of CO2 Emissions	Up to fifteen credits are available for demonstrating an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO2 emissions – credits based on EPC rating	15		7	4	-	-	-	6	10	D
Ene 2	Sub-metering of Substantial Energy Uses	One credit where the provision of direct sub-metering of energy uses within the building. e.g. space heating, domestic hot water, humidification, cooling, fans, lighting & small power, lifts, and escalators	1		1		-	-	1	1	1	D
Ene 3	Sub-metering of high energy load Areas and Tenancy	One credit where sub-metering of energy consumption by tenancy/building function area is installed within the building.	1		1		-	-	-	-	-	D
Ene 4	External Lighting	One credit where energy-efficient external lighting is specified and all light fittings are controlled for the presence of daylight.	1		1		-	-	-	-	-	D
Ene 5	Low zero carbon technologies	One credit where a feasibility study considering local (on-site and/or near site) low or zero carbon (LZC) technologies has been carried out and the results implemented. **Or alternatively:** A maximum of one credit where evidence provided demonstrates that a contract with an energy supplier is in place to provide sufficient electricity used within the assessed building/development to meet the above criteria from a 100% renewable energy source. (Note: a standard Green Tariff will not comply) One credit where, in addition to the above, there is a 10% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. Two credits where, in addition to the above, there is a 15% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology.	1 1 1		1	1 1	-	-	-	1	1	C
		Total Credits	21	0	11	17						
		Category Score		0%	52%	81%						
		Weighted Points	0.9 per credit	0.0	10.0	15.4						

Water

6%

Wat 1	Water Consumption	Up to three credits for the specification of low water usage taps, urinals, WCs and showers. Where consumption is 4.5-5.5 m^3 per person per year Where water consumption is 1.5-4.4 m^3 per person per year Where water consumption is <1.5 m^3 per person per year	1 1 1		1	1 1	-	1	1	1	1	D
Wat 2	Water meter	One credit where a water meter with a pulsed output will be installed on the mains supply to each building/unit.	1		1		-	1	1	1	1	D
Wat 3	Major leak detection	One credit where a leak detection system is specified or installed on the building's water supply. The system must cover all mains water supply between and within the building and the site boundary.	1			1	-	-	-	-	-	D
Wat 4	Sanitary supply shut off	One credit where proximity detection shut-off is provided to the water supply to all toilet areas. It must be controlled by a link to either: Infra-red movement detectors or Sensors / switches placed at or on entry doors	1		1		-	-	-	-	-	D
		Total Credits	6	0	4	6						
		Category Score		0%	67%	100%						
		Weighted Points	1.0 per credit	0.0	4.0	6.0						

Transport

8%

Tra 1	Provision of public transport	Up to three credits are available on a sliding scale based on the assessed buildings' accessibility to the public transport network, dependant on distances to bus stops / train station and frequencies of services	3		2		-	-	-	-	-	C
Tra 2	Proximity to amenities	One credit where the building is located within 500m of accessible local amenities appropriate to the building type and its users, i.e. grocery shop, food outlet, post box, cash machine	1		1		-	-	-	-	-	C
Tra 3	Cyclist Facilities	One credit where covered, secure and well-lit cycle storage facilities are provided for all building users. One credit where, in addition to the above, adequate changing facilities are provided for staff use, including showers, lockers or drying spaces	1 1		1	1	-	-	-	-	-	C
Tra 4	Pedestrian and cycle safety	One credit where the site layout has been designed in accordance with best practice to ensure safe and adequate pedestrian and cycle access.	1			1	-	-	-	-	-	C
Tra 5	Travel plan	One credit where a travel plan has been developed and tailored to the specific needs of the building users.	1			1	-	-	-	-	-	C
Tra 6	Maximum car parking capacity	One credit where no more than one parking space is provided for every three building users. Two credits where no more than one parking space is provided for every four building users.	1 1		1		-	-	-	-	-	C
		Total Credits	10	0	6	9						
		Category Score		0%	60%	90%						
		Weighted Points	0.8 per credit	0.0	4.8	7.2						

Materials

12.5%

Mat 1	Materials Specification (major building elements)	Up to four credits are available, determined by the Green Guide to Specification ratings for the following major building/finishing elements: 1. External Walls	1		1		-	-	-	-	-	D
		2. Windows	1			1	-	-	-	-	-	D
		3. Roof	1			1	-	-	-	-	-	D
		4. Upper Floor Slabs	1			1	-	-	-	-	-	D
		Based on the results of the Mat 1 calculator, details, areas and green guide ratings of all elements required										
Mat 1	Materials Specification - Fit out	Up to two credits are available, determined by the Green Guide to Specification ratings for the following major building/finishing elements: 1. Internal walls	0				-	-	-	-	-	D
		2. Floor Finishes /Coverings	0				-	-	-	-	-	D
Mat 2	Hard landscaping and boundary protection	One credit where at least 80% of the combined area of external hard landscaping and boundary protection specifications achieve an A or A+ rating, as defined by the Green Guide to Specification.	1		1		-	-	-	-	-	D
Mat 3	Re-use of building façade	One credit where at least 50% of the total façade (by area) is reused and at least 80% of the reused façade (by mass) comprises in-situ reused material.	1		1		-	-	-	-	-	D
Mat 4	Re-use of building structure	One credit where the design reuses at least 80% of an existing primary structure and for part refurbishment and part new build, the volume of the reused structure comprises at least 50% of the final structure's volume.	1		1		-	-	-	-	-	D
Mat 5	Responsible sourcing of materials	Up to 3 credits are available where evidence provided demonstrates that 80% of the assessed materials in the following building elements are responsibly sourced: Structural Frame, Ground floor, Upper floors (including separating floors), Roof, External walls, Internal walls, Foundation/substructure and Staircase Additionally 100% of any timber must be legally sourced.	1		1		-	-	-	-	-	H
			1				-	-	-	-	-	H
			1				-	-	-	-	-	H
Mat 5	Responsible sourcing of materials - Fit out	Up to 2 credits are available where evidence provided demonstrates 80% of the assessed materials in the following finishing elements are responsibly sourced: Stairs, Windows, External and internal doors, Skirting, Panelling, Furniture, Fascias, Any other significant use Additionally 100% of any timber must be legally sourced.	0				-	-	-	-	-	H
			0				-	-	-	-	-	H
Mat 6	Insulation	One credit where thermal insulation products used in the building have a low embodied impact relative to their thermal properties, determined by the Green Guide to Specification ratings (building fabric and services).	1		1		-	-	-	-	-	D
		One credit where thermal insulation products used in the building have been responsibly sourced.	1			1	-	-	-	-	-	H
Mat 7	Designing For Robustness	One credit where protection is given to vulnerable parts of the building such as areas exposed to high pedestrian traffic, vehicular and trolley movements.	1		1		-	-	-	-	-	D
	Total Credits		13	0	7	11						
	Category Score			0%	54%	85%						
	Weighted Points		1.0 per credit	0.0	6.7	10.6						

Waste

7.5%

Wst 1	Construction Site Waste Management	Up to three credits are available where non-hazardous construction waste generated by the building's construction phase meets or exceeds the following resource efficiency benchmarks: **One** credit: 13.0-16.6 m3 (6.6-8.5 tonnes) of waste generated per 100m2 **Two** credits: 9.2-12.9 m3 (4.7-6.5 tonnes) of waste generated per 100m2 **Three** credits : <9.2 m3 (<4.7 tonnes) of waste generated per 100m2	1		1		-	-	-	-	-	H
			1		1		-	-	-	-	-	H
			1			1	-	-	-	-	-	H
		One additional credit where at least 75% by weight or 65% by volume of non-hazardous construction waste generated by the project has been diverted from landfill	1			1	-	-	-	-	-	H
Wst 1	Construction Site Waste Management - Fit out	One credit where evidence provided demonstrates that waste generated by the fit-out works will be sorted, separated into key waste groups and measured.	0				-	-	-	-	-	H
		One additional credit where at least 75% by weight or 65% by volume of non-hazardous construction waste generated by the project has been diverted from landfill	0				-	-	-	-	-	H
Wst 2	Recycled aggregates	One credit where there is a significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses. At least 25% by weight or volume.	1			1	-	-	-	-	-	H
Wst 3	Recyclable waste storage	One credit where a central, dedicated space is provided for the storage of the building's recyclable waste streams. A minimum of 10m2 for buildings ≥ 5000m2 of floor area.	1		1		-	-	-	1	1	D
Wst 6	Floor Finishes	One credit where carpets and other floor finishes are specified by the future occupant or, in tenanted areas of speculative buildings, where carpets or floor finishes are installed in a limited show area only. i.e. <25% of total office NIA	1		1		-	-	-	-	-	D
	Total Credits		7	0	4	7						
	Category Score			0%	57%	100%						
	Weighted Points		1.1 per credit	0.0	4.3	7.5						

Land Use & Ecology

10%

LE1	Re-use of land	One credit where the majority of the footprint of the proposed development falls within the boundary of previously developed	1		1		-	-	-	-	-	C
LE2	Contaminated land	One credit where the land used for the new development has, prior to development, been defined as contaminated and adequate remedial steps have been taken to decontaminate the site prior to construction.	1				-	-	-	-	-	C
LE3	Ecological value of site AND Protection of ecological features	One credit where the construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damage during site preparation and construction works.	1		1		-	-	-	-	-	C
LE4	Mitigating Ecological impact	One credit where the change in the site's existing ecological value, as a result of development, is minimal.	1		1		-	-	1	1	1	C
		Two credits where there is no negative change in the site's existing ecological value as a result of development.	1		1		-	-	-	-	-	C
LE5	Enhancing Site Ecology	One credit for appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented their recommendations	1		1		-	-	-	-	-	C
		One credit where, in addition to the above, there is a positive increase in the ecological value of the site of up to (but not including) 6 species.	1		1		-	-	-	-	-	C
		Two credits where, in addition to the above, there is a positive increase in the ecological value of the site of 6 species or greater.	1			1	-	-	-	-	-	C
LE6	Long term impact on biodiversity	One credit where the client has committed to achieving the mandatory LE6 requirements and at least two of the additional requirements.	1			1	-	-	-	-	-	C
		Two credits where the client has committed to achieving the mandatory LE6 requirements and at least four of the additional requirements.	1			1	-	-	-	-	-	C
	Total Credits		10	0	6	9						
	Category Score			0%	60%	90%						
	Weighted Points		1.0 per credit	0.0	6.0	9.0						

Pollution

10%

Pol 1	Refrigerant GWP - Building services	One credit where the use of refrigerants with a global warming potential (GWP) of less than 5 or where there are no refrigerants specified for use in building services.	1			1	-	-	-	-	-	D
Pol 2	Preventing refrigerant leaks	One credit where refrigerant leaks can be detected or where there are no refrigerants specified for the development.	1			1	-	-	-	-	-	D
		One credit where the provision of automatic refrigerant pump down is made to a heat exchanger (or dedicated storage tanks) with isolation valves. Or where there are no refrigerants specified for the development.	1			1	-	-	-	-	-	D
Pol 4	NOx emissions from heating source	One credit where the maximum dry NOx emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O2).	1				-	-	-	-	-	D
		Two credits where evidence the maximum dry NOx emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O2)	1				-	-	-	-	-	D
		Three credits where evidence the maximum dry NOx emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O2).	1				-	-	-	-	-	D
Pol 5	Flood risk	One credit where the development is located in a zone of medium or high annual probability of flooding the ground level of the building, car parking and access is above the design flood level for the site's location. Flood Risk Assessment (FRA) required	1			1	-	-	-	-	-	C
		Two credits where the assessed development is located in a zone defined as having a low annual probability of flooding and a Flood Risk Assessment (FRA) has been carried out for all flood sources	1			1	-	-	-	-	-	C
		One further credit where evidence provided demonstrates that surface water run-off attenuation measures are specified to minimise the risk of localised flooding, resulting from a loss of flood storage on site due to development.	1			1	-	-	-	-	-	C
Pol 6	Minimising watercourse pollution	One credit where effective on site treatment such as Sustainable Drainage Systems (SUDs) or oil separators have been specified in areas that are or could be a source of watercourse pollution.	1			1	-	-	-	-	-	D
Pol 7	Reduction of Night Time Light Pollution	One credit where the external lighting design is in compliance with the guidance in the Institution of Lighting Engineers (ILE) Guidance notes for the reduction of obtrusive light, 2005.	1		1		-	-	-	-	-	D
Pol 8	Noise Attenuation	One credit where new sources of noise from the development do not give rise to the likelihood of complaints from existing noise-sensitive premises and amenity or wildlife areas that are within the locality of the site.	1		1		-	-	-	-	-	D
	Total Credits		12	0	2	9						
	Category Score			0%	17%	75%						
	Weighted Points		0.8 per credit	0.0	1.7	7.5						