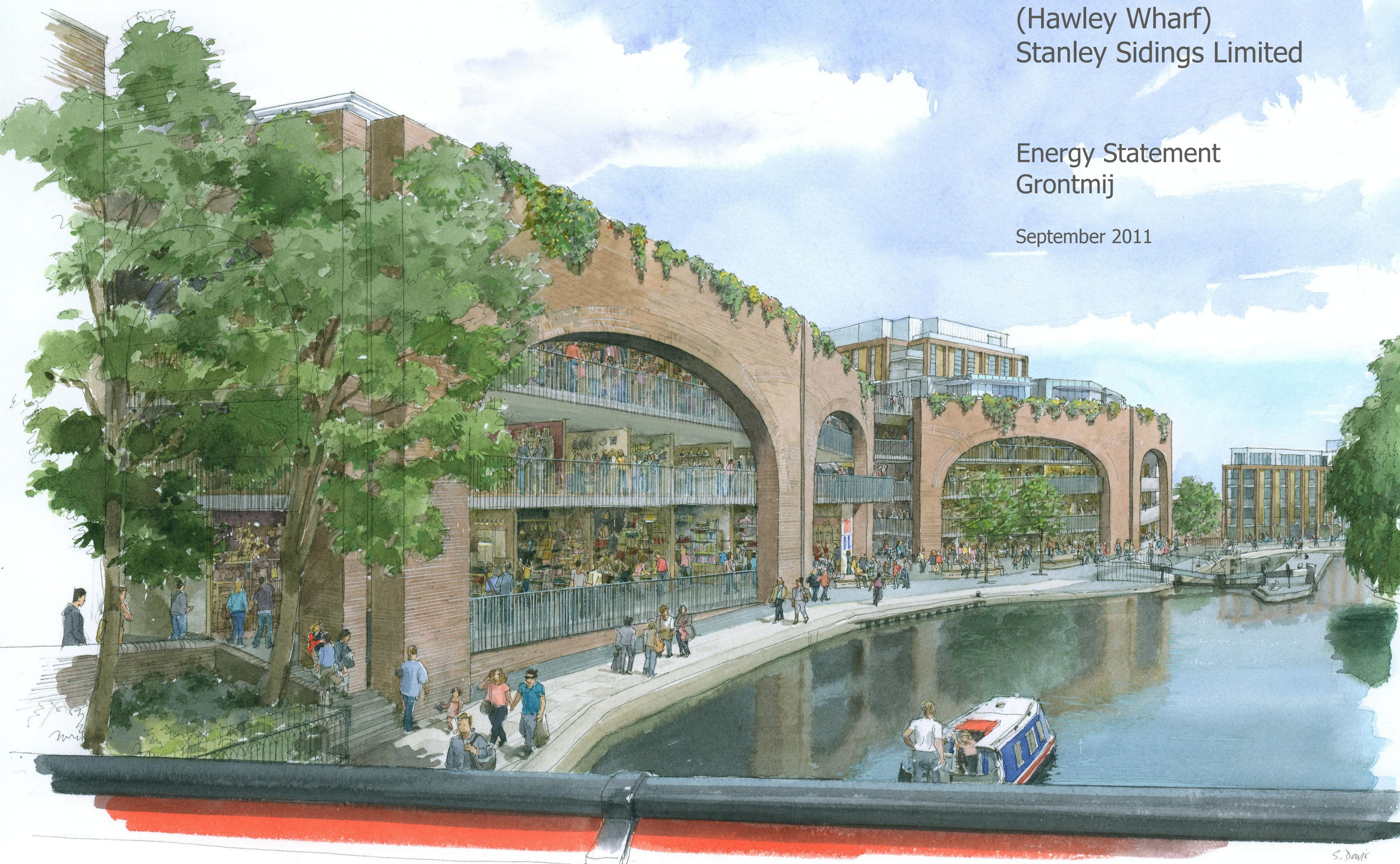
Camden Lock Village
(Hawley Wharf)
Stanley Sidings Limited

Energy Statement
Grontmij

September 2011



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Executive Summary

The Camden Lock Village development consists of four individual sites with an overall total GEA of approximately 49,785 m².
The four sites are outlined below;

- **Area A -** This development consists of two linked multi-floor blocks of flexible retail units on 5 levels additional retail units are located within railway arches adjacent. The blocks and arches have a combined GEA of approximately 8,635 m². An enclosed restaurant is located on the top of each of the blocks. The development space is assumed to be split between retail (83%) and food outlets (17%). Both the retail and food spaces are largely open-air markets, with only 10% of each being enclosed and conditioned/heated.
- **Area B -** This development comprises two residential blocks comprising 45 apartments, with a total GEA of approximately 4,825 m² and a one form entry primary school, nursery and arches consisting of mixed light/general industrial units and a public cycle store with a total GEA of approximately 3183 m². The school will also use No 1 Hawley Road which is a grade II listed building over three floors approximately 229 m².(It should be noted that though the demand forecast For 1 Hawley road is included in this assessment it is not included in the energy efficiency commitments contained in this report of the commitments in terms of U-Values or BREEAM Education Rating due to its listed status) It should also be noted that the school will be in outline with all matters reserved.
- **Area C** - This development consists of two separate residential blocks, namely Block C1 and C2. Block C1 comprises local retail at ground floor and 5 levels of residential above, along Castlehaven Road. Block C2 comprises of three levels of commercial floor space within the central building and Part 6, Part 7 and Part 8 story levels of residential above. The proposal includes arches consisting of light industrial units and two shared lower ground / basement floors which link the Blocks which will be used for plant storage and class D2 use. The overall development space is 26,334 m² GEA.
- **Area D** - This development comprises a ground floor café, commercial space provided at ground and basement, and residential apartments above. The total floor area for Area D is approximately 6,336 m² GEA.

This Energy Statement describes the energy assessment undertaken for the project and the proposed energy strategy/energy efficiency measures proposed as a result. It considers the Camden Lock Village development as a whole and addresses both planning policies and building regulations that will influence the solutions adopted for the development.
The energy assessment has been carried out using the methodology outlined in GLA Team Guidance on Planning Energy Assessments Version 1.1 – October 2010 and as discussed with LBC officers in March 2011.
The London Plan recognises that energy efficiency should come before energy supply considerations and has suggested a simple strategy known as the Mayor's Energy Hierarchy. This system follows good practice in the design of low carbon buildings and comprises three distinct stages in order of application:

1. Use Less Energy (Be Lean)
2. Supply Energy Efficiently (Be Clean)
3. Use Renewable Energy (Be Green)

As a result the Mayor's energy hierarchy of "Lean" then "Clean" then "Green" is followed.
The proposed "Lean" measures to reduce the development's CO_2 emissions are summarised below. It should be noted that not all of the measures are applicable to all four sites.

- Building external envelope performance
- Exposed thermal mass
- Low energy white goods
- Low energy lighting and lighting control
- High efficiency chillers
- Ventilation heat recover
- Low energy DC motors
- High efficiency lifts
- Power factor correction
- Variable flow air and water plant

Waste heat from the central CCHP plant will be the primary source of heating and hot water across the whole development. The system will also provide cooling (via an absorption chiller) when the requirement for heat is low. Only 20% of the private residential units are assumed to be cooled.
The possibility of connecting to an existing district heating network has been considered, as has the possibility of serving surrounding developments. These options do not appear viable and hence a site wide CCHP heating and cooling network has been adopted. Provision will be made for within the heating and cooling network to for future connections to district heating networks. Additional heating & cooling will be supplied by high-efficiency boilers and chillers
Thermal storage (both heat & coolth) will be provided as part of the centralised plant. These will allow the CCHP to run at maximum duty as often as possible. Thermal storage offers further benefits by offsetting fluctuations in heating & cooling demand and allowing the chillers to run at night, when the Coefficient of Performance will be higher. The heating & cooling systems will also be capable of connection to a local district scheme or adjacent properties.
Electricity to the development will be generated locally by the CCHP and PV. These will export to the grid when conditions allow (Subject to UKPN Approval). Other renewable technologies have been considered as inappropriate for this development.
As well as the energy saving options discussed above, a number of further sustainable measures have been introduced for the Camden Lock Village development. These are not strictly 'energy saving' and therefore are not discussed within the bulk of the report. These are outlined in the sustainability statement which forms part of this application.
The graph on the following page illustrates the proposed building performance of the entire development in relation to the London Mayor's Energy Strategy.
The Mayor's Energy Strategy is set out in The London Plan, Spatial Development Strategy for Greater London, 2011 (which consolidates the alterations since 2004). The key policies pertinent to this Energy Statement and the proposed measures are set out within this report.

As illustrated in the adjacent tables and graphs, overall carbon dioxide emissions arising from the use of fossil fuels are projected to be approximately 32.5% less than an equivalent new development which complies with the current 2010 Building Regulations.

As well as exceeding current Camden and GLA policy requirements the proposals also exceed the requirements of the recently adopted London Plan 2011, the development will also need to meet national requirements as detailed in Approved Document Part L of the Building Regulations (Conservation of Fuel & Power).

The graphs that follow outline the estimated annual CO_2 emissions for the development that relate to Part L of the Building Regulations. Separate graphs are provided for each phase of the development as separate applications to Building Control will be required, for example, for the residential and non-residential buildings.

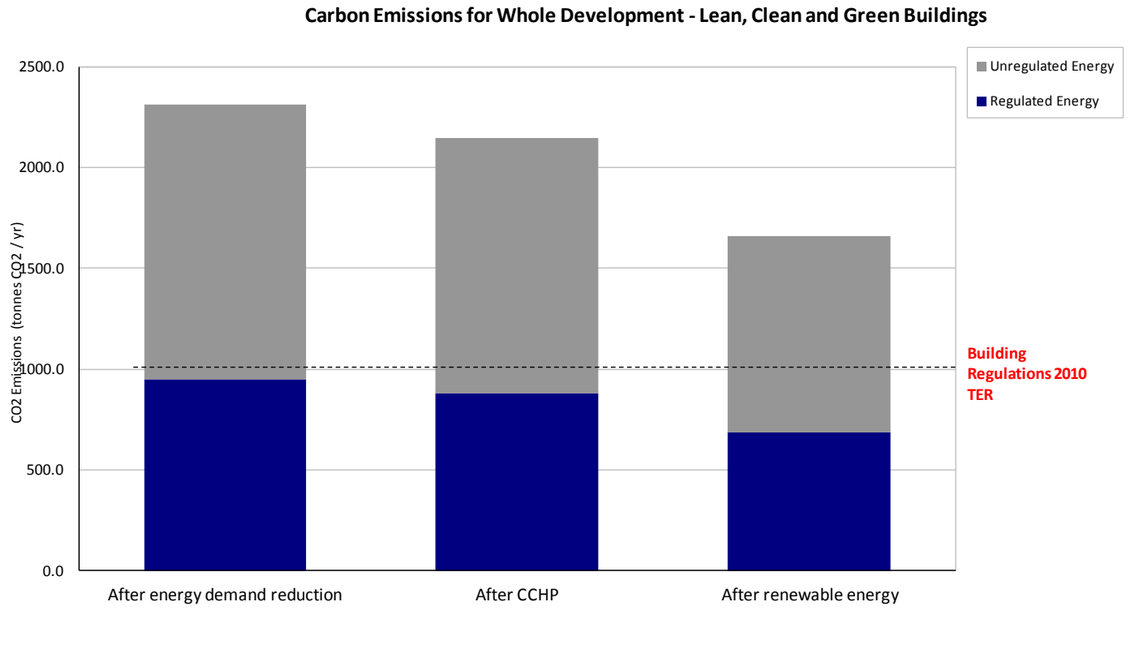
In each graph, the "Design" condition takes into account all proposed energy efficiency and low/zero carbon technologies.

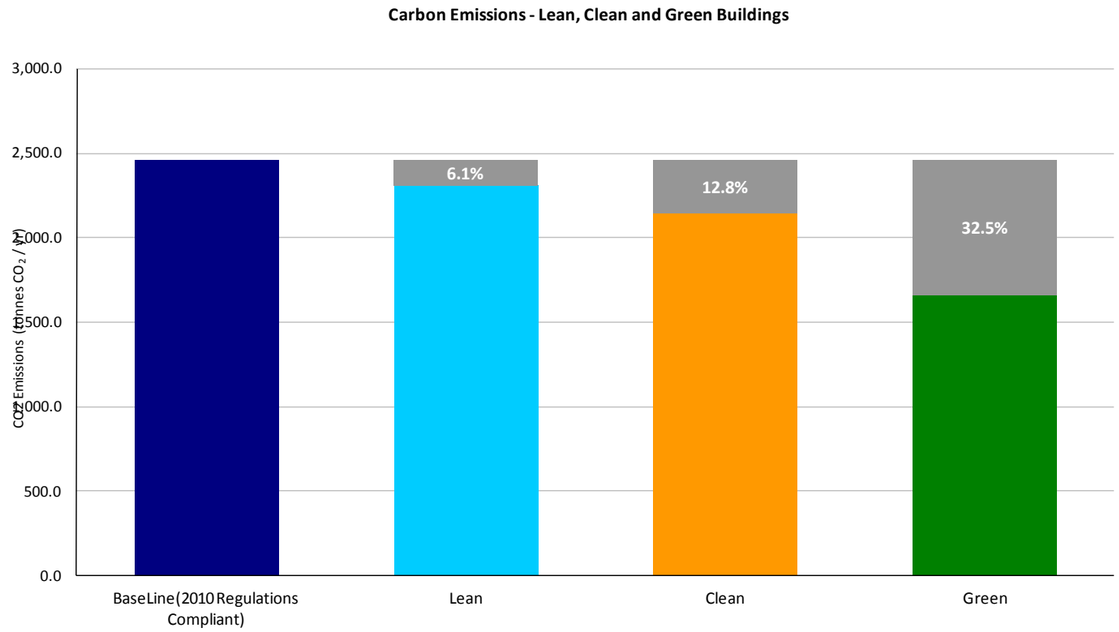
It should be noted that the London Plan and Part L (Building Regulations) results are *not* analogous. The differences between their respective calculations are outlined later in this report but the main differences are listed in the table bellow

Approved Document Part L	London Plan
National regulation.	Local regulation.
Only energy consumed by HVAC, DHW and lighting is considered in normally occupied and treated areas.	All energy consumption is considered.
Carbon reduction is calculated against a required reduction Notional Building.	Carbon reductions are measured against a Baseline building that includes all energy consumption.
Gas-fired CHP and CCHP are considered as low/zero carbon technologies.	Advocates C/CHP, but does not consider as a renewable technology, unless powered by a non-fossil fuel (e.g. Biomass).
Carbon reduction by renewables are calculated as part of the buildings overall reductions.	Carbon reduction by renewables is calculated after making allowances for the effect of energy efficiency and decentralised energy.

	Carbon Dioxide Emissions (Tonnes CO_2 per annum)		
	Regulated Energy	Unregulated Energy	Total
Building Regulations 2010 Part L Compliant Development	1,097.7	1,362.1	2,459.8
After energy demand reduction	951.4	1,359.0	2,310.3
After CCHP	883.1	1,261.5	2,144.6
After renewable energy	683.6	976.5	1,660.1

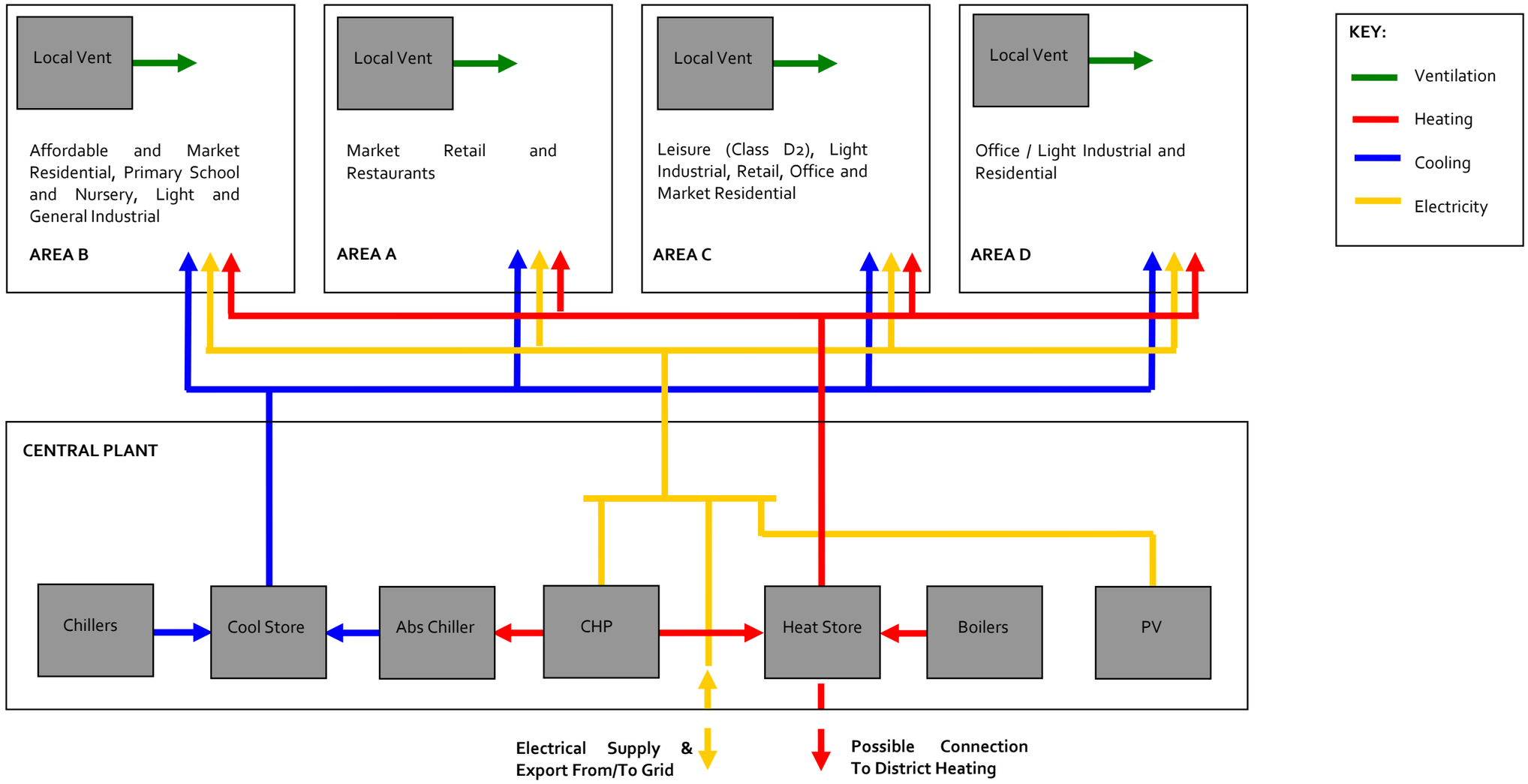
	Carbon Dioxide emissions savings (Tonnes CO_2 per annum)		Carbon Dioxide savings (%)	
	Regulated Energy	Total	Regulated Energy	Total
Savings from energy demand reduction	146.3	149.4	13.3%	6.1%
Savings from gas fired CCHP	68.3	165.8	7.2%	7.2%
Savings from renewable energy	199.5	484.5	22.6%	22.6%
Total cumulative savings	414.1	799.7	37.7%	32.5%





Energy Diagrammatic

The diagram below outlines the energy strategy for the development.



1 INTRODUCTION

1.2 Development Description

The Camden Lock Village development consists of four individual sites with an overall total GEA of approximately 49,785 m².
The four sites are outlined below;

- **Area A -** This development consists of two linked multi-floor blocks of flexible retail units on 5 levels additional retail units are located within railway arches adjacent. The blocks and arches have a combined GEA of approximately 8,635 m². An enclosed restaurant is located on the top of each of the blocks. The development space is assumed to be split between retail (83%) and food outlets (17%). Both the retail and food spaces are largely open-air markets, with only 10% of each being enclosed and conditioned/heated.
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- **Area D** - This development comprises a ground floor café, commercial space provided at ground and basement, and residential apartments above. The total floor area for Area D is approximately 6,336 m² GEA.

This Energy Statement describes the energy assessment undertaken for the project and the proposed energy strategy/energy efficiency measures proposed as a result. It considers the Camden Lock Village development as a whole and addresses both planning policies and building regulations that will influence the solutions adopted for the development.
The energy assessment has been carried out using the methodology outlined in GLA Team Guidance on Planning Energy Assessments Version 1.1 – October 2010 and as discussed with LBC officers in March 2011.

1.3 Purpose and content

This proposal relates to a hybrid planning application the school proposal is outline with all matters reserved and the remainder of the site is a full planning application .
Reducing carbon dioxide emissions into the atmosphere to reduce the impact on climate change is one of the major objectives of sustainable development.
A number of possible measures for reducing emissions in the Camden Lock Village development have been examined. This report details the analysis carried out and considers the possible options in terms of environmental, economic and technical feasibility as well as outlining the proposed energy strategy.
This report demonstrates that large-scale developments can provide modern, comfortable working and living environments without needing to consume large amounts of fossil fuels or release unsustainable quantities of CO_2 into the atmosphere.
This technical report follows the guidelines as set out in the document "Integrating Renewable Energy into New Developments: Toolkit for Planners, Developers and Consultants", produced by London Renewables.
Both passive and active energy efficiency measures are considered, as well as decentralised energy centre complying with local planning policy, such as the Mayor of London's Energy Strategy and Camden Planning Guidance.
The relevant national regulations (The Building Regulations Part L, Conservation of Fuel & Power) are also referenced. The current, 2010, edition is part of a rolling programme intended to reduce carbon dioxide emissions from buildings through a combination of energy efficiency measures and on-site renewable energy.
The analysis undertaken starts with a 'Lean' building which complies with Part L 2006 Building Regulations and also includes energy use not regulated by Part L (e.g. from cooking, electrical appliances, etc). The impact of active & passive energy conservation measures (see below) have been included, using approved software by accredited assessors, which results in a compliant 'Lean' building.
'Lean' Technologies

- Building external envelope performance, façade optimisation
- Exposed thermal mass
- Low energy white goods
- Low energy lighting and lighting control
- High efficiency chillers
- Ventilation heat recover
- Low energy DC motors
- High efficiency lifts
- Power factor correction
- Variable flow air and water plant

It is against this 'Lean' energy demand that options for 'Clean' technologies (e.g. Combined Heat & Power) and renewable technologies have been assessed. The technologies considered include:

'Clean' Technologies:

- Connection to local district C/CHP schemes
- On-Site C/CHP

As per the Mayor's Energy Hierarchy the 'Green' technologies are analysed after the 'Lean' and 'Clean' technologies have been included. These are as follows,
'Green'- Renewable Technologies:

- Wind turbines
- Photovoltaics
- Solar hot water heating
- Biomass heating
- Bio-fuel/biomass C/CHP
- Ground source heat pumps

Note that some of 'Green' technologies are not appropriate for this development, due to site and/or technical constraints.

1.3.1 Open Air Market Space

The open-air areas throughout the development (i.e. the open-air, unconditioned, retail & food outlets in the Site A) are not required to be assessed against Building Regulations Part L and are not covered by the BREEAM methodology.
For this reason, the Part L calculations carried out for this document have not accounted for these spaces. However, in reality, the Open Air Market space will have some energy requirement; primarily electricity for lighting and small power.
In assessing the overall development loads for sizing the CHP, an allowance has been made for these electrical demands of the market retail.

1.4 CO_2 Reduction Targets

The overall target for CO_2 reductions is 597 tonnesCO2

The target for CO_2 emissions savings through energy demand reduction is 146.7 tonnesCO_2.

2 PLANNING POLICIES AND COMPLIANCE

The planning policies relating the Camden Lock Village development are as follows,

National Planning Policy

PPS 1 – Delivering Sustainable Development
PPS 22 – Renewable Energy

Regional Planning Policy

The London Plan - Section 5 – 2011
GLA Guidance on Energy Statements –Sept 2010

Local Planning Policy

Camden Planning Policy (Core Strategy Development Policies Document , 2011) & Supplementary Planning Guidance

2.2 National Planning Policy

The government outlines national planning policy in Planning Policy Statements (PPS) The PPS's relevant to this report are PPS 1 and PPS 22.

2.3 Regional planning policy - The mayor of London's energy strategy

The Mayor of London published the current revision of the 'London Plan' in July 2011. This is the Spatial Development Strategy for Greater London. The Development Plans of all London Boroughs must eventually be in general conformity with the provisions of the London Plan.

To support borough planners, the Mayor has also published a guidance document through London Renewables: "Integrating Renewable Energy into New Developments: A Toolkit for Planners, Developers and Consultants" (Sep 2004) and the Supplementary Planning Guidance "Sustainable Design and Construction" (May 2006).

The London Plan includes policies both for reducing energy consumption within buildings and, significantly, promoting the use of decentralised electricity generation and renewable energy. These policies cover the role of boroughs in supporting the Mayor's Energy Strategy and the requirements of planning applications.

The London Plan recognises that energy efficiency should come before energy supply considerations and has suggested a simple strategy known as the Mayor's Energy Hierarchy. This system follows good practice in the design of low carbon buildings and comprises three distinct stages in order of application:

4. Use Less Energy (Be Lean)
5. Supply Energy Efficiently (Be Clean)
6. Use Renewable Energy (Be Green)

This strategy puts energy efficiency/conservation measures first in reducing the demand for energy, 'Be Lean'. Following this, consideration must be given to supplying the resultant reduced energy demand as efficiently as possible, including the use of combined heat and power (CHP) and tri-generation (CCHP), 'Be Clean'. Finally, sources of renewable energy should be examined, 'Be Green'.

The mayor will expect all major developments to demonstrate that the proposed heating and cooling systems have been selected in accordance with the following order of preference:

- Connection to an existing C/CHP scheme
- Site-wide C/CHP powered by renewable energy
- Gas-fired C/CHP (or fuel cell) (plus some renewables)
- Communal heating and cooling fuelled by renewables
- Gas-fired communal heating and cooling

Where C/CHP is to be installed in a new development, the feasibility of extending the system beyond the site should be investigated.

The possibility of connecting to an existing district heating network has been considered, as has the possibility of serving surrounding developments. These options do not appear viable and hence a site wide CCHP heating and cooling network has been adopted. Provision will be made for within the heating and cooling network to for future connections to district heating networks.

The current London Plan includes a notional target for on-site renewable energy, unless it can be demonstrated that such provision is not feasible. This target is for renewable energy to achieve a 20% reduction in carbon dioxide emissions after any energy efficiency measures and (non-renewable) C/CHP schemes have been applied.

The Plan also states that provision must be made in some form for the future Hydrogen Economy.

The table below outlines the key policies in the 2011 revision London Plan which this report addresses and impact on the Camden Lock Village development. It also summarises how the development will address these policies. Other policies in section 5 of the 2011 London Plan are addressed in the Sustainability statement and Environmental Statement which form part of this application.

Ref	Policy Outline	Proposed Scheme
5.1	Climate Change Mitigation	Refer to responses to policies 5.2, 4A.6 and 4A.7.
5.2	Minimising Carbon Dioxide Emissions.	The development will go beyond the requirements for Building Regulations and the targets outlined in Policy 5.2 of the emerging London Plan 2011 in reducing CO_2 emissions. Annual emissions for the development are expected to be approximately 32.5% below a baseline of 2010 building regulations compliant buildings including non-regulated energy uses. This document sets out the assessment as described in policy 5.2 and the recent GLA energy team guidance on Planning Energy Assessments. Calculations are based on the use of accredited Part L software. A baseline CO_2 emission has been determined representing the Target Emission Rate (TER) to which emissions associated with unregulated energy use have been added. The Building Emission Rate of the proposed buildings will be less than the TER as defined by Part L 2010. This will be achieved by passive design of the buildings and the incorporation of energy efficient plant & systems.
5.3	Sustainable Design and Construction	Many aspects of this policy will be dealt with via the BREEAM and Code for Sustainable Homes assessments.

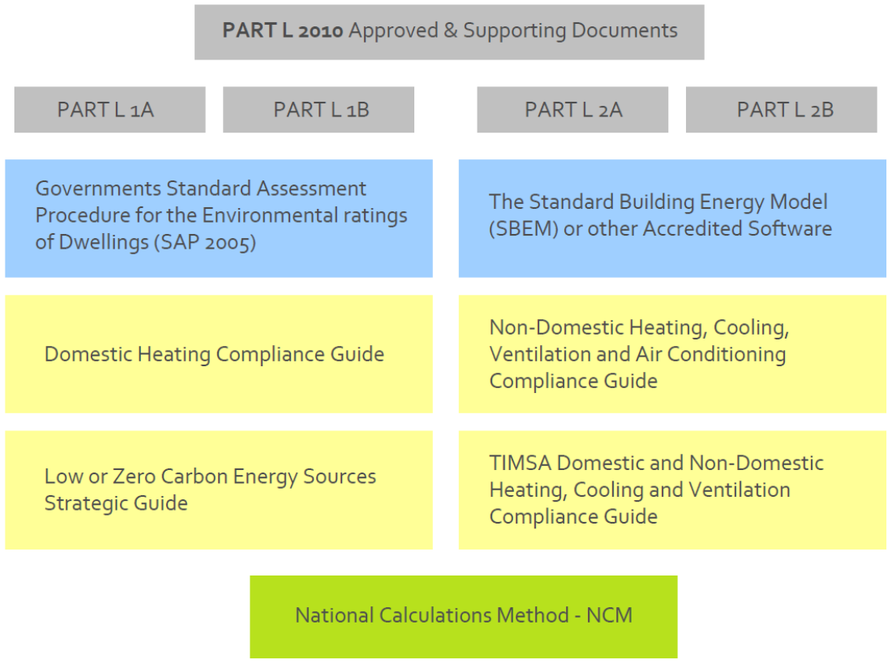
		Other responses within this table also apply to this policy.
5.4	Retrofitting	The existing buildings on the west of site A 1-6 Chalk Farm Road will be partially retained and reconfigured into market retail space and will be connected to the central energy centre. The existing listed building which will be retained as part of the development 1 Hawley Road will be upgraded as far as practicable within the constraints of the buildings listing and it will additionally be connected to the central energy centre.
5.5	Decentralised Energy Networks	Centralised energy plant will serve the entire Camden Lock Village development. This will include heating & cooling by bio-diesel-fired CCHP, boilers and chillers.
5.6	Decentralised Energy: Networks in development proposals.	An on-site CCHP scheme serving the entire Camden Lock Village development will be installed. This central energy system will incorporate connections ready to connect to future district heating schemes. The possibility of serving adjacent properties from the energy centre is being investigated Passive measures & façade optimisation will be used to minimise the requirement for heating & cooling.
5.7	Renewable Energy	Photovoltaics will be installed to provide on-site renewable electricity generation. However, PV will reduce the electrical demand on the CCHP. On the Mayor's energy hierarchy CCHP lies higher than PV. For these reasons, the PV is sized to achieve approximately a 1% reduction in carbon dioxide emissions, as a larger PV installation would reduce the savings from the CCHP. Various other renewable technologies have been examined but are not considered appropriate for the development. For example, solar hot water panels would reduce the heat load on the CCHP.
5.8	Innovative Energy Technologies	The building energy systems will be designed such that the CCHP unit can be replaced with a fuel cell once they become economical and technically viable for the development.
5.9	Overheating and Cooling	General building design, such as optimisation of the façade the use of solar shading will minimise solar gains to the buildings.

2.4 Local Planning Policy -Camden Council

Camden Council's Local Development Framework namely the Core Strategy and Development Policies document was adopted in November 2010 Policy DP22 – Promoting Sustainable Design and Construction is relevant to this report. The policy requires Code for Sustainable Homes (CFSH) Level 3 for residential and BREEAM 'Very Good' targeting 'Excellent' for non-domestic.
The policy also asks that buildings are deigned to avoid overheating and the use of air-conditioning to be avoided where possible.
The policies in the London Plan 2011 are equivalent or more onerous in terms of energy use and carbon emissions so compliance with the London Plan will ensure compliance with Camden Council policies.

3 BUILDING REGULATIONS -PART L

Carbon emissions, attributable to buildings 'in use' result from lighting, heating, cooling, ventilation and small power (including equipment, lifts, domestic appliances, etc). Both the national (Building Regulations, Part L) and the regional (London Plan, Energy Strategy) regulations require that these emissions are limited. Both set targets, although in somewhat different ways.
The latest revision of the Approved Documents (AD) for the Building Regulations Part L (Conservation of Fuel and Power) was published in October 2010. A number of second and third tier supporting documents have also been published. The diagram below indicates the suite of regulations and supporting documents that relate to building energy use.



The regulations set target reductions in carbon dioxide emissions compared to a 2010 compliant "Notional" building.

In summary:-

- These regulations apply to all new buildings from October 2010. Different regulations apply to refurbished buildings.
- There is an aggregate reduction of at least 25% in carbon emissions compared to 2010 requirements across all building types.
- Small power and energy use by cooking, appliances, catering equipment, plant-rooms, car parks and lifts are excluded.
- The reduction in CO_2 can be achieved by any mixture of energy efficiency features (i.e. reducing energy demand) and low or zero-carbon energy supply systems, but minimum standards of thermal performance apply.
- In all cases, the reduction in CO_2 achieved is determined by comparing the proposed "Design" building with a "Notional" building of the same size, shape and usage that complies with the 2010 elemental values.
- Although not mandatory, it is suggested that a suitable target for energy efficiency measures is a 20% reduction in carbon dioxide emissions and for low/zero carbon technologies.

3.2.1 Calculation Methods

A rigid calculation methodology is set out for implementation using accredited software.
The National Calculation Methodology (NCM) takes into account the efficiency of the HVAC (Heating Ventilation & Air Conditioning) systems and the method of energy supply, such as CHP (Combined Heat and Power) together with any renewable energy.
The software requirements are slightly different for domestic and non-domestic buildings, both of which are present in the Camden Lock Village development.

- **Non-Dwellings** For non-dwellings the software is iSBEM or an approved Dynamic Simulation Model (DSM) through which calculations must be undertaken by an accredited assessor. For this report the calculations have been carried out using ADSL TAS version 9.2.0 which is an approved DSM.
- **Dwellings** For dwellings this is the Standard Assessment Procedure (SAP) using approved software which must be undertaken by an accredited assessor.

All calculations relating to Part L in this report have been carried out using the current versions of accredited software and have been overseen by licensed Part L assessors. Refer to Appendix A for the accreditation details.

3.3 Part L and London plan Comparison

There are differences in the method of calculation and definition between Part L and the London Plan that give rise to difficulties in presenting those two requirements along side each other. The table below summarises the differences between the two:

Approved Document Part L	London Plan
National regulation.	Local regulation.
Only energy consumed by HVAC, DHW and lighting is considered in normally occupied and treated areas.	All energy consumption is considered.
Carbon reduction is calculated against a required reduction Notional Building.	Carbon reductions are measured against a Baseline building that includes all energy consumption.
Gas-fired CHP and CCHP are considered as low/zero carbon technologies.	Advocates C/CHP, but does not consider as a renewable technology, unless powered by a non-fossil fuel (e.g. Biomass).
Carbon reduction by renewables are calculated as part of the buildings overall reductions.	Carbon reduction by renewables is calculated after making allowances for the effect of energy efficiency and decentralised energy.

4 ENERGY ASSESMENT

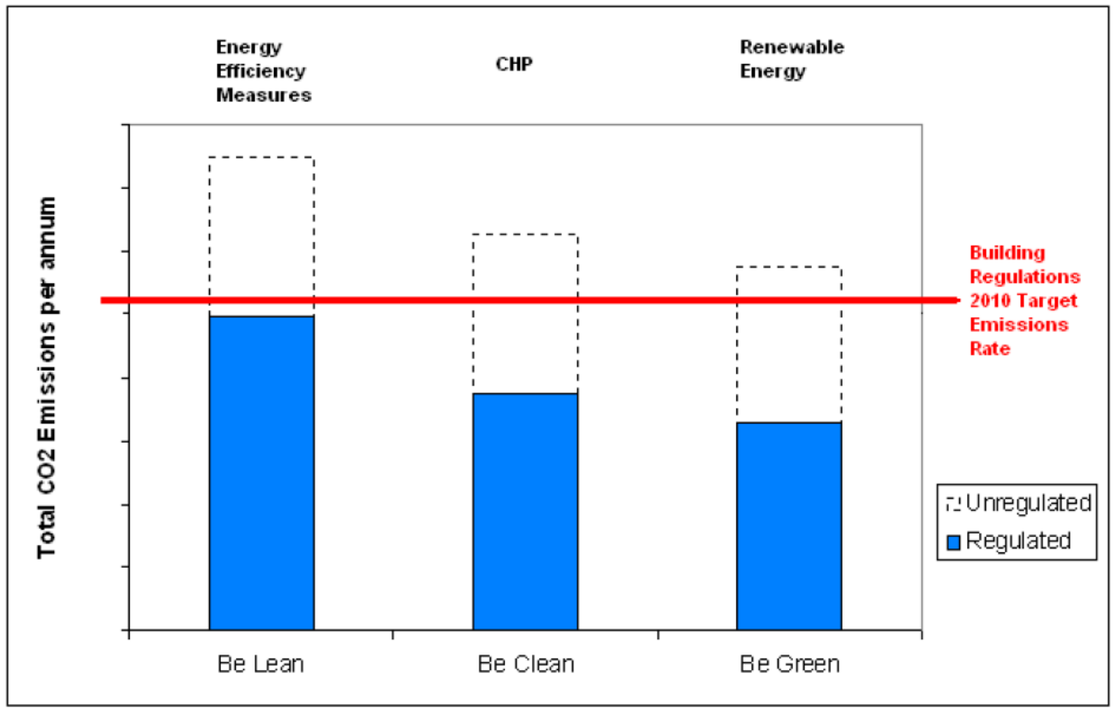
4.2 Methodology

Part L, 2010, of the Buildings Regulations use a 2010compliant "Notional" building against which target reductions in carbon emissions must be achieved.
The 2010 Approved Documents Part L and supporting second or third tier documents set out in detail how a 2010 notional building should be modelled to produce a base energy demand and resultant carbon dioxide emissions assessment.
The current London Plan assesses a development or buildings carbon emissions against Part L 2010 compliant building. This figure is calculated using Part L accredited software. The energy use assessment for Part L of the Building Regulations does not include all forms of energy use only 'Regulated' energy use is assessed. The London Plan however requires that 'unregulated' energy use such as appliances and cooking are included.
The 'unregulated' energy use is calculated by reference to published material or by calculation.

- For residential areas, an allowance for cooking & appliances has been added based on the information outlined in the SAP worksheet 9.81.
- For the functional non-domestic areas, an allowance for small power has been added based on output from the Part L model for the building (i.e. the NCM).
- For plant rooms, an estimate has been made of the lighting & small power energy demand.

The treated areas of the building have been modelled using the National Calculations Method (NCM). This is incorporated in SAP and a dynamic thermal simulation tool (TAS by EDSL Ltd) accredited for carrying out carbon emissions calculations. The results have been used to estimate energy consumption and carbon dioxide emission.

For reference, the typical break-down of emissions for a modern apartment indicates that 'unregulated energy use' (appliances and cooking) accounts for approximately half of the total carbon dioxide emissions.
The graph below indicates the process of analysis. The 'unregulated' energy use figure is added to the Part L 2010 compliant building / development figure. This summation is known as the 'Base Line' figure, this is figure to which all carbon reduction measures are assessed.
'Base Line' + Passive & Active Energy Efficiency Measures = **'Lean'** Building
'Lean' Building + C/CHP Technologies = **'Clean'** Building
'Clean' Building + Renewable Technologies = **'Green'** Building



4.2.1 Carbon Emission Factors

Carbon emission factors are used to calculate the equivalent carbon dioxide emissions associated with different fuels. For example, 1 kWh of power from grid electricity will have a different environmental impact than 1 kWh of power from natural gas.

The current version of the London Renewables Toolkit specifies that carbon intensities for fossil fuels and electricity used in all calculations are based on those specified in the current Approved Documents for the Building Regulations Part L. This includes electricity generated on site. For biomass the Toolkit is at odds with the Approved Documents.

The carbon emission factors for the various fuels used in this report are based entirely on those contained within the Building Regulations Approved Document, Part L2A.

The table below summarises the different carbon intensities, as well as the choices made for this report.

	Carbon Intensity kgCO2/kWh		
Fuel	**Approved Documents**	**Renewables Toolkit**	**This Report**
Natural Gas	0.198	0.194	0.198
Biodiesel	0.047	-	0.098
Biomass (woodchip)	0.025	0	0.009
Electricity from the Grid	0.422	0.422	0.517
Electricity generated on site	0.568	0.568	0.529

For on-site electrical generation systems (e.g. wind, photovoltaics, fuel cells and CHP) the Approved Documents specify that in calculating carbon dioxide savings, a carbon intensity of 0.568 kgCO_2/kWh should be used for the electricity grid displaced. This is higher than that specified for electricity taken from the grid (0.517 kgCO_2/kWh).

The renewable toolkit states zero carbon intensity for biomass and bio-fuel whilst the Approved Documents specifies a carbon intensity of 0.028kgCO_2/kWh.

The authors believe that the true value for biomass produced in the London and SE region is probably between these two values. It has been agreed with the GLA previously that the value used in the Approved Documents should be used.

The figures used in the calculations throughout this document are based on the Part L 2010 figures.

4.3 Energy Assessment Results

4.3.1 Baseline (2010 Regulations Compliant)

Annual energy demand by end use (kWh/m²/year)

		Regulated Energy					Unregulated Energy			
End Use	Area	Heating	DHW	Cooling	Auxiliary	Lighting	Small Power	Cooking	Annual Gas Consumption (kWh)	Annual Electricity Consumption (kWh)
Residential - Affordable	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Residential - Private	22,038.00	65.73	42.49	0.00	2.06	6.94	32.40	6.00	2,384,952	1,044,601
Hotel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Circulation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Buissness/Light Industrial	9,146.00	3.97	3.21	15.08	18.25	18.76	39.59	0.00	65,668	838,505
Restaurant	1,272.00	1.08	113.20	36.49	52.47	60.75	123.04	0.00	145,364	346,938
Retail	630.00	1.93	1.21	22.16	23.97	65.23	114.49	0.00	1,978	142,286
Kitchen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
School	1,931.00	7.01	36.80	0.00	16.10	18.84	50.38	0.00	84,597	164,753
Cinema	3,471.00	0.00	0.00	0.00	0.00	0.00	303.81	0.00	0	1,054,525
Open Market Retail	6,274.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0	31,370
Open Market Food	1,443.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0	14,430
Car Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Loading Bay	2,106.00	0.00	0.00	0.00	17.50	10.00	0.00	0.00	0	57,915
Plant	1,474.00	10.00	0.00	0.00	15.00	5.00	0.00	0.00	14,740	29,480
Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
TOTAL (Area Weighted)	49785	30.45	23.73	3.98	7.72	10.20	50.26	2.66	2,697,300	3,724,802

Annual CO2 emissions by end use ($kgCO_2/m^2/year$)

		Regulated Energy					Unregulated Energy		
End Use	Area	Heating	DHW	Cooling	Auxiliary	Lighting	Small Power	Cooking	Annual Lean CO2 Emissions (tonnes)
Residential - Affordable	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Residential - Private	22,038	13.01	8.41	0.00	1.07	3.59	16.75	3.10	1,012
Hotel	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Circulation	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Buissness/Light Industrial	9,146	0.79	0.64	7.80	9.44	9.70	20.47	0.00	447
Restaurant	1,272	0.21	22.41	18.87	27.13	31.41	63.61	0.00	208
Retail	630	0.38	0.24	11.46	12.39	33.72	59.19	0.00	74
Kitchen	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
School	1,931	1.39	7.29	0.00	8.32	9.74	26.05	0.00	102
Cinema	3,471	0.00	0.00	0.00	0.00	0.00	157.07	0.00	545
Open Market Retail	6,274	0.00	0.00	0.00	0.00	0.00	2.59	0.00	16
Open Market Food	1,443	0.00	0.00	0.00	0.00	0.00	5.17	0.00	7
Car Park	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Loading Bay	2,106	0.00	0.00	0.00	9.05	5.17	0.00	0.00	30
Plant	1,474	1.98	0.00	0.00	7.76	2.59	0.00	0.00	18
Storage	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
TOTAL (Area Weighted)	49,785	6.03	4.70	2.06	3.99	5.27	25.99	1.37	2,460

4.3.2 Lean Building(After Energy Savings)

Annual energy demand by end use (kWh/m²/year)										
		Regulated Energy					Unregulated Energy			
End Use	Area	Heating	DHW	Cooling	Auxiliary	Lighting	Small Power	Cooking	Annual Gas Consumption (kWh)	Annual Electricity Consumption (kWh)
Residential - Affordable	0.00	17.94	30.91	0.00	4.33	5.37	0.00	6.00	0	0
Residential - Private	22,038	23	29	1	4	5	32	6	1,166,912	1,066,132
Hotel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Circulation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Buissness/Light Industrial	9,146	5	3	7	18	21	40	0	75,089	779,529
Restaurant	1,272	1	111	15	49	55	122	0	142,159	306,647
Retail	630	16	1	10	29	65	113	0	10,786	136,889
Kitchen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
School	1,931	9	31	0	15	19	50	0	76,506	162,183
Cinema	3,471	3	2	2	17	24	303	0	15,897	1,202,619
Open Market Retail	6,274	0	0	0	0	8	5	0	0	81,518
Open Market Food	1,443	0	90	0	0	12	10	0	129,870	31,658
Car Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Loading Bay	2,106	0	0	0	15	10	0	0	0	52,650
Plant	1,474	8	0	0	12	5	0	0	11,792	25,058
Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
TOTAL (Area Weighted)	49785	12.31	20.41	2.24	9.45	12.74	50.14	2.66	1,629,010	3,844,883

Annual CO2 emissions by end use (kgCO$_2$/m²/year)									
		Regulated Energy					Unregulated Energy		
End Use	Area	Heating	DHW	Cooling	Auxiliary	Lighting	Small Power	Cooking	Annual Lean CO2 Emissions (tonnes)
Residential - Affordable	0	3.55	6.12	0.00	2.24	2.78	0.00	3.10	0
Residential - Private	22,038	4.65	5.84	0.34	2.16	2.67	16.74	3.10	782
Hotel	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Circulation	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Buissness/Light Industrial	9,146	1.00	0.62	3.63	9.06	10.92	20.45	0.00	418
Restaurant	1,272	0.21	21.92	7.89	25.28	28.29	63.17	0.00	187
Retail	630	3.16	0.23	5.36	14.89	33.72	58.36	0.00	73
Kitchen	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
School	1,931	1.75	6.09	0.00	7.82	9.68	25.93	0.00	99
Cinema	3,471	0.50	0.40	1.08	8.84	12.54	156.67	0.00	625
Open Market Retail	6,274	0.00	0.00	0.00	0.00	4.14	2.58	0.00	42
Open Market Food	1,443	0.00	17.82	0.00	0.00	6.20	5.14	0.00	42
Car Park	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Loading Bay	2,106	0.00	0.00	0.00	7.76	5.17	0.00	0.00	27
Plant	1,474	1.58	0.00	0.00	6.20	2.59	0.00	0.00	15
Storage	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
TOTAL (Area Weighted)	49,785	2.44	4.04	1.16	4.89	6.59	25.92	1.37	2,310

4.3.3 Summary of Carbon Emissions Reduction

	Carbon Dioxide Emissions (Tonnes CO_2 per annum)		
	Regulated Energy	Unregulated Energy	Total
Building Regulations 2010 Part L Compliant Development	1,097.7	1,362.1	2,459.8
After energy demand reduction	951.4	1,359.0	2,310.3
After CCHP	883.1	1,261.5	2,144.6
After renewable energy	683.6	976.5	1,660.1

	Carbon Dioxide emissions savings (Tonnes CO_2 per annum)		Carbon Dioxide savings (%)	
	Regulated Energy	Total	Regulated Energy	Total
Savings from energy demand reduction	146.3	149.4	13.3%	6.1%
Savings from gas fired CCHP	68.3	165.8	7.2%	7.2%
Savings from renewable energy	199.5	484.5	22.6%	22.6%
Total cumulative savings	414.1	799.7	37.7%	32.5%

4.4 Energy Assessment Conclusion

Assessments of the whole development carbon emissions show that, using a combination of efficiency measures and biodiesel fired CCHP, the carbon emissions of the development are reduced by 799.7 tonnesCO_2. This equates to a saving of 32.5% when compared to the 2010 Building Regulations target development.

5 BE 'LEAN': ENERGY EFFICIENCY MEASURES

As part of the Mayor's Hierarchy the first stage (Be Lean) is to reduce the energy consumption of the building by introducing energy efficiency measures.
This can be both through passive measures (i.e. non-energy consuming) such as improving the buildings façade thermal performance or active measures (i.e. energy consuming) such as using low-energy lighting within the building.

5.2 Passive & Active Measures

5.2.1 Building External Envelope

The external envelope is an important climatic modifier. A well-designed external envelope can significantly reduce the total combined energy demand of heating, cooling and lighting.
In addition, fenestration must be designed to reduce discomfort from solar gains and glare but also provide a good view out, considered essential for health and wellbeing.

5.2.2 Building Fabric Thermal Performance

Building external façades with low thermal conductivities (i.e. U-Values) reduce building heating & cooling requirements by improving building performance during extreme weather (i.e. lower heat loss in winter and lower heat gain in summer).
Glazing properties can also be used to influence building heat losses & gains. Reducing the g-value lowers the solar gains entering the building, which in turn reduces the need for cooling in the summer. However a low g-value also reduces beneficial solar gains in winter, thus increasing the heating requirement. The g-value is can also be linked to the glazing 'light transmittance' which measures the proportion of daylight which enters the building, and can therefore impact on the requirement for artificial lighting.
The fenestration for each of the buildings will be designed to reduce unwanted solar gains in summer and, where possible, to allow natural ventilation to be used. The glazing will be a high performance solar control in sites with cooling to reduce solar gains, whilst permitting daylight to enter (selective reflective coating). The glazing fraction (i.e. percentage glazing of the external walls) will be fixed to reduce solar gains. The form of the buildings will provide some external shading and external shading devices will be used strategically.
Building elements within the development will be insulated at least to Part L standards to improve the thermal performance of the development and reduce conduction gains & losses.

Building Element (Part L max)	Area A	Area B	Area C	Area D
Floor (0.25 W/m²K)	(will comply with proposed Zero Carbon Standards)			
Roof (0.25 W/m²K)	(will comply with proposed Zero Carbon Standards)			
Wall (0.35 W/m²K)	(will comply with proposed Zero Carbon Standards)			
Glazing (2.2 W/m²K) *	(will comply with proposed Zero Carbon Standards)			
** Display glazing is not required to meet this U-value*				

Glazing g-values will typically be lower than those used in the National Calculation Methodology.

5.2.3 Building Leakage Rate

It is intended that a building leakage rate under a building regulations test will be lower for the development buildings than Building Regulations requirements.
This reduces infiltration throughout the year, decreasing both the buildings heating requirement (due to less cold external air entering the building in winter) and the buildings cooling requirement (due to less hot external air entering the building in summer). The proposed overall envelope leakage rates for the development are detailed below.

- Building Regulations: 10 m³/hr/m² at 50 Pa
- Area A : 3 m³/hr/m² at 50 Pa
- Area B: 3 m³/hr/m² at 50 Pa *
- Area C: 3 m³/hr/m² at 50 Pa
- Area D: 3m³/hr/m² at 50 Pa

* It should be noted that much of the Village Market development is open-air.

5.2.4 Exposed Thermal Mass

Area A will not have a false ceiling; instead there will be an exposed concrete soffit.
This exposed thermal mass absorbs heat during the day, which is then re-emitted from the structure through the night. Effectively this acts to dampen fluctuations in temperature within the building and increases the buildings response time to heat gains & losses.
Due to the building design, the other phases (Areas B, C, and D) will not have exposed thermal mass.

5.2.5 Low Energy White Goods

White goods including washing machines, dryers, dishwashers and fridge/freezers are responsible for a large proportion of electrical consumption in dwellings. Electrical consumption is responsible for roughly half the carbon emissions from a dwelling.
White goods are now provided with a certified energy label. Although the labelling method is currently under review, currently they are rated A+, A, B and C with C being the least efficient. Data supplied by the Energy Advice Centre suggests that using A rather than C rated white goods would reduce electrical energy consumption in each dwelling by 800 kWh/year.
It is intended that all white goods provided in the development will have the highest energy ratings available. The expected carbon dioxide emission reductions are summarised below.

White Goods	
All white goods supplied, "A" rated	
Capital Costs	**£**
Fridge freezers	500
Dishwashers	500
Washing machines	500
Total Effective Capital Cost (Residential)	**351,000**
Annual Operating Costs	**£/year**
Electricity	-163,351
Gas	0
Maintenance	0
Total Annual Operating Costs	**-£163,351**
Simple Payback Period (years)	**2**
Carbon Emissions	
Reduction in CO2 Emissions (tonnes p.a.)	**84.5**
% Reduction in CO2 Emissions	**3.5%**
Carbon Cost Index (£/tonneCO2 p.a.)	**4,156**

In addition to the energy savings achieved by this measure, the BREEAM and Code for Sustainable Homes schemes both award credits (Energy category) for the provision of energy efficient white goods.

5.2.6 Low Energy Lighting & Lighting Control

Dedicated low energy light fittings (i.e. for lamps with a luminous efficacy greater than 40 lumens per circuit-Watt) will be used throughout the development. According to the Energy Saving Trust, low-energy compact fluorescent lamps use around 80% less electricity than standard tungsten filament lamps.
For new residential developments, the Part L Building Regulations require that 25% of light fittings, or 1 per 25 m^2 of floor area, are dedicated low energy light fittings. The savings shown in the table below outline the emissions reduction that can be achieved by installing more low energy light fittings than this requirement. It should be noted that installing 100% low energy fittings is not considered feasible. It is not always possible to achieve the required lighting effects using low energy light sources though lighting technology is rapidly advancing and this issue will be reviewed and reassessed until construction.
Further savings are claimed for the latest LED lamps which are becoming available for domestic luminaires. The possible use of such fittings will be investigated.
The BREEAM and Code for Sustainable Homes schemes both award credits (Energy category) for the provision of low energy lighting.
Where appropriate, lighting will be controlled by movement and daylight sensors to ensure they dim or switch off when possible. In particular, this system of control will be used in the public areas of all four phases.

Energy Efficient Lighting and Control - Non Residential			
Capital Costs			**£**
Equipment & Installation			54,355
Value of Lost Space	**£/m^2**	**m^2**	**£**
None	0	0 m2	0
Total Effective Capital Cost			**54,355**
Annual Operating Costs			**£/year**
Electricity			-2,671
Maintenance			0
Total Annual Operating Costs			**-2,671**
Simple Payback Period (years)			**20**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**12.0**
% Reduction in CO2 Emissions			**0.5%**
Carbon Cost Index (£/tonneCO2 p.a.)			**4,511**

5.2.7 High Efficiency Chillers

The requirement for mechanical cooling will be minimised through the passive and active design features discussed. The Area B dwellings and much of the Area A development will not be provided with mechanical space cooling.
The 'Non-Domestic Heating, Cooling and Ventilation Compliance Guide', a second tier document to Part L, lists minimum full-load Energy Efficiency Ratios (EERs) for different comfort cooling systems.
The exact type of comfort cooling to be provided will largely be influenced by the space & location available for the plant. As this space has not been finalised, the choice of plant has not been decided. However, it is intended that plant with higher EERs than required will be used. The table below outlines the minimum provisions outlined in the Guide.

Table 31 Minimum Energy Efficiency Ratio (EER) for comfort cooling

Type		Minimum cooling plant full load EER
Packaged air conditioners	Single duct types	1.8
	Other types	2.2
Split and multi-split air conditioners including variable refrigerant flow systems		2.4
Vapour compression cycle chillers, water cooled		3.4
Vapour compression cycle chillers, air cooled		2.25
Water loop heat pump		3.2
Absorption cycle chillers		0.5
Gas engine driven variable refrigerant flow		1.0

5.2.8 Ventilation Heat Recovery

Heat recovery systems take heat from the warm exhaust air and transfer it to the cold incoming fresh air in winter. In summer, the reverse occurs. Large savings in heating (and, to a lesser extent, cooling) energy is achieved. The disadvantage is that the plant adds additional resistance to the ventilation system so increasing fan power. Nevertheless, a well-designed system can provide overall carbon savings.
Heat recovery is not required by Part L Building Regulation but is rewarded under Part L and Part F as an effective and efficient strategy.

- Heat recovery on the outside air will be provided to all feasible main air handling units within the development. A minimum thermal effectiveness of 60 % will be specified to heat recovery systems.
- Additionally, 'whole-house ventilation units' with heat recovery will allow ventilation to be provided to the dwellings without the need for heating or cooling of the incoming air. These individual dwelling units will be provided with bypasses to minimise the impact of an increased system resistance when heat recovery is not required.

The increased fan power has been factored into the calculations outlined below.

Heat Recovery			
Type:			Plate Heat Exchanger
Efficiency:			65%
Capital Costs			**£**
Equipment & Installation			50,000
Value of Lost Space	**£/m²**	**m²**	**£**
Plant	3,000	8 m2	24,000
Total Effective Capital Cost			**74,000**
Annual Operating Costs			**£/year**
Electricity			2,177
Gas			-621
Maintenance			1,000
Total Annual Operating Costs			**2,556**
Simple Payback Period (years)			**No Payback**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**-5.9**
% Reduction in CO2 Emissions			**-0.2%**
Carbon Cost Index (£/tonneCO2 p.a.)			**-12,642**

5.2.9 Low Energy DC Motors

The current Part L Building Regulations set stringent energy efficiency requirements for fans used in building ventilation. Maximum Specific Fan Powers are outlined in the 'Non-Domestic Heating, Cooling and Ventilation Compliance Guide' for different system types.
Recent advances in fan motor technology have resulted in considerable potential reductions in mechanical ventilation energy consumption, a significant proportion of building energy use. Electronically Commutated Direct Current (EC/DC) motors can have far higher efficiencies than traditional AC ones.
The business uses and retail units will in part be served by Fan Coil Units. EC/DC motors rather than conventional AC motors will be specified in these FCUs.

Fan Coil Unit Motors	
Motor type:	DC Variable
Specific Fan Power:	0.40 W/l/s
Capital Costs	**£**
Equipment & Installation	250,000
Total Effective Capital Cost	**250,000**
Annual Operating Costs	**£/year**
Electricity	-6,766
Gas	0
Maintenance	750
Total Annual Operating Costs	**-6,016**
Simple Payback Period (years)	**42**
Carbon Emissions	
Reduction in CO2 Emissions (tonnes p.a.)	**30.5**
% Reduction in CO2 Emissions	**1.3%**
Carbon Cost Index (£/tonneCO2 p.a.)	**8,190**

5.2.10 High Efficiency Lifts

There are a number of energy efficiency measures that can be fitted to vertical transportation systems.
This includes controls that ensure that no more lifts are in service than are required, and switching off lift controllers and car lighting when the lifts are not in use. Savings of about 0.5% total carbon dioxide emissions are estimated. This energy efficiency measure will be applied.
Another energy efficiency measure often proposed for vertical transportation is regenerative breaking but it is not considered appropriate for low buildings and will not therefore be applied.
The BREEAM Retail & Offices schemes award credits (Energy category) for the provision of energy efficiency measures for lifts.

High Efficiency Chillers	
Improved COP:	4.5
Capital Costs	**£**
Equipment & Installation	2,400
Total Effective Capital Cost	**2,400**
Annual Operating Costs	**£/year**
Electricity	-9,039
Gas	0
Maintenance	0
Total Annual Operating Costs	**-9,039**
Simple Payback Period (years)	**0.3**
Carbon Emissions	
Reduction in CO2 Emissions (tonnes p.a.)	**40.8**
% Reduction in CO2 Emissions	**1.7%**
Carbon Cost Index (£/tonneCO2 p.a.)	**59**

5.2.11 Power Factor Correction

Fan and pump motors and those associated with lifts cause a phase shift between electrical current and voltage, reducing the efficiency of the supply.
Power Factor Correction (PFC) can be incorporated to redress this effect.
It is proposed that this development is equipped with PFC equipment to achieve a PFC of 0.95. This is higher than is traditionally incorporated. An estimation of the possible reduction in carbon dioxide emissions associated with PFC at this level is shown below.

Power Factor Correction			
Power Factor Correction:			0.95
Location:			Basement
Capital Costs			**£**
Equipment & Installation			71,815
Value of Lost Space	**£/m²**	**m²**	**£**
Basement	3,500	4 m2	14,000
Total Effective Capital Cost			**85,815**
Annual Operating Costs			**£/year**
Electricity			-10,288
Maintenance			2,000
Total Annual Operating Costs			**-8,288**
Simple Payback Period (years)			**10**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**46.4**
% Reduction in CO2 Emissions			**1.9%**
Carbon Cost Index (£/tonneCO2 p.a.)			**1,849**

5.2.12 Variable Flow Air & Water Plant

Variable speed fans and pumps will be specified throughout the Camden Lock Village development. This will allow fan & pump speeds to be matched to the actual demand and will result in savings, particularly at part-load conditions.
For example, where a centralised mechanical ventilation strategy is used (e.g. the main retail spaces), outside air flow will be correspond to occupancy levels, cooling requirement and CO_2 concentrations. Air flow rates will be reduced when possible, and the corresponding fan power will also reduce.
Where appropriate, all cooling & heating water systems will utilise variable flow pumping to reduce power consumption by the pumps.
As the system designs are progressed the savings from variable flow air and water systems will be analysed in more detail. Significant savings can be expected but are not accounted for at this time.
It should be noted that where constant volume systems are installed, variable speed fans & pumps will still be specified. However, the savings associated with these systems will be less than for variable flow systems.

5.3 Energy Efficiency Summary

The energy efficiency measures detailed above have been incorporated into the Part L software models. As discussed, not all of the active options are practical or beneficial for all phases of the development. The table below summarises the options chosen. The cells in yellow indicate 'passive' measures, whilst those in green indicate 'active' measures.

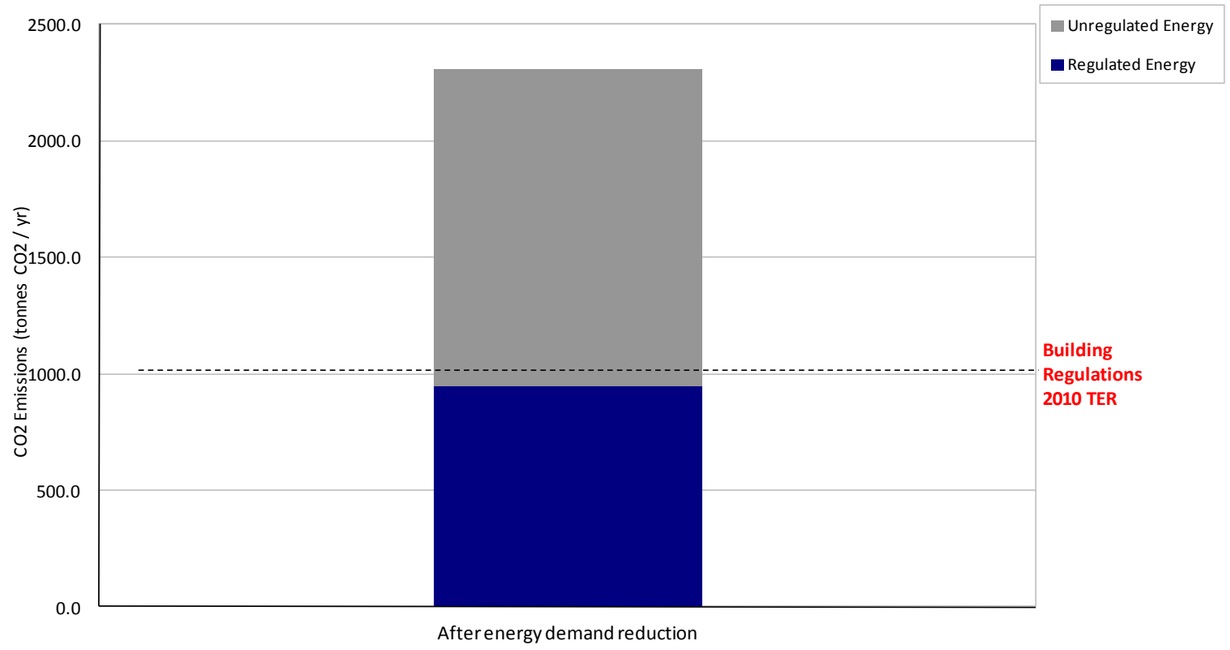
Active Energy Efficiency Measure	Area A	Area B	Area C	Area D
Low Energy White Goods	N/A	✓	✓	✓
Facade Optimisation	✓	✓	✓	✓
Low Energy Lighting & Lighting Control	✓	✓	✓	✓
High Efficiency Chillers	✓	✓	✓	✓
Ventilation Heat Recovery	N/A	✓	✓	✓
Low Energy DC Motors	N/A	✓	✓	✓
High Efficiency Lifts	✓	✓	✓	✓
Power Factor Correction	✓	✓	✓	✓

The graphs that follow indicate building compliance with Part L of Building Regulations for each part of the development.
A further set of graphs show compliance with the first part of the London Plan: The development emissions are lower than the Baseline emissions with Lean (energy efficiency) measures alone.

5.4 'LEAN' BUILDING CO_2 EMISSIONS Results

5.4.1 Part L Compliance

The graphs below illustrate the overall emissions reductions achieved with the proposed energy efficiency measures. The results were produced using Part L approved software (TAS version 9.1.3 for non-domestic buildings and NHER Plan Assessor-SAP for domestic buildings). Appendix A includes details of the software used, as well as the accredited users.
These calculations include no allowance for clean technologies (e.g. CHP) or any renewable technologies. These ('Clean' & 'Green') items are considered later in the report.



5.4.2 London Plan Compliance

As described previously, the development can be shown to pass Building Regulations requirements using solely passive & active energy efficiency measures via the baseline emissions calculations.
This 'Lean' building demonstrates further energy savings that result from passive and active measures over and above those required for building compliance.

Annual CO2 emissions by end use ($kgCO_2/m^2$/year)									
		Regulated Energy					Unregulated Energy		
End Use	Area	Heating	DHW	Cooling	Auxiliary	Lighting	Small Power	Cooking	Annual Lean CO2 Emissions (tonnes)
Residential - Affordable	0	3.55	6.12	0.00	2.24	2.78	0.00	3.10	0
Residential - Private	22,038	4.65	5.84	0.34	2.16	2.67	16.74	3.10	782
Hotel	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Circulation	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Office	7,765	1.00	0.62	3.63	9.06	10.92	20.44	0.00	355
Restaurant	1,272	0.21	21.92	7.89	25.28	28.29	63.17	0.00	187
Retail	630	3.16	0.23	5.36	14.89	33.72	58.36	0.00	73
Kitchen	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
School	1,931	1.75	6.09	0.00	7.82	9.68	25.93	0.00	99
Cinema	3,471	0.50	0.40	1.08	8.84	12.54	156.67	0.00	625
Open Market Retail	6,274	0.00	0.00	0.00	0.00	5.17	2.58	0.00	49
Open Market Food	765	0.00	19.80	0.00	0.00	7.76	5.11	0.00	25
Car Park	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Loading Bay	2,106	0.00	0.00	0.00	9.05	5.17	0.00	0.00	30
Plant	1,441	1.98	0.00	0.00	7.76	2.59	0.00	0.00	18
Storage	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
TOTAL (Area Weighted)	47,693	2.53	3.98	1.11	4.94	6.63	26.39	1.43	2,242

6 'CLEAN' SUPPLYING ENERGY EFFICIENTLY

As part of the Mayor's Hierarchy the second stage (Be Clean) is to reduce the energy consumption of the building by providing energy efficient energy. This involves generating electricity locally, and utilising, rather than throwing away, the waste heat.
This can be both through the use of Combined Heat & Power, or Combined Cooling Heat & Power, either within the development or as part of a larger district scheme.

6.2 Local Utility Provider

It should be noted that the installation and operation of a C/CHP system is dependent on acceptance by the local electricity provider (EDF).
The calculations for estimated CO_2 savings in each option are based on the units operating in parallel with the mains electricity. This means that both the C/CHP and the mains electricity are connected to the entire building and ensures maximum use of the C/CHP.
At this early stage of the design it is not possible to determine via the local electricity provider if this will be acceptable. If it is not, it will not be possible for the CHP system to operate in this form (other methods are available, such as 'Island' mode) and the CO_2 savings may be considerably reduced. Should this prove to be the case an alternative low energy system will be installed.

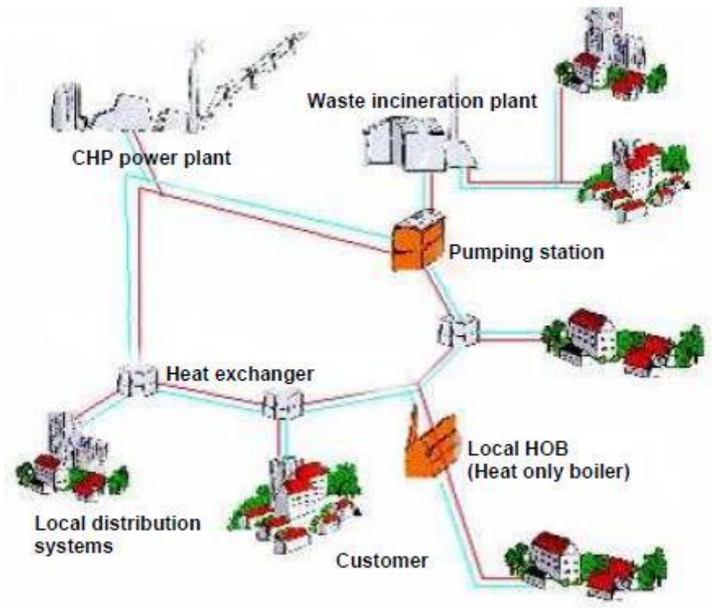
6.3 Heating & Cooling systems

6.3.1 Local District Combined Heat & Power / Tri-Generation Schemes

The area adjacent to the Camden Lock Village development has been identified as a 'CHP Growth Area'. Discussions with Camden Council indicate there are a number of district CHP and heating schemes in the borough. Maps of these developments are included as Appendix B:

- **Royal Free Hospital** New CHP plant will serve 1,500 homes south of the hospital, but is approximately 2km away from the Camden Lock Village development. The cost of installing the pipework infrastructure between the RFH and Camden Lock Village will most likely make connecting the two CHP schemes financial unviable without more users.
- **Hawley Wharf** There are a number of small (non-CHP) community heating housing schemes located north of Camden Lock Village. These are too small to serve the Camden Lock Village development but could, at some stage, form part of a large community scheme.

It is intended that the central energy system serving the proposed development will be equipped with the provision for future connection to a district heating or C/CHP scheme, should one be installed locally.



6.3.2 Site-Wide Combined Heat & Power

Consideration has been made for the provision of site-wide Combined Heat & Power. Under this option a gas-fired CHP system located in the basement of Area C will serve the entire Camden Lock Village development.
Serving the entire development, rather than individual buildings, off a single system allows the CHP to be significantly increased in size.
Serving a number of buildings, with differing heating & cooling needs, also allows the CHP system to take advantage of the diversities in heating requirement across the buildings. Thermal heat storage will be provided which will level out fluctuations in the buildings' heating requirements and further increase the potential CHP operation.
The adjacent table outlines the carbon emission and operating cost savings estimated across the development under this option. The analysis shows that, although initial costs are higher, savings for site-wide CHP are larger than those for CHP plant serving each individual building.

Gas-Fired CHP			
Electrical Duty:			350 kW
Overall efficiency:			65%
Heat-Power ratio:			1.3
Location:			Basement
Capital Costs			**£**
Equipment & Installation			183,750
Value of Lost Space	**£/m²**	**m²**	**£**
Basement	3,500	15 m2	52,500
Total Effective Capital Cost			**236,250**
Annual Operating Costs			**£/year**
Electricity			-136,374
Gas			73,442
Maintenance			11,900
Total Annual Operating Costs			**-51,032**
Simple Payback Period (years)			**5**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**160.4**
% Reduction in CO2 Emissions			**6.5%**
Carbon Cost Index (£/tonneCO2 p.a.)			**1,473**

Additionally, although significantly more plant space will be required in Area C, to locate the centralised plant compared to plant serving solely the building itself, the plant space requirement in Areas A, B, C and D will be considerably reduced.
Services coordination and BMS/plant controls will also be more complex under this option than for the individual buildings options. In particular, interfacing between the four buildings if they are built in separate phases across long timescales will need to ensure that the system can work as the buildings are completed.

6.3.3 Site-Wide Tri-Generation

A final 'Clean' option considered was the provision of site-wide Tri-Generation.

Similar to the site-wide CHP option, under this option central plant is located in the basement of Area C will serve the entire Camden Lock Village development.

This will include CCHP (with an Absorption Chiller), as well as thermal storage (both heat & coolth) to level out the imposed loads and improve the tri-generation operation.

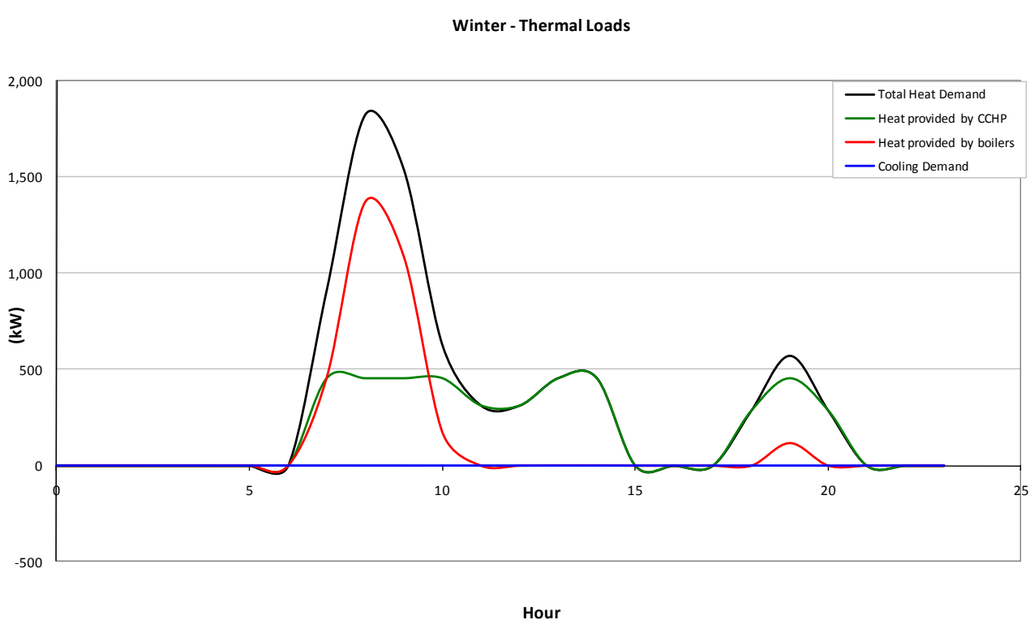
The benefits and drawbacks of installing plant to serve the entire development, rather than simply individual buildings, are a combination of those for the site-wide CHP and individual building CCHP options;

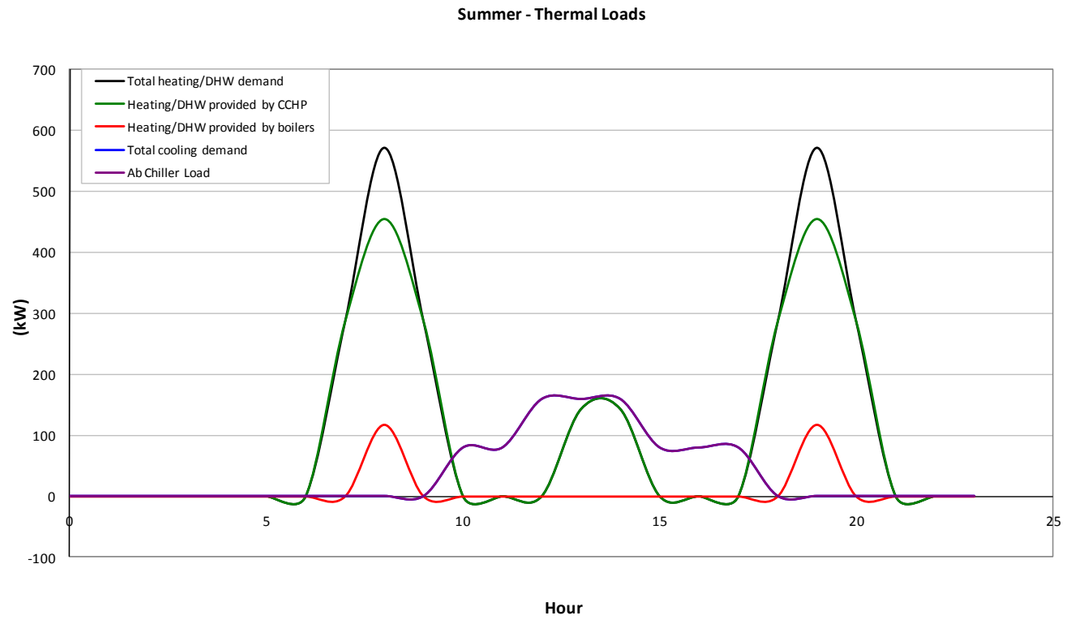
- **Plant Operation & Size** Providing cooling via the absorption chiller creates a demand for waste heat when the requirements for heating & hot water are low, and increases the potential duty & operation of the CCHP in comparison to CHP. In particular, the office and retail spaces are the areas which require significant cooling.
- **Costs** More cost-effective than individual buildings options, but the requirement for an absorption chiller and associated heat rejection means this option is more expensive than the site-wide CHP option.
- **Plant Space** In comparison to the individual buildings options, significantly more plant space is required in Area C and significantly less plant space is required in Areas A, B& D. The additional plant means the CCHP option will require greater plant space (including roof plant for the absorption chillers heat rejection) than the CHP option.
- **Complexity** Services coordination, BMS/plant controls and interfacing across the different buildings will be more complex than the individual buildings options.

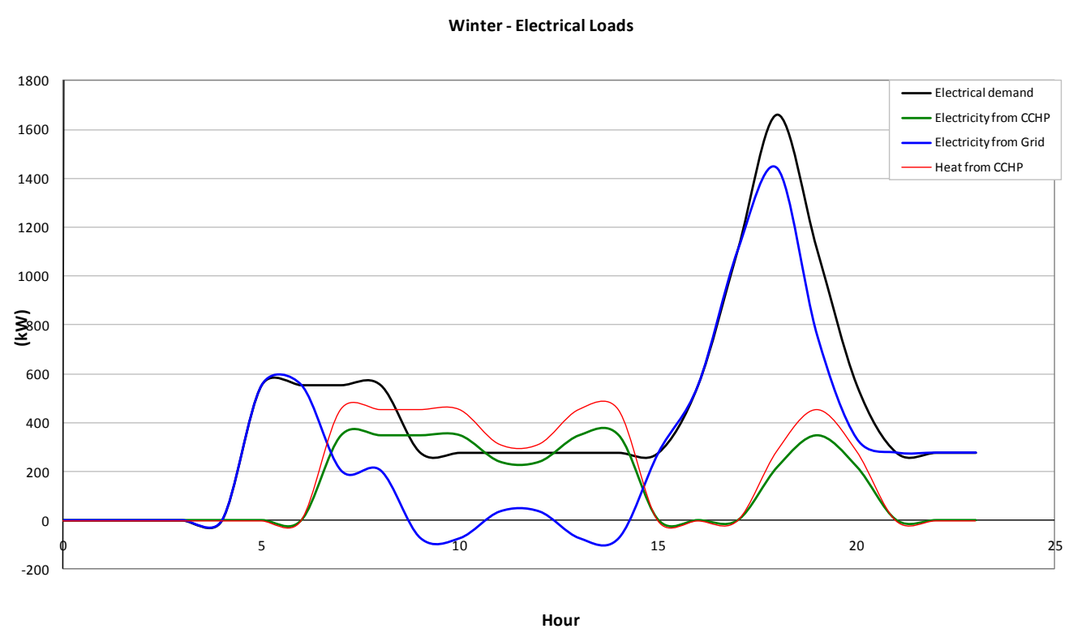
The table opposite summarises the results of our analysis of this option.

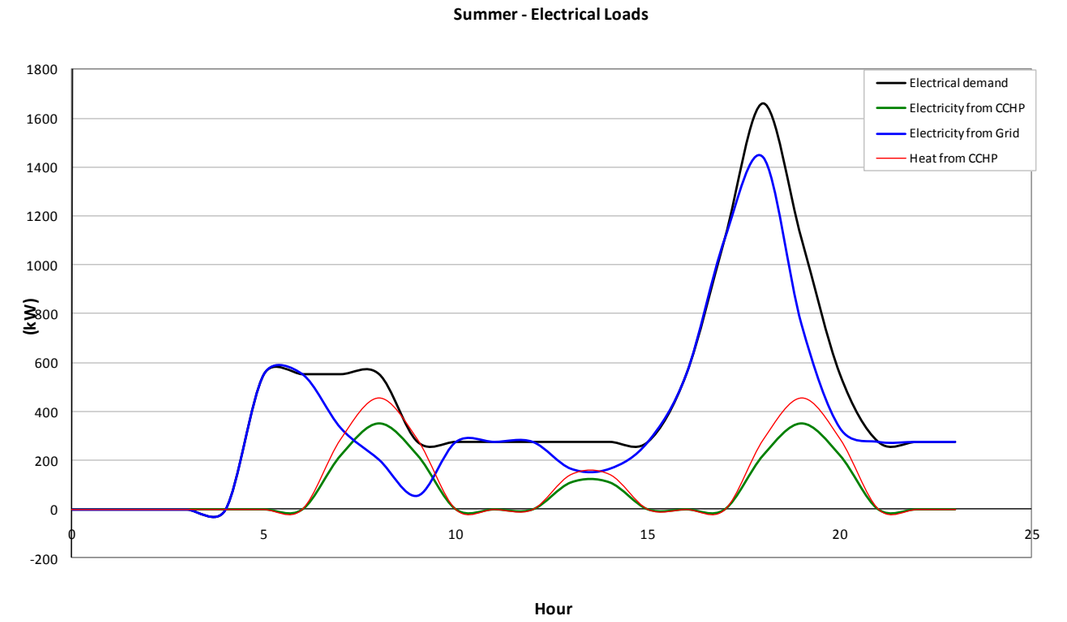
Gas Fired CCHP (Tri-Generation)			
Electrical Duty:			350 kWe
Overall efficiency:			65%
Heat-Power ratio:			1.3
Location:			Basement
Capital Costs			**£**
Equipment & Installation			183,750
Value of Lost Space	**£/m²**	**m²**	**£**
Basement	3,500	15 m2	52,500
Total Effective Capital Cost			**236,250**
Annual Operating Costs			**£/year**
Electricity			-146,309
Gas			79,783
Maintenance			12,320
Total Annual Operating Costs			**-54,206**
Simple Payback Period (years)			**4**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**165.8**
% Reduction in CO2 Emissions against baseline			**6.7%**
Carbon Cost Index (£/tonneCO2 p.a.)			**1,425**

6.3.4 CCHP Load Profiles



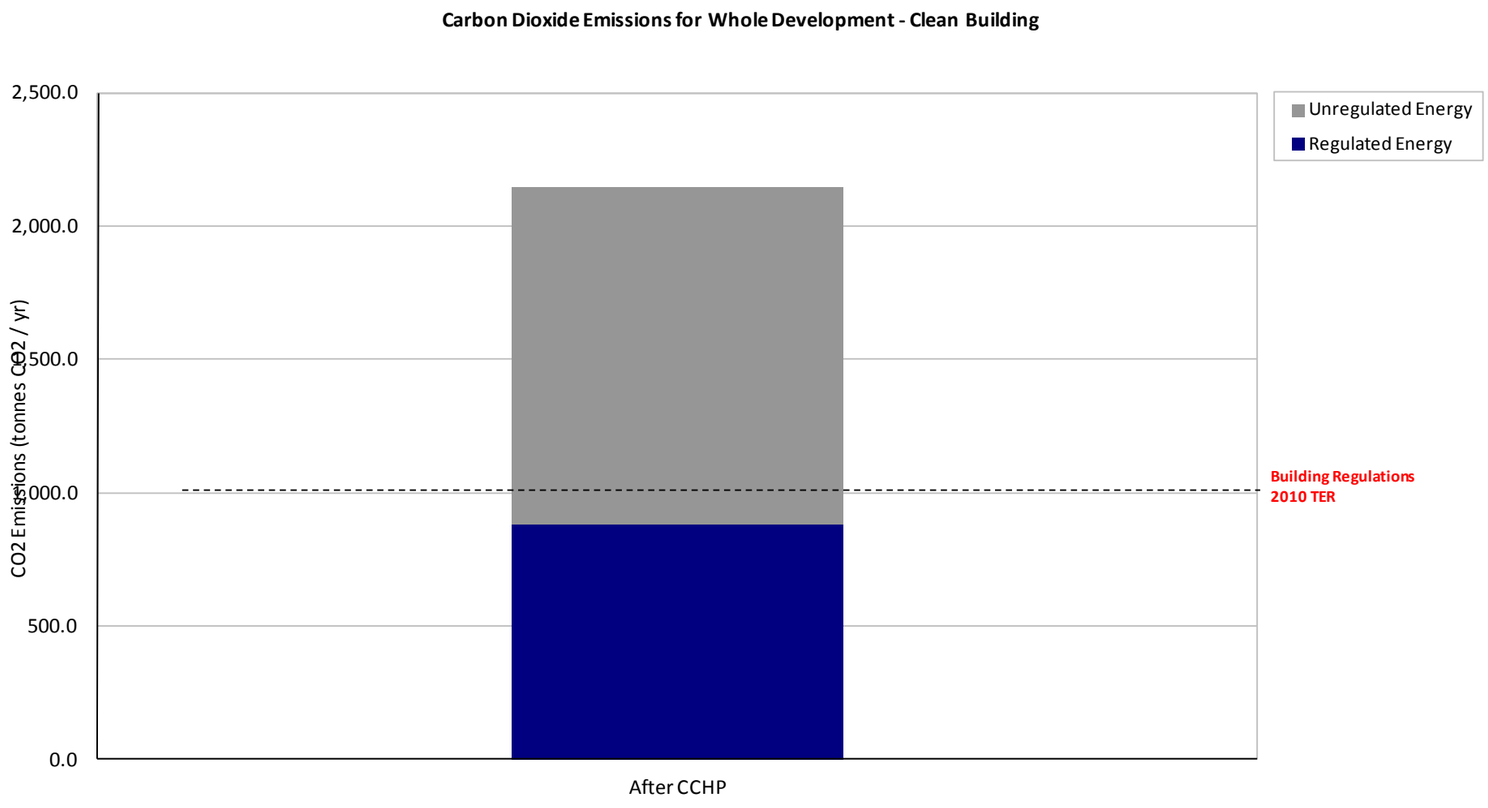






6.4 'Clean' Building CO_2 Emissions Results

Given the requirements of the development and the pro's and con's of each option, it is proposed to install a site-wide tri-generation system for the Camden Lock Village development.
Thermal storage will be provided to both the low temperature hot water & chilled water circuits.
The CCHP system will provide a significant proportion of the hot water demand and heating load of the overall development. During the summer, when the requirement for heating is low, it will provide cooling to the development via an absorption chiller.
Subject to confirmation from the utility provider the plant will provide electricity to the development in parallel with the mains.



7 BE 'GREEN': RENEWABLE ENERGY

As part of the Mayor's Hierarchy the third stage (Be Green) is to install renewable technologies for providing heating, cooling and electricity to the development.
The Renewables Toolkit recommends the following renewable energy technologies are likely to offer the best potential in London buildings in terms of environmental, technical and economic feasibility:

- Wind turbines
- Photovoltaics
- Solar Hot Water Heating
- Biomass Heating
- Biomass/Bio-fuel CHP/Trigeneration
- Ground Source Heat Pumps

In addition, two further options have been considered:

- Anaerobic digesters using site food waste
- Heat pumps using the canal as a heat sink/source

Each of these technologies has been assessed for this development with the results for each set out in the following sections.

7.2 Wind Turbines

Wind turbines produce electricity directly from the energy in wind. This is then fed into the development's electrical system via control gear, they can contribute to carbon emissions reductions by providing clean electricity to the development and act as a recognisable, 'green label'. Two types of wind turbine are available; horizontal axis and vertical axis. The former tend to be noisy and produce vibration. The latter are quieter in operation and better suited to changing wind direction, but are generally less efficient and more expensive.
Six, vertical axis turbines could be located within the site; however, it would have a considerable impact on the townscape. Small, roof-mounted turbines could be placed on the roof. It is estimated that 6 medium sized turbines (approximately 3.0m diameter, 10m high) would reduce overall carbon emissions to the overall development by around 1.4% (based on manufacturer's data).
However, research by the BRE and a study named the 'Warwick Wind Trials' indicate that most small-scale urban wind turbines do not produce as much energy as claimed by manufacturers. The report by the BRE also states that many small-scale urban wind turbines may not even save as much CO_2 in use over their life, as emitted during manufacture. This discrepancy is due to wind conditions in urban areas being affected by surrounding buildings. For these reasons, it is not proposed to install wind turbines in this development.

Wind Turbines			
Rated Power Output:			6.0 kW
Number:			6
Location:			Roof
Capital Costs			**£**
Equipment & Installation			96,000
Value of Lost Space	**£/m²**	**m²**	**£**
Roof	3,000	18 m2	54,000
Total Effective Capital Cost			**150,000**
Annual Operating Costs			**£/year**
Electricity			-7,228
Maintenance			2,400
Total Annual Operating Costs			**-4,828**
Feed in Tariff Received			**21,760**
Simple Payback Period (years)			**6**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**33.4**
% Reduction in CO2 Emissions against baseline			**1.4%**
Carbon Cost Index (£/tonneCO2 p.a.)			**4,496**

7.3 Photovoltaics

Photovoltaics must be located in an un-shaded location, generally south-facing position, ideally at about 30° to the horizontal. They provide clean electricity and can act as a recognisable 'green label' for the development, as with the installation of wind turbines.
For the Camden Lock Village development, the only practical location is the roof of the individual buildings, where space will also be required for heat rejection, a green roof, and terraced access. The scheme investigated was based upon installing 250m² of poly/mono crystalline PV panels on the roofs of Area A, B, C, and D.
It should be noted that although the panels will be located on the roof of Area B& C, the power generated will serve the entire development. This will produce about 1% carbon emissions savings annually across the development compared with the base line emissions.
For this development, 250m² of photovoltaic panels are proposed to be installed.

Photovoltaics			
Type:			Monocrystalline
Area of panels:			250 m2
Location:			Roof
Capital Costs			**£**
Equipment & Installation			175,000
Value of Lost Space	**£/m²**	**m²**	**£**
Roof	3,000	5 m2	15,000
Total Effective Capital Cost			**190,000**
Annual Operating Costs			**£/year**
Electricity			-4,298
Maintenance			750
Total Annual Operating Costs			**-3,548**
Feed in Tariff Received			**10,988**
Simple Payback Period (years)			**13**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**19.8**
% Reduction in CO2 Emissions against baseline			**0.8%**
Carbon Cost Index (£/tonneCO2 p.a.)			**9,578**

7.4 Solar Hot Water Heating

Similar to photovoltaic's, solar hot water panels must be located in a generally south-facing position, ideally located at around 30° from the horizontal. If located vertically, output is reduced by around 15°. They provide clean heating and can act as a 'green label'.
For the development, a scheme of installing 50m² of high-efficiency evacuated tube collectors on the roofs of Area A, B, C and D was considered.
Such an installation could produce about 0.2% carbon emissions savings annually across the development compared with the base line emissions.
Despite the potential emissions savings possible from a solar hot water installation, this would offset the heat output from the CCHP unit. Although the inclusion of an absorption chiller will help this (by increasing the demand for heating in the summer), the duty of the CCHP plant will still be reduced.
For this reason, as 'Clean technology (i.e. the C/CHP) falls higher up the hierarchy on the London Plan than renewable technologies, it is not proposed to install solar hot water on the Camden Lock Village development.

Solar Thermal Panels			
Type:			Evacuated Tube
Area of panels:			50 m2
Size of storage tank:			50,000 litre
Location:			Roof
Capital Costs			**£**
Equipment & Installation			25,000
Value of Lost Space	**£/m²**	**m²**	**£**
Roof	3,000	1.0 m2	3,000
Total Effective Capital Cost			**28,000**
Annual Operating Costs			**£/year**
Electricity			0
Gas			-930
Maintenance			150
Total Annual Operating Costs			**-780**
Simple Payback Period (years)			**36**
Carbon Emissions			
Reduction in CO2 Emissions (tonnes p.a.)			**5.9**
% Reduction in CO2 Emissions against baseline			**0.2%**
Carbon Cost Index (£/tonneCO2 p.a.)			**4,714**

7.5 Biomass

7.5.1 Biomass Heating

A biomass boiler producing low temperature hot water (LTHW) sized to meet a base load with gas-fired boilers providing top-up at times of peak load has been considered.
The base heating load of the development is small and short-lived making the use of biomass boilers for heating-only technically impracticable.
A biomass boiler would offset the heat output from the CCHP, reducing its duty.
Additionally, problems have been experienced on recently installed biomass heating installations where the boiler has repeatedly locked out on high temperature due to insufficient heating load (Building Services Journal June 2006, Kingsmead School).
Biomass boilers require regular supervision by skilled maintenance engineers. For a development of this type, taking into account possible concerns about local emissions, fuel delivery and supply, a biomass boiler is not considered feasible.

7.5.2 Bio-CHP/Tri-Generation

It is important to note that the engine for a CHP/Tri-Generation could either be run either off biomass, or bio-diesel, which are distinctly different fuels.
As previously discussed, CHP will not be installed due to the reduced requirement for heating during the summer when, largely, the LTHW will be used solely for hot water heating in the residential & commercial spaces. Instead, CCHP is proposed.
A CCHP engine run on bio-diesel could provide substantial CO_2 savings. The bio-diesel supply chain is well established as 5% of road transport fuel is no bio-diesel. CCHP manufactures are willing to warrant the operation of their equipment on 100% bio-diesel or bio-oil. The increased costs of bio-diesel operation are recognised and accepted.
For these reasons, bio-diesel fuelled CCHP is proposed for the development.
Alternatively, packaged biomass (wood chip) has been investigated as a source of fuel as an alternative to the gas-fired tri-generation system. But no commercially available solution has been found.
It is anticipated that at worst the bio fuel CCHP would have the same issues of fuel delivery into central London would apply as to biomass heating though deliveries would be less frequent.
Installation of a bio fuel CCHP will typically require 2 fuel deliveries per week.

Biodiesel CCHP (Tri-Generation)			
Electrical Duty:			350 kW
Overall efficiency:			70%
Heat-Power ratio:			1.3
Fuel storage required (for weeks)			0.0 m3
Location:			Basement
Capital Costs			**£**
Equipment & Installation			183,750
Value of Lost Space	**£/m²**	**m²**	**£**
Basement	3,500	40 m2	140,000
Total Effective Capital Cost			**323,750**
Annual Operating Costs			**£/year**
Electricity			-145,908
Gas			-55,190
Biodiesel			363,285
Maintenance			12,285
Total Annual Operating Costs			**174,472**
Simple Payback Period (years)			**No Payback**
Carbon Emissions			
Reduction in CO2 Emissions, compared to gsa CCHP (tonnes p.a.)			**464.7**
% Reduction in CO2 Emissions against baseline			**18.9%**
Carbon Cost Index (£/tonneCO2 p.a.)			**697**

7.6 Ground Source Heat Pumps

7.6.1 Closed Loop Systems

Ground source heat pumps could be installed to provide low-energy heating & cooling to the development.
Closed loop systems consist of loops of piping buried in boreholes in the ground. A water/anti-freeze mixture is pumped within these pipes to reject or absorb heat from the ground, to provide cooling & heating as necessary.
There is a significant amount of groundwork required for digging the boreholes for this system, which can be either laid vertically, or horizontally in the ground.
Installation of a ground source heat pump to provide heating & cooling will conflict with the proposed CCHP system which will also provide heating & cooling.

7.6.2 Open Loop Systems

The major infrastructure in and around the site makes the drilling of boreholes impractical.

7.7 Other Renewable technologies

a. Two further potential renewable energy technologies for the Camden Village Market development are the use of anaerobic digesters (as a fuel source) or a fuel cell to provide heating & cooling.

7.7.2 Anaerobic Digesters

Anaerobic Digesters produce a biogas, methane, from the food waste from the development (primarily the Area A). This gas can then be used as a fuel to provide power and/or heat via a generator, boiler or CHP plant.
Although this system could provide a use for the development waste, there are a number of risks associated with anaerobic digestion;

- Anaerobic digesters are not currently available at significantly large sizes
- Plant requires specialist maintenance & operation
- Potential fire explosion risk
- Capital costs are likely to be very high

Due to these issues listed above, anaerobic digestion is not proposed for the Camden Village development.

7.7.3 Natural Gas - Fuel Cell

The site has an excess of electrical demand relative to the site heating demands so a technology with an lower heat to power ratio than can be achieved with a CHP engine would achieve significantly greater savings . Fuel cells typically have a heat to power ratio of 1 a CHP engine typically has a heat to power ratio of 1.3. If a suitable fuel becomes commercially available in the UK within project timescales then it would be explored as a realistic alternative to Bio-Diesel fired CCHP.

7.8 Summary of renewable energy systems assessment

7.8.1 Proposed Renewable Technologies

As described above, it is proposed to incorporate the following renewable technologies into the Camden Canal Lock Village development:

a. ***Photovoltaics - approximately 250m² of PV panels will be installed on the roofs of Area A, B, C and D. This will serve the entire development and result in a approximate 1% reduction in carbon emissions annually in comparison to the baseline emissions.***

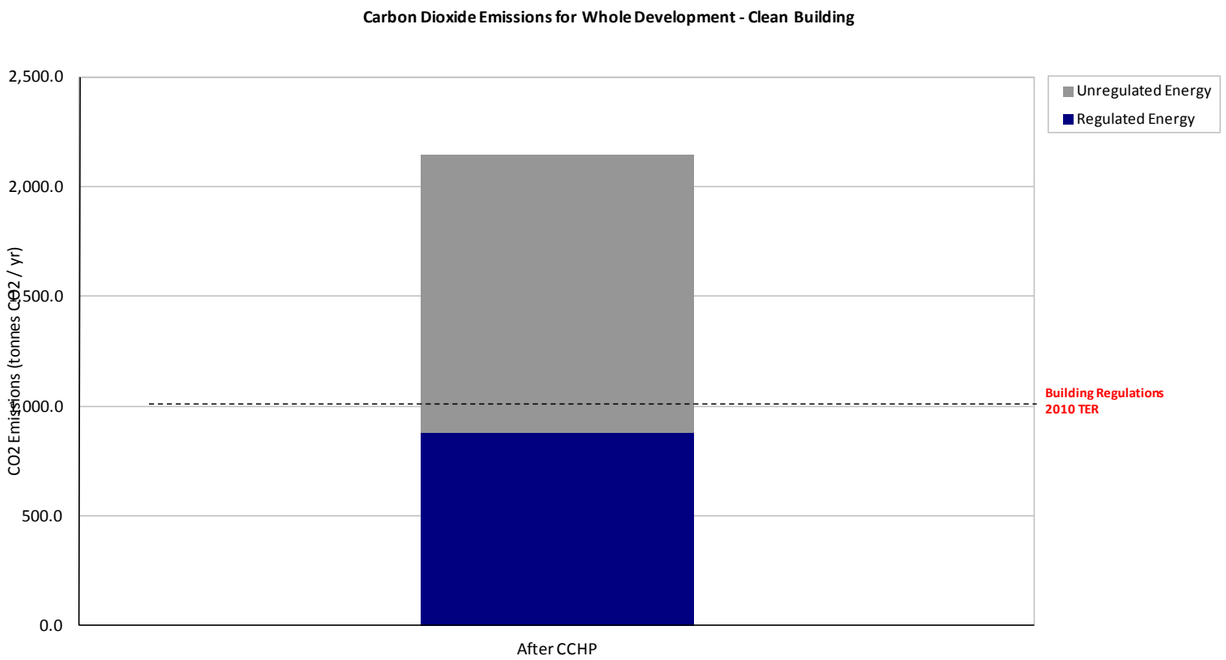
b. ***An installed bio-fuel CCHP of 350kW would serve the entire development and would result in a total reduction in carbon emissions by 32.5% annually in comparison to the baseline emissions.***

7.9 Rejected renewable technologies

The following technologies are not proposed for the development:

- **Wind Turbines** Wind Turbines are not considered viable for this project as there are potential noise and vibration concerns. There is also uncertainty on the local wind conditions which could reduce the emissions savings in using this technology. Wind turbines would also have an visual impact on the local townscape.
- **Solar Hot Water Heating** The heat produced from solar hot water panels would offset the output from the CCHP plant. For this reason solar hot water heating is not proposed for the development.
- **Biomass Heating** Potential issues with pollution and the difficulty of delivering biomass into central London mean that although this technology could provide low CO_2 heating to the development it is not proposed. The heat from the biomass boilers would also offset the output from the CCHP plant.
- **Bio-CCHP** As with biomass boilers, potential issues exist with pollution and delivery for biomass CCHP. Additionally, this is still not a fully tested technology. Biomass CCHP is therefore rejected. Bio-diesel is an alternative bio-fuel, however, the fuel is not widely accepted as truly sustainable, and the range of generators capable of running on 100% bio-diesel is limited. Therefore, bio-diesel CCHP is also rejected.
- **Ground Source Heat Pumps** This technology is not considered viable due to the conflict with the output from the CCHP and the numerous site constraints, railway lines, London Underground lines, National Grid cables.

7.10 'Green' Building co2 emissions results



7.11 Conclusions

A number of energy efficiency measures, and clean & renewable technologies have been assessed for this development, to determine the potential for reducing carbon emissions.
A scheme has been designed incorporating a number of these measures, in order to meet the local requirements (Camden Council and the London Plan) as well as the national requirements (Building Regulations).

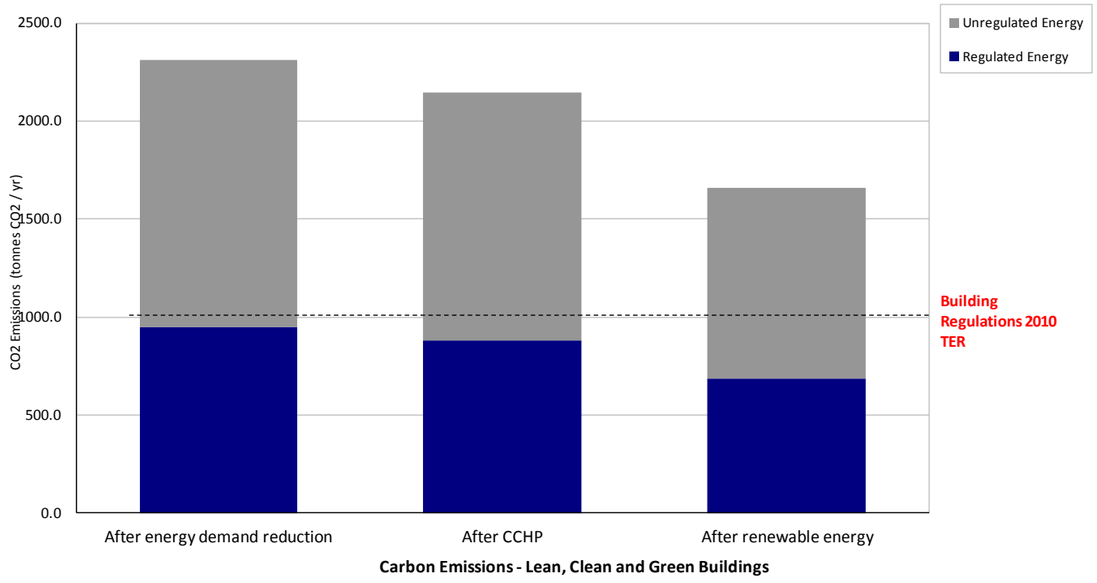
- A number of 'Lean' measures including low energy lighting, high efficiency chillers, and power factor correction are proposed across the development. Analysis shows these measures will result in a reduction in CO_2 emissions across the entire development of approximately 6.1% as compared to the baseline.
- In order to provide 'Clean' energy, a centralised gas-fired CCHP system is proposed for Camden Lock Village. It will supply power to the development as well as heating & cooling using the waste heat. Both the heating & cooling systems will incorporate thermal storage to maximise the duty of the CCHP unit and the heating will be designed to allow for future integration with a local district heating system. The CCHP system is predicted to result in a reduction in CO_2 emissions across the entire development of approximately 7.1% as compared to the baseline.
- 'Green' technology has also been incorporated into the development. It is proposed to provide 250m^2 of photovoltaic panels to serve the entire site and to fuel the proposed CCHP unit using B100 Bio-diesel. Analysis shows that these measures will reduce emissions from the development by approximately 22.6% in comparison to the baseline.

In addition to these specific measures, a culture of low energy will be encouraged amongst the building users. Substantial additional savings are possible but have not been included in the predicted savings reported in this assessment.
A number of further sustainable measures will be included in the development which will not result directly in reductions in carbon emissions. These include the provision of a green roof and low water consumption sanitary fittings.
The graphs that follow show the estimated carbon emissions savings for the entire development in comparison to the London Plan. It is important to note that this result, although indicative of, is not identical to Part L savings. The Part L graphs are presented elsewhere in this report (see Executive Summary).
The London Plan results opposite summarise the savings associated with the different clean, lean & green measures when measured against the base line emissions. The combined effect of these options indicates that Camden Lock Village development will achieve around 32.5% emissions reductions compared to the baseline figure (Part L 2010 Compliant building)..

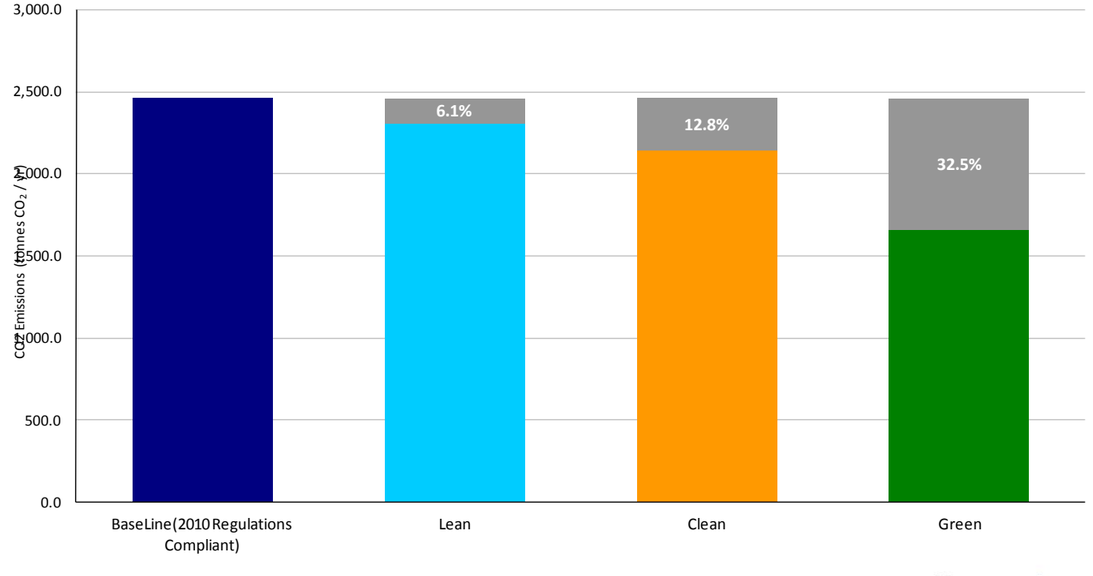
	Carbon Dioxide Emissions (Tonnes CO_2 per annum)		
	Regulated Energy	Unregulated Energy	Total
Building Regulations 2010 Part L Compliant Development	1,097.7	1,362.1	2,459.8
After energy demand reduction	951.4	1,359.0	2,310.3
After CCHP	883.1	1,261.5	2,144.6
After renewable energy	683.6	976.5	1,660.1

	Carbon Dioxide emissions savings (Tonnes CO_2 per annum)		Carbon Dioxide savings (%)	
	Regulated Energy	Total	Regulated Energy	Total
Savings from energy demand reduction	146.3	149.4	13.3%	6.1%
Savings from gas fired CCHP	68.3	165.8	7.2%	7.2%
Savings from renewable energy	199.5	484.5	22.6%	22.6%
Total cumulative savings	414.1	799.7	37.7%	32.5%

Carbon Emissions for Whole Development - Lean, Clean and Green Buildings



Carbon Emissions - Lean, Clean and Green Buildings



Email from Dresser-Rand re. CCHP warranty and maintenance
From: Abloom@Dresser-Rand.com
To: Martin.Lema-Trillo@rpreston.com
Sent: Tue 26/05/2011 13:31
Subject: FW: Bio-Diesel CCHP
Martin, further to your recent discussions with Joe Knowles I'm sure your aware of the biodiesel CHP Project we have recently installed at the PWC offices at 7 More, London. For this project we worked in conjunction with RPP to provide the zero carbon building the client was seeking. If you would like to visit this installation we can arrange. With regard to the operating parameters associated with Biodiesel we would advise as follows:
Manufacturer's Warranty: The standard Dresser-Rand warranty for all new equipment is 12 months from commissioning or 18 months from delivery, whichever is the sooner, and this applies to all CHP products including those fired with biodiesel B100 to BS En 14214. It should be noted however that Dresser-Rand can offer fully inclusive maintenance contracts on all CHP equipment covering all maintenance requirements and offering a guaranteed level of system availability. The maintenance contract is supported by 24/7 remote monitoring and control of the system, and emergency attendance designed to protect the customer asset and ensure the guaranteed availability and performance are achieved.
Maintenance Regime: The maintenance of biodiesel CHP can vary significantly from the more familiar natural gas fired CHP systems and all major differences relate to the fuel. In summary there are:

- Fuel condition must be maintained in storage to avoid degradation and to keep viscosity in the required range. Generally this requires the fuel temperature to be maintained between 15 and 25 degC, and never to be above 40 degC in the storage tanks, and for a degree of recirculation to be allowed to eliminate standing pockets of fuel. This recirculation can be provided by return of unburnt fuel from the engine system.
- Fuel will also deteriorate over time, and generally a maximum "shelf" life of six months is quoted. Careful design of the fuel storage, use and ordering processes are needed to ensure the fuel remains suitable for use in the engine.
- Over time, fuel can leach into the engine lubricating oil system which has the effect of destroying the lubrication properties of the oil. It is recommended that more frequent sampling of the oil be carried out to assess the degree and rate of contamination. In addition, Dresser-Rand offer an extended oil system which provides additional protection to the engine and minimises the number of oil changes required.
- The most vulnerable component of the engine when using biodiesel fuel are the injectors which are intolerant of poor quality and contaminated fuel. It can be anticipated that more frequent attention and replacement will be needed to these and other fuel system components.

Other components of the engine will experience similar maintenance requirements and wear to those of a normal diesel engine, and by using the extended lubrication system, service intervals in terms of hours run should also be similar. Overall maintenance costs will be marginally higher than for a standard diesel engine operating a similar regime.
Should you require any further information please don't hesitate to contact me.

Regards

Adam Bloom
Business Development Manager
CHP Solutions Business Unit
Dresser-Rand Company Ltd

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8 APPENDICES

8.2 Appendix A -Software Approvals

8.3 Appendix B - SAP Calculations (Typical Areas B,C&D)

8.4 Appendix C - BRUKL outputs (Site-Wide Retail, Offices, Cinema, Restaurant, School)

8.5 Appendix D - Code for Sustainable Homes Pre-assessments (Areas B,C&D)

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8.7 Appendix F - Energy Centre Location (Area C Basement Drawing) and Site Distribution

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8.9 Appendix H - Photovoltaics (Area B & Area C Roof Plans)

Appendix A – Software Approvals

Contents

Building Energy Calculation Software Approval Scheme

Provided by AECOM (formerly FaberMaunsell) on behalf of Department for Communities and Local Government

Non-domestic

General Information

Validation procedure

- ORCalc tests and criteria
- FI-SBEM tests and criteria
- DSM tests and criteria
- Software test information pack

Applying and Submission

Approved software

Approved Software Listing

The software listed below have been validated and approved by DCLG.

Approved FI-SBEM software for EPC & Part L 2010:

Software name	Company/Vendor	1st version approved	Date 1st approved	Engine/spec version	Latest version approved	Date re-approved
CarbonChecker	BuildDesk Ltd	v1.7	05/04/2011	SBEM v4.1.c	v1.7	05/04/2011
DesignBuilder SBEM	DesignBuilder Software Ltd	v2.4.2	05/04/2011	SBEM v4.1.c	v2.4.2	05/04/2011
DesignDatabase	Bentley Systems (UK) Ltd	v25.05	06/05/2011	SBEM v4.1.c	v25.05	06/04/2011
Pro EP Cert [more info]	Bentley Systems (UK) Ltd	v25.05	06/04/2011	SBEM v4.1.c	v25.05	06/04/2011
SBEM Online	NES Ltd	v1.3	07/04/2011	SBEM v4.1.c	v1.3	07/04/2011
Lifespan SBEM	Property-Tectonics Ltd	v4.1.c	07/04/2011	SBEM v4.1.c	v4.1.c	07/04/2011
Virtual Environment	IES Ltd	v6.4.0	11/04/2011	SBEM v4.1.c	v6.4.0	11/04/2011
G-ISBEM Standard [Interface to iSBEM]	G-ISBEM Ltd	v17.0	14/04/2011	SBEM v4.1.c	v17.0	14/04/2011
G-ISBEM + SiteNotes [Interface to iSBEM]	G-ISBEM Ltd	v17.0	14/04/2011	SBEM v4.1.c	v17.0	14/04/2011
SiteMaster EPC	Graebert GmbH	v.5.0.4.1.c	27/05/2011	SBEM v4.1.c	v.5.0.4.1.c	27/05/2011
Space Manager	Pythagoras International Ltd	v2.61	13/06/2011	SBEM v4.1.c	v2.61	13/06/2011

Approved FI-SBEM software for Part L 2006 (Legacy):

Software name	Company/Vendor	1st version approved	Date 1st approved	Engine/spec version	Latest version approved	Date re-approved
Cymap [Interface to iSBEM more info]	CADline Ltd	Build 90	24/04/2008	SBEM v3.5.b.0	v2010	17/01/2011
DesignBuilder SBEM	DesignBuilder Software Ltd	v1.5	28/04/2008	SBEM v3.5.b.0	v2.3.6	17/01/2011
Lifespan SBEM	Property-Tectonics Ltd	v1.0	04/06/2008	SBEM v3.5.b.0	v3.5.b	21/01/2011

Carbon Checker	BuildDesk Ltd	v1.3.1	29/07/2008	SBEM v3.5.b.0	v1.5.1	17/01/2011
Virtual Environment	IES Ltd	v5.8.2	25/03/2008	SBEM v3.5.b.1	v6.1.1	14/03/2011
DesignDatabase	Bentley Systems (UK) Ltd	v24.00	25/03/2008	SBEM v3.5.b.0	v25.04	17/01/2011
Pro EP Cert [more info]	Bentley Systems (UK) Ltd	v24.21	04/11/2008	SBEM v3.5.b.0	v25.04	28/01/2011
Quick EP Cert [more info]	Bentley Systems (UK) Ltd	v24.21	04/11/2008	SBEM v3.5.b.0	v25.04	28/01/2011
Space Manager	Pythagoras International Ltd	v2.59	12/11/2008	SBEM v3.5.b.1	v2.6	15/03/2011
G-ISBEM [Interface to iSBEM]	G-ISBEM Ltd	v14.0	12/12/2008	SBEM v3.5.b.0	v16.0	21/01/2011
SBEM Online	NES Ltd	v0.1.0.3	23/02/2009	SBEM v3.5.b.0	v1.2	25/01/2011
LiveEPC	Greenspace Research Ltd	v0.8.8	27/02/2009	SBEM v3.5a.0	v1.0	10/06/2010
Lifespan SBEM gDi	Property-Tectonics Ltd	v3.3c	25/08/2009	SBEM v3.5.b.0	v3.5.b	28/01/2011
G-ISBEM + SiteNotes [Interface to iSBEM]	G-ISBEM Ltd	v16.0	01/12/2009	SBEM v3.5.b.0	v16.0	21/01/2011
SiteMaster EPC	Graebert GmbH	v.5.0.a	27/07/2010	SBEM v3.5.b.0	v.5.0.3.5.b	11/02/2010

Approved ORCalc software:

Software name	Company/Vendor	1st version approved	Date 1st approved	Engine/spec version	Latest version approved	Date re-approved
digitalenergy	i-Prophets Energy Services	v2.0	10/07/2008	ORCalc v3.6.1	v3.1	06/04/2011
ORToolkit	SystemsLink	v1.0.0	27/08/2008	ORCalc v3.6.1	v3.6	06/04/2011
Sigma DEC	TEAM	v4.0	29/08/2008	ORCalc v3.6.1	v3.6	07/04/2011
EPLabel	Camco/EPES	v1.0	29/09/2008	ORCalc v3.6.1	v2.4	14/04/2011
LifeSpan DEC	Property-Tectonics Ltd	v1.05.02	13/01/2009	ORCalc v3.6.1	v3.6.0	07/04/2011
DEC Assessor	IES Ltd	v1.0b1	24/10/2008	ORCalc v3.6.1	v5.0	21/04/2011
Stark Essentials [more info]	Stark Software Ltd	v4.0e	10/10/2008	ORCalc v3.5.1	v4.0f with DEC v3.5.1.ear	23/11/2010
eSight [more info]	eSight Energy Ltd	v3.5	04/03/2009	ORCalc v3.0.1	v2010.1	08/03/2010
DynamatPlus DYNAMAT decsterity	Energy Metering Technology Ltd	v1.0	13/01/2010	ORCalc v2.0.3	v1.1	13/08/2010

Approved DSM software for EPC & Part L 2010:

Software name	Company/Vendor	1st version approved	Date 1st approved	Engine/spec version	Latest version approved	Date re-approved
Virtual Environment	IES Ltd	v6.2.0	01/10/2010	Proprietary engine NCM modelling guide (on-going draft published May2010)	v6.4.0	11/04/2011
TAS	Environmental Design Solution Limited	v9.2	14/12/2010	Proprietary engine NCM modelling guide (on-going draft published May2010)	v9.2.1	14/04/2011
Hevacomp Simulator V8i	Bentley Systems (UK) Ltd	v25.01	01/06/2011	EnergyPlus v4.0 NCM modelling guide (on-going draft published May2010)	v25.01	01/06/2011

Approved DSM software for Part L 2006(Legacy):

Software name	Company/Vendor	1st version approved	Date 1st approved	Engine/spec version	Latest version approved	Date re-approved
TAS	Environmental Design Solution Limited	v9.1	30/05/2008	Proprietary engine NCM modelling guide (on-going draft published Nov2009)	v9.1.4	05/03/2010
Virtual Environment	IES Ltd	v5.9	28/07/2008	Proprietary engine NCM modelling guide (on-going draft published Nov2009)	v6.1.1	01/10/2010
Hevacomp Simulator V8i	Bentley Systems (UK) Ltd	v25.00	10/07/2008	EnergyPlus v4.0 NCM modelling guide (on-going draft published Nov2009)	v25.00	03/03/2010
ESP-r	Energy Systems Research Unit	v11.10	10/02/2011	Proprietary engine NCM modelling guide (on-going draft published Nov2009)	v11.10	10/02/2011

A/C Inspection Reporting software:

Software name	Company/Vendor	1st version approved	Date 1st approved	Latest version approved	Date re-approved
AIRS	QUIDOS Limited	v1.2	29/07/2009	v2.0	07/04/2011

AirCon Software	DCLG	v1.3.2	22/12/2009	v2.0.4	15/04/2011

The latest xml register for Active and Listed software packages in England & Wales can be found here.This information is exclusive to Software vendors and Accreditation Scheme.

The validation process carried out in this scheme was restricted primarily to a set of test criteria and considerations and did not include assessment of any other aspect of the software in question. As in the case of all software it was not possible to test the software submission against all possible inputs and function requirements and therefore there may be cases where the software generates erroneous results. The scheme will not be held liable for any consequences of such errors.

SAP 2009 (SAP version 9.90 – applicable from 01 October 2011 for regulations and from 17 April 2011 for EPCs)

List of SAP programs tested by BRE* and approved by DCLG, SBS and DFPNI for use in connection with building regulations and energy performance certificates for new dwellings

See notes on last page.

Organisation	Contact name	Address, telephone, fax, e-mail, website	Program name	Program version	TER / DER			EPC			Date of approval
					E&W	Scot	NI	E&W	Scot	NI	
Elmhurst Energy Systems Ltd	Stephen O'Hara	Unit 16 St Johns Business Park Lutterworth Leicestershire LE17 4HB Tel: 08700 850490 Fax: 08700 850491 stephen@elmhurstenergy.co.uk www.elmhurstenergy.co.uk	EES Design SAP 2009	1.x	Yes	Yes	-	-	-	-	29/09/2010
				2.x	Yes	Yes	-	-	-	-	24/11/2010
				2.03.x	Yes	Yes	-	-	-	-	18/12/2010
				3.x	Yes	Yes	-	-	-	-	14/03/2011
				3.x	Yes	Yes	-	Yes	Yes	-	15/04/2011
National Energy Services Ltd (NES)	Paul Holmes	The National Energy Centre Davy Avenue, Knowlhill Milton Keynes MK5 8NA Tel: 01908 672787 Fax: 01908 662296 paul.holmes@nesltd.co.uk www.nher.co.uk	NHER Plan Assessor	5.0.x	Yes	Yes	-	-	-	-	29/09/2010
				5.1.x	Yes	Yes	-	-	-	-	17/11/2010
				5.2.x	Yes	Yes	-	-	-	-	24/02/2011
				5.2.x	Yes	Yes	-	Yes	Yes	-	15/04/2011
				5.3.x	Yes	Yes	-	Yes	Yes	-	21/04/2011
Northgate Land and Property Solutions	Mark La-Rue	2 Oakfield Road Clifton, Bristol, BS8 2AL Tel: 0117 906 4440 Mark.LaRue@northgate-is.com www.northgate-is.com/publicservices	SAPCalc	2.1.x	Yes	-	-	-	-	-	29/09/2010
				2.1.4.x	Yes	-	-	-	-	-	21/12/2010

*** The SAP programs listed have been checked by BRE on behalf of DECC, DCLG, SBS and DFPNI. Whilst BRE has taken due care and precaution in testing the programs, it will not be held liable for any failure or consequence thereof that may occur in their use or application.**

Organisation	Contact name	Address, telephone, fax, e-mail, website	Program name	Program version	TER / DER			EPC			Date of approval
					E&W	Scot	NI	E&W	Scot	NI	
Stroma Accreditation Ltd	Neil Bleakley	Unit 4, Pioneer Way Pioneer Business Park Castleford WF10 5QU Tel: 0845 621 1111 n.bleakley@stroma.com www.stroma.com	Stroma FSAP 2009	1.1.0.x	Yes	-	-	-	-	-	18/10/2010
				1.2.0.x	Yes	-	-	-	-	-	18/12/2010
				1.3.0.x	Yes	Yes	-	-	-	-	14/03/2011
				1.3.0.x	Yes	Yes	-	Yes			15/04/2011
JPA TL Ltd	Huw Evans	Design Works William Street Gateshead Tyne and Wear NE10 0JP Tel: 0191 438 7997 sales@techlit.co.uk www.techlit.co.uk	JPA Designer	5.01x	Yes	Yes	-	-	-	-	28/02/2011
				5.02x	Yes	Yes	-	Yes	-	-	15/04/2011
RUSFA	Reg James	High Gables Crawborough Charlbury Oxon, OX7 3TX Tel: 01608 811105 regjames@rusfa.com www.rusfa.com	SAPPER	9.01.x	Yes	Yes	-	-	-	-	19/04/2011

NOTES

1. "TER / DER" indicates whether the software calculates the target and dwelling emissions for building regulations. "EPC" indicates whether the software produces an energy performance certificate.
2. “x” in the version number may be incremented for minor updates that do not affect the calculated results. The software approval applies to any “x”.
3. The list of programs is complete as at the date at the top of the page. Additional programs may be added.

For further information on SAP 2009 and RdSAP 2009 see: **www.bre.co.uk/sap2009**

*** The SAP programs listed have been checked by BRE on behalf of DECC, DCLG, SBS and DFPNI. Whilst BRE has taken due care and precaution in testing the programs, it will not be held liable for any failure or consequence thereof that may occur in their use or application.**

Appendix B – SAP Calculation Sample Outputs

Contents

Sample SAP 2009 calculations for Areas B, C & D

CAMDEN VILLAGE MARKET
SAP 2009 SUMMARY

Area B		DER	TER	Reduction	Apartment multiplier	Area	Area x mult	Area x mult x DER	Area x mult x TER			
	G2	13	14.8	12.2%	3	120.45	361.35	4697.55	5347.98			
	2.1	13.44	15.15	11.3%	2	83.15	166.3	2235.07	2519.45			
X	2.2	14.17	15.17	6.6%	2	87.22	174.44	2471.81	2646.25			
	2.3	15.04	15.37	2.1%	3	76.23	228.69	3439.50	3514.97			
	2.4	13.36	13.89	3.8%	3	83.04	249.12	3328.24	3460.28			
	2.1	14.26	14.88	4.2%	3	76.16	228.48	3258.12	3399.78			
	2.2	14.01	15.2	7.8%	6	77.46	464.76	6511.29	7064.35			
	2.3	13.54	14.83	8.7%	3	80.07	240.21	3252.44	3562.31			
W	2.4	13.16	13.98	5.9%	3	76.95	230.85	3037.99	3227.28			
	4.5	17.74	19.65	9.7%	3	59.27	177.81	3154.35	3493.97			
	5.1	14.03	15.17	7.5%	2	76.29	152.58	2140.70	2314.64			
	7.1	17.65	19.73	10.5%	1	76.29	76.29	1346.52	1505.20			
	G.1	17.69	19.16	7.7%	1	52.71	52.71	932.44	1009.92	**Block DER**	**Block TER**	**Reduction**
					35	**Total**	2803.59	39806.02	43066.38	14.20	15.36	7.6%
Area C												
	207	15.65	14.79	-5.8%	3	87.3	261.9	4098.74	3873.50			
	208	13.89	15.11	8.1%	3	77.84	233.52	3243.59	3528.49			
	209	13.12	13.63	3.7%	3	90.02	270.06	3543.19	3680.92			
	210	16.18	16.19	0.1%	15	50.89	763.35	12351.00	12358.64			
	201	13.36	14.52	8.0%	3	96.13	288.39	3852.89	4187.42			
	202	14.78	13.83	-6.9%	6	79.71	478.26	7068.68	6614.34			
C1	504	16.33	15.54	-5.1%	1	129.46	129.46	2114.08	2011.81			
	508	18.92	19.49	2.9%	6	43.88	263.28	4981.26	5131.33			
	502	16.09	16.18	0.6%	2	86.44	172.88	2781.64	2797.20			
	106	17.06	17.79	4.1%	1	87.3	87.3	1489.34	1553.07			
	101	14.79	17.52	15.6%	1	96.13	96.13	1421.76	1684.20			
	104	18.36	19.19	4.3%	1	50.89	50.89	934.34	976.58			
	105	15.87	16.71	5.0%	1	90.02	90.02	1428.62	1504.23			
C2	705	15.9	14.45	-10.0%	1	170.52	170.52	2711.27	2464.01			
	404	10.73	11.86	9.5%	4	160.15	640.6	6873.64	7597.52			
	406	12.12	12.78	5.2%	8	105.07	840.56	10187.59	10742.36			
West	407	11.88	13.19	9.9%	8	106.07	848.56	10080.89	11192.51			
	707	14.15	15.58	9.2%	1	106.07	106.07	1500.89	1652.57			
	701	14.44	14.12	-2.3%	2	141.96	283.92	4099.80	4008.95			
C2	309	13.02	13.9	6.3%	1	101.47	101.47	1321.14	1410.43			
	310	14.03	14.65	4.2%	1	111.22	111.22	1560.42	1629.37			
	308	17.97	18	0.2%	1	46.35	46.35	832.91	834.30			
	409	15.55	15.01	-3.6%	3	77.34	232.02	3607.91	3482.62			
East	410	13.31	14.65	9.1%	3	111.22	333.66	4441.01	4888.12			
	408	14.19	14.86	4.5%	3	82.48	247.44	3511.17	3676.96			
	709	18.57	15.75	-17.9%	1	127.91	127.91	2375.29	2014.58			
	710	14.68	14.29	-2.7%	1	123.41	123.41	1811.66	1763.53			
	711	15.65	14.89	-5.1%	1	201.37	201.37	3151.44	2998.40	**Block DER**	**Block TER**	**Reduction**
					85	**Total**	7600.52	107376.16	110257.94	14.13	14.51	2.6%
	101	14.88	18.62	20.1%	1	98	98	1458.24	1824.76			
	104	15.79	19.22	17.8%	1	66	66	1042.14	1268.52			
	106	15.8	18.91	16.4%	1	61	61	963.80	1153.51			
	107	13.85	16.71	17.1%	1	107	107	1481.95	1787.97			
	201	13.41	15.45	13.2%	2	98	196	2628.36	3028.20			
	204	14.48	16.05	9.8%	2	66	132	1911.36	2118.60			
Area D	205	16.42	17.62	6.8%	3	48	144	2364.48	2537.28			
	206	14.5	15.71	7.7%	3	61	183	2653.50	2874.93			
	207	12.3	13.65	9.9%	2	107	214	2632.20	2921.10			
	401	19.34	21.27	9.1%	1	70	70	1353.80	1488.90			
	501	16.29	16.4	0.7%	1	116.04	116.04	1890.29	1903.06			
	502	17.72	16.98	-4.4%	1	88.83	88.83	1574.07	1508.33			
	503	15.17	16.07	5.6%	1	119.78	119.78	1817.06	1924.86	**Block DER**	**Block TER**	**Reduction**
					20	**Total**	1595.65	23771.25	26340.02	14.90	16.51	9.8%

L1A 2010 - Regulations Compliance Report

This design draft submission provides evidence towards compliance with Part L of the Building Regulations, in accordance with Appendix A of AD L1A. It has been carried out by an Authorised SAP Assessor. It has been prepared from plans and specifications and may not reflect the 'as built' property. This report covers only items included within the SAP and is not a complete report of regulations compliance.

Assessor name	Mr David Partington	Assessor number	5662
Client		Last modified	06/07/2011
Address	4.5 Block W Area B, London		

Check	Evidence	Produced by	OK?
Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target			
TER (kg $CO_2/m^2.a$)	Fuel = Mains gas Fuel factor = 1.00 TER = 19.65	Authorised SAP Assessor	
DER for dwelling as designed (kg $CO_2/m^2.a$)	DER = 17.74	Authorised SAP Assessor	
Are emissions from dwelling as designed less than or equal to the target?	DER 17.74 < TER 19.65	Authorised SAP Assessor	Passed
Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits			
Fabric U-values			
Are all U-values better than the design limits in Table 2?	**Element** **Weighted average** **Highest** Wall 0.18 (max 0.30) 0.18 (max 0.70) Party wall (no party wall) Floor (no floor) Roof 0.13 (max 0.20) 0.13 (max 0.35) Openings 1.40 (max 2.00) 1.40 (max 3.30)	Authorised SAP Assessor	Passed
Heating and hot water systems			
Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: Mains gas, Regular boiler a Data from manufacturer Efficiency = 90.00% 2009 SEDBUK Minimum = 88.00% Secondary heating system: None	Authorised SAP Assessor	Passed
Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder volume = 180.00 litres Declared cylinder loss = 1.60kWh/day Maximum permitted cylinder loss = 2.10kWh/day Primary hot water pipes are insulated	Authorised SAP Assessor	Passed
Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: Programmer, room thermostat and TRVs Hot water control: Boiler interlock (main system 1) Cylinder thermostat Separate water control	Authorised SAP Assessor	Passed
Fixed internal lighting			
Does fixed internal lighting comply with paragraphs 42 to 44?	Schedule of installed fixed internal lighting Standard lights = 5 Low energy lights = 15 Percentage of low energy lights = 75 % Minimum = 75 %	Authorised SAP Assessor	Passed

Check	Evidence	Produced by	OK?
Criterion 3: the dwelling has appropriate passive control measures to limit solar gains			
Does the dwelling have a strong tendency to high summertime temperatures?	Overheating risk (June) = Slight Overheating risk (July) = Medium Overheating risk (August) = Medium Region = Thames Thermal mass parameter = 100.00 Ventilation rate in hot weather = 3.00 ach Blinds/curtains = None	Authorised SAP Assessor	Passed
Criterion 4: the performance of the dwelling, as designed, is consistent with the DER			
Design air permeability ($m^3/(h.m^2)$ at 50Pa)	Design air permeability = 3.00 Max air permeability = 10.00	Authorised SAP Assessor	Passed
Mechanical ventilation system Specific fan power (SFP)	Mechanical ventilation with heat recovery: SFP = 0.51 W/(litre/sec) Max SFP = 1.5 W/(litre/sec) Heat recovery efficiency = 91.00 % Min heat recovery efficiency = 70.00 %	Authorised SAP Assessor	Passed
Have the key features of the design been included (or bettered) in practice?	The following walls/wall have a U-value less than 0.2W/m^2K: • External - Lower (0.18) The following openings have a U-value less than 1.5W/m^2K: • Window reference 1 (1.40) • Window reference 2 (1.40) Design air permeability of 3 $m^3/(h.m^2)$ is less than 5 $m^3/(h.m^2)$ at 50 Pa	Authorised SAP Assessor	

L1A 2010 - Regulations Compliance Report

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Assessor name	Mr David Partington	Assessor number	5662
Client		Last modified	06/07/2011
Address	210 C1 Area C, London		

Check	Evidence	Produced by	OK?
Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target			
TER (kg $CO_2/m^2.a$)	Fuel = Mains gas Fuel factor = 1.00 TER = 16.19	Authorised SAP Assessor	
DER for dwelling as designed (kg $CO_2/m^2.a$)	DER = 16.18	Authorised SAP Assessor	
Are emissions from dwelling as designed less than or equal to the target?	DER 16.18 < TER 16.19	Authorised SAP Assessor	Passed
Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits			
Fabric U-values			
Are all U-values better than the design limits in Table 2?	**Element** **Weighted average** **Highest** Wall 0.18 (max 0.30) 0.18 (max 0.70) Party wall (no party wall) Floor (no floor) Roof (no roof) Openings 1.40 (max 2.00) 1.40 (max 3.30)	Authorised SAP Assessor	Passed
Heating and hot water systems			
Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: Mains gas, Regular boiler a Data from manufacturer Efficiency = 90.00% 2009 SEDBUK Minimum = 88.00% Secondary heating system: None	Authorised SAP Assessor	Passed
Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder volume = 180.00 litres Declared cylinder loss = 1.60kWh/day Maximum permitted cylinder loss = 2.10kWh/day Primary hot water pipes are insulated	Authorised SAP Assessor	Passed
Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: Programmer, room thermostat and TRVs Hot water control: Boiler interlock (main system 1) Cylinder thermostat Separate water control	Authorised SAP Assessor	Passed
Fixed internal lighting			
Does fixed internal lighting comply with paragraphs 42 to 44?	Schedule of installed fixed internal lighting Standard lights = 5 Low energy lights = 15 Percentage of low energy lights = 75 % Minimum = 75 %	Authorised SAP Assessor	Passed

Check	Evidence	Produced by	OK?
Criterion 3: the dwelling has appropriate passive control measures to limit solar gains			
Does the dwelling have a strong tendency to high summertime temperatures?	Overheating risk (June) = Not significant Overheating risk (July) = Medium Overheating risk (August) = Medium Region = Thames Thermal mass parameter = 100.00 Ventilation rate in hot weather = 6.00 ach Blinds/curtains = None	Authorised SAP Assessor	Passed
Criterion 4: the performance of the dwelling, as designed, is consistent with the DER			
Design air permeability ($m^3/(h.m^2)$ at 50Pa)	Design air permeability = 3.00 Max air permeability = 10.00	Authorised SAP Assessor	Passed
Mechanical ventilation system Specific fan power (SFP)	Mechanical ventilation with heat recovery: SFP = 0.51 W/(litre/sec) Max SFP = 1.5 W/(litre/sec) Heat recovery efficiency = 91.00 % Min heat recovery efficiency = 70.00 %	Authorised SAP Assessor	Passed
Have the key features of the design been included (or bettered) in practice?	The following walls/wall have a U-value less than 0.2W/m^2K: • External - Lower (0.18) The following openings have a U-value less than 1.5W/m^2K: • Window reference 1 (1.40) • Window reference 2 (1.40) • Window reference 3 (1.40) Design air permeability of 3 $m^3/(h.m^2)$ is less than 5 $m^3/(h.m^2)$ at 50 Pa	Authorised SAP Assessor	

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Assessor name	Mr David Partington	Assessor number	5662
Client		Last modified	05/05/2011
Address	502 C1 Site C, London		

Check	Evidence	Produced by	OK?
Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target			
TER (kg $CO_2/m^2.a$)	Fuel = Mains gas Fuel factor = 1.00 TER = 16.18	Authorised SAP Assessor	
DER for dwelling as designed (kg $CO_2/m^2.a$)	DER = 16.09	Authorised SAP Assessor	
Are emissions from dwelling as designed less than or equal to the target?	DER 16.09 < TER 16.18	Authorised SAP Assessor	Passed
Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits			
Fabric U-values			
Are all U-values better than the design limits in Table 2?	**Element** — **Weighted average** — **Highest** Wall — 0.18 (max 0.30) — 0.18 (max 0.70) Party wall — (no party wall) Floor — (no floor) Roof — 0.13 (max 0.20) — 0.13 (max 0.35) Openings — 1.40 (max 2.00) — 1.40 (max 3.30)	Authorised SAP Assessor	Passed
Heating and hot water systems			
Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: Mains gas, Regular boiler a Data from manufacturer Efficiency = 90.00% 2009 SEDBUK Minimum = 88.00% Secondary heating system: None	Authorised SAP Assessor	Passed
Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder volume = 180.00 litres Declared cylinder loss = 1.60kWh/day Maximum permitted cylinder loss = 2.10kWh/day Primary hot water pipes are insulated	Authorised SAP Assessor	Passed
Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: Programmer, room thermostat and TRVs Hot water control: Boiler interlock (main system 1) Cylinder thermostat Separate water control	Authorised SAP Assessor	Passed
Fixed internal lighting			
Does fixed internal lighting comply with paragraphs 42 to 44?	Schedule of installed fixed internal lighting Standard lights = 5 Low energy lights = 15 Percentage of low energy lights = 75 % Minimum = 75 %	Authorised SAP Assessor	Passed

Check	Evidence	Produced by	OK?
Criterion 3: the dwelling has appropriate passive control measures to limit solar gains			
Does the dwelling have a strong tendency to high summertime temperatures?	Overheating risk (June) = Not significant Overheating risk (July) = Medium Overheating risk (August) = Slight Region = Thames Thermal mass parameter = 100.00 Ventilation rate in hot weather = 4.00 ach Blinds/curtains = None	Authorised SAP Assessor	Passed
Criterion 4: the performance of the dwelling, as designed, is consistent with the DER			
Design air permeability ($m^3/(h.m^2)$ at 50Pa)	Design air permeability = 3.00 Max air permeability = 10.00	Authorised SAP Assessor	Passed
Mechanical ventilation system Specific fan power (SFP)	Mechanical ventilation with heat recovery: SFP = 0.58 W/(litre/sec) Max SFP = 1.5 W/(litre/sec) Heat recovery efficiency = 90.00 % Min heat recovery efficiency = 70.00 %	Authorised SAP Assessor	Passed
Have the key features of the design been included (or bettered) in practice?	The following walls/wall have a U-value less than 0.2W/m^2K: • External - Lower (0.18) The following openings have a U-value less than 1.5W/m^2K: • Window reference 1 (1.40) Design air permeability of 3 $m^3/(h.m^2)$ is less than 5 $m^3/(h.m^2)$ at 50 Pa Space cooling is specified	Authorised SAP Assessor	

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Assessor name	Mr David Partington	Assessor number	5662
Client		Last modified	05/05/2011
Address	106 D Site D, London		

Check	Evidence	Produced by	OK?
Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target			
TER (kg $CO_2/m^2.a$)	Fuel = Mains gas Fuel factor = 1.00 TER = 18.91	Authorised SAP Assessor	
DER for dwelling as designed (kg $CO_2/m^2.a$)	DER = 15.80	Authorised SAP Assessor	
Are emissions from dwelling as designed less than or equal to the target?	DER 15.80 < TER 18.91	Authorised SAP Assessor	Passed
Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits			
Fabric U-values			
Are all U-values better than the design limits in Table 2?	**Element** / **Weighted average** / **Highest** Wall: 0.18 (max 0.30) / 0.18 (max 0.70) Party wall: (no party wall) Floor: 0.09 (max 0.25) / 0.09 (max 0.70) Roof: (no roof) Openings: 1.40 (max 2.00) / 1.40 (max 3.30)	Authorised SAP Assessor	Passed
Heating and hot water systems			
Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: Mains gas, Regular boiler a Data from manufacturer Efficiency = 90.00% 2009 SEDBUK Minimum = 88.00% Secondary heating system: None	Authorised SAP Assessor	Passed
Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder volume = 180.00 litres Declared cylinder loss = 1.60kWh/day Maximum permitted cylinder loss = 2.10kWh/day Primary hot water pipes are insulated	Authorised SAP Assessor	Passed
Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: Programmer, room thermostat and TRVs Hot water control: Boiler interlock (main system 1) Cylinder thermostat Separate water control	Authorised SAP Assessor	Passed
Fixed internal lighting			
Does fixed internal lighting comply with paragraphs 42 to 44?	Schedule of installed fixed internal lighting Standard lights = 5 Low energy lights = 15 Percentage of low energy lights = 75 % Minimum = 75 %	Authorised SAP Assessor	Passed

Check	Evidence	Produced by	OK?
Criterion 3: the dwelling has appropriate passive control measures to limit solar gains			
Does the dwelling have a strong tendency to high summertime temperatures?	Overheating risk (June) = Not significant Overheating risk (July) = Slight Overheating risk (August) = Slight Region = Thames Thermal mass parameter = 100.00 Ventilation rate in hot weather = 4.00 ach Blinds/curtains = None	Authorised SAP Assessor	Passed
Criterion 4: the performance of the dwelling, as designed, is consistent with the DER			
Design air permeability ($m^3/(h.m^2)$ at 50Pa)	Design air permeability = 3.00 Max air permeability = 10.00	Authorised SAP Assessor	Passed
Mechanical ventilation system Specific fan power (SFP)	Mechanical ventilation with heat recovery: SFP = 0.51 W/(litre/sec) Max SFP = 1.5 W/(litre/sec) Heat recovery efficiency = 91.00 % Min heat recovery efficiency = 70.00 %	Authorised SAP Assessor	Passed
Have the key features of the design been included (or bettered) in practice?	The following walls/wall have a U-value less than 0.2W/m^2K: • External - Lower (0.18) The following floors/floor have a U-value less than 0.2W/m^2K: • Floor 1 (0.09) The following openings have a U-value less than 1.5W/m^2K: • Window reference 1 (1.40) • Window reference 2 (1.40) • Window reference 3 (1.40) Design air permeability of 3 $m^3/(h.m^2)$ is less than 5 $m^3/(h.m^2)$ at 50 Pa	Authorised SAP Assessor	

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This design draft submission provides evidence towards compliance with Part L of the Building Regulations, in accordance with Appendix A of AD L1A. It has been carried out by an Authorised SAP Assessor. It has been prepared from plans and specifications and may not reflect the 'as built' property. This report covers only items included within the SAP and is not a complete report of regulations compliance.

Assessor name	Mr David Partington	Assessor number	5662
Client		Last modified	27/06/2011
Address	503 D Area D, London		

Check	Evidence	Produced by	OK?
Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target			
TER (kg $CO_2/m^2.a$)	Fuel = Mains gas Fuel factor = 1.00 TER = 16.07	Authorised SAP Assessor	
DER for dwelling as designed (kg $CO_2/m^2.a$)	DER = 15.17	Authorised SAP Assessor	
Are emissions from dwelling as designed less than or equal to the target?	DER 15.17 < TER 16.07	Authorised SAP Assessor	Passed
Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits			
Fabric U-values			
Are all U-values better than the design limits in Table 2?	**Element** / **Weighted average** / **Highest** Wall: 0.18 (max 0.30) / 0.18 (max 0.70) Party wall: (no party wall) Floor: (no floor) Roof: 0.13 (max 0.20) / 0.13 (max 0.35) Openings: 1.40 (max 2.00) / 1.40 (max 3.30)	Authorised SAP Assessor	Passed
Heating and hot water systems			
Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: Mains gas, Regular boiler a Data from manufacturer Efficiency = 90.00% 2009 SEDBUK Minimum = 88.00% Secondary heating system: None	Authorised SAP Assessor	Passed
Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder volume = 180.00 litres Declared cylinder loss = 1.60kWh/day Maximum permitted cylinder loss = 2.10kWh/day Primary hot water pipes are insulated	Authorised SAP Assessor	Passed
Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: Programmer, room thermostat and TRVs Hot water control: Boiler interlock (main system 1) Cylinder thermostat Separate water control	Authorised SAP Assessor	Passed
Fixed internal lighting			
Does fixed internal lighting comply with paragraphs 42 to 44?	Schedule of installed fixed internal lighting Standard lights = 5 Low energy lights = 15 Percentage of low energy lights = 75 % Minimum = 75 %	Authorised SAP Assessor	Passed

Check	Evidence	Produced by	OK?
Criterion 3: the dwelling has appropriate passive control measures to limit solar gains			
Does the dwelling have a strong tendency to high summertime temperatures?	Overheating risk (June) = Not significant Overheating risk (July) = Medium Overheating risk (August) = Medium Region = Thames Thermal mass parameter = 100.00 Ventilation rate in hot weather = 6.00 ach Blinds/curtains = None	Authorised SAP Assessor	Passed
Criterion 4: the performance of the dwelling, as designed, is consistent with the DER			
Design air permeability ($m^3/(h.m^2)$ at 50Pa)	Design air permeability = 3.00 Max air permeability = 10.00	Authorised SAP Assessor	Passed
Mechanical ventilation system Specific fan power (SFP)	Mechanical ventilation with heat recovery: SFP = 0.58 W/(litre/sec) Max SFP = 1.5 W/(litre/sec) Heat recovery efficiency = 90.00 % Min heat recovery efficiency = 70.00 %	Authorised SAP Assessor	Passed
Have the key features of the design been included (or bettered) in practice?	The following walls/wall have a U-value less than 0.2W/m^2K: • External - Lower (0.18) The following openings have a U-value less than 1.5W/m^2K: • Window reference 1 (1.40) • Window reference 2 (1.40) • Window reference 3 (1.40) Design air permeability of 3 $m^3/(h.m^2)$ is less than 5 $m^3/(h.m^2)$ at 50 Pa Space cooling is specified	Authorised SAP Assessor	

Appendix C – BRUKL Outputs for non domestic uses

Contents

OFFICE

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Lock Village Market

As designed

Date: Sat Jun 25 15:47:07 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	26.3
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	26.3
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	23.4
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	External Wall
Floor	0.25	0.22	0.22	Ground Floor
Roof	0.25	0.18	0.18	Ceiling
Windows***, roof windows, and rooflights	2.2	1.78	1.81	Window-D-South-top
Personnel doors	2.2	-	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	3

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Fan Coil (34 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0.95	8	1.7	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
0.9	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
C2-L01-Office Perimeter-1	1	-	0.7
C2-L01-Office Perimeter-2	1	-	0.7
C2-L01-Office Perimeter-3	1	-	0.7
C2-L01-Office Perimeter-4	1	-	0.7
C2-L01-Office Perimeter-5	1	-	0.7
C2-L01-Office Perimeter-6	1	-	0.7
C2-L01-Office Perimeter-7	1	-	0.7
C2-L01-Office Perimeter-8	1	-	0.7
C2-L01-Office Perimeter-9	1	-	0.7
C2-L01-Office Perimeter-10	1	-	0.7
C2-L02-Office Perimeter-1	1	-	0.7
C2-L02-Office Perimeter-2	1	-	0.7
C2-L02-Office Perimeter-3	1	-	0.7
C2-L02-Office Perimeter-4	1	-	0.7
C2-L02-Office Perimeter-5	1	-	0.7
C2-L02-Office Perimeter-6	1	-	0.7
C2-L02-Office Perimeter-7	1	-	0.7
C2-L02-Office Perimeter-8	1	-	0.7
C2-L02-Office Perimeter-9	1	-	0.7
C2-L02-Office Perimeter-10	1	-	0.7
C2-L01-Office Core	1	-	0.7
C2-L02-Office Core	1	-	0.7
D-Office-Perimeter-1	1	-	0.7
D-Office-Perimeter-2	1	-	0.7
D-Office-Perimeter-3	1	-	0.7
D-Office-Perimeter-4	1	-	0.7
D-Office-Core	1	-	0.7
D-Office-	1	-	0.7
C1-WC-1	1	-	0.7
C2-WC-1	1	-	0.7
C2-WC-2	1	-	0.7
C2-WC-3	1	-	0.7
C2-WC-4	1	-	0.7

Local mechanical ventilation and exhaust

Zone	Supply/extract SFP [W/(l/s)]	HR seasonal efficiency	Exhaust SFP [W/(l/s)]
C2-WC-5	1	-	0.7

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C1-Plant- -Site Wide Energy Centre	5150	-
C1-Plant- Cinema	3000	-
C1-Storage-1	450	-
C1-Storage-2	200	-
C1-Storage-3	100	-
C1-Storage-4	50	-
C1-Storage-5	50	-
C1-Storage-6	50	-
C1-Car Park-1	1300	-
C1-Stair Case-1	50	-
C1-Stair Case-2	50	-
C1-Stair Case-3	50	-
C1-Stair Case-4	50	-
C1-Stair Case-5	50	-
C1-Stair Case-6	50	-
C1-Corridor-1	100	-
C1-Corridor-2	200	-
C1-Corridor-3	100	-
C1-Corridor-4	350	-
C1-Corridor-5	200	-
C1-Cinema Foyer-1	3150	-
C1-Auditorium-1	850	-
C1-Auditorium-2	1400	-
C1-Auditorium-3	1650	-
C1-Entrance-Cinema-1	950	22
C1-Entrance-Cinema-2	700	22
C1-Entrance--Residential	200	-
C1-Retail-Core-1	1950	22
C1-Retail-Core-2	1100	22
C1-Retail-Perimeter-1	1050	22
C1-Retail-Perimeter-2	1350	22
C1-Retail-Perimeter-3	900	22
C1-Resi-unused-1	1750	-
C1-Resi-unused-2	850	-
C2-Plant-UKPN-00	350	-
C2-Plant-UKPN-00 Mezz	350	-
C2-Plant-3	100	-
C2-Entrance-1	300	-
C2-Entrance-2	350	-
C2-Retail-Core-1	1050	22
C2-Retail-Core-2	2450	22
C2-Retail-Perimeter-1	1000	22
C2-Retail-Perimeter-2	1200	22

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-Retail-Perimeter-3	1100	22
C2-Retail-Perimeter-4	650	22
C2-Retail-Perimeter-5	1450	22
C2-Retail-Perimeter-6	1550	22
C2-Stair Case-1	100	-
C2-Stair Case-2	50	-
C2-Stair Case-3	100	-
C2-Stair Case-4	100	-
C2-L01-Office Perimeter-1	750	-
C2-L01-Office Perimeter-2	900	-
C2-L01-Office Perimeter-3	900	-
C2-L01-Office Perimeter-4	950	-
C2-L01-Office Perimeter-5	700	-
C2-L01-Office Perimeter-6	800	-
C2-L01-Office Perimeter-7	550	-
C2-L01-Office Perimeter-8	800	-
C2-L01-Office Perimeter-9	650	-
C2-L01-Office Perimeter-10	1300	-
C2-L02-Office Perimeter-1	750	-
C2-L02-Office Perimeter-2	900	-
C2-L02-Office Perimeter-3	900	-
C2-L02-Office Perimeter-4	950	-
C2-L02-Office Perimeter-5	700	-
C2-L02-Office Perimeter-6	800	-
C2-L02-Office Perimeter-7	550	-
C2-L02-Office Perimeter-8	800	-
C2-L02-Office Perimeter-9	650	-
C2-L02-Office Perimeter-10	1300	-
C2-L01-Office Core	3650	-
C2-L02-Office Core	3650	-
C2-Corridor-1	150	-
C2-Corridor-2	250	-
C2-Corridor-3	250	-
C2-Corridor-4	300	-
C2-Resi-Unused-1	3000	-
C2-Resi-Unused-2	1150	-
D-Plant-1	400	-
D-Refuse Store-1	0	-
D-Refuse Store-2	0	-
D-Stair Case-1	50	-
D-Stair Case-2	50	-
D-Stair Case-3	50	-
D-Stair Case-4	50	-
D-Stair Case-5	50	-
D-Stair Case-6	50	-
D-Corridor-1	50	-
D-Corridor-2	50	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
D-Cafe-1	550	-
D-Office-Perimeter-1	950	-
D-Office-Perimeter-2	700	-
D-Office-Perimeter-3	1000	-
D-Office-Perimeter-4	1400	-
D-Office-Core	850	-
D-Office-	750	-
D-Entrance-Residential-1	100	-
D-Entrance-Residential-2	150	-
D-Entrance-Residential-3	150	-
D-Resi-Unused-1	2750	-
A-Restaurant-Perimeter-1	400	22
A-Restaurant-Perimeter-2	200	22
A-Restaurant-Perimeter-3	500	22
A-Restaurant-Perimeter-4	400	22
A-Restaurant-Core-1	500	22
A-Restaurant-Core-2	650	22
A-Kitchen-1	1700	-
A-Kitchen-2	1000	-
A-WC-1	200	-
A-WC-2	100	-
A-Stair Case-1	50	-
A-Stair Case-2	50	-
C1-WC-1	450	-
C2-WC-1	150	-
C2-WC-2	150	-
C2-WC-3	200	-
C2-WC-4	300	-
C2-WC-5	50	-
C1-Retail-Perimeter-4	1200	22
C2-Retail-Core-3	1800	22
C2-Retail-Core-4	3450	22
D-Car park-1	1450	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C1-Auditorium-1	N/A	N/A
C1-Auditorium-2	N/A	N/A
C1-Auditorium-3	N/A	N/A
C1-Entrance-Cinema-1	N/A	N/A
C1-Entrance-Cinema-2	YES (+214%)	NO
C1-Entrance--Residential	YES (+242%)	NO
C1-Retail-Core-1	YES (+32%)	NO
C1-Retail-Core-2	YES (+88%)	NO
C1-Retail-Perimeter-1	YES (+204%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C1-Retail-Perimeter-2	YES (+157%)	NO
C1-Retail-Perimeter-3	YES (+128%)	NO
C1-Resi-unused-1	N/A	N/A
C1-Resi-unused-2	N/A	N/A
C2-Retail-Core-1	NO (-65%)	NO
C2-Retail-Core-2	NO (-67%)	NO
C2-Retail-Perimeter-1	NO (-49%)	NO
C2-Retail-Perimeter-2	NO (-37%)	NO
C2-Retail-Perimeter-3	NO (-9%)	NO
C2-Retail-Perimeter-4	YES (+16%)	NO
C2-Retail-Perimeter-5	YES (+2%)	NO
C2-Retail-Perimeter-6	YES (+0%)	NO
C2-L01-Office Perimeter-1	NO (-45%)	NO
C2-L01-Office Perimeter-2	NO (-53%)	NO
C2-L01-Office Perimeter-3	NO (-46%)	NO
C2-L01-Office Perimeter-4	NO (-40%)	NO
C2-L01-Office Perimeter-5	NO (-43%)	NO
C2-L01-Office Perimeter-6	NO (-26%)	NO
C2-L01-Office Perimeter-7	YES (+58%)	NO
C2-L01-Office Perimeter-8	NO (-86%)	NO
C2-L01-Office Perimeter-9	NO (-95%)	NO
C2-L01-Office Perimeter-10	NO (-70%)	NO
C2-L02-Office Perimeter-1	NO (-39%)	NO
C2-L02-Office Perimeter-2	NO (-46%)	NO
C2-L02-Office Perimeter-3	NO (-37%)	NO
C2-L02-Office Perimeter-4	NO (-32%)	NO
C2-L02-Office Perimeter-5	NO (-36%)	NO
C2-L02-Office Perimeter-6	NO (-16%)	NO
C2-L02-Office Perimeter-7	YES (+71%)	NO
C2-L02-Office Perimeter-8	NO (-84%)	NO
C2-L02-Office Perimeter-9	NO (-95%)	NO
C2-L02-Office Perimeter-10	NO (-64%)	NO
C2-L01-Office Core	NO (-84%)	NO
C2-L02-Office Core	NO (-85%)	NO
C2-Resi-Unused-1	N/A	N/A
C2-Resi-Unused-2	N/A	N/A
D-Cafe-1	NO (-20%)	NO
D-Office-Perimeter-1	NO (-45%)	NO
D-Office-Perimeter-2	NO (-49%)	NO
D-Office-Perimeter-3	NO (-60%)	NO
D-Office-Perimeter-4	NO (-78%)	NO
D-Office-Core	YES (+69%)	NO
D-Office-	NO (-40%)	NO
D-Resi-Unused-1	N/A	N/A
A-Restaurant-Perimeter-1	NO (-32%)	NO
A-Restaurant-Perimeter-2	NO (-35%)	NO
A-Restaurant-Perimeter-3	NO (-32%)	NO
A-Restaurant-Perimeter-4	NO (-32%)	NO
A-Restaurant-Core-1	NO (-72%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
A-Restaurant-Core-2	NO (-32%)	NO
C1-WC-1	N/A	N/A
C2-WC-1	N/A	N/A
C2-WC-2	N/A	N/A
C2-WC-3	N/A	N/A
C2-WC-4	N/A	N/A
C2-WC-5	N/A	N/A
C1-Retail-Perimeter-4	YES (+199%)	NO
C2-Retail-Core-3	NO (-65%)	NO
C2-Retail-Core-4	NO (-79%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m^2]	3682	3682
External area [m^2]	14848	14848
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	10073	4143
Average U-value [W/m^2K]	0.68	0.28
Alpha value* [%]	17.71	17.71

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
98	**B1 Offices and Workshop businesses**
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
2	**D2 General Assembly and Leisure, Night Clubs and Theatres**
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	5.07	3.97
Cooling	7.02	15.08
Auxiliary	17.53	18.25
Lighting	21.13	18.76
Hot water	3.14	3.21
Equipment*	39.59	39.59
TOTAL	**53.89**	**59.27**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m^2]	208.44	206.75
Total consumption [kWh/m^2]	53.89	59.27
Total emissions [kg/m^2]	23.4	26.3

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid Supplied Electricity										
	Actual	16.5	191.9	5.1	7	17.5	0.9	7.6	0.95	8
	Notional	11.3	195.4	4	15.1	18.3	0.79	3.6	—	—

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	Metal wall-C2.---pane
Floor	0.2	0.18	Upper Floor
Roof	0.15	0.18	Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Glazed Wall-Restaurant
Personnel doors	1.5	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	3

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

RETAIL

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Lock Village Market

As designed

Date: Sat Jun 25 15:36:26 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	53.8
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	53.8
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	53.2
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	External Wall
Floor	0.25	0.22	0.22	Ground Floor
Roof	0.25	0.18	0.18	Ceiling
Windows***, roof windows, and rooflights	2.2	1.78	1.81	Window-D-South-top
Personnel doors	2.2	-	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	3

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Fan Coil (17 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0.95	8	1.7	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
0.9	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
C1-Retail-Core-1	1	-	0.7
C1-Retail-Core-2	1	-	0.7
C1-Retail-Perimeter-1	1	-	0.7
C1-Retail-Perimeter-2	1	-	0.7
C1-Retail-Perimeter-3	1	-	0.7
C2-Retail-Core-1	1	-	0.7
C2-Retail-Core-2	1	-	0.7
C2-Retail-Perimeter-1	1	-	0.7
C2-Retail-Perimeter-2	1	-	0.7
C2-Retail-Perimeter-3	1	-	0.7
C2-Retail-Perimeter-4	1	-	0.7
C2-Retail-Perimeter-5	1	-	0.7
C2-Retail-Perimeter-6	1	-	0.7
D-Cafe-1	1	-	0.7
C1-Retail-Perimeter-4	1	-	0.7
C2-Retail-Core-3	1	-	0.7
C2-Retail-Core-4	1	-	0.7

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
C1-Plant- -Site Wide Energy Centre	5150	-
C1-Plant- Cinema	3000	-
C1-Storage-1	450	-
C1-Storage-2	200	-
C1-Storage-3	100	-
C1-Storage-4	50	-
C1-Storage-5	50	-
C1-Storage-6	50	-
C1-Car Park-1	1300	-
C1-Stair Case-1	50	-
C1-Stair Case-2	50	-
C1-Stair Case-3	50	-
C1-Stair Case-4	50	-
C1-Stair Case-5	50	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C1-Stair Case-6	50	-
C1-Corridor-1	100	-
C1-Corridor-2	200	-
C1-Corridor-3	100	-
C1-Corridor-4	350	-
C1-Corridor-5	200	-
C1-Cinema Foyer-1	3150	-
C1-Auditorium-1	850	-
C1-Auditorium-2	1400	-
C1-Auditorium-3	1650	-
C1-Entrance-Cinema-1	950	22
C1-Entrance-Cinema-2	700	22
C1-Entrance--Residential	200	-
C1-Retail-Core-1	1950	22
C1-Retail-Core-2	1100	22
C1-Retail-Perimeter-1	1050	22
C1-Retail-Perimeter-2	1350	22
C1-Retail-Perimeter-3	900	22
C1-Resi-unused-1	1750	-
C1-Resi-unused-2	850	-
C2-Plant-UKPN-00	350	-
C2-Plant-UKPN-00 Mezz	350	-
C2-Plant-3	100	-
C2-Entrance-1	300	-
C2-Entrance-2	350	-
C2-Retail-Core-1	1050	22
C2-Retail-Core-2	2450	22
C2-Retail-Perimeter-1	1000	22
C2-Retail-Perimeter-2	1200	22
C2-Retail-Perimeter-3	1100	22
C2-Retail-Perimeter-4	650	22
C2-Retail-Perimeter-5	1450	22
C2-Retail-Perimeter-6	1550	22
C2-Stair Case-1	100	-
C2-Stair Case-2	50	-
C2-Stair Case-3	100	-
C2-Stair Case-4	100	-
C2-L01-Office Perimeter-1	750	-
C2-L01-Office Perimeter-2	900	-
C2-L01-Office Perimeter-3	900	-
C2-L01-Office Perimeter-4	950	-
C2-L01-Office Perimeter-5	700	-
C2-L01-Office Perimeter-6	800	-
C2-L01-Office Perimeter-7	550	-
C2-L01-Office Perimeter-8	800	-
C2-L01-Office Perimeter-9	650	-
C2-L01-Office Perimeter-10	1300	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-L02-Office Perimeter-1	750	-
C2-L02-Office Perimeter-2	900	-
C2-L02-Office Perimeter-3	900	-
C2-L02-Office Perimeter-4	950	-
C2-L02-Office Perimeter-5	700	-
C2-L02-Office Perimeter-6	800	-
C2-L02-Office Perimeter-7	550	-
C2-L02-Office Perimeter-8	800	-
C2-L02-Office Perimeter-9	650	-
C2-L02-Office Perimeter-10	1300	-
C2-L01-Office Core	3650	-
C2-L02-Office Core	3650	-
C2-Corridor-1	150	-
C2-Corridor-2	250	-
C2-Corridor-3	250	-
C2-Corridor-4	300	-
C2-Resi-Unused-1	3000	-
C2-Resi-Unused-2	1150	-
D-Plant-1	400	-
D-Refuse Store-1	0	-
D-Refuse Store-2	0	-
D-Stair Case-1	50	-
D-Stair Case-2	50	-
D-Stair Case-3	50	-
D-Stair Case-4	50	-
D-Stair Case-5	50	-
D-Stair Case-6	50	-
D-Corridor-1	50	-
D-Corridor-2	50	-
D-Cafe-1	550	-
D-Office-Perimeter-1	950	-
D-Office-Perimeter-2	700	-
D-Office-Perimeter-3	1000	-
D-Office-Perimeter-4	1400	-
D-Office-Core	850	-
D-Office-	750	-
D-Entrance-Residential-1	100	-
D-Entrance-Residential-2	150	-
D-Entrance-Residential-3	150	-
D-Resi-Unused-1	2750	-
A-Restaurant-Perimeter-1	400	22
A-Restaurant-Perimeter-2	200	22
A-Restaurant-Perimeter-3	500	22
A-Restaurant-Perimeter-4	400	22
A-Restaurant-Core-1	500	22
A-Restaurant-Core-2	650	22
A-Kitchen-1	1700	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
A-Kitchen-2	1000	-
A-WC-1	200	-
A-WC-2	100	-
A-Stair Case-1	50	-
A-Stair Case-2	50	-
C1-WC-1	450	-
C2-WC-1	150	-
C2-WC-2	150	-
C2-WC-3	200	-
C2-WC-4	300	-
C2-WC-5	50	-
C1-Retail-Perimeter-4	1200	22
C2-Retail-Core-3	1800	22
C2-Retail-Core-4	3450	22
D-Car park-1	1450	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C1-Auditorium-1	N/A	N/A
C1-Auditorium-2	N/A	N/A
C1-Auditorium-3	N/A	N/A
C1-Entrance-Cinema-1	N/A	N/A
C1-Entrance-Cinema-2	YES (+214%)	NO
C1-Entrance--Residential	YES (+242%)	NO
C1-Retail-Core-1	YES (+32%)	NO
C1-Retail-Core-2	YES (+88%)	NO
C1-Retail-Perimeter-1	YES (+204%)	NO
C1-Retail-Perimeter-2	YES (+157%)	NO
C1-Retail-Perimeter-3	YES (+128%)	NO
C1-Resi-unused-1	N/A	N/A
C1-Resi-unused-2	N/A	N/A
C2-Retail-Core-1	NO (-65%)	NO
C2-Retail-Core-2	NO (-67%)	NO
C2-Retail-Perimeter-1	NO (-49%)	NO
C2-Retail-Perimeter-2	NO (-37%)	NO
C2-Retail-Perimeter-3	NO (-9%)	NO
C2-Retail-Perimeter-4	YES (+16%)	NO
C2-Retail-Perimeter-5	YES (+2%)	NO
C2-Retail-Perimeter-6	YES (+0%)	NO
C2-L01-Office Perimeter-1	NO (-45%)	NO
C2-L01-Office Perimeter-2	NO (-53%)	NO
C2-L01-Office Perimeter-3	NO (-46%)	NO
C2-L01-Office Perimeter-4	NO (-40%)	NO
C2-L01-Office Perimeter-5	NO (-43%)	NO
C2-L01-Office Perimeter-6	NO (-26%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C2-L01-Office Perimeter-7	YES (+58%)	NO
C2-L01-Office Perimeter-8	NO (-86%)	NO
C2-L01-Office Perimeter-9	NO (-95%)	NO
C2-L01-Office Perimeter-10	NO (-70%)	NO
C2-L02-Office Perimeter-1	NO (-39%)	NO
C2-L02-Office Perimeter-2	NO (-46%)	NO
C2-L02-Office Perimeter-3	NO (-37%)	NO
C2-L02-Office Perimeter-4	NO (-32%)	NO
C2-L02-Office Perimeter-5	NO (-36%)	NO
C2-L02-Office Perimeter-6	NO (-16%)	NO
C2-L02-Office Perimeter-7	YES (+71%)	NO
C2-L02-Office Perimeter-8	NO (-84%)	NO
C2-L02-Office Perimeter-9	NO (-95%)	NO
C2-L02-Office Perimeter-10	NO (-64%)	NO
C2-L01-Office Core	NO (-84%)	NO
C2-L02-Office Core	NO (-85%)	NO
C2-Resi-Unused-1	N/A	N/A
C2-Resi-Unused-2	N/A	N/A
D-Cafe-1	NO (-20%)	NO
D-Office-Perimeter-1	NO (-45%)	NO
D-Office-Perimeter-2	NO (-49%)	NO
D-Office-Perimeter-3	NO (-60%)	NO
D-Office-Perimeter-4	NO (-78%)	NO
D-Office-Core	YES (+69%)	NO
D-Office-	NO (-40%)	NO
D-Resi-Unused-1	N/A	N/A
A-Restaurant-Perimeter-1	NO (-32%)	NO
A-Restaurant-Perimeter-2	NO (-35%)	NO
A-Restaurant-Perimeter-3	NO (-32%)	NO
A-Restaurant-Perimeter-4	NO (-32%)	NO
A-Restaurant-Core-1	NO (-72%)	NO
A-Restaurant-Core-2	NO (-32%)	NO
C2-WC-1	N/A	N/A
C2-WC-2	N/A	N/A
C2-WC-3	N/A	N/A
C2-WC-4	N/A	N/A
C2-WC-5	N/A	N/A
C1-Retail-Perimeter-4	YES (+199%)	NO
C2-Retail-Core-3	NO (-65%)	NO
C2-Retail-Core-4	NO (-79%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	1799	1799
External area [m²]	14848	14848
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	5
Average conductance [W/K]	10073	4143
Average U-value [W/m²K]	0.68	0.28
Alpha value* [%]	17.71	17.71

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
100	**A1/A2 Retail/Financial and Professional services**
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	15.94	1.93
Cooling	10.36	22.16
Auxiliary	28.81	23.97
Lighting	65.23	65.23
Hot water	1.18	1.21
Equipment*	20.85	20.85
TOTAL	**121.52**	**114.49**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m²]	335.34	292.68
Total consumption [kWh/m²]	121.52	114.49
Total emissions [kg/m²]	53.2	53.8

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid Supplied Electricity										
	Actual	51.8	283.5	15.9	10.4	28.8	0.9	7.6	0.95	8
	Notional	5.5	287.2	1.9	22.2	24	0.79	3.6	---	---

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	Metal wall-C2.---pane
Floor	0.2	0.18	Upper Floor
Roof	0.15	0.18	Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Glazed Wall-Restaurant
Personnel doors	1.5	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	3

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

RESTAURANT

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Lock Village Market

As designed

Date: Sat Jun 25 16:01:35 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	93.1
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	93.1
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	77.9
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	External Wall
Floor	0.25	0.22	0.22	Ground Floor
Roof	0.25	0.18	0.18	Ceiling
Windows***, roof windows, and rooflights	2.2	1.78	1.81	Window-D-South-top
Personnel doors	2.2	-	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	3

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Fan Coil (10 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0	-	1.7	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
0.9	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
A-Restaurant-Perimeter-1	1	-	0.7
A-Restaurant-Perimeter-2	1	-	0.7
A-Restaurant-Perimeter-3	1	-	0.7
A-Restaurant-Perimeter-4	1	-	0.7
A-Restaurant-Core-1	1	-	0.7
A-Restaurant-Core-2	1	-	0.7
A-Kitchen-1	1	-	0.7
A-Kitchen-2	1	-	0.7
A-WC-1	1	-	0.7
A-WC-2	1	-	0.7

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
C1-Plant- -Site Wide Energy Centre	5150	-
C1-Plant- Cinema	3000	-
C1-Storage-1	450	-
C1-Storage-2	200	-
C1-Storage-3	100	-
C1-Storage-4	50	-
C1-Storage-5	50	-
C1-Storage-6	50	-
C1-Car Park-1	1300	-
C1-Stair Case-1	50	-
C1-Stair Case-2	50	-
C1-Stair Case-3	50	-
C1-Stair Case-4	50	-
C1-Stair Case-5	50	-
C1-Stair Case-6	50	-
C1-Corridor-1	100	-
C1-Corridor-2	200	-
C1-Corridor-3	100	-
C1-Corridor-4	350	-
C1-Corridor-5	200	-
C1-Cinema Foyer-1	3150	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C1-Auditorium-1	850	-
C1-Auditorium-2	1400	-
C1-Auditorium-3	1650	-
C1-Entrance-Cinema-1	950	22
C1-Entrance-Cinema-2	700	22
C1-Entrance--Residential	200	-
C1-Retail-Core-1	1950	22
C1-Retail-Core-2	1100	22
C1-Retail-Perimeter-1	1050	22
C1-Retail-Perimeter-2	1350	22
C1-Retail-Perimeter-3	900	22
C1-Resi-unused-1	1750	-
C1-Resi-unused-2	850	-
C2-Plant-UKPN-00	350	-
C2-Plant-UKPN-00 Mezz	350	-
C2-Plant-3	100	-
C2-Entrance-1	300	-
C2-Entrance-2	350	-
C2-Retail-Core-1	1050	22
C2-Retail-Core-2	2450	22
C2-Retail-Perimeter-1	1000	22
C2-Retail-Perimeter-2	1200	22
C2-Retail-Perimeter-3	1100	22
C2-Retail-Perimeter-4	650	22
C2-Retail-Perimeter-5	1450	22
C2-Retail-Perimeter-6	1550	22
C2-Stair Case-1	100	-
C2-Stair Case-2	50	-
C2-Stair Case-3	100	-
C2-Stair Case-4	100	-
C2-L01-Office Perimeter-1	750	-
C2-L01-Office Perimeter-2	900	-
C2-L01-Office Perimeter-3	900	-
C2-L01-Office Perimeter-4	950	-
C2-L01-Office Perimeter-5	700	-
C2-L01-Office Perimeter-6	800	-
C2-L01-Office Perimeter-7	550	-
C2-L01-Office Perimeter-8	800	-
C2-L01-Office Perimeter-9	650	-
C2-L01-Office Perimeter-10	1300	-
C2-L02-Office Perimeter-1	750	-
C2-L02-Office Perimeter-2	900	-
C2-L02-Office Perimeter-3	900	-
C2-L02-Office Perimeter-4	950	-
C2-L02-Office Perimeter-5	700	-
C2-L02-Office Perimeter-6	800	-
C2-L02-Office Perimeter-7	550	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-L02-Office Perimeter-8	800	-
C2-L02-Office Perimeter-9	650	-
C2-L02-Office Perimeter-10	1300	-
C2-L01-Office Core	3650	-
C2-L02-Office Core	3650	-
C2-Corridor-1	150	-
C2-Corridor-2	250	-
C2-Corridor-3	250	-
C2-Corridor-4	300	-
C2-Resi-Unused-1	3000	-
C2-Resi-Unused-2	1150	-
D-Plant-1	400	-
D-Refuse Store-1	0	-
D-Refuse Store-2	0	-
D-Stair Case-1	50	-
D-Stair Case-2	50	-
D-Stair Case-3	50	-
D-Stair Case-4	50	-
D-Stair Case-5	50	-
D-Stair Case-6	50	-
D-Corridor-1	50	-
D-Corridor-2	50	-
D-Cafe-1	550	-
D-Office-Perimeter-1	950	-
D-Office-Perimeter-2	700	-
D-Office-Perimeter-3	1000	-
D-Office-Perimeter-4	1400	-
D-Office-Core	850	-
D-Office-	750	-
D-Entrance-Residential-1	100	-
D-Entrance-Residential-2	150	-
D-Entrance-Residential-3	150	-
D-Resi-Unused-1	2750	-
A-Restaurant-Perimeter-1	400	22
A-Restaurant-Perimeter-2	200	22
A-Restaurant-Perimeter-3	500	22
A-Restaurant-Perimeter-4	400	22
A-Restaurant-Core-1	500	22
A-Restaurant-Core-2	650	22
A-Kitchen-1	1700	-
A-Kitchen-2	1000	-
A-WC-1	200	-
A-WC-2	100	-
A-Stair Case-1	50	-
A-Stair Case-2	50	-
C1-WC-1	450	-
C2-WC-1	150	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-WC-2	150	-
C2-WC-3	200	-
C2-WC-4	300	-
C2-WC-5	50	-
C1-Retail-Perimeter-4	1200	22
C2-Retail-Core-3	1800	22
C2-Retail-Core-4	3450	22
D-Car park-1	1450	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C1-Auditorium-1	N/A	N/A
C1-Auditorium-2	N/A	N/A
C1-Auditorium-3	N/A	N/A
C1-Entrance-Cinema-1	N/A	N/A
C1-Entrance-Cinema-2	YES (+214%)	NO
C1-Entrance--Residential	YES (+242%)	NO
C1-Retail-Core-1	YES (+32%)	NO
C1-Retail-Core-2	YES (+88%)	NO
C1-Retail-Perimeter-1	YES (+204%)	NO
C1-Retail-Perimeter-2	YES (+157%)	NO
C1-Retail-Perimeter-3	YES (+128%)	NO
C1-Resi-unused-1	N/A	N/A
C1-Resi-unused-2	N/A	N/A
C2-Retail-Core-1	NO (-65%)	NO
C2-Retail-Core-2	NO (-67%)	NO
C2-Retail-Perimeter-1	NO (-49%)	NO
C2-Retail-Perimeter-2	NO (-37%)	NO
C2-Retail-Perimeter-3	NO (-9%)	NO
C2-Retail-Perimeter-4	YES (+16%)	NO
C2-Retail-Perimeter-5	YES (+2%)	NO
C2-Retail-Perimeter-6	YES (+0%)	NO
C2-L01-Office Perimeter-1	NO (-45%)	NO
C2-L01-Office Perimeter-2	NO (-53%)	NO
C2-L01-Office Perimeter-3	NO (-46%)	NO
C2-L01-Office Perimeter-4	NO (-40%)	NO
C2-L01-Office Perimeter-5	NO (-43%)	NO
C2-L01-Office Perimeter-6	NO (-26%)	NO
C2-L01-Office Perimeter-7	YES (+58%)	NO
C2-L01-Office Perimeter-8	NO (-86%)	NO
C2-L01-Office Perimeter-9	NO (-95%)	NO
C2-L01-Office Perimeter-10	NO (-70%)	NO
C2-L02-Office Perimeter-1	NO (-39%)	NO
C2-L02-Office Perimeter-2	NO (-46%)	NO
C2-L02-Office Perimeter-3	NO (-37%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C2-L02-Office Perimeter-4	NO (-32%)	NO
C2-L02-Office Perimeter-5	NO (-36%)	NO
C2-L02-Office Perimeter-6	NO (-16%)	NO
C2-L02-Office Perimeter-7	YES (+71%)	NO
C2-L02-Office Perimeter-8	NO (-84%)	NO
C2-L02-Office Perimeter-9	NO (-95%)	NO
C2-L02-Office Perimeter-10	NO (-64%)	NO
C2-L01-Office Core	NO (-84%)	NO
C2-L02-Office Core	NO (-85%)	NO
C2-Resi-Unused-1	N/A	N/A
C2-Resi-Unused-2	N/A	N/A
D-Cafe-1	NO (-20%)	NO
D-Office-Perimeter-1	NO (-45%)	NO
D-Office-Perimeter-2	NO (-49%)	NO
D-Office-Perimeter-3	NO (-60%)	NO
D-Office-Perimeter-4	NO (-78%)	NO
D-Office-Core	YES (+69%)	NO
D-Office-	NO (-40%)	NO
D-Resi-Unused-1	N/A	N/A
A-Restaurant-Perimeter-1	NO (-32%)	NO
A-Restaurant-Perimeter-2	NO (-35%)	NO
A-Restaurant-Perimeter-3	NO (-32%)	NO
A-Restaurant-Perimeter-4	NO (-32%)	NO
A-Restaurant-Core-1	NO (-72%)	NO
A-Restaurant-Core-2	NO (-32%)	NO
A-Kitchen-1	N/A	N/A
A-Kitchen-2	N/A	N/A
A-WC-1	N/A	N/A
A-WC-2	N/A	N/A
C1-WC-1	N/A	N/A
C2-WC-1	N/A	N/A
C2-WC-2	N/A	N/A
C2-WC-3	N/A	N/A
C2-WC-4	N/A	N/A
C2-WC-5	N/A	N/A
C1-Retail-Perimeter-4	YES (+199%)	NO
C2-Retail-Core-3	NO (-65%)	NO
C2-Retail-Core-4	NO (-79%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m^2]	1115	1115
External area [m^2]	14848	14848
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	10073	4143
Average U-value [W/m^2K]	0.68	0.28
Alpha value* [%]	17.71	17.71

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
100	**A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways**
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	1.07	1.08
Cooling	15.27	36.49
Auxiliary	48.9	52.47
Lighting	54.72	60.75
Hot water	110.69	113.2
Equipment*	123.04	123.04
TOTAL	**230.65**	**264**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m^2]	421.31	475.99
Total consumption [kWh/m^2]	230.65	264
Total emissions [kg/m^2]	77.9	93.1

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid Supplied Electricity										
	Actual	3.5	417.8	1.1	15.3	48.9	0.9	7.6	0	0
	Notional	3.1	472.9	1.1	36.5	52.5	0.79	3.6	—	—

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	Metal wall-C2.--pane
Floor	0.2	0.18	Upper Floor
Roof	0.15	0.18	Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Glazed Wall-Restaurant
Personnel doors	1.5	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	3

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

CINEMA

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Lock Village Market

As designed

Date: Sat Jun 25 16:25:48 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	26.4
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	26.4
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	21.6
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	External Wall
Floor	0.25	0.22	0.22	Ground Floor
Roof	0.25	0.18	0.18	Ceiling
Windows***, roof windows, and rooflights	2.2	1.78	1.81	Window-D-South-top
Personnel doors	2.2	-	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	3

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Fan Coil (7 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0	-	1.7	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
0.9	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
C1-Cinema Foyer-1	1	-	0.7
C1-Auditorium-1	1	-	0.7
C1-Auditorium-2	1	-	0.7
C1-Auditorium-3	1	-	0.7
C1-Entrance-Cinema-1	1	-	0.7
C1-Entrance-Cinema-2	1	-	0.7
C1-Entrance--Residential	1	-	0.7

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
C1-Plant- -Site Wide Energy Centre	5150	-
C1-Plant- Cinema	3000	-
C1-Storage-1	450	-
C1-Storage-2	200	-
C1-Storage-3	100	-
C1-Storage-4	50	-
C1-Storage-5	50	-
C1-Storage-6	50	-
C1-Car Park-1	1300	-
C1-Stair Case-1	50	-
C1-Stair Case-2	50	-
C1-Stair Case-3	50	-
C1-Stair Case-4	50	-
C1-Stair Case-5	50	-
C1-Stair Case-6	50	-
C1-Corridor-1	100	-
C1-Corridor-2	200	-
C1-Corridor-3	100	-
C1-Corridor-4	350	-
C1-Corridor-5	200	-
C1-Cinema Foyer-1	3150	-
C1-Auditorium-1	850	-
C1-Auditorium-2	1400	-
C1-Auditorium-3	1650	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C1-Entrance-Cinema-1	950	22
C1-Entrance-Cinema-2	700	22
C1-Entrance--Residential	200	-
C1-Retail-Core-1	1950	22
C1-Retail-Core-2	1100	22
C1-Retail-Perimeter-1	1050	22
C1-Retail-Perimeter-2	1350	22
C1-Retail-Perimeter-3	900	22
C1-Resi-unused-1	1750	-
C1-Resi-unused-2	850	-
C2-Plant-UKPN-00	350	-
C2-Plant-UKPN-00 Mezz	350	-
C2-Plant-3	100	-
C2-Entrance-1	300	-
C2-Entrance-2	350	-
C2-Retail-Core-1	1050	22
C2-Retail-Core-2	2450	22
C2-Retail-Perimeter-1	1000	22
C2-Retail-Perimeter-2	1200	22
C2-Retail-Perimeter-3	1100	22
C2-Retail-Perimeter-4	650	22
C2-Retail-Perimeter-5	1450	22
C2-Retail-Perimeter-6	1550	22
C2-Stair Case-1	100	-
C2-Stair Case-2	50	-
C2-Stair Case-3	100	-
C2-Stair Case-4	100	-
C2-L01-Office Perimeter-1	750	-
C2-L01-Office Perimeter-2	900	-
C2-L01-Office Perimeter-3	900	-
C2-L01-Office Perimeter-4	950	-
C2-L01-Office Perimeter-5	700	-
C2-L01-Office Perimeter-6	800	-
C2-L01-Office Perimeter-7	550	-
C2-L01-Office Perimeter-8	800	-
C2-L01-Office Perimeter-9	650	-
C2-L01-Office Perimeter-10	1300	-
C2-L02-Office Perimeter-1	750	-
C2-L02-Office Perimeter-2	900	-
C2-L02-Office Perimeter-3	900	-
C2-L02-Office Perimeter-4	950	-
C2-L02-Office Perimeter-5	700	-
C2-L02-Office Perimeter-6	800	-
C2-L02-Office Perimeter-7	550	-
C2-L02-Office Perimeter-8	800	-
C2-L02-Office Perimeter-9	650	-
C2-L02-Office Perimeter-10	1300	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-L01-Office Core	3650	-
C2-L02-Office Core	3650	-
C2-Corridor-1	150	-
C2-Corridor-2	250	-
C2-Corridor-3	250	-
C2-Corridor-4	300	-
C2-Resi-Unused-1	3000	-
C2-Resi-Unused-2	1150	-
D-Plant-1	400	-
D-Refuse Store-1	0	-
D-Refuse Store-2	0	-
D-Stair Case-1	50	-
D-Stair Case-2	50	-
D-Stair Case-3	50	-
D-Stair Case-4	50	-
D-Stair Case-5	50	-
D-Stair Case-6	50	-
D-Corridor-1	50	-
D-Corridor-2	50	-
D-Cafe-1	550	-
D-Office-Perimeter-1	950	-
D-Office-Perimeter-2	700	-
D-Office-Perimeter-3	1000	-
D-Office-Perimeter-4	1400	-
D-Office-Core	850	-
D-Office-	750	-
D-Entrance-Residential-1	100	-
D-Entrance-Residential-2	150	-
D-Entrance-Residential-3	150	-
D-Resi-Unused-1	2750	-
A-Restaurant-Perimeter-1	400	22
A-Restaurant-Perimeter-2	200	22
A-Restaurant-Perimeter-3	500	22
A-Restaurant-Perimeter-4	400	22
A-Restaurant-Core-1	500	22
A-Restaurant-Core-2	650	22
A-Kitchen-1	1700	-
A-Kitchen-2	1000	-
A-WC-1	200	-
A-WC-2	100	-
A-Stair Case-1	50	-
A-Stair Case-2	50	-
C1-WC-1	450	-
C2-WC-1	150	-
C2-WC-2	150	-
C2-WC-3	200	-
C2-WC-4	300	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
C2-WC-5	50	-
C1-Retail-Perimeter-4	1200	22
C2-Retail-Core-3	1800	22
C2-Retail-Core-4	3450	22
D-Car park-1	1450	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C1-Cinema Foyer-1	N/A	N/A
C1-Auditorium-1	N/A	N/A
C1-Auditorium-2	N/A	N/A
C1-Auditorium-3	N/A	N/A
C1-Entrance-Cinema-1	N/A	N/A
C1-Entrance-Cinema-2	YES (+214%)	NO
C1-Entrance--Residential	YES (+242%)	NO
C1-Retail-Core-1	YES (+32%)	NO
C1-Retail-Core-2	YES (+88%)	NO
C1-Retail-Perimeter-1	YES (+204%)	NO
C1-Retail-Perimeter-2	YES (+157%)	NO
C1-Retail-Perimeter-3	YES (+128%)	NO
C1-Resi-unused-1	N/A	N/A
C1-Resi-unused-2	N/A	N/A
C2-Retail-Core-1	NO (-65%)	NO
C2-Retail-Core-2	NO (-67%)	NO
C2-Retail-Perimeter-1	NO (-49%)	NO
C2-Retail-Perimeter-2	NO (-37%)	NO
C2-Retail-Perimeter-3	NO (-9%)	NO
C2-Retail-Perimeter-4	YES (+16%)	NO
C2-Retail-Perimeter-5	YES (+2%)	NO
C2-Retail-Perimeter-6	YES (+0%)	NO
C2-L01-Office Perimeter-1	NO (-45%)	NO
C2-L01-Office Perimeter-2	NO (-53%)	NO
C2-L01-Office Perimeter-3	NO (-46%)	NO
C2-L01-Office Perimeter-4	NO (-40%)	NO
C2-L01-Office Perimeter-5	NO (-43%)	NO
C2-L01-Office Perimeter-6	NO (-26%)	NO
C2-L01-Office Perimeter-7	YES (+58%)	NO
C2-L01-Office Perimeter-8	NO (-86%)	NO
C2-L01-Office Perimeter-9	NO (-95%)	NO
C2-L01-Office Perimeter-10	NO (-70%)	NO
C2-L02-Office Perimeter-1	NO (-39%)	NO
C2-L02-Office Perimeter-2	NO (-46%)	NO
C2-L02-Office Perimeter-3	NO (-37%)	NO
C2-L02-Office Perimeter-4	NO (-32%)	NO
C2-L02-Office Perimeter-5	NO (-36%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C2-L02-Office Perimeter-6	NO (-16%)	NO
C2-L02-Office Perimeter-7	YES (+71%)	NO
C2-L02-Office Perimeter-8	NO (-84%)	NO
C2-L02-Office Perimeter-9	NO (-95%)	NO
C2-L02-Office Perimeter-10	NO (-64%)	NO
C2-L01-Office Core	NO (-84%)	NO
C2-L02-Office Core	NO (-85%)	NO
C2-Resi-Unused-1	N/A	N/A
C2-Resi-Unused-2	N/A	N/A
D-Cafe-1	NO (-20%)	NO
D-Office-Perimeter-1	NO (-45%)	NO
D-Office-Perimeter-2	NO (-49%)	NO
D-Office-Perimeter-3	NO (-60%)	NO
D-Office-Perimeter-4	NO (-78%)	NO
D-Office-Core	YES (+69%)	NO
D-Office-	NO (-40%)	NO
D-Resi-Unused-1	N/A	N/A
A-Restaurant-Perimeter-1	NO (-32%)	NO
A-Restaurant-Perimeter-2	NO (-35%)	NO
A-Restaurant-Perimeter-3	NO (-32%)	NO
A-Restaurant-Perimeter-4	NO (-32%)	NO
A-Restaurant-Core-1	NO (-72%)	NO
A-Restaurant-Core-2	NO (-32%)	NO
A-Kitchen-1	N/A	N/A
A-Kitchen-2	N/A	N/A
A-WC-1	N/A	N/A
A-WC-2	N/A	N/A
C1-WC-1	N/A	N/A
C2-WC-1	N/A	N/A
C2-WC-2	N/A	N/A
C2-WC-3	N/A	N/A
C2-WC-4	N/A	N/A
C2-WC-5	N/A	N/A
C1-Retail-Perimeter-4	YES (+199%)	NO
C2-Retail-Core-3	NO (-65%)	NO
C2-Retail-Core-4	NO (-79%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	1715	1715
External area [m²]	14848	14848
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	5
Average conductance [W/K]	10073	4143
Average U-value [W/m²K]	0.68	0.28
Alpha value* [%]	17.71	17.71

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
4	**Residential spaces**
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
96	**D2 General Assembly and Leisure, Night Clubs and Theatres**
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	2.55	2.29
Cooling	2.09	6.44
Auxiliary	17.1	21.32
Lighting	24.25	25.75
Hot water	2.03	2.08
Equipment*	303.81	303.81
TOTAL	**48.03**	**57.88**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m²]	65.59	90.04
Total consumption [kWh/m²]	48.03	57.88
Total emissions [kg/m²]	21.6	26.4

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Chilled ceilings or passive chilled beams and displacement ventilation, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid										
	Actual	8.3	57.3	2.6	2.1	17.1	0.9	7.6	0	0
	Notional	6.5	83.5	2.3	6.4	21.3	0.79	3.6	---	---

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	Metal wall-C2.---pane
Floor	0.2	0.18	Upper Floor
Roof	0.15	0.18	Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Glazed Wall-Restaurant
Personnel doors	1.5	-	No personal doors in project
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	3

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

SCHOOL

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Village Market

As designed

Date: Thu Sep 01 18:06:33 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	25
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	25
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	23.6
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	School External Wall
Floor	0.25	0.22	0.22	School Ground Floor
Roof	0.25	0.18	0.18	School Corridor Ceiling
Windows***, roof windows, and rooflights	2.2	1.75	1.77	School Upper Entrance Window
Personnel doors	2.2	1.8	1.81	School Door
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	5

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- School (16 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0	-	2.1	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
1	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
School Kitchen	1.2	-	0.9
School Hall	1.2	-	0.9
School Entrance	1.2	-	0.9
School Admin	1.2	-	0.9
School Classbase 1	1.2	-	0.9
School Classbase 2	1.2	-	0.9
School Classbase 3	1.2	-	0.9
School Classbase 4	1.2	-	0.9
School G Circulation	1.2	-	0.9
School Plant	1.2	-	0.9
School Staff	1.2	-	0.9
School Classbase 5	1.2	-	0.9
School Classbase 6	1.2	-	0.9
School Classbase 7	1.2	-	0.9
School Classbase 8	1.2	-	0.9
School 1 Circulation	1.2	-	0.9

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
School Kitchen	5800	-
School Hall	700	-
School Entrance	250	-
School Admin	650	-
School Classbase 1	450	-
School Classbase 2	550	-
School Classbase 3	500	-
School Classbase 4	500	-
School G Circulation	200	-
School Plant	300	-
School Staff	250	-
School Classbase 5	450	-
School Classbase 6	550	-
School Classbase 7	500	-
School Classbase 8	500	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
School 1 Circulation	200	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
School Hall	NO (-34%)	NO
School Admin	NO (-47%)	NO
School Classbase 1	NO (-34%)	NO
School Classbase 2	NO (-28%)	NO
School Classbase 3	NO (-28%)	NO
School Classbase 4	NO (-29%)	NO
School Classbase 5	NO (-17%)	NO
School Classbase 6	NO (-9%)	NO
School Classbase 7	NO (-8%)	NO
School Classbase 8	NO (-17%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	1536	1536
External area [m²]	2986	2986
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	5
Average conductance [W/K]	1530	1331
Average U-value [W/m²K]	0.51	0.45
Alpha value* [%]	14.94	14.94

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
100	**C2 Residential Inst.: Residential schools**
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	8.86	7.01
Cooling	0	0
Auxiliary	15.12	16.1
Lighting	18.72	18.84
Hot water	30.76	36.8
Equipment*	50.38	50.38
TOTAL	**73.46**	**78.75**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m²]	28.48	19.98
Total consumption [kWh/m²]	73.46	78.75
Total emissions [kg/m²]	23.6	25

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid Supplied Electricity										
	Actual	28.5	0	8.9	0	15.1	0.89	0	0	0
	Notional	20	0	7	0	16.1	0.79	0	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	School External Wall
Floor	0.2	0.22	School Ground Floor
Roof	0.15	0.18	School Corridor Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Window
Personnel doors	1.5	1.79	School Corridor Door
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

SCHOOL

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Camden Village Market

As designed

Date: Thu Sep 01 18:06:33 2011

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.2.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.2.1

BRUKL compliance check version: v4.1.c.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	25
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	25
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	23.6
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.26	School External Wall
Floor	0.25	0.22	0.22	School Ground Floor
Roof	0.25	0.18	0.18	School Corridor Ceiling
Windows***, roof windows, and rooflights	2.2	1.75	1.77	School Upper Entrance Window
Personnel doors	2.2	1.8	1.81	School Door
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	5

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- School (16 Zones)

Heating seasonal efficiency	**Cooling seasonal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0	-	2.1	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- New DHW Group

Heating seasonal efficiency	**Hot water storage loss factor [kWh/litre per day]**
1	0

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
School Kitchen	1.2	-	0.9
School Hall	1.2	-	0.9
School Entrance	1.2	-	0.9
School Admin	1.2	-	0.9
School Classbase 1	1.2	-	0.9
School Classbase 2	1.2	-	0.9
School Classbase 3	1.2	-	0.9
School Classbase 4	1.2	-	0.9
School G Circulation	1.2	-	0.9
School Plant	1.2	-	0.9
School Staff	1.2	-	0.9
School Classbase 5	1.2	-	0.9
School Classbase 6	1.2	-	0.9
School Classbase 7	1.2	-	0.9
School Classbase 8	1.2	-	0.9
School 1 Circulation	1.2	-	0.9

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
School Kitchen	5800	-
School Hall	700	-
School Entrance	250	-
School Admin	650	-
School Classbase 1	450	-
School Classbase 2	550	-
School Classbase 3	500	-
School Classbase 4	500	-
School G Circulation	200	-
School Plant	300	-
School Staff	250	-
School Classbase 5	450	-
School Classbase 6	550	-
School Classbase 7	500	-
School Classbase 8	500	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
School 1 Circulation	200	-

Criterion 3: The spaces in the building should have propriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
School Hall	NO (-34%)	NO
School Admin	NO (-47%)	NO
School Classbase 1	NO (-34%)	NO
School Classbase 2	NO (-28%)	NO
School Classbase 3	NO (-28%)	NO
School Classbase 4	NO (-29%)	NO
School Classbase 5	NO (-17%)	NO
School Classbase 6	NO (-9%)	NO
School Classbase 7	NO (-8%)	NO
School Classbase 8	NO (-17%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	1536	1536
External area [m²]	2986	2986
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	5
Average conductance [W/K]	1530	1331
Average U-value [W/m²K]	0.51	0.45
Alpha value* [%]	14.94	14.94

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
100	**C2 Residential Inst.: Residential schools**
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Telephone exchanges
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	8.86	7.01
Cooling	0	0
Auxiliary	15.12	16.1
Lighting	18.72	18.84
Hot water	30.76	36.8
Equipment*	50.38	50.38
TOTAL	**73.46**	**78.75**

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m²]	28.48	19.98
Total consumption [kWh/m²]	73.46	78.75
Total emissions [kg/m²]	23.6	25

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Grid Supplied Electricity										
	Actual	28.5	0	8.9	0	15.1	0.89	0	0	0
	Notional	20	0	7	0	16.1	0.79	0	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.26	School External Wall
Floor	0.2	0.22	School Ground Floor
Roof	0.15	0.18	School Corridor Ceiling
Windows, roof windows, and rooflights	1.5	1.75	Window
Personnel doors	1.5	1.79	School Corridor Door
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5

Thermal bridges

There is at least one junction in the project whose linear thermal transmittance has been defined as having been calculated following a quality-assured accredited construction details approach in accordance with a scheme approved by the Secretary of State.

Appendix D - Code for Sustainable Homes Pre-assessments

Contents

Code for Sustainable Homes
PRE ASSESSMENT ESTIMATOR TOOL

RESULTS

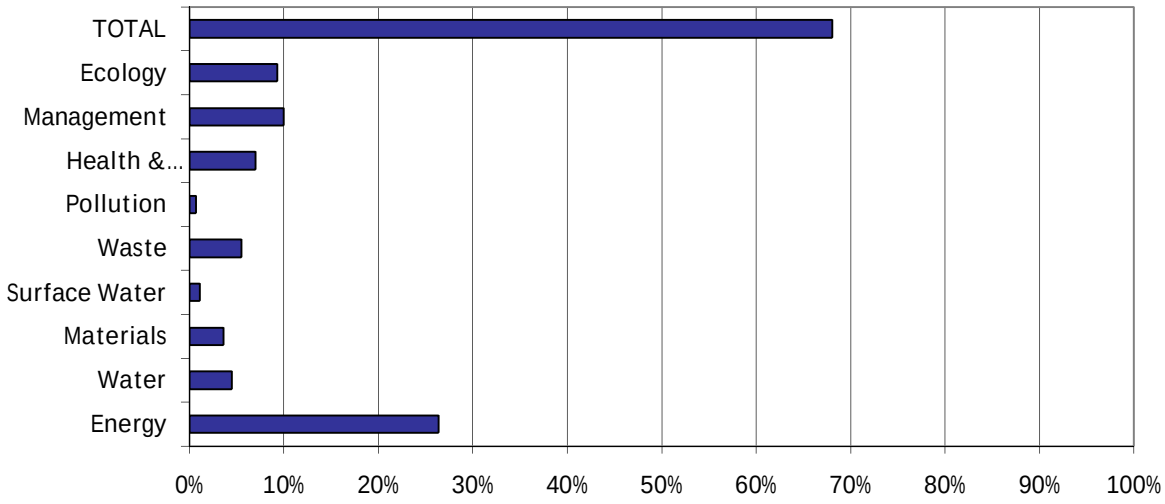
Development Name:	Camden Village Market
Dwelling Description:	Area B
Name of Company:	Grontmij Ltd
Code Assessor's Name:	David Partington
Company Address:	
Notes/Comments:	

PREDICTED RATING - CODE LEVEL: 4

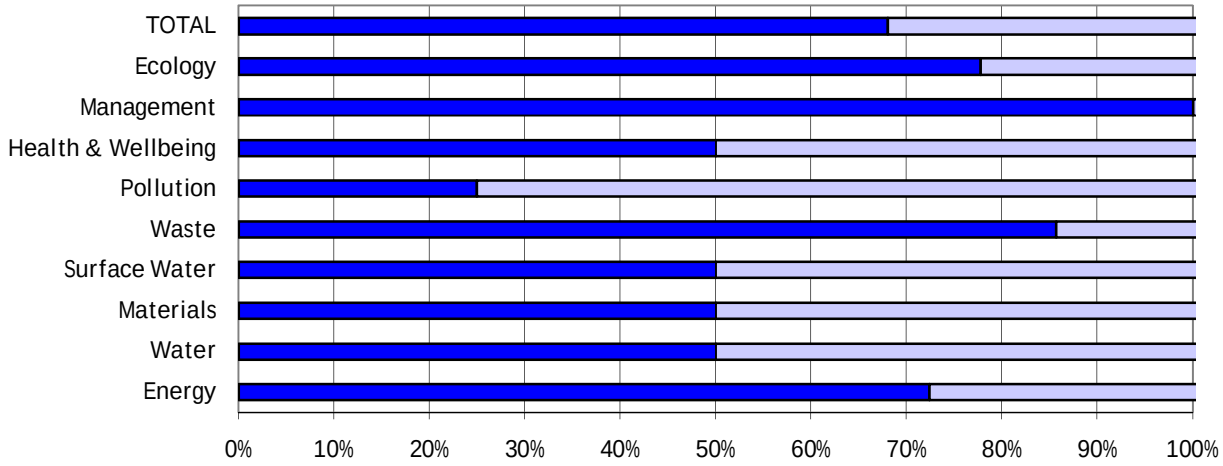
Mandatory Requirements: All Levels

% Points:	68.06%	- Code Level: 4
Breakdown:	Energy	- Code Level: 4
	Water	- Code Level: 4

Graph 1: Predicted contribution of individual sections to the total score and percentage of total achievable score



Graph 2: Predicted percentage of credits achievable: Total and by Category



NOTE: The rating obtained by using this Pre Assessment Estimator is for guidance only. Predicted ratings may differ from those obtained through a formal assessment, which must be carried out by a licensed Code assessor.

CATEGORY 1 ENERGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 72.00%		Credits	Level		
Contribution to Overall Score: 26.35 points		21 of 29 Credits	Level 4		
Ene 1 Dwelling Emission Rate	Credits are awarded based on the percentage improvement of the Dwelling Emission Rate (DER) over the Target Emission Rate (TER) as calculated using SAP 2005. Minimum standards for each Code level apply. Select the % improvement / Mandatory Requirement 0% improvement ○ OR 10% Improvement ○ OR 14% Improvement ○ OR 18 % Improvement ○ OR 22% Improvement ○ OR 25% Improvement ○ OR 31% Improvement ○ OR 37% Improvement ○ OR 44% Improvement ○ OR 52% Improvement ◉ OR 60% Improvement ○ OR 69% Improvement ○ OR 79% Improvement ○ OR 89% Improvement ○ OR 100% Improvement ○ OR Zero Carbon Home* ○ * as defined in the Code Technical Guide	9 of 15 Credits	Level 4	Assumed	Grontmij SAP calculations
Ene 2 Building Fabric	Credits are awarded based on the Heat Loss Parameter (HLP) obtained from the SAP 2005 calculations. This is based on the level of insulation provided in the dwellings. Select a HLP range Greater than 1.30 ○ OR Less than or equal to 1.30 ○ OR Less than or equal to 1.10 ◉	2 of 2 Credits	-	Assumed	Grontmij SAP calculations
Ene 3 Internal Lighting	Credits are awarded based on the percentage of fixed internal fittings that are dedicated energy efficient provided in habitable spaces within the dwelling. Select the % of dedicated energy efficient fittings Less than 40% ○ OR Greater than or equal to 40% ○ OR Greater than or equal to 75% ◉	2 of 2 Credits	-	Assumed	

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 4 Drying Space	One credit is awarded for the provision of either internal or external secure drying space with posts and footings or fixings capable of holding 4m+ of drying line for 1-2 bed dwellings and 6m+ for dwellings with 3 bedrooms or greater. Will drying space meeting the criteria be provided? Yes ◉ OR No ○	1 of 1 Credits	-	Extendable clothes line in a bathroom	AHMM
Ene 5 Energy Labelled White Goods	Credits are awarded where each dwelling is provided with either information about the EU Energy Labelling Scheme, White Goods with ratings ranging from A+ to B or a combination of the previous acording to the technical guide. Select the appropriate option below EU Energy labelling information ☑ A+ Rated Fridges and Freezers ☐ Combination of rated white goods with EU Energy Labelling Scheme ☐	1 of 2 Credits	-	EU labelling leaflet to be provided.	Stanley Sidings
Ene 6 External Lighting	Credits are awarded based* on the provision of space lighting with dedicated energy efficient fittings and security lighting fittings with appropriate control gear OR provision of dual lamp luminaires with both space and security lamps compliant with the above energy effiicciency requirements. Space Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting ◉ Security Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting and controls ◉ Dual lamp luminaires Compliant with both above criteria ☐ * Statutory safety lighting is not covered by this requirement	2 of 2 Credits	-	Assumed	Grontmij

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 7 Low or Zero Carbon Technologies	Credits are awarded where either there is a 10% or 15% reduction in total carbon emissions that result from using low or zero carbon technologies. Note that where funding has not been granted through the Low Carbon Buildings Programme, a feasibility study is required that meets the Code requirements. Select % contribution made by low or zero carbon technologies Less than 10% of demand ○ OR 10% of demand or greater ○ OR 15% of demand or greater ◉	2 of 2 Credits	-	Assumed	Grontmij
Ene 8 Cycle Storage	Credits are awarded where adequate, safe, secure and weather proof cycle storage is provided according to the Code requirements. Fill in the development details below Number of bedrooms: 64 Number of cycles stored per dwelling* 0.5 * if you have storage for 1 cycle per two dwellings insert 0.5 in number of cycles stored per dwelling	1 of 2 Credits	-	Each building requires the following minimum number of cycle spaces to achieve 1 credit based on 1404/2011 AHMM document W = 32 X = 16	AHMM to achieve ONE credit requires at least 1 cycle space per 2-bed or 3-bed apt, 2 cycle spaces per 4-bed or more apts and 1 cycle space for every TWO 1-bed or studio apts. To achieve TWO credits need to double this number. Communal cycle store to be within 100m of main entrance to apartment building.
Ene 9 Home Office	A credit is awarded for the provision of space for a home office. The location, space and services provided must meet the Code requirements. Will there be provision for a Home Office? Yes ◉ OR No ○	1 of 1 Credits	-	For dwellings with three or more bedrooms, a suitable room is a room other than the kitchen, living room, master bedroom or bathroom. For dwellings with one or two bedrooms or studio homes, a suitable room is the living room, one of the bedrooms or any other suitable area in the home such as a large hall or dining area.	AHMM An average daylight factor of 1.5% min 1.8m wall length for desk/chair etc. Appropriate services

CATEGORY 2 WATER	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 4.50 points		3 of 6 Credits	Level 4		
Wat 1 Indoor Water Use	Credits are awarded based on the predicted average household water consumption, calculated using the Code Water Calculator Tool. Minimum standards for each code level apply. Select the predicted water use / Mandatory Requirement greater than 120 litres/ person/ day ○ OR less than 120 litres/ person/ day ○ OR less than 110 litres/ person/ day ○ OR less than 105 litres/ person/ day ◉ OR less than 90 litres/ person/ day ○ OR less than 80 litres/ person/ day ○	3 of 5 Credits	Level 3 AND Level 4	Mandatory for level 4	Grontmij to provide recommendations on how achieved but will require agreement from whole project team particularly relating to choice of sanitary fittings
Wat 2 External Water Use	A credit is awarded where a compliant system is specified for collecting rainwater for external irrigation purposes. Where no outdoor space is provided the credit can be achieved by default. Select the scenario that applies No internal or communal outdoor space ○ OR Outdoor space with collection system ○ OR Outdoor space without collection system ◉	0 of 1 Credits	-	Assumed	Landscape architect/ Ecologist - does not apply where only balconies are provided. (For communal gardens, allow at least 30L rainwater storage per dwellings using the garden. This can be halved if drought resistent species are planted.)

CATEGORY 3 MATERIALS	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 3.60 points		12 of 24 Credits	All Levels		
Mat 1 Environm-ental Impact of Materials	Mandatory Requirement: At least three of the five key building elements must achieve a Green Guide 2008 Rating of A+ to D. Tradable Credits: Points are awarded on a scale based on the Green Guide Rating of the specifications. The Code Materials Calculator can be used to predict a potential score. Mandatory Requirement: Will the mandatory requirement be met? ☑ Enter the predicted score: What is the predicted number of credits? 7	7 of 15 Credits	All Levels	Assume the following elements are predominantly A rated • Roof • External walls • Internal walls (including separating walls) • Upper and ground floors (including separating floors) • Windows	AHMM Grontmij to advise on selection of materials
Mat 2 Responsible Sourcing of Materials - Basic Building Elements	Credits are awarded where materials used in the basic building elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score: What is the predicted number of credits? 3	3 of 6 Credits	-	Assumed main contractor's EMS is minimum Tier Level 3.	Stanley Sidings
Mat 3 Responsible Sourcing of Materials - Finishing Elements	Credits are awarded where materials used in the finishing elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score: What is the predicted number of credits? 2	2 of 3 Credits	-	Assumed main contractor sources FSC timber or equivalen	Stanley Sidings

CATEGORY 4 SURFACE WATER RUN-OFF	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 1.10 points		2 of 4 Credits	All Levels		
Sur 1 Management of Surface Water Run-off from developments	Mandatory Requirement: Peak rate of run-off into watercourses is no greater for the developed site than it was for the pre-development site and that the additional predicted volume of rainwater discharge caused by the new development is entirely reduced. Tradable Credits: Where SUDS are used to improve water quality of the rainwater discharged or for protecting the quality of the receiving waters. Mandatory Requirement Will the mandatory requirement be met? ☑ Select the appropriate option No SUDS or default case compliance ◉ Code compliant SUDS systems ○ Non Code compliant SUDS systems ○ Site discharges rainwater directly to a tidal estuary or the sea ○	0 of 2 Credits	All Levels	Mandatory requirement achieved.	Walsh Assoc/Grontmij Walsh Associates/Grontmij investigating proposed SUDs scheme for compliance with new CfSH requirements
Sur 2 Flood Risk	Credits are awarded where developments are located in areas of low flood risk or where in areas of medium or high flood risk appropriate measures are taken to prevent damage to the property and its contents in accordance with the Code criteria in the technical guide. Select the annual probability of flooding (from PPS25*) Zone 1 - Low ◉ OR Zone 2 - Medium ○ OR Zone 3 - High ○ Select the apropriate option(s) Low risk of flooding from FRA** ☑ All measures of protection are demonstrated in FRA ☐ Ground floor level and access routes are 600 mm above design flood level ☐ * Planning Policy Statement 25 - Planning and Flood Risk ** FRA - Flood Risk Assessment	2 of 2 Credits	-	Flood risk assessment required	Watermans

CATEGORY 5 WASTE	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 85.00%		Credits	Level		
Contribution to Overall Score: 5.48 points		6 of 7 Credits	All Levels		
Was 1 Storage of non-recyclable waste and recyclable household waste	Mandatory Requirement: The space provided for waste storage should be sized to hold the larger of either all external containers provided by the Local Authority or the min capacity calculated from BS 5906. Tradable Credits are awarded for adequate internal and/ or external recycling facilities. **Mandatory Requirement** Will the minimum space be provided and be accessible to disabled people? ☑ **Internal Recyclable household waste storage** Where there is no external recyclable waste storage and no Local Authority collection scheme Internal storage (capacity 60 litres) ☐ **Local Authority collection Scheme** Post Collection sorting Internal storage (capacity 30 litres) ☑ Pre-collection sorting Internal storage (capacity 30 litres) ☐ **External Storage, no Local Authority collection scheme** 3 separate internal storage bins (capacity 30 litres) ☐ Houses External Storage(capacity 180 litres) ☐ Flats Private recycling operator ☐ 3 or greater types of waste collected ☐	0 of 2 Credits 4 of 4 Credits 0 of 4 Credits	All Levels	Need confirmation of the proposed recycled waste strategy	AHMM see additional document setting out requirements.

Issue		Credits	Level	Assumptions Made	Evidence Required
Was 2 Construction Site Waste Management	Mandatory Requirements: A SWMP plan including the monitoring of waste generated on site and the setting of targets to promote resource efficiency must be produced and implemented. Tradable Credits: The SWMP should also include procedures and commitments for minimising waste and/ or commitments to sort, reuse and recycle construction waste. **Mandatory Requirement** Is the development cost less than £300K? ☐ **Contents of the SWMP** Does the SWMP include: + monitoring of waste generated on site? ☑ + targets to promote resource efficiency? ☑ + the waste groups? ☑ + compliance with best practice? ☑ + procedures for reducing waste? ☑ + commitments for reducing waste? ☑ + procedures to sort, reuse and recycle waste? ☑ + commitments to sort, reuse and recycle waste? ☑	2 of 2 Credits	All Levels		Stanley Sidings
Was 3 Composting	A credit is awarded where individual home composting facilities are provided, or where a community/ communal composting service, either run by the Local Authority or overseen by a management plan is in operation. **Select the facilities available** No composting facilities ◉ Individual composting facilities ○ OR Communal/ community composting*? ○ Local Authority ☐ OR Private with management plan ☐ * including if a automated waste collection system is in place	0 of 1 Credit	-		Landscape Architect

CATEGORY 6 POLLUTION	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 25.00%		Credits	Level		
Contribution to Overall Score: 0.70 points		1 of 4 Credits	All Levels		
Pol 1 Global Warming Potential (GWP) of Insulants	A credit is awarded where <u>all</u> insulating materials only use substances (in manufacture AND installation) that have a GWP of less than 5. Select the most appropriate option All insulants have a GWP less than 5 (●) OR Some insulants have a GWP of less than 5 (○) OR No insulants have a GWP of less than 5 (○)	1 of 1 Credits	-	All fabric and services insulation will be compliant	AHMM/Grontmij
Pol 2 NOx Emissions	Credits are awarded on the basis of NOx emissions arising from the operation of the space and water heating system within the dwelling. Select the most appropriate option Greater than 100 mg/kWh (●) OR Less than 100 mg/kWh (○) OR Less than 70 mg/kWh (○) OR Less than 40 mg/kWh (○) OR Class 4 boiler (○) OR Class 5 boiler (○) OR All space and hot water energy requirements are met by systems who do not produce NOx emissions (○)	0 of 3 Credits	-		Grontmij

CATEGORY 7 HEALTH & WELLBEING Overall Level: 4		Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 7.00 points		6 of 12 Credits	-		
Hea 1 Daylighting	Credits are awarded for ensuring key rooms in the dwelling have high daylight factors (DF) and a view of the sky. Select the compliant areas Room Kitchen: Avg DF of at least 2% ☐ Living Room*: Avg DF of at least 1.5% ☑ Dining Room*: Avg DF of at least 1.5% ☑ Study*: Avg DF of at least 1.5% ☑ 80% of working plane in all above rooms receive direct light from the sky? ☐ Any room used for Ene 9 Home Office must also achieve a min DF of 1.5%. *Tick the box if there is no study/ home office as this aspect of the credit will be awarded by default.	1 of 3 Credits	-	Assumed at least 1 credit will be achieved, subject to a daylight study. Apartments higher up and not facing any obstructions likely to achieve additional credits	AHMM
Hea 2 Sound Insulation	Credits are awarded where performance standards exceed those required in Building Regulations Part E. This can be demonstrated by carrying out pre-completion testing or through the use of Robust Details Limited. Select a type of property Detached Property ○ Attached Properties: - Separating walls and floors only exist between non habitable spaces ○ - Separating walls and floors exist between habitable spaces ◉ Select a performance standard Performance standard not sought ◉ Airborne: 3db higher; Impact: 3dB lower ○ OR Airborne: 5db higher; Impact: 5dB lower ○ OR Airborne: 8db higher; Impact: 8dB lower ○	0 of 4 Credits	-		Acoustic Consultant

Issue		Credits	Level	Assumptions Made	Evidence Required
Hea 3 Private Space	A credit is awarded for the provision of an outdoor space that is at least partially private. The space must allow easy access to all occupants. Will a private/ semi-private space be provided? Yes, private/semi-private space will be provided ◉ OR No private/semi-private space ○	1 of 1 Credits	-		AHMM - For balconies require at least 1.5m2/bedroom. For communal spaces, accessible only to residents, require at least 1m2/bedroom. Outdoor spaces must be accessible to wheelchair users.
Hea 4 Lifetime Homes	Mandatory Requirement: Lifetime Homes is mandatory when a dwelling is to achieve Code Level 6. Tradable credits: Credits are awarded where the developer has implemented all of the principles of the Lifetime Homes scheme. Mandatory Requirement Dwelling to achieve Code Level 6? ☐ Lifetime Homes Compliance All Lifetime Homes criteria will be met ◉ OR Credit not sought ○	4 of 4 Credits	-		AHMM

CATEGORY 8 MANAGEMENT	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 100.00%		Credits	Level		
Contribution to Overall Score: 10.00 points		9 of 9 Credits	All Levels		
Man 1 Home User Guide	Credits are awarded where a simple guide is provided to each dwelling covering information relevant to the 'non-technical' home occupier, in accordance with the Code requirements. Tick the topics covered by the Home User Guide Operational Issues? ☑ Site and Surroundings? ☑ Is available in alternative formats? ☑	3 of 3 Credits	-		Stanley Sidings
Man 2 Considerate Constructors Scheme	Credits are awarded where there is a commitment to comply with best practice site management principles using either the Considerate Constructors Scheme or an alternative locally/ nationally recognised scheme. Select the appropriate scheme and score No scheme used ○ Considerate Constructors OR Best Practice: Score between 24 and 31.5 ○ OR Best Practice+: Score between 32 and 40 ◉ Alternative Scheme* OR Mandatory + 50% optional requirements ○ OR Mandatory + 80% optional requirements ○ * In the first instance, contact a Code Service Provider if you are considering to use an alternative scheme.	2 of 2 Credits	-	Assumed. Best practice requires a minimum score of 4 in each section.	Stanley Sidings
Man 3 Construction Site Impacts	Credits are awarded where there is a commitment and strategy to operate site management procedures on site as following: Tick the impacts that will be addressed Monitor, report and set targets, where applicable, for: - CO_2/ energy use from site activities ☑ - CO_2/ energy use from site related transport ☑ - water consumption from site activities ☑ Adopt best practice policies in respect of: - air (dust) pollution from site activities ☑ - water (ground and surface) pollution on site ☐ 80% of site timber is reclaimed, re-used or responsibly sourced ☐	2 of 2 Credits	-	Assume any 4 out of the 6 will be undertaken	Stanley Sidings

Issue		Credits	Level	Assumptions Made	Evidence Required
Man 4 Security	Credits are awarded for complying with Section 2 - Physical Security from Secured by Design - New Homes. An Architectural Liaison Officer (ALO), or alternative, needs to be appointed early in the design process and their recommendations incorporated. Secured by Design Compliance Credit not sought ○ OR Secured by Design Section 2 Compliance ◉	2 of 2 Credits	-		AHMM

CATEGORY 9 ECOLOGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 77.00%		Credits	Level		
Contribution to Overall Score: 9.33 points		7 of 9 Credits	All Levels		
Eco 1 Ecological Value of Site	One credit is awarded for developing land of inherently low value. Select the appropriate option Credit not sought ○ OR Land has ecological value ○ OR Land has low/ insignificant ecological value* ◉ * Low ecological value is determined either a) by using Checklist Eco 1 across the whole development site; or b) where an suitably qualified ecologist is appointed and can confirm or c) produces an independent ecological report of the site, that the construction zone is of low/ insignificant value; AND the rest of the development site will remain undisturbed by the works.	1 of 1 Credits	-	Assume a Suitable Qualified ecologist will be appointed and will visit site prior to commencement of construction work/site clearance.	Watermans
Eco 2 Ecological Enhancement	A credit is awarded where there is a commitment to enhance the ecological value of the development site. Tick the appropriate boxes Will a *Suitably Qualified Ecologist* be appointed to recommend appropriate ecological features? ☑ AND Will all key recommendations be adopted? ☑ AND 30% of other recommendations be adopted? ☑	1 of 1 Credits	-	Assumed	Watermans
Eco 3 Protection of Ecological Features	A credit is awarded where there is a commitment to maintain and adequately protect features of ecological value. Type and protection of existing features Site with features of ecological value? ○ OR Site of low ecological value (as Eco 1)? ◉ AND All* existing features potentially affected by site works are maintained and adequately protected? ☐ *If a suitably qualified ecologist has confirmed that a feature can be removed due to insignificant ecological value or poor health conditions, as long all the rest have been protected, then this box can be ticked.	1 of 1 Credits	-	Assume any existing features will be protected (if any)	Watermans

Issue		Credits	Level	Assumptions Made	Evidence Required
Eco 4 Change of Ecological Value of Site	Credits are awarded where the change in ecological value has been calculated in accordance with the Code requirements and is calculated to be: Change in Ecological Value Major negative change: fewer than -9 ○ Minor negative change: between -9 and -3 ○ OR Neutral: between -3 and +3 ◉ Minor enhancement: between +3 and +9 ○ Major enhancement: greater than 9 ○	2 of 4 Credits	-	Minimum 2 credits achievable. Potential for more.	Watermans
Eco 5 Building Footprint	Credits are awarded where the ratio of combined floor area of all dwellings on the site to their footprint is: Ratio of Net Internal Floor Area: Net Internal Ground Floor Area Credit Not Sought ○ OR Houses: 2.5:1 OR Flats: 3:1 ○ OR Houses: 3:1 OR Flats: 4:1 ○ OR Houses & Flats Weighted (2.5:1 & 3:1) ○ OR Houses & Flats Weighted (3:1 & 4:1) ◉	2 of 2 Credits			AHMM

RESULTS

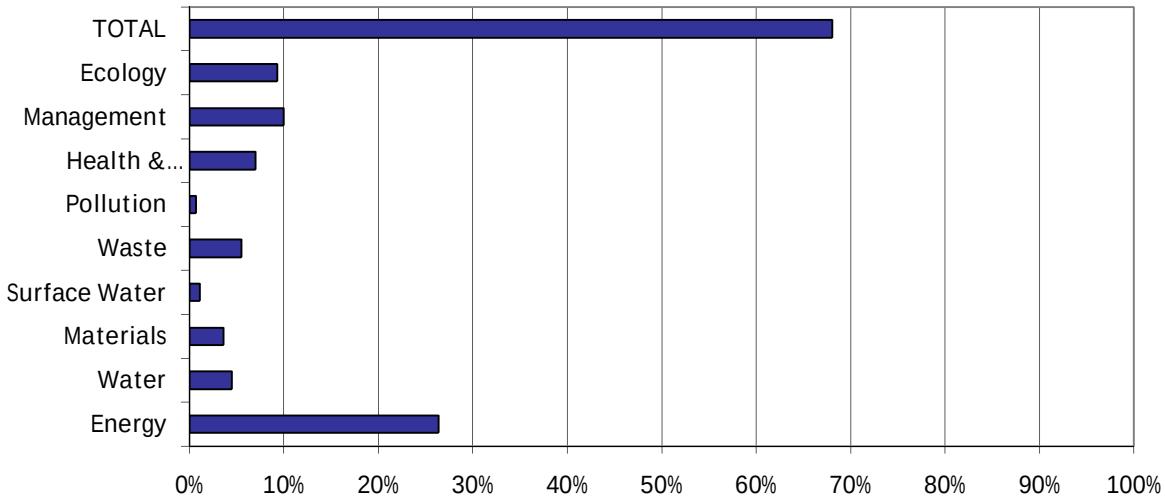
Development Name:	Camden Village Market
Dwelling Description:	Area C
Name of Company:	Grontmij Ltd
Code Assessor's Name:	David Partington
Company Address:	
Notes/Comments:	

PREDICTED RATING - CODE LEVEL: 4

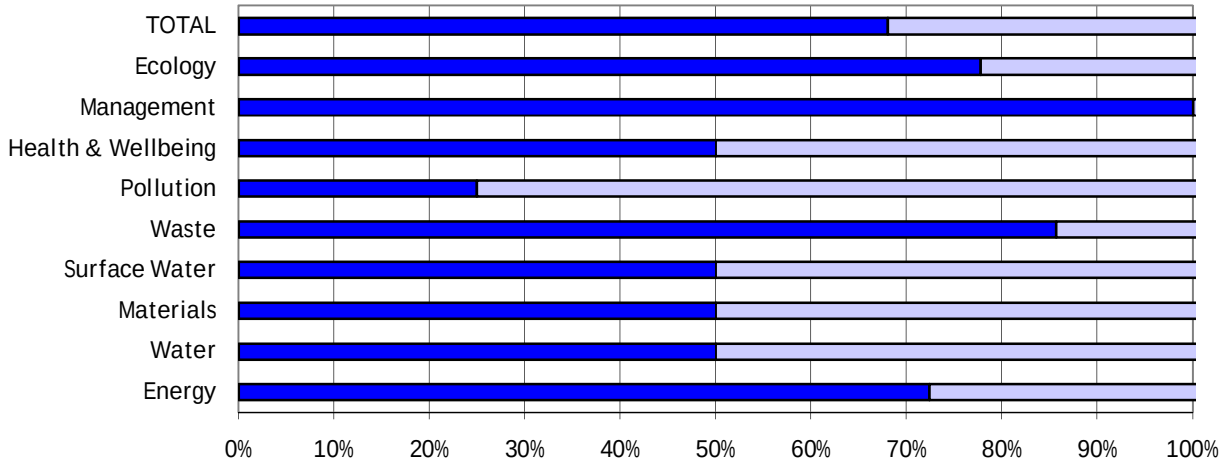
Mandatory Requirements: All Levels

% Points:	68.06%	- Code Level: 4
Breakdown:	Energy	- Code Level: 4
	Water	- Code Level: 4

Graph 1: Predicted contribution of individual sections to the total score and percentage of total achievable score



Graph 2: Predicted percentage of credits achievable: Total and by Category



NOTE: The rating obtained by using this Pre Assessment Estimator is for guidance only. Predicted ratings may differ from those obtained through a formal assessment, which must be carried out by a licensed Code assessor.

CATEGORY 1 ENERGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 72.00%		Credits	Level		
Contribution to Overall Score: 26.35 points		21 of 29 Credits	Level 4		
Ene 1 Dwelling Emission Rate	Credits are awarded based on the percentage improvement of the Dwelling Emission Rate (DER) over the Target Emission Rate (TER) as calculated using SAP 2005. Minimum standards for each Code level apply. Select the % improvement / Mandatory Requirement 0% improvement ○ OR 10% Improvement ○ OR 14% Improvement ○ OR 18 % Improvement ○ OR 22% Improvement ○ OR 25% Improvement ○ OR 31% Improvement ○ OR 37% Improvement ○ OR 44% Improvement ○ OR 52% Improvement ◉ OR 60% Improvement ○ OR 69% Improvement ○ OR 79% Improvement ○ OR 89% Improvement ○ OR 100% Improvement ○ OR Zero Carbon Home* ○ * as defined in the Code Technical Guide	9 of 15 Credits	Level 4	Assumed	Grontmij SAP calculations
Ene 2 Building Fabric	Credits are awarded based on the Heat Loss Parameter (HLP) obtained from the SAP 2005 calculations. This is based on the level of insulation provided in the dwellings. Select a HLP range Greater than 1.30 ○ OR Less than or equal to 1.30 ○ OR Less than or equal to 1.10 ◉	2 of 2 Credits	-	Assumed	Grontmij SAP calculations
Ene 3 Internal Lighting	Credits are awarded based on the percentage of fixed internal fittings that are dedicated energy efficient provided in habitable spaces within the dwelling. Select the % of dedicated energy efficient fittings Less than 40% ○ OR Greater than or equal to 40% ○ OR Greater than or equal to 75% ◉	2 of 2 Credits	-	Assumed	

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 4 Drying Space	One credit is awarded for the provision of either internal or external secure drying space with posts and footings or fixings capable of holding 4m+ of drying line for 1-2 bed dwellings and 6m+ for dwellings with 3 bedrooms or greater. Will drying space meeting the criteria be provided? Yes ◉ OR No ○	1 of 1 Credits	-	Extendable clothes line in a bathroom	MAKE
Ene 5 Energy Labelled White Goods	Credits are awarded where each dwelling is provided with either information about the EU Energy Labelling Scheme, White Goods with ratings ranging from A+ to B or a combination of the previous acording to the technical guide. Select the appropriate option below EU Energy labelling information ☑ A+ Rated Fridges and Freezers ☐ Combination of rated white goods with EU Energy Labelling Scheme ☐	1 of 2 Credits	-	EU labelling leaflet to be provided.	Stanley Sidings
Ene 6 External Lighting	Credits are awarded based* on the provision of space lighting with dedicated energy efficient fittings and security lighting fittings with appropriate control gear OR provision of dual lamp luminaires with both space and security lamps compliant with the above energy effiicciency requirements. Space Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting ◉ Security Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting and controls ◉ Dual lamp luminaires Compliant with both above criteria ☐ * Statutory safety lighting is not covered by this requirement	2 of 2 Credits	-	Assumed	Grontmij

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 7 Low or Zero Carbon Technologies	Credits are awarded where either there is a 10% or 15% reduction in total carbon emissions that result from using low or zero carbon technologies. Note that where funding has not been granted through the Low Carbon Buildings Programme, a feasibility study is required that meets the Code requirements. Select % contribution made by low or zero carbon technologies Less than 10% of demand ○ OR 10% of demand or greater ○ OR 15% of demand or greater ◉	2 of 2 Credits	-	Assumed	Grontmij
Ene 8 Cycle Storage	Credits are awarded where adequate, safe, secure and weather proof cycle storage is provided according to the Code requirements. Fill in the development details below Number of bedrooms: 64 Number of cycles stored per dwelling* 0.5 * if you have storage for 1 cycle per two dwellings insert 0.5 in number of cycles stored per dwelling	1 of 2 Credits	-	Each building requires the following minimum number of cycle spaces to achieve 1 credit based on 110418 Design Freeze. C1 = 39 C2 (EAST) = 18 C2 (WEST) = 33 or C2 (as a whole) = 51	MAKE to achieve ONE credit requires at least 1 cycle space per 2-bed or 3-bed apt, 2 cycle spaces per 4-bed or more apts and 1 cycle space for every TWO 1-bed or studio apts. To achieve TWO credits need to double this number. Communal cycle store to be within 100m of main entrance to apartment building.
Ene 9 Home Office	A credit is awarded for the provision of space for a home office. The location, space and services provided must meet the Code requirements. Will there be provision for a Home Office? Yes ◉ OR No ○	1 of 1 Credits	-	For dwellings with three or more bedrooms, a suitable room is a room other than the kitchen, living room, master bedroom or bathroom. For dwellings with one or two bedrooms or studio homes, a suitable room is the living room, one of the bedrooms or any other suitable area in the home such as a large hall or dining area.	MAKE An average daylight factor of 1.5% min 1.8m wall length for desk/chair etc. Appropriate services

CATEGORY 2 WATER	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 4.50 points		3 of 6 Credits	Level 4		
Wat 1 Indoor Water Use	Credits are awarded based on the predicted average household water consumption, calculated using the Code Water Calculator Tool. Minimum standards for each code level apply. Select the predicted water use / Mandatory Requirement greater than 120 litres/ person/ day ○ OR less than 120 litres/ person/ day ○ OR less than 110 litres/ person/ day ○ OR less than 105 litres/ person/ day ◉ OR less than 90 litres/ person/ day ○ OR less than 80 litres/ person/ day ○	3 of 5 Credits	Level 3 AND Level 4	Mandatory for level 4	Grontmij to provide recommendations on how achieved but will require agreement from whole project team particularly relating to choice of sanitary fittings
Wat 2 External Water Use	A credit is awarded where a compliant system is specified for collecting rainwater for external irrigation purposes. Where no outdoor space is provided the credit can be achieved by default. Select the scenario that applies No internal or communal outdoor space ○ OR Outdoor space with collection system ○ OR Outdoor space without collection system ◉	0 of 1 Credits	-	Assumed	Landscape architect/ Ecologist - does not apply where only balconies are provided. (For communal gardens, allow at least 30L rainwater storage per dwellings using the garden. This can be halved if drought resistent species are planted.)

CATEGORY 3 MATERIALS	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 3.60 points		12 of 24 Credits	All Levels		
Mat 1 Environm-ental Impact of Materials	Mandatory Requirement: At least three of the five key building elements must achieve a Green Guide 2008 Rating of A+ to D. Tradable Credits: Points are awarded on a scale based on the Green Guide Rating of the specifications. The Code Materials Calculator can be used to predict a potential score. Mandatory Requirement Will the mandatory requirement be met? ☑ Enter the predicted score What is the predicted number of credits? 7	7 of 15 Credits	All Levels	Assume the following elements are predominantly A rated • Roof • External walls • Internal walls (including separating walls) • Upper and ground floors (including separating floors) • Windows	MAKE Grontmij to advise on selection of materials
Mat 2 Responsible Sourcing of Materials - Basic Building Elements	Credits are awarded where materials used in the basic building elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score What is the predicted number of credits? 3	3 of 6 Credits	-	Assumed main contractor's EMS is minimum Tier Level 3.	Stanley Sidings
Mat 3 Responsible Sourcing of Materials - Finishing Elements	Credits are awarded where materials used in the finishing elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score What is the predicted number of credits? 2	2 of 3 Credits	-	Assumed main contractor sources FSC timber or equivalen	Stanley Sidings

CATEGORY 4 SURFACE WATER RUN-OFF	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 1.10 points		2 of 4 Credits	All Levels		
Sur 1 Management of Surface Water Run-off from developments	Mandatory Requirement: Peak rate of run-off into watercourses is no greater for the developed site than it was for the pre-development site and that the additional predicted volume of rainwater discharge caused by the new development is entirely reduced. Tradable Credits: Where SUDS are used to improve water quality of the rainwater discharged or for protecting the quality of the receiving waters. Mandatory Requirement Will the mandatory requirement be met? ☑ Select the appropriate option No SUDS or default case compliance ◉ Code compliant SUDS systems ○ Non Code compliant SUDS systems ○ Site discharges rainwater directly to a tidal estuary or the sea ○	0 of 2 Credits	All Levels	Mandatory requirement achieved.	Walsh Assoc/Grontmij Walsh Associates/Grontmij investigating proposed SUDs scheme for compliance with new CfSH requirements
Sur 2 Flood Risk	Credits are awarded where developments are located in areas of low flood risk or where in areas of medium or high flood risk appropriate measures are taken to prevent damage to the property and its contents in accordance with the Code criteria in the technical guide. Select the annual probability of flooding (from PPS25*) Zone 1 - Low ◉ OR Zone 2 - Medium ○ OR Zone 3 - High ○ Select the apropriate option(s) Low risk of flooding from FRA** ☑ All measures of protection are demonstrated in FRA ☐ Ground floor level and access routes are 600 mm above design flood level ☐ * Planning Policy Statement 25 - Planning and Flood Risk ** FRA - Flood Risk Assessment	2 of 2 Credits	-	Flood risk assessment required	Watermans

CATEGORY 5 WASTE	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 85.00%		Credits	Level		
Contribution to Overall Score: 5.48 points		6 of 7 Credits	All Levels		
Was 1 Storage of non-recyclable waste and recyclable household waste	Mandatory Requirement: The space provided for waste storage should be sized to hold the larger of either all external containers provided by the Local Authority or the min capacity calculated from BS 5906. Tradable Credits are awarded for adequate internal and/ or external recycling facilities. **Mandatory Requirement** Will the minimum space be provided and be accessible to disabled people? ☑ **Internal Recyclable household waste storage** Where there is no external recyclable waste storage and no Local Authority collection scheme Internal storage (capacity 60 litres) ☐ **Local Authority collection Scheme** Post Collection sorting Internal storage (capacity 30 litres) ☑ Pre-collection sorting Internal storage (capacity 30 litres) ☐ **External Storage, no Local Authority collection scheme** 3 separate internal storage bins (capacity 30 litres) ☐ Houses External Storage(capacity 180 litres) ☐ Flats Private recycling operator ☐ 3 or greater types of waste collected ☐	0 of 2 Credits 4 of 4 Credits 0 of 4 Credits	All Levels	Need confirmation of the proposed recycled waste strategy	MAKE see additional document setting out requirements.

Issue		Credits	Level	Assumptions Made	Evidence Required
Was 2 Construction Site Waste Management	Mandatory Requirements: A SWMP plan including the monitoring of waste generated on site and the setting of targets to promote resource efficiency must be produced and implemented. Tradable Credits: The SWMP should also include procedures and commitments for minimising waste and/ or commitments to sort, reuse and recycle construction waste. **Mandatory Requirement** Is the development cost less than £300K? ☐ **Contents of the SWMP** Does the SWMP include: + monitoring of waste generated on site? ☑ + targets to promote resource efficiency? ☑ + the waste groups? ☑ + compliance with best practice? ☑ + procedures for reducing waste? ☑ + commitments for reducing waste? ☑ + procedures to sort, reuse and recycle waste? ☑ + commitments to sort, reuse and recycle waste? ☑	2 of 2 Credits	All Levels		Stanley Sidings
Was 3 Composting	A credit is awarded where individual home composting facilities are provided, or where a community/ communal composting service, either run by the Local Authority or overseen by a management plan is in operation. **Select the facilities available** No composting facilities ◉ Individual composting facilities ○ OR Communal/ community composting*? ○ Local Authority ☐ OR Private with management plan ☐ * including if a automated waste collection system is in place	0 of 1 Credit	-		Landscape Architect

CATEGORY 6 POLLUTION	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 25.00%		Credits	Level		
Contribution to Overall Score: 0.70 points		1 of 4 Credits	All Levels		
Pol 1 Global Warming Potential (GWP) of Insulants	A credit is awarded where all insulating materials only use substances (in manufacture AND installation) that have a GWP of less than 5. Select the most appropriate option (●) All insulants have a GWP less than 5 OR ( ) Some insulants have a GWP of less than 5 OR ( ) No insulants have a GWP of less than 5	1 of 1 Credits	-	All fabric and services insulation will be compliant	MAKE/Grontmij
Pol 2 NOx Emissions	Credits are awarded on the basis of NOx emissions arising from the operation of the space and water heating system within the dwelling. Select the most appropriate option (●) Greater than 100 mg/kWh OR ( ) Less than 100 mg/kWh OR ( ) Less than 70 mg/kWh OR ( ) Less than 40 mg/kWh OR ( ) Class 4 boiler OR ( ) Class 5 boiler OR ( ) All space and hot water energy requirements are met by systems who do not produce NOx emissions	0 of 3 Credits	-		Grontmij

CATEGORY 7 HEALTH & WELLBEING	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 7.00 points		6 of 12 Credits	-		
Hea 1 Daylighting	Credits are awarded for ensuring key rooms in the dwelling have high daylight factors (DF) and a view of the sky. Select the compliant areas Room Kitchen: Avg DF of at least 2% ☐ Living Room*: Avg DF of at least 1.5% ☑ Dining Room*: Avg DF of at least 1.5% ☑ Study*: Avg DF of at least 1.5% ☑ 80% of working plane in all above rooms receive direct light from the sky? ☐ Any room used for Ene 9 Home Office must also achieve a min DF of 1.5%. *Tick the box if there is no study/ home office as this aspect of the credit will be awarded by default.	1 of 3 Credits	-	Assumed at least 1 credit will be achieved, subject to a daylight study. Apartments higher up and not facing any obstructions likely to achieve additional credits	MAKE
Hea 2 Sound Insulation	Credits are awarded where performance standards exceed those required in Building Regulations Part E. This can be demonstrated by carrying out pre-completion testing or through the use of Robust Details Limited. Select a type of property Detached Property ○ Attached Properties: - Separating walls and floors only exist between non habitable spaces ○ - Separating walls and floors exist between habitable spaces ◉ Select a performance standard Performance standard not sought ◉ Airborne: 3db higher; Impact: 3dB lower ○ OR Airborne: 5db higher; Impact: 5dB lower ○ OR Airborne: 8db higher; Impact: 8dB lower ○	0 of 4 Credits	-		Acoustic Consultant

Issue		Credits	Level	Assumptions Made	Evidence Required
Hea 3 Private Space	A credit is awarded for the provision of an outdoor space that is at least partially private. The space must allow easy access to all occupants. Will a private/ semi-private space be provided? Yes, private/semi-private space will be provided ◉ OR No private/semi-private space ○	1 of 1 Credits	-		MAKE - For balconies require at least 1.5m2/bedroom. For communal spaces, accessible only to residents, require at least 1m2/bedroom. Outdoor spaces must be accessible to wheelchair users.
Hea 4 Lifetime Homes	Mandatory Requirement: Lifetime Homes is mandatory when a dwelling is to achieve Code Level 6. Tradable credits: Credits are awarded where the developer has implemented all of the principles of the Lifetime Homes scheme. Mandatory Requirement Dwelling to achieve Code Level 6? ☐ Lifetime Homes Compliance All Lifetime Homes criteria will be met ◉ OR Credit not sought ○	4 of 4 Credits	-		MAKE

CATEGORY 8 MANAGEMENT	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 100.00%		Credits	Level		
Contribution to Overall Score: 10.00 points		9 of 9 Credits	All Levels		
Man 1 Home User Guide	Credits are awarded where a simple guide is provided to each dwelling covering information relevant to the 'non-technical' home occupier, in accordance with the Code requirements. Tick the topics covered by the Home User Guide Operational Issues? ☑ Site and Surroundings? ☑ Is available in alternative formats? ☑	3 of 3 Credits	-		Stanley Sidings
Man 2 Considerate Constructors Scheme	Credits are awarded where there is a commitment to comply with best practice site management principles using either the Considerate Constructors Scheme or an alternative locally/ nationally recognised scheme. Select the appropriate scheme and score No scheme used ○ Considerate Constructors OR Best Practice: Score between 24 and 31.5 ○ OR Best Practice+: Score between 32 and 40 ◉ Alternative Scheme* OR Mandatory + 50% optional requirements ○ OR Mandatory + 80% optional requirements ○ * In the first instance, contact a Code Service Provider if you are considering to use an alternative scheme.	2 of 2 Credits	-	Assumed. Best practice requires a minimum score of 4 in each section.	Stanley Sidings
Man 3 Construction Site Impacts	Credits are awarded where there is a commitment and strategy to operate site management procedures on site as following: Tick the impacts that will be addressed Monitor, report and set targets, where applicable, for: - CO_2/ energy use from site activities ☑ - CO_2/ energy use from site related transport ☑ - water consumption from site activities ☑ Adopt best practice policies in respect of: - air (dust) pollution from site activities ☑ - water (ground and surface) pollution on site ☐ 80% of site timber is reclaimed, re-used or responsibly sourced ☐	2 of 2 Credits	-	Assume any 4 out of the 6 will be undertaken	Stanley Sidings

Issue		Credits	Level	Assumptions Made	Evidence Required
Man 4 Security	Credits are awarded for complying with Section 2 - Physical Security from Secured by Design - New Homes. An Architectural Liaison Officer (ALO), or alternative, needs to be appointed early in the design process and their recommendations incorporated. Secured by Design Compliance Credit not sought ○ OR Secured by Design Section 2 Compliance ◉	2 of 2 Credits	-		MAKE

CATEGORY 9 ECOLOGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 77.00%		Credits	Level		
Contribution to Overall Score: 9.33 points		7 of 9 Credits	All Levels		
Eco 1 Ecological Value of Site	One credit is awarded for developing land of inherently low value. Select the appropriate option Credit not sought ○ OR Land has ecological value ○ OR Land has low/ insignificant ecological value* ◉ * Low ecological value is determined either a) by using Checklist Eco 1 across the whole development site; or b) where an suitably qualified ecologist is appointed and can confirm or c) produces an independent ecological report of the site, that the construction zone is of low/ insignificant value; AND the rest of the development site will remain undisturbed by the works.	1 of 1 Credits	-	Assume a Suitable Qualified ecologist will be appointed and will visit site prior to commencement of construction work/site clearance.	Watermans
Eco 2 Ecological Enhancement	A credit is awarded where there is a commitment to enhance the ecological value of the development site. Tick the appropriate boxes Will a *Suitably Qualified Ecologist* be appointed to recommend appropriate ecological features? ☑ AND Will all key recommendations be adopted? ☑ AND 30% of other recommendations be adopted? ☑	1 of 1 Credits	-	Assumed	Watermans
Eco 3 Protection of Ecological Features	A credit is awarded where there is a commitment to maintain and adequately protect features of ecological value. Type and protection of existing features Site with features of ecological value? ○ OR Site of low ecological value (as Eco 1)? ◉ AND All* existing features potentially affected by site works are maintained and adequately protected? ☐ *If a suitably qualified ecologist has confirmed that a feature can be removed due to insignificant ecological value or poor health conditions, as long all the rest have been protected, then this box can be ticked.	1 of 1 Credits	-	Assume any existing features will be protected (if any)	Watermans

Issue		Credits	Level	Assumptions Made	Evidence Required
Eco 4 Change of Ecological Value of Site	Credits are awarded where the change in ecological value has been calculated in accordance with the Code requirements and is calculated to be: Change in Ecological Value Major negative change: fewer than -9 ○ Minor negative change: between -9 and -3 ○ OR Neutral: between -3 and +3 ◉ Minor enhancement: between +3 and +9 ○ Major enhancement: greater than 9 ○	2 of 4 Credits	-	Minimum 2 credits achievable. Potential for more.	Watermans
Eco 5 Building Footprint	Credits are awarded where the ratio of combined floor area of all dwellings on the site to their footprint is: Ratio of Net Internal Floor Area: Net Internal Ground Floor Area Credit Not Sought ○ OR Houses: 2.5:1 OR Flats: 3:1 ○ OR Houses: 3:1 OR Flats: 4:1 ○ OR Houses & Flats Weighted (2.5:1 & 3:1) ○ OR Houses & Flats Weighted (3:1 & 4:1) ◉	2 of 2 Credits			MAKE

RESULTS

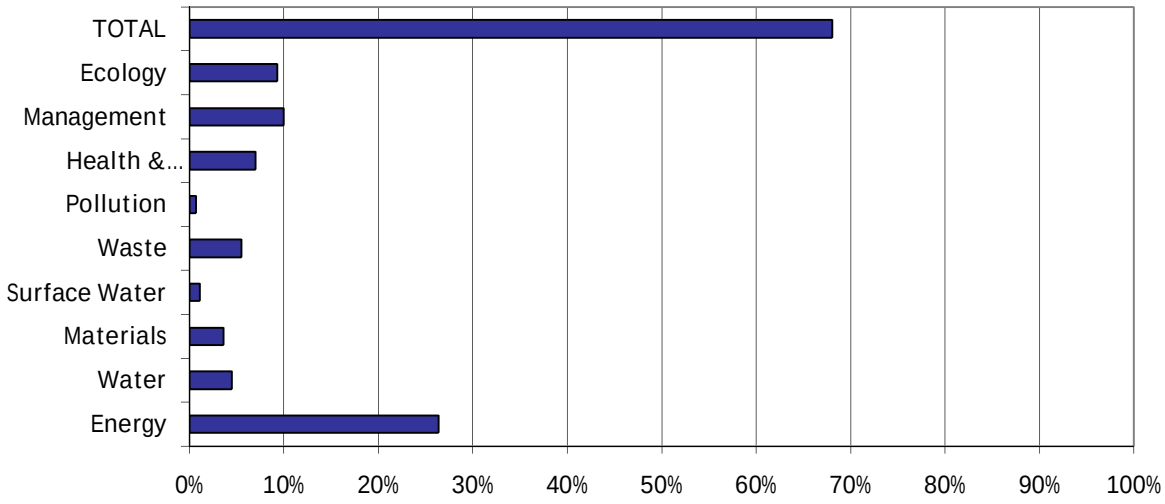
Development Name:	Camden Village Market
Dwelling Description:	Area D
Name of Company:	Grontmij Ltd
Code Assessor's Name:	David Partington
Company Address:	
Notes/Comments:	

PREDICTED RATING - CODE LEVEL: 4

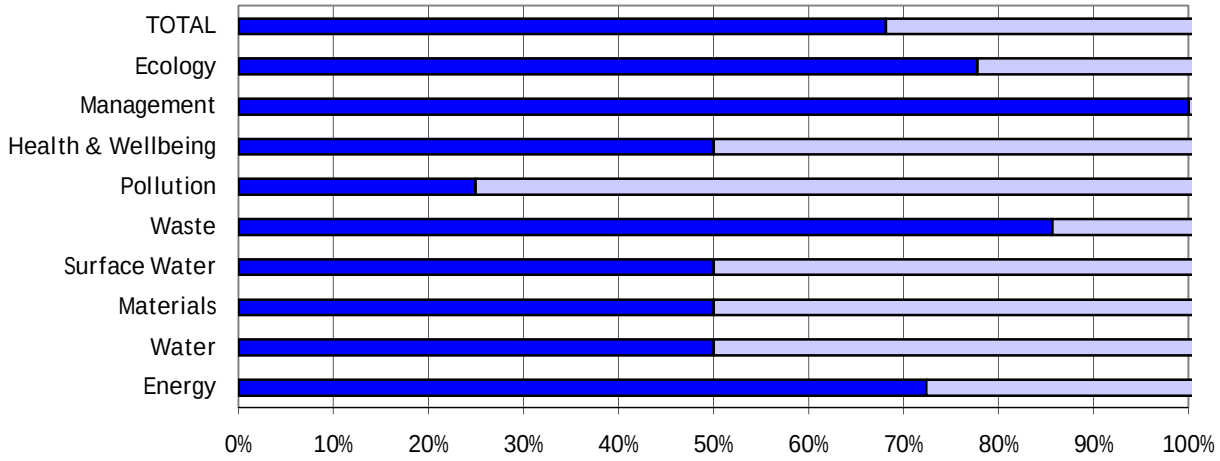
Mandatory Requirements: All Levels

% Points:	68.06%	- Code Level: 4
Breakdown:	Energy	- Code Level: 4
	Water	- Code Level: 4

Graph 1: Predicted contribution of individual sections to the total score and percentage of total achievable score



Graph 2: Predicted percentage of credits achievable: Total and by Category



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CATEGORY 1 ENERGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 72.00%		Credits	Level		
Contribution to Overall Score: 26.35 points		21 of 29 Credits	Level 4		
Ene 1 Dwelling Emission Rate	Credits are awarded based on the percentage improvement of the Dwelling Emission Rate (DER) over the Target Emission Rate (TER) as calculated using SAP 2005. Minimum standards for each Code level apply. Select the % improvement / Mandatory Requirement 0% improvement ○ OR 10% Improvement ○ OR 14% Improvement ○ OR 18 % Improvement ○ OR 22% Improvement ○ OR 25% Improvement ○ OR 31% Improvement ○ OR 37% Improvement ○ OR 44% Improvement ○ OR 52% Improvement ◉ OR 60% Improvement ○ OR 69% Improvement ○ OR 79% Improvement ○ OR 89% Improvement ○ OR 100% Improvement ○ OR Zero Carbon Home* ○ * as defined in the Code Technical Guide	9 of 15 Credits	Level 4	Assumed	Grontmij SAP calculations
Ene 2 Building Fabric	Credits are awarded based on the Heat Loss Parameter (HLP) obtained from the SAP 2005 calculations. This is based on the level of insulation provided in the dwellings. Select a HLP range Greater than 1.30 ○ OR Less than or equal to 1.30 ○ OR Less than or equal to 1.10 ◉	2 of 2 Credits	-	Assumed	Grontmij SAP calculations
Ene 3 Internal Lighting	Credits are awarded based on the percentage of fixed internal fittings that are dedicated energy efficient provided in habitable spaces within the dwelling. Select the % of dedicated energy efficient fittings Less than 40% ○ OR Greater than or equal to 40% ○ OR Greater than or equal to 75% ◉	2 of 2 Credits	-	Assumed	

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 4 Drying Space	One credit is awarded for the provision of either internal or external secure drying space with posts and footings or fixings capable of holding 4m+ of drying line for 1-2 bed dwellings and 6m+ for dwellings with 3 bedrooms or greater. Will drying space meeting the criteria be provided? Yes ◉ OR No ○	1 of 1 Credits	-	Extendable clothes line in a bathroom	MAKE
Ene 5 Energy Labelled White Goods	Credits are awarded where each dwelling is provided with either information about the EU Energy Labelling Scheme, White Goods with ratings ranging from A+ to B or a combination of the previous acording to the technical guide. Select the appropriate option below EU Energy labelling information ☑ A+ Rated Fridges and Freezers ☐ Combination of rated white goods with EU Energy Labelling Scheme ☐	1 of 2 Credits	-	EU labelling leaflet to be provided.	Stanley Sidings
Ene 6 External Lighting	Credits are awarded based* on the provision of space lighting with dedicated energy efficient fittings and security lighting fittings with appropriate control gear OR provision of dual lamp luminaires with both space and security lamps compliant with the above energy effiicciency requirements. Space Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting ◉ Security Lighting None provided ○ OR Non Code compliant lighting ○ OR Code compliant lighting and controls ◉ Dual lamp luminaires Compliant with both above criteria ☐ * Statutory safety lighting is not covered by this requirement	2 of 2 Credits	-	Assumed	Grontmij

Issue		Credits	Level	Assumptions Made	Evidence Required
Ene 7 Low or Zero Carbon Technologies	Credits are awarded where either there is a 10% or 15% reduction in total carbon emissions that result from using low or zero carbon technologies. Note that where funding has not been granted through the Low Carbon Buildings Programme, a feasibility study is required that meets the Code requirements. Select % contribution made by low or zero carbon technologies Less than 10% of demand ○ OR 10% of demand or greater ○ OR 15% of demand or greater ◉	2 of 2 Credits	-	Assumed	Grontmij
Ene 8 Cycle Storage	Credits are awarded where adequate, safe, secure and weather proof cycle storage is provided according to the Code requirements. Fill in the development details below Number of bedrooms: 61 Number of cycles stored per dwelling* 0.5 * if you have storage for 1 cycle per two dwellings insert 0.5 in number of cycles stored per dwelling	1 of 2 Credits	-	The building requires a minimum number of 28 cycle spaces to achieve 1 credit based on 110418 Design Freeze.	MAKE to achieve ONE credit requires at least 1 cycle space per 2-bed or 3-bed apt, 2 cycle spaces per 4-bed or more apts and 1 cycle space for every TWO 1-bed or studio apts. To achieve TWO credits need to double this number. Communal cycle store to be within 100m of main entrance to apartment building.
Ene 9 Home Office	A credit is awarded for the provision of space for a home office. The location, space and services provided must meet the Code requirements. Will there be provision for a Home Office? Yes ◉ OR No ○	1 of 1 Credits	-	For dwellings with three or more bedrooms, a suitable room is a room other than the kitchen, living room, master bedroom or bathroom. For dwellings with one or two bedrooms or studio homes, a suitable room is the living room, one of the bedrooms or any other suitable area in the home such as a large hall or dining area.	MAKE An average daylight factor of 1.5% min 1.8m wall length for desk/chair etc. Appropriate services

CATEGORY 2 WATER	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 4.50 points		3 of 6 Credits	Level 4		
Wat 1 Indoor Water Use	Credits are awarded based on the predicted average household water consumption, calculated using the Code Water Calculator Tool. Minimum standards for each code level apply. Select the predicted water use / Mandatory Requirement greater than 120 litres/ person/ day ○ OR less than 120 litres/ person/ day ○ OR less than 110 litres/ person/ day ○ OR less than 105 litres/ person/ day ◉ OR less than 90 litres/ person/ day ○ OR less than 80 litres/ person/ day ○	3 of 5 Credits	Level 3 AND Level 4	Mandatory for level 4	Grontmij to provide recommendations on how achieved but will require agreement from whole project team particularly relating to choice of sanitary fittings
Wat 2 External Water Use	A credit is awarded where a compliant system is specified for collecting rainwater for external irrigation purposes. Where no outdoor space is provided the credit can be achieved by default. Select the scenario that applies No internal or communal outdoor space ○ OR Outdoor space with collection system ○ OR Outdoor space without collection system ◉	0 of 1 Credits	-	Assumed	Landscape architect/ Ecologist - does not apply where only balconies are provided. (For communal gardens, allow at least 30L rainwater storage per dwellings using the garden. This can be halved if drought resistent species are planted.)

CATEGORY 3 MATERIALS	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 3.60 points		12 of 24 Credits	All Levels		
Mat 1 Environm-ental Impact of Materials	Mandatory Requirement: At least three of the five key building elements must achieve a Green Guide 2008 Rating of A+ to D. Tradable Credits: Points are awarded on a scale based on the Green Guide Rating of the specifications. The Code Materials Calculator can be used to predict a potential score. Mandatory Requirement Will the mandatory requirement be met? ☑ Enter the predicted score What is the predicted number of credits? 7	7 of 15 Credits	All Levels	Assume the following elements are predominantly A rated • Roof • External walls • Internal walls (including separating walls) • Upper and ground floors (including separating floors) • Windows	MAKE Grontmij to advise on selection of materials
Mat 2 Responsible Sourcing of Materials - Basic Building Elements	Credits are awarded where materials used in the basic building elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score What is the predicted number of credits? 3	3 of 6 Credits	-	Assumed main contractor's EMS is minimum Tier Level 3.	Stanley Sidings
Mat 3 Responsible Sourcing of Materials - Finishing Elements	Credits are awarded where materials used in the finishing elements are responsibly sourced. The Code Materials Calculator can be used to predict a potential score. Enter the predicted Score What is the predicted number of credits? 2	2 of 3 Credits	-	Assumed main contractor sources FSC timber or equivalen	Stanley Sidings

CATEGORY 4 SURFACE WATER RUN-OFF	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 1.10 points		2 of 4 Credits	All Levels		
Sur 1 Management of Surface Water Run-off from developments	Mandatory Requirement: Peak rate of run-off into watercourses is no greater for the developed site than it was for the pre-development site and that the additional predicted volume of rainwater discharge caused by the new development is entirely reduced. Tradable Credits: Where SUDS are used to improve water quality of the rainwater discharged or for protecting the quality of the receiving waters. Mandatory Requirement Will the mandatory requirement be met? ☑ Select the appropriate option No SUDS or default case compliance ◉ Code compliant SUDS systems ○ Non Code compliant SUDS systems ○ Site discharges rainwater directly to a tidal estuary or the sea ○	0 of 2 Credits	All Levels	Mandatory requirement achieved.	Walsh Assoc/Grontmij Walsh Associates/Grontmij investigating proposed SUDs scheme for compliance with new CfSH requirements
Sur 2 Flood Risk	Credits are awarded where developments are located in areas of low flood risk or where in areas of medium or high flood risk appropriate measures are taken to prevent damage to the property and its contents in accordance with the Code criteria in the technical guide. Select the annual probability of flooding (from PPS25*) Zone 1 - Low ◉ OR Zone 2 - Medium ○ OR Zone 3 - High ○ Select the apropriate option(s) Low risk of flooding from FRA** ☑ All measures of protection are demonstrated in FRA ☐ Ground floor level and access routes are 600 mm above design flood level ☐ * Planning Policy Statement 25 - Planning and Flood Risk ** FRA - Flood Risk Assessment	2 of 2 Credits	-	Flood risk assessment required	Watermans

CATEGORY 5 WASTE	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 85.00%		Credits	Level		
Contribution to Overall Score: 5.48 points		6 of 7 Credits	All Levels		
Was 1 Storage of non-recyclable waste and recyclable household waste	Mandatory Requirement: The space provided for waste storage should be sized to hold the larger of either all external containers provided by the Local Authority or the min capacity calculated from BS 5906. Tradable Credits are awarded for adequate internal and/ or external recycling facilities. **Mandatory Requirement** Will the minimum space be provided and be accessible to disabled people? ☑ **Internal Recyclable household waste storage** Where there is no external recyclable waste storage and no Local Authority collection scheme Internal storage (capacity 60 litres) ☐ **Local Authority collection Scheme** Post Collection sorting Internal storage (capacity 30 litres) ☑ Pre-collection sorting Internal storage (capacity 30 litres) ☐ **External Storage, no Local Authority collection scheme** 3 separate internal storage bins (capacity 30 litres) ☐ Houses External Storage(capacity 180 litres) ☐ Flats Private recycling operator ☐ 3 or greater types of waste collected ☐	0 of 2 Credits 4 of 4 Credits 0 of 4 Credits	All Levels	Need confirmation of the proposed recycled waste strategy	MAKE see additional document setting out requirements.

Issue		Credits	Level	Assumptions Made	Evidence Required
Was 2 Construction Site Waste Management	Mandatory Requirements: A SWMP plan including the monitoring of waste generated on site and the setting of targets to promote resource efficiency must be produced and implemented. Tradable Credits: The SWMP should also include procedures and commitments for minimising waste and/ or commitments to sort, reuse and recycle construction waste. **Mandatory Requirement** Is the development cost less than £300K? ☐ **Contents of the SWMP** Does the SWMP include: + monitoring of waste generated on site? ☑ + targets to promote resource efficiency? ☑ + the waste groups? ☑ + compliance with best practice? ☑ + procedures for reducing waste? ☑ + commitments for reducing waste? ☑ + procedures to sort, reuse and recycle waste? ☑ + commitments to sort, reuse and recycle waste? ☑	2 of 2 Credits	All Levels		Stanley Sidings
Was 3 Composting	A credit is awarded where individual home composting facilities are provided, or where a community/ communal composting service, either run by the Local Authority or overseen by a management plan is in operation. **Select the facilities available** No composting facilities ◉ Individual composting facilities ○ OR Communal/ community composting*? ○ Local Authority ☐ OR Private with management plan ☐ * including if a automated waste collection system is in place	0 of 1 Credit	-		Landscape Architect

CATEGORY 6 POLLUTION	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 25.00%		Credits	Level		
Contribution to Overall Score: 0.70 points		1 of 4 Credits	All Levels		
Pol 1 Global Warming Potential (GWP) of Insulants	A credit is awarded where all insulating materials only use substances (in manufacture AND installation) that have a GWP of less than 5. Select the most appropriate option (●) All insulants have a GWP less than 5 OR ( ) Some insulants have a GWP of less than 5 OR ( ) No insulants have a GWP of less than 5	1 of 1 Credits	-	All fabric and services insulation will be compliant	MAKE/Grontmij
Pol 2 NOx Emissions	Credits are awarded on the basis of NOx emissions arising from the operation of the space and water heating system within the dwelling. Select the most appropriate option (●) Greater than 100 mg/kWh OR ( ) Less than 100 mg/kWh OR ( ) Less than 70 mg/kWh OR ( ) Less than 40 mg/kWh OR ( ) Class 4 boiler OR ( ) Class 5 boiler OR ( ) All space and hot water energy requirements are met by systems who do not produce NOx emissions	0 of 3 Credits	-		Grontmij

CATEGORY 7 HEALTH & WELLBEING	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 50.00%		Credits	Level		
Contribution to Overall Score: 7.00 points		6 of 12 Credits	-		
Hea 1 Daylighting	Credits are awarded for ensuring key rooms in the dwelling have high daylight factors (DF) and a view of the sky. Select the compliant areas Room Kitchen: Avg DF of at least 2% ☐ Living Room*: Avg DF of at least 1.5% ☑ Dining Room*: Avg DF of at least 1.5% ☑ Study*: Avg DF of at least 1.5% ☑ 80% of working plane in all above rooms receive direct light from the sky? ☐ Any room used for Ene 9 Home Office must also achieve a min DF of 1.5%. *Tick the box if there is no study/ home office as this aspect of the credit will be awarded by default.	1 of 3 Credits	-	Assumed at least 1 credit will be achieved, subject to a daylight study. Apartments higher up and not facing any obstructions likely to achieve additional credits	MAKE
Hea 2 Sound Insulation	Credits are awarded where performance standards exceed those required in Building Regulations Part E. This can be demonstrated by carrying out pre-completion testing or through the use of Robust Details Limited. Select a type of property Detached Property ○ Attached Properties: - Separating walls and floors only exist between non habitable spaces ○ - Separating walls and floors exist between habitable spaces ◉ Select a performance standard Performance standard not sought ◉ Airborne: 3db higher; Impact: 3dB lower ○ OR Airborne: 5db higher; Impact: 5dB lower ○ OR Airborne: 8db higher; Impact: 8dB lower ○	0 of 4 Credits	-		Acoustic Consultant

Issue		Credits	Level	Assumptions Made	Evidence Required
Hea 3 Private Space	A credit is awarded for the provision of an outdoor space that is at least partially private. The space must allow easy access to all occupants. Will a private/ semi-private space be provided? Yes, private/semi-private space will be provided ◉ OR No private/semi-private space ○	1 of 1 Credits	-		MAKE - For balconies require at least 1.5m2/bedroom. For communal spaces, accessible only to residents, require at least 1m2/bedroom. Outdoor spaces must be accessible to wheelchair users.
Hea 4 Lifetime Homes	Mandatory Requirement: Lifetime Homes is mandatory when a dwelling is to achieve Code Level 6. Tradable credits: Credits are awarded where the developer has implemented all of the principles of the Lifetime Homes scheme. Mandatory Requirement Dwelling to achieve Code Level 6? ☐ Lifetime Homes Compliance All Lifetime Homes criteria will be met ◉ OR Credit not sought ○	4 of 4 Credits	-		MAKE

CATEGORY 8 MANAGEMENT	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 100.00%		Credits	Level		
Contribution to Overall Score: 10.00 points		9 of 9 Credits	All Levels		
Man 1 Home User Guide	Credits are awarded where a simple guide is provided to each dwelling covering information relevant to the 'non-technical' home occupier, in accordance with the Code requirements. Tick the topics covered by the Home User Guide Operational Issues? ☑ Site and Surroundings? ☑ Is available in alternative formats? ☑	3 of 3 Credits	-		Stanley Sidings
Man 2 Considerate Constructors Scheme	Credits are awarded where there is a commitment to comply with best practice site management principles using either the Considerate Constructors Scheme or an alternative locally/ nationally recognised scheme. Select the appropriate scheme and score No scheme used ○ Considerate Constructors OR Best Practice: Score between 24 and 31.5 ○ OR Best Practice+: Score between 32 and 40 ◉ Alternative Scheme* OR Mandatory + 50% optional requirements ○ OR Mandatory + 80% optional requirements ○ * In the first instance, contact a Code Service Provider if you are considering to use an alternative scheme.	2 of 2 Credits	-	Assumed. Best practice requires a minimum score of 4 in each section.	Stanley Sidings
Man 3 Construction Site Impacts	Credits are awarded where there is a commitment and strategy to operate site management procedures on site as following: Tick the impacts that will be addressed Monitor, report and set targets, where applicable, for: - CO_2/ energy use from site activities ☑ - CO_2/ energy use from site related transport ☑ - water consumption from site activities ☑ Adopt best practice policies in respect of: - air (dust) pollution from site activities ☑ - water (ground and surface) pollution on site ☐ 80% of site timber is reclaimed, re-used or responsibly sourced ☐	2 of 2 Credits	-	Assume any 4 out of the 6 will be undertaken	Stanley Sidings

Issue		Credits	Level	Assumptions Made	Evidence Required
Man 4 Security	Credits are awarded for complying with Section 2 - Physical Security from Secured by Design - New Homes. An Architectural Liaison Officer (ALO), or alternative, needs to be appointed early in the design process and their recommendations incorporated. Secured by Design Compliance Credit not sought ○ OR Secured by Design Section 2 Compliance ◉	2 of 2 Credits	-		MAKE

CATEGORY 9 ECOLOGY	Overall Level: 4	Overall Score	68.06	Assumptions Made	Evidence Required
% of Section Credits Predicted: 77.00%		Credits	Level		
Contribution to Overall Score: 9.33 points		7 of 9 Credits	All Levels		
Eco 1 Ecological Value of Site	One credit is awarded for developing land of inherently low value. Select the appropriate option Credit not sought ○ OR Land has ecological value ○ OR Land has low/ insignificant ecological value* ◉ * Low ecological value is determined either a) by using Checklist Eco 1 across the whole development site; or b) where an suitably qualified ecologist is appointed and can confirm or c) produces an independent ecological report of the site, that the construction zone is of low/ insignificant value; AND the rest of the development site will remain undisturbed by the works.	1 of 1 Credits	-	Assume a Suitable Qualified ecologist will be appointed and will visit site prior to commencement of construction work/site clearance.	Watermans
Eco 2 Ecological Enhancement	A credit is awarded where there is a commitment to enhance the ecological value of the development site. Tick the appropriate boxes Will a *Suitably Qualified Ecologist* be appointed to recommend appropriate ecological features? ☑ AND Will all key recommendations be adopted? ☑ AND 30% of other recommendations be adopted? ☑	1 of 1 Credits	-	Assumed	Watermans
Eco 3 Protection of Ecological Features	A credit is awarded where there is a commitment to maintain and adequately protect features of ecological value. Type and protection of existing features Site with features of ecological value? ○ OR Site of low ecological value (as Eco 1)? ◉ AND All* existing features potentially affected by site works are maintained and adequately protected? ☐ *If a suitably qualified ecologist has confirmed that a feature can be removed due to insignificant ecological value or poor health conditions, as long all the rest have been protected, then this box can be ticked.	1 of 1 Credits	-	Assume any existing features will be protected (if any)	Watermans

Issue		Credits	Level	Assumptions Made	Evidence Required
Eco 4 Change of Ecological Value of Site	Credits are awarded where the change in ecological value has been calculated in accordance with the Code requirements and is calculated to be: Change in Ecological Value Major negative change: fewer than -9 ○ Minor negative change: between -9 and -3 ○ OR Neutral: between -3 and +3 ◉ Minor enhancement: between +3 and +9 ○ Major enhancement: greater than 9 ○	2 of 4 Credits	-	Minimum 2 credits achievable. Potential for more.	Watermans
Eco 5 Building Footprint	Credits are awarded where the ratio of combined floor area of all dwellings on the site to their footprint is: Ratio of Net Internal Floor Area: Net Internal Ground Floor Area Credit Not Sought ○ OR Houses: 2.5:1 OR Flats: 3:1 ○ OR Houses: 3:1 OR Flats: 4:1 ○ OR Houses & Flats Weighted (2.5:1 & 3:1) ○ OR Houses & Flats Weighted (3:1 & 4:1) ◉	2 of 2 Credits			MAKE

Appendix E – BREEAM Pre-assessments

Contents

breeam

BREEAM Scheme:	BREEAM Offices 2008
Building Name:	Camden Village Market - Office
BREEAM Registration No.:	RO-OFF-MR02-34
BREEAM Assessor:	Martin Ratcliffe
Licensed Assessor organisation:	Grontmij

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

Stage of Assessment	BREEAM Score	BREEAM Rating
Interim - Design Stage	64.85%	VERY GOOD

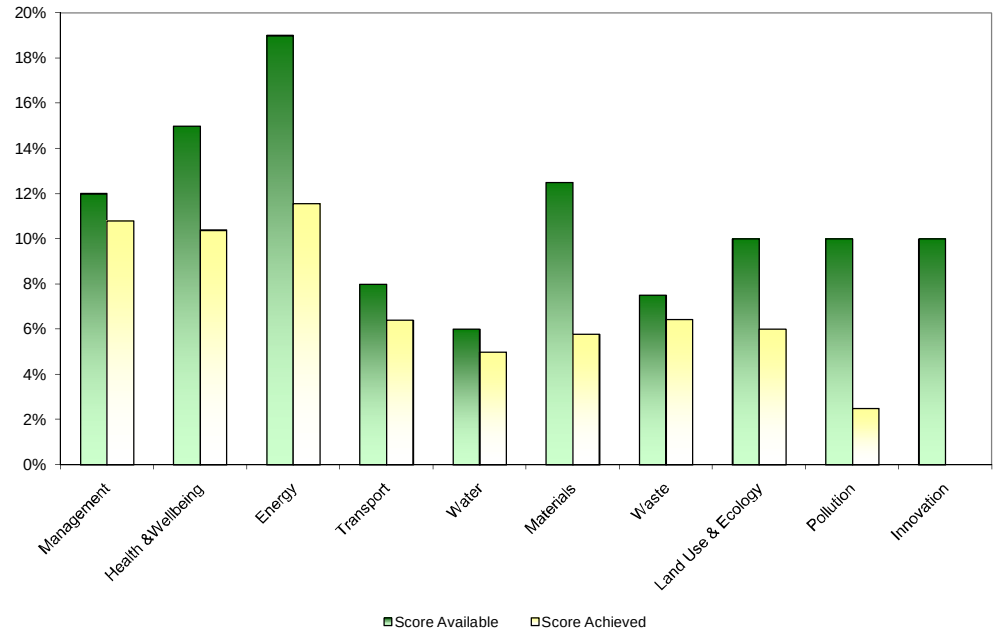
Minimum BREEAM Standards

Rating Level	Pass	Good	Very Good	Excellent	Outstanding
Minimum Standards Achieved	YES	YES	YES	YES	NO

Building Performance by Section

	Environmental weighting	Credits available	Credits achieved	%Achieved	Weighted Score
Management	12.00%	10.00	9.00	90.00%	10.80%
Health & Wellbeing	15.00%	13.00	9.00	69.23%	10.38%
Energy	19.00%	23.00	14.00	60.87%	11.57%
Transport	8.00%	10.00	8.00	80.00%	6.40%
Water	6.00%	6.00	5.00	83.33%	5.00%
Materials	12.50%	13.00	6.00	46.15%	5.77%
Waste	7.50%	7.00	6.00	85.71%	6.43%
Land Use & Ecology	10.00%	10.00	6.00	60.00%	6.00%
Pollution	10.00%	12.00	3.00	25.00%	2.50%
Innovation	10.00%	10.00	0.00	0.00%	0.00%
				Total BREEAM Score	64.85%

Assessed Building's BREEAM Performance by Section



breeam

BREEAM Scheme: BREEAM Offices 2008
Building Name: Camden Village Market - Office
BREEAM Registration No.: RO-OFF-MR02-34
BREEAM Assessor: Martin Ratcliffe

	Minimum BREEAM Standards				
	Pass	Good	Very Good	Excellent	Outstanding
Achieved?	YES	YES	YES	YES	NO

Ref	Title	Offices Criteria	Number of BREEAM credits available	Total BREEAM credits achieved	Minimum required credits by BREEAM issue and rating					Comments/Actions
Management										
Man 1	Commissioning	One credit where evidence provided demonstrates that an appropriate project team member has been appointed to monitor commissioning on behalf of the client to ensure commissioning will be carried out in line with current best practice. Two credits where, in addition to the above, evidence provided demonstrates that seasonal commissioning will be carried out during the first year of occupation, post construction (or post fit out).	2	1	1	1	1	1	2	
Man 2	Considerate Constructors	One credit where evidence provided demonstrates that there is a commitment to comply with best practice site management principles. Two credits where evidence provided demonstrates that there is a commitment to go beyond best practice site management principles.	2	2	-	-	-	1	2	
Man 3	Construction Site Impacts	One credit where evidence provided demonstrates that 2 or more of items a-g (listed below) are achieved. Two credits where evidence provided demonstrates that 4 or more of items a-g (listed below) are achieved. Three credits where evidence provided demonstrates that 6 or more of items a-g 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. One additional credit where evidence provided demonstrates that at least 80% of site timber is responsibly sourced and 100% is legally sourced.	4	4	-	-	-	-	-	
Man 4	Building user guide	One credit where evidence provided demonstrates 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	
Man 8	Security	One credit where evidence provided demonstrates that 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 (if relevant).	1	1	-	-	-	-	-	
Health & Wellbeing										
Hea 1	Daylighting	One credit where evidence provided demonstrates that at least 80% of floor area in	1	0	-	-	-	-	-	

	Daylighting	each occupied space is adequately daylit.	1	0							
Hea 2	View Out	One credit where evidence provided demonstrates that all relevant building areas have an adequate view out.	1	0	-	-	-	-	-		
Hea 3	Glare Control	One credit where evidence provided demonstrates that an occupant-controlled shading system (e.g. internal or external blinds) is fitted in relevant building areas.	1	1	-	-	-	-	-		
Hea 4	High frequency lighting	One credit where evidence provided demonstrates that high frequency ballasts are installed on all fluorescent and compact fluorescent lamps.	1	1	1	1	1	1	1		
Hea 5	Internal and external lighting levels	One credit where evidence provided demonstrates that all internal and external lighting, where relevant, is specified in accordance with the appropriate maintained illuminance levels (in lux) recommended by CIBSE.	1	1	-	-	-	-	-		
Hea 6	Lighting zones & controls	One credit where evidence provided demonstrates that, in all relevant building areas, lighting is appropriately zoned and occupant controllable.	1	1	-	-	-	-	-		
Hea 7	Potential for natural ventilation	One credit where evidence provided demonstrates that 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.	1	0	-	-	-	-	-		
Hea 8	Indoor air quality	One credit where air intakes serving occupied areas avoid major sources of external pollution and recirculation of exhaust air.	1	0	-	-	-	-	-		
Hea 9	Volatile Organic Compounds	One credit where evidence provided demonstrates that the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels.	1	1	-	-	-	-	-		
Hea 10	Thermal comfort	One credit where evidence provided demonstrates that 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	-	-	-	-	-		
Hea 11	Thermal zoning	One credit where evidence provided demonstrates that local occupant control is available for temperature adjustment in each occupied space to reflect differing user demands.	1	1	-	-	-	-	-		
Hea 12	Microbial contamination	One credit where evidence provided demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.	1	1	1	1	1	1	1		
Hea 13	Acoustic Performance	One credit where evidence provided demonstrates that 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	-	-	-	-	-		
Energy											
Ene 1	Reduction of CO2 Emissions	Up to fifteen credits where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO2 emissions.	15	7	-	-	-	6	10		
Ene 2	Sub-metering of Substantial Energy Uses	One credit where evidence provided demonstrates the provision of direct sub-metering of energy uses within the building.	1	1	-	-	1	1	1		
Ene 3	Sub-metering of high energy load Areas and Tenancy	One credit where evidence provided demonstrates sub-metering of energy consumption by tenancy/building function area is installed within the building.	1	1	-	-	-	-	-		

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	-	-	-	-	-	
Ene 5	Low zero carbon technologies	One credit where evidence provided demonstrates that 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. Two credits where evidence provided demonstrates that the first credit has been achieved and there is a 10% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. Three credits where evidence provided demonstrates that the first credit has been achieved and there is a 15% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. 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)	3	3	-	-	-	1	1	
Ene 8	Lifts	Up to two credits are available where evidence provided demonstrates the installation of energy-efficient lift(s).	2	1	-	-	-	-	-	
Transport										
Tra 1	Provision of public transport	Up to three credits are awarded on a sliding scale based on the assessed buildings' accessibility to the public transport network.	3	3	-	-	-	-	-	
Tra 2	Proximity to amenities	One credit where evidence provided demonstrates that the building is located within 500m of accessible local amenities appropriate to the building type and its users.	1	1	-	-	-	-	-	
Tra 3	Cyclist Facilities	One credit where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities are provided for all building users. Two credits where, in addition to the above, adequate changing facilities are provided for staff use.	2	1	-	-	-	-	-	
Tra 4	Pedestrian and cycle safety	One credit where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate pedestrian and cycle access.	1	0	-	-	-	-	-	
Tra 5	Travel plan	One credit where evidence is provided to demonstrate that a travel plan has been developed and tailored to the specific needs of the building users.	1	1	-	-	-	-	-	
Tra 6	Maximum car parking capacity	One credit where evidence provided demonstrates no more than one parking space is provided for every three building users. Two credits where evidence provided demonstrates no more than one parking space is provided for every four building users.	2	2	-	-	-	-	-	
Water										

Wat 1	Water Consumption	Up to three credits where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings.	**3**	**2**	-	1	1	1	2	
Wat 2	Water meter	One credit where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.	**1**	**1**	-	1	1	1	1	
Wat 3	Major leak detection	One credit where evidence provided demonstrates that a leak detection system is specified or installed on the building's water supply.	**1**	**1**	-	-	-	-	-	
Wat 4	Sanitary supply shut off	One credit where evidence provided demonstrates that proximity detection shut-off is provided to the water supply to all toilet areas.	**1**	**1**	-	-	-	-	-	
Materials											
Mat 1	Materials Specification (major building elements)	Up to four credits are available, determined by the Green Guide to Specification ratings for the major building elements.	**4**	**1**	-	-	-	-	-	
Mat 2	Hard landscaping and boundary protection	One credit where evidence provided demonstrates that 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**	-	-	-	-	-	
Mat 3	Re-use of building façade	One credit is awarded where evidence provided demonstrates that 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**	**0**	-	-	-	-	-	
Mat 4	Re-use of building structure	One credit is awarded where evidence provided demonstrates that a 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**	**0**	-	-	-	-	-	
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: a. Structural Frame b. Ground floor c. Upper floors (including separating floors) d. Roof e. External walls f. Internal walls g. Foundation/substructure h. Staircase Additionally 100% of any timber must be legally sourced.	**3**	**1**	-	-	-	-	-	
Mat 6	Insulation	One credit where evidence provided demonstrates that 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. One credit where evidence provided demonstrates that thermal insulation products used in the building have been responsibly sourced.	**2**	**2**	-	-	-	-	-	
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**	-	-	-	-	-	
Waste											
Wst 1	Construction Site Waste Management	Up to three credits are available where evidence provided demonstrates that the amount of non-hazardous construction waste (m3/100m2 or tonnes100m2) generated on site by the development is the same as or better than good or best practice levels. One credit where evidence provided demonstrates that a significant majority of non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled.	**4**	**4**	-	-	-	-	-	
Wst 2	Recycled aggregates	One credit where evidence provided demonstrates the significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses.	**1**	**0**	-	-	-	-	-	

Wst 3	Recyclable waste storage	One credit where a central, dedicated space is provided for the storage of the building's recyclable waste streams.	1	1	-	-	-	1	1		
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.	1	1	-	-	-	-	-		
Land Use & Ecology											
LE1	Re-use of land	One credit where evidence provided demonstrates that the majority of the footprint of the proposed development falls within the boundary of previously developed land.	1	1	-	-	-	-	-		
LE2	Contaminated land	One credit is awarded where evidence provided demonstrates that the land used for the new development has, prior to development, been defined as contaminated and where adequate remedial steps have been taken to decontaminate the site prior to construction.	1	0	-	-	-	-	-		
LE3	Ecological value of site AND Protection of ecological features	One credit is awarded where evidence provided demonstrates that 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	-	-	-	-	-		
LE4	Mitigating Ecological impact	One credit where evidence provided demonstrates that the change in the site's existing ecological value, as a result of development, is minimal. Two credits where evidence provided demonstrates that there is no negative change in the site's existing ecological value as a result of development.	2	2	-	-	1	1	1		
LE5	Enhancing Site Ecology	One credit where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented the professional's recommendations for general enhancement and protection of site ecology. Two credits 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. Three credits where, in addition to the above, evidence is provided to demonstrate a positive increase in the ecological value of the site of 6 species or greater.	3	1	-	-	-	-	-		
LE6	Long term impact on biodiversity	One credit where the client has committed to achieving the mandatory requirements listed below and at least two of the additional requirements. Two credits where the client has committed to achieving the mandatory requirements listed below and at least four of the additional requirements.	2	1	-	-	-	-	-		
Pollution											
Pol 1	Refrigerant GWP - Building services	One credit where evidence provided demonstrates 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	0	-	-	-	-	-		
Pol 2	Preventing refrigerant leaks	One credit where evidence provided demonstrates that refrigerant leaks can be detected or where there are no refrigerants specified for the development. One credit where evidence provided demonstrates that 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.	2	0	-	-	-	-	-		

Pol 4	NOx emissions from heating source	One credit where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O2). Twp credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O2). Three credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O2).	**3**	**0**	-	-	-	-	-	
Pol 5	Flood risk	Two credits where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding. One credit where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium or high 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. 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.	**3**	**0**	-	-	-	-	-	
Pol 6	Minimising watercourse pollution	One credit here evidence provided demonstrates that 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**	-	-	-	-	-	
Pol 7	Reduction of Night Time Light Pollution	One credit where evidence provided demonstrates that 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**	-	-	-	-	-	
Pol 8	Noise Attenuation	One credit where evidence provided demonstrates that 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**	-	-	-	-	-	

Innovation - Exemplary Level Criteria

Innovation	Man 2: Considerate Constructors	Where post construction, a Considerate Constructors Scheme certificate can be provided demonstrating that the site achieved CCS Code of Considerate Practice with a score of at least 36. OR Where post construction, the site has complied in full with the alternative, independently assessed scheme, and the alternative scheme addresses all the mandatory and optional items in Checklist A2.	**1**	**0**						
Innovation	Hea 1: Daylighting	At least 80% of the floor area (for the building spaces/room identified above in the standard requirements) has an average daylight factor of 3% in multi-storey buildings and 4% in single-storey buildings.	**1**	**0**						
Innovation	Ene 1: Reduction of CO2 emissions	One additional innovation credit can be awarded where evidence provided demonstrates the building is designed to be a carbon neutral building as defined by the NCM (i.e. in terms of building services energy demand), as follows: a. A new building achieves a CO2 index less than 0 on the benchmark scale. b. A refurbished building achieves a CO2 index equal to or less than 0 on the benchmark scale. Two additional innovation credits can be awarded where evidence provided demonstrates the building is designed to be a True zero carbon building (in terms of building services and operational energy demand).	**2**	**0**						
Innovation	Ene 5: Low or Zero Carbon Technologies	A local LZC energy technology has been installed in line with the recommendations of a compliant feasibility study and this method of supply results in a 20% reduction in the building's CO2 emissions.	**1**	**0**						

Innovation	Wat 2: Water Meter	Where sub meters are fitted to allow individual water-consuming plant or building areas to be monitored such as cooling towers, car washes, catering areas, etc. If the building does not have any major water consuming plant this exemplar credit is not available. Each sub meter has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption. In addition to the above, for sites with multiple departments e.g. large health centres or acute hospitals, separate pulsed sub meters are fitted on the supply to the following areas where present: a. Staff and public areas b. Clinical areas and wards c. Letting areas: On the water supply to each tenant unit d. Laundries e. Main production kitchen f. Hydrotherapy pools g. Laboratories h. CSSD/HSDU, pathology, pharmacy, mortuary and any other major process water user.	**1**	**0**	
Innovation	Materials Specification	One exemplary BREEAM credit can be awarded as follows: a. Where assessing four or more applicable building elements, the building achieves at least two points additional to the total points required to achieve maximum credits under the standard BREEAM requirements. b. Where assessing fewer than four applicable building elements, the building achieves at least one point additional to the total points required to achieve maximum credits under the standard BREEAM requirements.	**1**	**0**	
Innovation	Responsible Sourcing of Materials	Where, in addition to the standard BREEAM requirements, 95% of the applicable materials, comprised within the applicable building elements, have been responsibly sourced.	**1**	**0**	
Innovation	Wst 1 Construction Site Waste Management	Where non-hazardous construction waste generated by the building's development meets or exceeds the resource efficiency benchmark required to achieve three credits (as outlined in the guidance). Where at least 90% by weight (80% by volume) of non-hazardous construction waste and 95% of demolition waste by weight (85% by volume) (if applicable) generated by the build has been diverted from landfill and either: a. Reused on site (in-situ or for new applications) b. Reused on other sites c. Salvaged/reclaimed for reuse d. Returned to the supplier via a 'take-back' scheme e. Recovered from site by an approved waste management contractor and recycled. Where all key waste groups are identified for diversion from landfill at pre-construction stage SWMP.	**1**	**0**	

Innovation - BREEAM Accredited Professional or Suitably Qualified BREEAM Assessor

Innovation	BREEAM Accredited Professional	Up to two credits are available for the comprehensive use of a BREEAM Accredited Professional (AP) throughout project work stages.	**2**		

Innovation - BRE Global Approved Innovation credits

Innovation	Approved Innovations	Additional BREEAM Innovation Credits can be awareded where an application is made to, and approved by the BREEAM office using the Innovation Application Form and the assessor confirms compliance with the criteria set out within the Innovation Application Form.			

breeam

BREEAM Scheme:	BREEAM Retail 2008
Building Name:	Site Wide Retail
BREEAM Registration No.:	0
BREEAM Assessor:	0
Licensed Assessor organisation:	0

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

Stage of Assessment	BREEAM Score	BREEAM Rating
Interim - Design Stage	61.11%	VERY GOOD

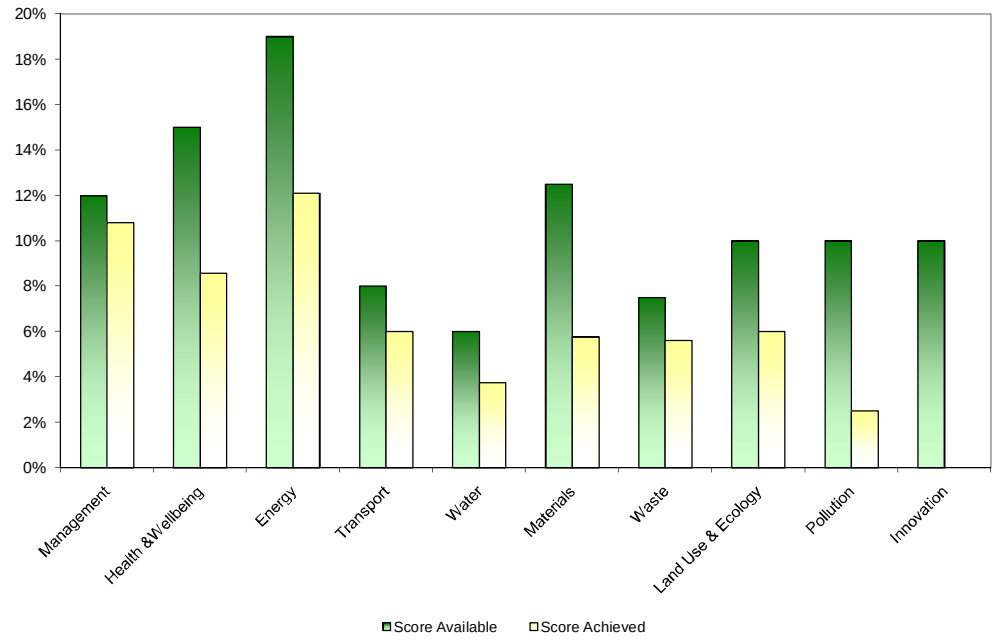
Minimum BREEAM Standards

Rating Level	Pass	Good	Very Good	Excellent	Outstanding
Minimum Standards Achieved	YES	YES	YES	YES	NO

Building Performance by Section

	Environmental weighting	Credits available	Credits achieved	%Achieved	Weighted Score
Management	12.00%	10.00	9.00	90.00%	10.80%
Health & Wellbeing	15.00%	7.00	4.00	57.14%	8.57%
Energy	19.00%	22.00	14.00	63.64%	12.09%
Transport	8.00%	12.00	9.00	75.00%	6.00%
Water	6.00%	8.00	5.00	62.50%	3.75%
Materials	12.50%	13.00	6.00	46.15%	5.77%
Waste	7.50%	8.00	6.00	75.00%	5.63%
Land Use & Ecology	10.00%	10.00	6.00	60.00%	6.00%
Pollution	10.00%	12.00	3.00	25.00%	2.50%
Innovation	10.00%	10.00	0.00	0.00%	0.00%
				Total BREEAM Score	61.11%

Assessed Building's BREEAM Performance by Section



breeam

BREEAM Scheme: BREEAM Retail 2008
Building Name: Site Wide Retail
BREEAM Registration No.: 0
BREEAM Assessor: 0

	Minimum BREEAM Standards				
	Pass	Good	Very Good	Excellent	Outstanding
Achieved?	YES	YES	YES	YES	NO

Ref	Title	Retail Criteria	Number of BREEAM credits available	Total BREEAM credits achieved	Shell & Core Assessment Evidence Used?	Minimum required credits by BREEAM issue and rating					Comments/Actions
						Pass	Good	Very Good	Excellent	Outstanding	
Management											
Man 1	Commissioning	One credit where evidence provided demonstrates that an appropriate project team member has been appointed to monitor commissioning on behalf of the client to ensure commissioning will be carried out in line with current best practice. Two credits where, in addition to the above, evidence provided demonstrates that seasonal commissioning will be carried out during the first year of occupation, post construction (or post fit out).	2	1	Option 1 - Lease Agreement	1	1	1	1	2	
Man 2	Considerate Constructors	One credit where evidence provided demonstrates that there is a commitment to comply with best practice site management principles. Two credits where evidence provided demonstrates that there is a commitment to go beyond best practice site management principles.	2	2		-	-	-	1	2	
Man 3	Construction Site Impacts	One credit where evidence provided demonstrates that 2 or more of items a-g (listed below) are achieved. Two credits where evidence provided demonstrates that 4 or more of items a-g (listed below) are achieved. Three credits where evidence provided demonstrates that 6 or more of items a-g 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. One additional credit where evidence provided demonstrates that at least 80% of site timber is responsibly sourced and 100% is legally sourced.	4	4		-	-	-	-	-	
Man 4	Building user guide	One credit where evidence provided demonstrates 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	Option 1 - Lease Agreement	-	-	-	1	1	
Man 8	Security	One credit where evidence provided demonstrates that 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 (if relevant).	1	1		-	-	-	-	-	
Health & Wellbeing											

Hea 1	Daylighting	One credit where evidence provided demonstrates at least 35% of the sales and common floor area (if relevant) is adequately daylit.	1	1		-	-	-	-	-	
Hea 4	High frequency lighting	One credit where evidence provided demonstrates that high frequency ballasts are installed on all fluorescent and compact fluorescent lamps.	1	1	Option 1 - Lease Agreement	1	1	1	1	1	
Hea 5	Internal and external lighting levels	One credit where evidence provided demonstrates that all internal and external lighting, where relevant, is specified in accordance with the appropriate maintained illuminance levels (in lux) recommended by CIBSE.	1	0	Option 4 - No evidence	-	-	-	-	-	
Hea 8	Indoor air quality	One credit where air intakes serving occupied areas avoid major sources of external pollution and recirculation of exhaust air.	1	0		-	-	-	-	-	
Hea 9	Volatile Organic Compounds	One credit where evidence provided demonstrates that the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
Hea 10	Thermal comfort	One credit where evidence provided demonstrates that 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	0	Option 4 - No evidence	-	-	-	-	-	
Hea 12	Microbial contamination	One credit where evidence provided demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.	1	1	Option 1 - Lease Agreement	1	1	1	1	1	
Energy												
Ene 1	Reduction of CO2 Emissions	Up to fifteen credits where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO2 emissions.	15	7	Option 4 - No evidence	-	-	-	6	10	
Ene 2	Sub-metering of Substantial Energy Uses	One credit where evidence provided demonstrates the provision of direct sub-metering of energy uses within the building.	1	1	Option 1 - Lease Agreement	-	-	1	1	1	
Ene 3	Sub-metering of high energy load Areas and Tenancy	One credit where evidence provided demonstrates sub-metering of energy consumption by tenancy/building function area is installed within the building.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
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	Option 1 - Lease Agreement	-	-	-	-	-	
Ene 5	Low zero carbon technologies	One credit where evidence provided demonstrates that 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. Two credits where evidence provided demonstrates that the first credit has been achieved and there is a 10% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. Three credits where evidence provided demonstrates that the first credit has been achieved and there is a 15% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. 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)	3	3		-	-	-	1	1	
Ene 6	Building fabric performance & avoidance of air infiltration	One credit where evidence provided demonstrates that appropriate design and as built performance measures (as identified in the compliance requirements) are taken to minimise heat loss and air infiltration through the building fabric.	1	1		-	-	-	-	-	
Transport												

Tra 1	Provision of public transport	Up to five credits are awarded on a sliding scale based on the assessed buildings' accessibility to the public transport network.	5	5		-	-	-	-	-	
Tra 2	Proximity to amenities	One credit where evidence provided demonstrates that the building is located within 500m of accessible local amenities appropriate to the building type and its users.	1	1		-	-	-	-	-	
Tra 3	Cyclist Facilities	One credit where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities are provided for all building users. Two credits where, in addition to the above, adequate changing facilities are provided for staff use.	2	1		-	-	-	-	-	
Tra 4	Pedestrian and cycle safety	One credit where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate cycle access. One credit where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate pedestrian access.	2	0		-	-	-	-	-	
Tra 5	Travel plan	One credit where evidence is provided to demonstrate that a travel plan has been developed and tailored to the specific needs of the building users.	1	1		-	-	-	-	-	
Tra 8	Deliveries & manoeuvring	One credit where evidence provided demonstrates that vehicle access areas have been designed to ensure adequate space for manoeuvring delivery vehicles and provide space away from manoeuvring area for storage of refuse skips and pallets.	1	1		-	-	-	-	-	
Water											
Wat 1	Water Consumption	Up to three credits where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings.	3	2	Option 1 - Lease Agreement	-	1	1	1	2	
Wat 2	Water meter	One credit where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.	1	1	Option 1 - Lease Agreement	-	1	1	1	1	
Wat 3	Major leak detection	One credit where evidence provided demonstrates that a leak detection system is specified or installed on the building's water supply.	1	1		-	-	-	-	-	
Wat 4	Sanitary supply shut off	One credit where evidence provided demonstrates that proximity detection shut-off is provided to the water supply to all toilet areas.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
Wat5	Water recycling	Up to two credits where evidence provided demonstrates the specification of systems that collect, store and, where necessary treat, rainwater or greywater for WC and urinal flushing purposes.	2	0	Option 4 - No evidence	-	-	-	-	-	
Materials											
Mat 1	Materials Specification (major building elements)	Up to four credits are available, determined by the Green Guide to Specification ratings for the major building elements.	4	1		-	-	-	-	-	
Mat 2	Hard landscaping and boundary protection	One credit where evidence provided demonstrates that 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		-	-	-	-	-	

Mat 3	Re-use of building façade	One credit is awarded where evidence provided demonstrates that 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	0		-	-	-	-	-	
Mat 4	Re-use of building structure	One credit is awarded where evidence provided demonstrates that a 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	0		-	-	-	-	-	
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: a. Structural Frame b. Ground floor c. Upper floors (including separating floors) d. Roof e. External walls f. Internal walls g. Foundation/substructure h. Staircase Additionally 100% of any timber must be legally sourced.	3	1		-	-	-	-	-	
Mat 6	Insulation	One credit where evidence provided demonstrates that 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. One credit where evidence provided demonstrates that thermal insulation products used in the building have been responsibly sourced.	2	2	Option 1 - Lease Agreement	-	-	-	-	-	
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		-	-	-	-	-	
Waste												
Wst 1	Construction Site Waste Management	Up to three credits are available where evidence provided demonstrates that the amount of non-hazardous construction waste (m3/100m2 or tonnes100m2) generated on site by the development is the same as or better than good or best practice levels. One credit where evidence provided demonstrates that a significant majority of non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled.	4	4		-	-	-	-	-	
Wst 2	Recycled aggregates	One credit where evidence provided demonstrates the significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses.	1	0		-	-	-	-	-	
Wst 3	Recyclable waste storage	One credit where a central, dedicated space is provided for the storage of the building's recyclable waste streams.	1	1		-	-	-	1	1	
Wst 4	Compactor / Baler	One credit where evidence provided demonstrates that either an industrial waste compactor or baler is installed for compacting/baling waste materials generated on site and a. A water outlet is provided for cleaning b. The development achieves the BREEAM credit for storage of recyclable waste.	1	1		-	-	-	-	-	
Wst 5	Composting	One credit w here evidence provided demonstrates there is a vessel on site for composting food waste, and adequate storage for such waste generated by the building's users and operation. OR Where space or access is limited, there is a dedicated space for compostable food waste to be stored prior to removal and composting at an alternative site.	1	0		-	-	-	-	-	

Land Use & Ecology

LE1	Re-use of land	One credit where evidence provided demonstrates that the majority of the footprint of the proposed development falls within the boundary of previously developed land.	1	1		-	-	-	-	-		
LE2	Contaminated land	One credit is awarded where evidence provided demonstrates that the land used for the new development has, prior to development, been defined as contaminated and where adequate remedial steps have been taken to decontaminate the site prior to construction.	1	0		-	-	-	-	-		
LE3	Ecological value of site AND Protection of ecological features	One credit is awarded where evidence provided demonstrates that 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		-	-	-	-	-		
LE4	Mitigating Ecological impact	One credit where evidence provided demonstrates that the change in the site's existing ecological value, as a result of development, is minimal. Two credits where evidence provided demonstrates that there is no negative change in the site's existing ecological value as a result of development.	2	2		-	-	1	1	1		
LE5	Enhancing Site Ecology	One credit where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented the professional's recommendations for general enhancement and protection of site ecology. Two credits 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. Three credits where, in addition to the above, evidence is provided to demonstrate a positive increase in the ecological value of the site of 6 species or greater.	3	1		-	-	-	-	-		
LE6	Long term impact on biodiversity	One credit where the client has committed to achieving the mandatory requirements listed below and at least two of the additional requirements. Two credits where the client has committed to achieving the mandatory requirements listed below and at least four of the additional requirements.	2	1		-	-	-	-	-		

Pollution

Pol 1	Refrigerant GWP - Building services	One credit where evidence provided demonstrates 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	0	Option 4 - No evidence	-	-	-	-	-		
Pol 2	Preventing refrigerant leaks	One credit where evidence provided demonstrates that refrigerant leaks can be detected or where there are no refrigerants specified for the development. One credit where evidence provided demonstrates that 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.	2	0	Option 4 - No evidence	-	-	-	-	-		

Pol 4	NOx emissions from heating source	One credit where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O2). Twp credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O2). Three credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O2).	3	0	Option 4 - No evidence	-	-	-	-	-	
Pol 5	Flood risk	Two credits where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding. One credit where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium or high 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. 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.	3	0		-	-	-	-	-	
Pol 6	Minimising watercourse pollution	One credit here evidence provided demonstrates that 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		-	-	-	-	-	
Pol 7	Reduction of Night Time Light Pollution	One credit where evidence provided demonstrates that 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	Option 1 - Lease Agreement	-	-	-	-	-	
Pol 8	Noise Attenuation	One credit where evidence provided demonstrates that 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	Option 1 - Lease Agreement	-	-	-	-	-	

Innovation - Exemplary Level Criteria

Innovation	Man 2: Considerate Constructors	Where post construction, a Considerate Constructors Scheme certificate can be provided demonstrating that the site achieved CCS Code of Considerate Practice with a score of at least 36. OR Where post construction, the site has complied in full with the alternative, independently assessed scheme, and the alternative scheme addresses all the mandatory and optional items in Checklist A2.	1	0							
Innovation	Hea 1: Daylighting	At least 50% by floor area of the sales and common spaces have point daylight factors of at least 2%.	1	0							
Innovation	Ene 1: Reduction of CO2 emissions	One additional innovation credit can be awarded where evidence provided demonstrates the building is designed to be a carbon neutral building as defined by the NCM (i.e. in terms of building services energy demand), as follows: a. A new building achieves a CO2 index less than 0 on the benchmark scale. b. A refurbished building achieves a CO2 index equal to or less than 0 on the benchmark scale. Two additional innovation credits can be awarded where evidence provided demonstrates the building is designed to be a True zero carbon building (in terms of building services and operational energy demand).	2	0	Option 4 - No evidence						

Innovation	Ene 5: Low or Zero Carbon Technologies	A local LZC energy technology has been installed in line with the recommendations of a compliant feasibility study and this method of supply results in a 20% reduction in the building's CO2 emissions.	1	0		
Innovation	Wat 2: Water Meter	Where sub meters are fitted to allow individual water-consuming plant or building areas to be monitored such as cooling towers, car washes, catering areas, etc. If the building does not have any major water consuming plant this exemplar credit is not available. Each sub meter has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption. In addition to the above, for sites with multiple departments e.g. large health centres or acute hospitals, separate pulsed sub meters are fitted on the supply to the following areas where present: a. Staff and public areas b. Clinical areas and wards c. Letting areas: On the water supply to each tenant unit d. Laundries e. Main production kitchen f. Hydrotherapy pools g. Laboratories h. CSSD/HSDU, pathology, pharmacy, mortuary and any other major process water user.	1	0	Option 4 - No evidence	
Innovation	Materials Specification	One exemplary BREEAM credit can be awarded as follows: a. Where assessing four or more applicable building elements, the building achieves at least two points additional to the total points required to achieve maximum credits under the standard BREEAM requirements. b. Where assessing fewer than four applicable building elements, the building achieves at least one point additional to the total points required to achieve maximum credits under the standard BREEAM requirements.	1	0		
Innovation	Responsible Sourcing of Materials	Where, in addition to the standard BREEAM requirements, 95% of the applicable materials, comprised within the applicable building elements, have been responsibly sourced.	1	0		
Innovation	Wst 1 Construction Site Waste Management	Where non-hazardous construction waste generated by the building's development meets or exceeds the resource efficiency benchmark required to achieve three credits (as outlined in the guidance). Where at least 90% by weight (80% by volume) of non-hazardous construction waste and 95% of demolition waste by weight (85% by volume) (if applicable) generated by the build has been diverted from landfill and either: a. Reused on site (in-situ or for new applications) b. Reused on other sites c. Salvaged/reclaimed for reuse d. Returned to the supplier via a 'take-back' scheme e. Recovered from site by an approved waste management contractor and recycled. Where all key waste groups are identified for diversion from landfill at pre-construction stage SWMP.	1	0		

Innovation - BREEAM Accredited Professional or Suitably Qualified BREEAM Assessor

Innovation	BREEAM Accredited Professional / Suitably Qualified Assessor	Up to two credits are available for the comprehensive use of a BREEAM Accredited Professional (AP) or Suitably Qualified BREEAM Assessor (SQA) throughout project work stages.	2	0		

Innovation - BRE Global Approved Innovation credits

Innovation	Approved Innovations	Additional BREEAM Innovation Credits can be awareded where an application is made to, and approved by the BREEAM office using the Innovation Application Form and the assessor confirms compliance with the criteria set out within the Innovation Application Form.				

breeam

BREEAM Scheme:	BREEAM Retail 2008
Building Name:	Area A Restaurant
BREEAM Registration No.:	0
BREEAM Assessor:	David Partington
Licensed Assessor organisation:	Grontmij

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

Stage of Assessment	BREEAM Score	BREEAM Rating
Interim - Design Stage	61.04%	VERY GOOD

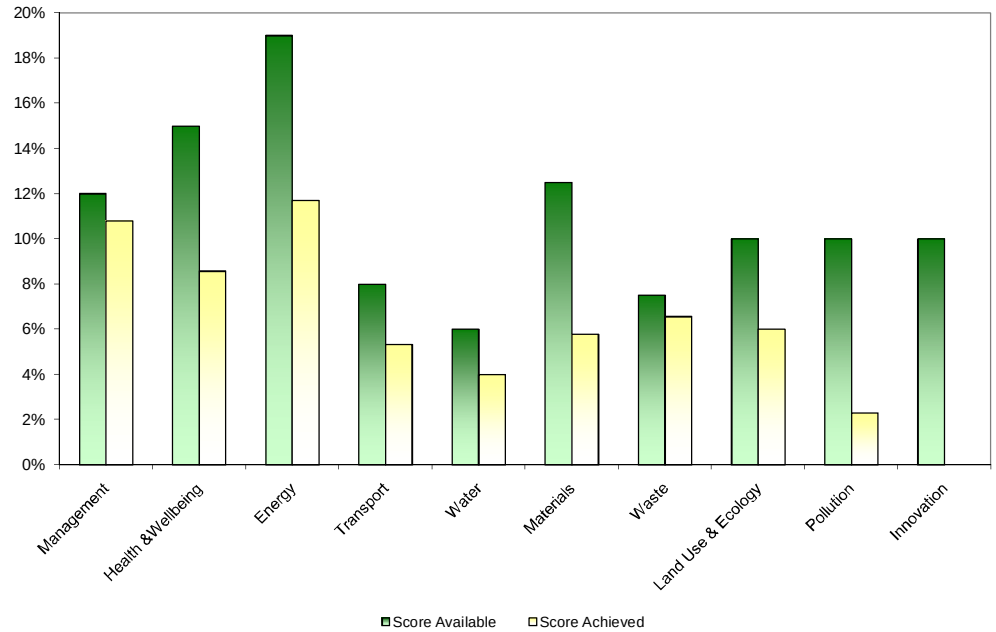
Minimum BREEAM Standards

Rating Level	Pass	Good	Very Good	Excellent	Outstanding
Minimum Standards Achieved	YES	YES	YES	YES	NO

Building Performance by Section

	Environmental weighting	Credits available	Credits achieved	%Achieved	Weighted Score
Management	12.00%	10.00	9.00	90.00%	10.80%
Health & Wellbeing	15.00%	7.00	4.00	57.14%	8.57%
Energy	19.00%	26.00	16.00	61.54%	11.69%
Transport	8.00%	12.00	8.00	66.67%	5.33%
Water	6.00%	9.00	6.00	66.67%	4.00%
Materials	12.50%	13.00	6.00	46.15%	5.77%
Waste	7.50%	8.00	7.00	87.50%	6.56%
Land Use & Ecology	10.00%	10.00	6.00	60.00%	6.00%
Pollution	10.00%	13.00	3.00	23.08%	2.31%
Innovation	10.00%	10.00	0.00	0.00%	0.00%
				Total BREEAM Score	61.04%

Assessed Building's BREEAM Performance by Section



breeam

BREEAM Scheme: BREEAM Retail 2008
Building Name: Area A Restaurant
BREEAM Registration No.: 0
BREEAM Assessor: David Partington

	Minimum BREEAM Standards				
	Pass	Good	Very Good	Excellent	Outstanding
Achieved?	YES	YES	YES	YES	NO

Ref	Title	Retail Criteria	Number of BREEAM credits available	Total BREEAM credits achieved	Shell & Core Assessment Evidence Used?	Minimum required credits by BREEAM issue and rating					Comments/Actions
Management											
Man 1	Commissioning	One credit where evidence provided demonstrates that an appropriate project team member has been appointed to monitor commissioning on behalf of the client to ensure commissioning will be carried out in line with current best practice. Two credits where, in addition to the above, evidence provided demonstrates that seasonal commissioning will be carried out during the first year of occupation, post construction (or post fit out).	2	1	Option 1 - Lease Agreement	1	1	1	1	2	
Man 2	Considerate Constructors	One credit where evidence provided demonstrates that there is a commitment to comply with best practice site management principles. Two credits where evidence provided demonstrates that there is a commitment to go beyond best practice site management principles.	2	2		-	-	-	1	2	
Man 3	Construction Site Impacts	One credit where evidence provided demonstrates that 2 or more of items a-g (listed below) are achieved. Two credits where evidence provided demonstrates that 4 or more of items a-g (listed below) are achieved. Three credits where evidence provided demonstrates that 6 or more of items a-g 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. One additional credit where evidence provided demonstrates that at least 80% of site timber is responsibly sourced and 100% is legally sourced.	4	4		-	-	-	-	-	
Man 4	Building user guide	One credit where evidence provided demonstrates 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	Option 1 - Lease Agreement	-	-	-	1	1	
Man 8	Security	One credit where evidence provided demonstrates that 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 (if relevant).	1	1		-	-	-	-	-	
Health & Wellbeing											

Hea 1	Daylighting	One credit where evidence provided demonstrates at least 35% of the sales and common floor area (if relevant) is adequately daylit.	1	1		-	-	-	-	-	
Hea 4	High frequency lighting	One credit where evidence provided demonstrates that high frequency ballasts are installed on all fluorescent and compact fluorescent lamps.	1	1	Option 1 - Lease Agreement	1	1	1	1	1	
Hea 5	Internal and external lighting levels	One credit where evidence provided demonstrates that all internal and external lighting, where relevant, is specified in accordance with the appropriate maintained illuminance levels (in lux) recommended by CIBSE.	1	0	Option 4 - No evidence	-	-	-	-	-	
Hea 8	Indoor air quality	One credit where air intakes serving occupied areas avoid major sources of external pollution and recirculation of exhaust air.	1	0		-	-	-	-	-	
Hea 9	Volatile Organic Compounds	One credit where evidence provided demonstrates that the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
Hea 10	Thermal comfort	One credit where evidence provided demonstrates that 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	0	Option 1 - Lease Agreement	-	-	-	-	-	
Hea 12	Microbial contamination	One credit where evidence provided demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.	1	1	Option 1 - Lease Agreement	1	1	1	1	1	
Energy												
Ene 1	Reduction of CO2 Emissions	Up to fifteen credits where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO2 emissions.	15	7	Option 1 - Lease Agreement	-	-	-	6	10	
Ene 2	Sub-metering of Substantial Energy Uses	One credit where evidence provided demonstrates the provision of direct sub-metering of energy uses within the building.	1	1	Option 1 - Lease Agreement	-	-	1	1	1	
Ene 3	Sub-metering of high energy load Areas and Tenancy	One credit where evidence provided demonstrates sub-metering of energy consumption by tenancy/building function area is installed within the building.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
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	Option 1 - Lease Agreement	-	-	-	-	-	
Ene 5	Low zero carbon technologies	One credit where evidence provided demonstrates that 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. Two credits where evidence provided demonstrates that the first credit has been achieved and there is a 10% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. Three credits where evidence provided demonstrates that the first credit has been achieved and there is a 15% reduction in the building's CO2 emissions as a result of the installation of a feasible local LZC technology. 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)	3	3		-	-	-	1	1	
Ene 7	Cold storage equipment	One credit where evidence provided demonstrates that the cold storage refrigeration plant components are on the ECA Energy Technology Product List. One credit where evidence provided demonstrates that the cold food storage plant is designed to minimise energy consumption in operation. One credit where evidence provided demonstrates that opportunities for heat recovery, free cooling or thermal storage are identified and taken advantage of.	3	1		-	-	-	-	-	

Ene 8	Lifts	Up to two credits are available where evidence provided demonstrates the installation of energy-efficient lift(s).	2	2		-	-	-	-	-	
Transport											
Tra 1	Provision of public transport	Up to five credits are awarded on a sliding scale based on the assessed buildings' accessibility to the public transport network.	5	5		-	-	-	-	-	
Tra 2	Proximity to amenities	One credit where evidence provided demonstrates that the building is located within 500m of accessible local amenities appropriate to the building type and its users.	1	1		-	-	-	-	-	
Tra 3	Cyclist Facilities	One credit where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities are provided for all building users. Two credits where, in addition to the above, adequate changing facilities are provided for staff use.	2	1		-	-	-	-	-	
Tra 4	Pedestrian and cycle safety	One credit where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate cycle access. One credit where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate pedestrian access.	2	0		-	-	-	-	-	
Tra 5	Travel plan	One credit where evidence is provided to demonstrate that a travel plan has been developed and tailored to the specific needs of the building users.	1	1		-	-	-	-	-	
Tra 7	Travel information point	One credit where evidence provided demonstrates there is a dedicated space within the development for the provision of real-time public transport information.	1	0		-	-	-	-	-	
Water											
Wat 1	Water Consumption	Up to three credits where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings.	3	2	Option 1 - Lease Agreement	-	1	1	1	2	
Wat 2	Water meter	One credit where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.	1	1	Option 1 - Lease Agreement	-	1	1	1	1	
Wat 3	Major leak detection	One credit where evidence provided demonstrates that a leak detection system is specified or installed on the building's water supply.	1	1		-	-	-	-	-	
Wat 4	Sanitary supply shut off	One credit where evidence provided demonstrates that proximity detection shut-off is provided to the water supply to all toilet areas.	1	1	Option 1 - Lease Agreement	-	-	-	-	-	
Wat5	Water recycling	Up to two credits where evidence provided demonstrates the specification of systems that collect, store and, where necessary treat, rainwater or greywater for WC and urinal flushing purposes.	2	0	Option 4 - No evidence	-	-	-	-	-	
Wat 6	Irrigation systems	One credit where evidence provided demonstrates that a low-water irrigation strategy/system has been installed, or where planting and landscaping is irrigated via rainwater or reclaimed water.	1	1		-	-	-	-	-	
Materials											

Mat 1	Materials Specification (major building elements)	Up to four credits are available, determined by the Green Guide to Specification ratings for the major building elements.	**4**	**1**		-	-	-	-	-	
Mat 2	Hard landscaping and boundary protection	One credit where evidence provided demonstrates that 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**		-	-	-	-	-	
Mat 3	Re-use of building façade	One credit is awarded where evidence provided demonstrates that 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**	**0**		-	-	-	-	-	
Mat 4	Re-use of building structure	One credit is awarded where evidence provided demonstrates that a 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**	**0**		-	-	-	-	-	
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: a. Structural Frame b. Ground floor c. Upper floors (including separating floors) d. Roof e. External walls f. Internal walls g. Foundation/substructure h. Staircase Additionally 100% of any timber must be legally sourced.	**3**	**1**		-	-	-	-	-	
Mat 6	Insulation	One credit where evidence provided demonstrates that 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. One credit where evidence provided demonstrates that thermal insulation products used in the building have been responsibly sourced.	**2**	**2**	Option 1 - Lease Agreement	-	-	-	-	-	
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**		-	-	-	-	-	
Waste											
Wst 1	Construction Site Waste Management	Up to three credits are available where evidence provided demonstrates that the amount of non-hazardous construction waste (m3/100m2 or tonnes100m2) generated on site by the development is the same as or better than good or best practice levels. One credit where evidence provided demonstrates that a significant majority of non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled.	**4**	**4**		-	-	-	-	-	
Wst 2	Recycled aggregates	One credit where evidence provided demonstrates the significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses.	**1**	**0**		-	-	-	-	-	
Wst 3	Recyclable waste storage	One credit where a central, dedicated space is provided for the storage of the building's recyclable waste streams.	**1**	**1**		-	-	-	1	1	
Wst 4	Compactor / Baler	One credit where evidence provided demonstrates that either an industrial waste compactor or baler is installed for compacting/baling waste materials generated on site and a. A water outlet is provided for cleaning b. The development achieves the BREEAM credit for storage of recyclable waste.	**1**	**1**		-	-	-	-	-	

Wst 5	Composting	One credit w here evidence provided demonstrates there is a vessel on site for composting food waste, and adequate storage for such waste generated by the building's users and operation. OR Where space or access is limited, there is a dedicated space for compostable food waste to be stored prior to removal and composting at an alternative site.	1	1		-	-	-	-	-	
Land Use & Ecology												
LE1	Re-use of land	One credit where evidence provided demonstrates that the majority of the footprint of the proposed development falls within the boundary of previously developed land.	1	1		-	-	-	-	-	
LE2	Contaminated land	One credit is awarded where evidence provided demonstrates that the land used for the new development has, prior to development, been defined as contaminated and where adequate remedial steps have been taken to decontaminate the site prior to construction.	1	0		-	-	-	-	-	
LE3	Ecological value of site AND Protection of ecological features	One credit is awarded where evidence provided demonstrates that 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		-	-	-	-	-	
LE4	Mitigating Ecological impact	One credit where evidence provided demonstrates that the change in the site's existing ecological value, as a result of development, is minimal. Two credits where evidence provided demonstrates that there is no negative change in the site's existing ecological value as a result of development.	2	2		-	-	1	1	1	
LE5	Enhancing Site Ecology	One credit where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented the professional's recommendations for general enhancement and protection of site ecology. Two credits 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. Three credits where, in addition to the above, evidence is provided to demonstrate a positive increase in the ecological value of the site of 6 species or greater.	3	1		-	-	-	-	-	
LE6	Long term impact on biodiversity	One credit where the client has committed to achieving the mandatory requirements listed below and at least two of the additional requirements. Two credits where the client has committed to achieving the mandatory requirements listed below and at least four of the additional requirements.	2	1		-	-	-	-	-	
Pollution												
Pol 1	Refrigerant GWP - Building services	One credit where evidence provided demonstrates 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	0	Option 4 - No evidence	-	-	-	-	-	
Pol 2	Preventing refrigerant leaks	One credit where evidence provided demonstrates that refrigerant leaks can be detected or where there are no refrigerants specified for the development. One credit where evidence provided demonstrates that 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.	2	0	Option 4 - No evidence	-	-	-	-	-	

Pol 3	Refrigerant GWP - Cold storage	One credit where evidence provided demonstrates the use of refrigerants within cold storage systems with a global warming potential (GWP) of less than 5.	1	0		-	-	-	-	-	
Pol 4	NOx emissions from heating source	One credit where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O2). Twp credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O2). Three credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O2).	3	0	Option 4 - No evidence	-	-	-	-	-	
Pol 5	Flood risk	Two credits where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding. One credit where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium or high 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. 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.	3	0		-	-	-	-	-	
Pol 6	Minimising watercourse pollution	One credit here evidence provided demonstrates that 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		-	-	-	-	-	
Pol 7	Reduction of Night Time Light Pollution	One credit where evidence provided demonstrates that 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	Option 1 - Lease Agreement	-	-	-	-	-	
Pol 8	Noise Attenuation	One credit where evidence provided demonstrates that 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	Option 1 - Lease Agreement	-	-	-	-	-	

Innovation - Exemplary Level Criteria

Innovation	Man 2: Considerate Constructors	Where post construction, a Considerate Constructors Scheme certificate can be provided demonstrating that the site achieved CCS Code of Considerate Practice with a score of at least 36. OR Where post construction, the site has complied in full with the alternative, independently assessed scheme, and the alternative scheme addresses all the mandatory and optional items in Checklist A2.	1	0							
Innovation	Hea 1: Daylighting	At least 50% by floor area of the sales and common spaces have point daylight factors of at least 2%.	1								
Innovation	Ene 1: Reduction of CO2 emissions	One additional innovation credit can be awarded where evidence provided demonstrates the building is designed to be a carbon neutral building as defined by the NCM (i.e. in terms of building services energy demand), as follows: a. A new building achieves a CO2 index less than 0 on the benchmark scale. b. A refurbished building achieves a CO2 index equal to or less than 0 on the benchmark scale. Two additional innovation credits can be awarded where evidence provided demonstrates the building is designed to be a True zero carbon building (in terms of building services and operational energy demand).	2	0	Option 4 - No evidence						

Innovation	Ene 5: Low or Zero Carbon Technologies	A local LZC energy technology has been installed in line with the recommendations of a compliant feasibility study and this method of supply results in a 20% reduction in the building's CO2 emissions.	1	0		
Innovation	Wat 2: Water Meter	Where sub meters are fitted to allow individual water-consuming plant or building areas to be monitored such as cooling towers, car washes, catering areas, etc. If the building does not have any major water consuming plant this exemplar credit is not available. Each sub meter has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption. In addition to the above, for sites with multiple departments e.g. large health centres or acute hospitals, separate pulsed sub meters are fitted on the supply to the following areas where present: a. Staff and public areas b. Clinical areas and wards c. Letting areas: On the water supply to each tenant unit d. Laundries e. Main production kitchen f. Hydrotherapy pools g. Laboratories h. CSSD/HSDU, pathology, pharmacy, mortuary and any other major process water user.	1	0	Option 4 - No evidence	
Innovation	Materials Specification	One exemplary BREEAM credit can be awarded as follows: a. Where assessing four or more applicable building elements, the building achieves at least two points additional to the total points required to achieve maximum credits under the standard BREEAM requirements. b. Where assessing fewer than four applicable building elements, the building achieves at least one point additional to the total points required to achieve maximum credits under the standard BREEAM requirements.	1	0		
Innovation	Responsible Sourcing of Materials	Where, in addition to the standard BREEAM requirements, 95% of the applicable materials, comprised within the applicable building elements, have been responsibly sourced.	1	0		
Innovation	Wst 1 Construction Site Waste Management	Where non-hazardous construction waste generated by the building's development meets or exceeds the resource efficiency benchmark required to achieve three credits (as outlined in the guidance). Where at least 90% by weight (80% by volume) of non-hazardous construction waste and 95% of demolition waste by weight (85% by volume) (if applicable) generated by the build has been diverted from landfill and either: a. Reused on site (in-situ or for new applications) b. Reused on other sites c. Salvaged/reclaimed for reuse d. Returned to the supplier via a 'take-back' scheme e. Recovered from site by an approved waste management contractor and recycled. Where all key waste groups are identified for diversion from landfill at pre-construction stage SWMP	1	0		

Innovation - BREEAM Accredited Professional or Suitably Qualified BREEAM Assessor

Innovation	BREEAM Accredited Professional / Suitably Qualified Assessor	Up to two credits are available for the comprehensive use of a BREEAM Accredited Professional (AP) or Suitably Qualified BREEAM Assessor (SQA) throughout project work stages.	2	0		

Innovation - BRE Global Approved Innovation credits

Innovation	Approved Innovations	Additional BREEAM Innovation Credits can be awareded where an application is made to, and approved by the BREEAM office using the Innovation Application Form and the assessor confirms compliance with the criteria set out within the Innovation Application Form.				

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BREEAM 2011 New Construction Pre-Assessment Estimator

Building details

Building name	Hawley Wharf	
Building type (main description)	Education	*
Building type (sub-group)	Education - Primary school	*
Project type	New Construction (shell only)	*
Will the building be heated and/or cooled?	Yes	*
If applicable, does this industrial building have a heated or cooled operational area?		
Commercial/industrial refrigeration and storage systems	No	*
Internal or external planting and/or soft landscaping	Yes	*
Building user transportation systems (lifts and/or escalators)	Yes	*
Laboratory function/area and size category	No laboratory	*
Laboratory containment level	No laboratory	*
Fume cupboard(s) and/or other containment devices	No	*
Vehicle Wash System	No	*
If applicable, will this healthcare building house inpatients?		
If applicable, does this industrial building have an office area?		

BREEAM 2011 New Construction Pre-Assessment Estimator

This assessment and indicative BREEAM rating is not a formal certified BREEAM assessment or rating and must not be communicated as such. The score presented is indicative of a buildings potential performance and is based on a simplified pre-formal BREEAM assessment and unverified commitments given at an early stage in the design process.

Building name	Hawley Wharf
Indicative building score (%)	55.95%
Indicative BREEAM rating	Pre-Assessment result indicates potential for BREEAM Very Good rating
Indicative minimum standards level achieved	Pre-Assessment result indicates the minimum standards for Very Good level

Environmental Section	Indicative % Score Available	Indicative % Score Achieved
Management	12.00%	7.09%
Health & Wellbeing	15.00%	7.00%
Energy	19.00%	5.85%
Transport	8.00%	6.86%
Water	6.00%	4.00%
Materials	12.50%	5.77%
Waste	7.50%	5.00%
Land Use and Ecology	10.00%	8.00%
Pollution	10.00%	5.38%
Innovation	10.00%	1.00%

MANAGEMENT	*Section Weighting*	12.00%	*Indicative Section Score*	7.09%

Man01 Sustainable Procurement

No. of BREEAM credits available	8	Available contribution to overall score	4.36%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will roles, responsibilities and a training schedule be defined in accordance with BREEAM?	Yes	1	1	N/A
Will a BREEAM AP be appointed at RIBA stage A/B and performance targets contractually agreed?		1	0	N/A
Will a BREEAM AP be appointed to monitor and report progress during RIBA stage B-E ?		1	0	N/A
Willa BREEAM AP be appointed to monitor and report progress during RIBA stage F-L?		1	0	N/A
Will a thermographic survey be conducted and any defects uncovered remedied?	Yes	1	1	N/A
Will compliant commissioning of building services be carried out?	Yes	1	1	N/A
Will compliant seasonal commissioning of building services be carried out?		1	0	N/A
Will water/energy consumption data be recorded and aftercare support provided for 12 months?		1	0	N/A
Will water/energy consumption be recorded/reported for 3 years post construction?		1	0	N/A

Total indicative BREEAM credits achieved	3
Total indicative contribution to overall building score	1.64%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Man02 Responsible Construction Practices

No. of BREEAM credits available	2	Available contribution to overall score	1.09%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria		Shell & Core option?
Which considerate construction scheme will be used or required to be used by the principal contractor?	Considerate Constructors Scheme	
For the required scheme, what will be the target performance level set for the site/contractor?	A CCS score of 36 or more	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.09%
Total indicative BREEAM innovation credits achieved	1
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Man03 Construction Site Impacts

No. of BREEAM credits available	5	Available contribution to overall score	2.73%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

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Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will site energy consumption be metered/monitored?	Yes	1	1	N/A
Will site water consumption be metered/monitored?	Yes	1	1	N/A
Will the transport of construction materials and waste to/from site be measured/monitored?	Yes	1	1	N/A
Will timber be sourced in accordance with the Government's Timber Procurement Policy?	Yes	1	1	N/A
Will/does the principal contractor operate a compliant Environmental Management System?	Yes	1	1	N/A
Will the principal contractor adopt best practice pollution prevention policies & procedures?	Yes			

Total indicative BREEAM credits achieved	5
Total indicative contribution to overall building score	2.73%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Man04 Stakeholder Participation

No. of BREEAM credits available	4	Available contribution to overall score	2.18%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will an appropriate level of consultation activities be undertaken?	Yes	1	1	N/A
Will an access statement be developed and appropriate building user facilities provided?	Yes	1	1	N/A
Will building user guides and relevant user information be provided?	Yes	1	1	N/A
Will a post occupancy evaluation assessment be undertaken and information disseminated?		1	0	N/A

Total indicative BREEAM credits achieved	3
Total indicative contribution to overall building score	1.64%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Man05 Life cycle cost and service life planning

No. of BREEAM credits available	3	Available contribution to overall score	1.64%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a feasibility stage Life Cycle Cost (LCC) analysis be commissioned and completed?	No	1	0	N/A
Will a strategic and system level LCC be commissioned and completed?	No	1	0	N/A
Will a technical design LCC to be commissioned and completed?	No	1	0	N/A

Total indicative BREEAM credits achieved	0
Total indicative contribution to overall building score	0.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

HEALTH & WELLBEING	*Section Weighting*	15.00%	*Indicative Section Score*	7.00%

Hea01 Visual Comfort

No. of BREEAM credits available	3	Available contribution to overall score	3.00%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will all fluorescent lamps be fitted with high frequency ballasts?	Yes	N/A	N/A	N/A
Will all relevant building areas be designed to achieve the appropriate daylight factor(s)?		1		N/A
Will the design provide adequate glare control and view out for building users?		1	0	N/A
Will internal/external lighting be specified in accordance with the relevant CIBSE Guides/British Standards?	Yes	1	1	N/A

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Will all relevant building areas be designed to achieve exemplary level daylight factor(s)?		1	0	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Hea02 Indoor Air Quality

No. of BREEAM credits available	4	Available contribution to overall score	4.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will an air quality plan be produced and building designed to minimise air pollution?		1	0	N/A
Will the relevant products be specified to meet the VOC testing and emission levels required?		1	0	N/A
Will formaldehyde and total VOC levels be measured post construction?		1	0	N/A
Will the building be designed to, or have the potential to provide, natural ventilation?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Hea03 Thermal Comfort

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will thermal modelling of the design be carried out?	Yes	1	1	N/A
Will the modelling inform the development of a thermal zoning and control strategy?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	2.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Hea04 Water Quality

No. of BREEAM credits available	1	Available contribution to overall score	1.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will all water systems be designed to comply with the relevant HSE Approved Code of Practice and Guidance?	Yes	1	1	N/A
Where humidification is to be provided, will a failsafe humidification system be specified?	Yes			N/A
Will a wholesome supply of accessible, clean and fresh drinking water be supplied for building users?	Yes			N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

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Hea05 Acoustic Performance

No. of BREEAM credits available	3	Available contribution to overall score	3.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will/has a suitably qualified acoustician be appointed to provide appropriate design advice?	Yes			
Will the building meet the relevant acoustic performance standards and testing requirements?		3		N/A

Total indicative BREEAM credits achieved	0
Total indicative contribution to overall building score	0.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Hea06 Safety and Security

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Where external site areas are present, will safe access be designed for pedestrians and cyclists?	Yes	1	1	N/A
Will a suitably qualified security consultant be appointed and security considerations accounted for?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	2.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

ENERGY	*Section Weighting*	19.00%	*Indicative Section Score*	5.85%

Ene01 Reduction of CO_2 Emissions

No. of BREEAM credits available	15	Available contribution to overall score	10.96%
No. of BREEAM innovation credits available	5	Minimum standards applicable	Yes

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits achieved		
Select the target number of BREEAM credits for the Ene01 issue	3	BREEAM Innovation credits	

2

NC

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Total indicative BREEAM credits achieved	3
Total indicative contribution to overall building score	2.19%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Very Good level

Comments/notes:

Ene02 Energy Monitoring

No. of BREEAM credits available	1	Available contribution to overall score	0.73%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a BMS or sub-meters be specified to monitor energy use from major building services systems?	Yes	1	1	N/A
Will a BMS or sub-meters be specified to monitor energy use by tenant/building function areas?		N/A	N/A	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.73%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Ene03 External Lighting

No. of BREEAM credits available	1	Available contribution to overall score	0.73%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will external light fittings and controls be specified in accordance with the BREEAM criteria?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.73%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Ene04 Low and Zero Carbon Technology

No. of BREEAM credits available	5	Available contribution to overall score	3.65%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Compliant LZC feasibility study to be undertaken	Yes	2	1	N/A
What will be the intended scope of the feasibility study?	Operational stage carbon savings/emissions			
Target percentage net reduction in operational stage CO2 emissions	10.00%	2	1	N/A
Please confirm the intended energy source of the Low and/or zero carbon system?	Mains gas via compliant CHP plant			
Please select	No	1	0	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.46%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Ene05 Energy Efficient Cold Storage

Assessment Issue Not Applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?

Total indicative BREEAM credits achieved	N/A
Total indicative contribution to overall building score	N/A
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Ene06 Energy Efficient Transportation Systems

No. of BREEAM credits available	2	Available contribution to overall score	1.46%
No. of BREEAM innovation credits available	0	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a transportation system analysis be carried out to determine the optimum number and size of lifts?	Yes	1	1	N/A
Will three energy-efficient features offering the greatest potential energy savings be part of the system?	No	1	0	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.73%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Ene07 Energy Efficient Laboratory Systems

Assessment Issue Not Applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will fume cupboards and/or other containment devices be specified				
Will the laboratory meet BREEAM's Best Practice Energy Practices in Laboratories criteria (table 6-2)?				
Will the laboratory meet criteria item b) of table 6-2: Fan power?				
Will the laboratory criteria item c) of table 6-2: Fume cupboard volume flow rates?				
Will the lab meet criteria item d) of table 6-2: Grouping / isolation of high filtration/ventilation activities?				
Will the laboratory meet criteria item e) of table 6-2: Energy recovery - heat?				
Will the laboratory meet criteria item f) of table 6-2: Energy recovery - cooling?				
Will the laboratory meet criteria item g) of table 6-2: Grouping of cooling loads?				
Will the laboratory meet criteria item h) of table 6-2: Free cooling?				
Will the laboratory meet criteria item i) of table 6-2: Load responsiveness?				
Will the laboratory meet criteria item j) of table 6-2: Cleanrooms?				
Will the laboratory meet criteria item k) of table 6-2: Diversity?				
Will the laboratory meet criteria item l) of table 6-2: Room air-change rates?				

Total indicative BREEAM credits achieved	N/A
Total indicative contribution to overall building score	N/A
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Ene08 Energy Efficient Equipment

No. of BREEAM credits available	2	Available contribution to overall score	1.46%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Present	Significant majority contributor
Which of the following will be present and likely to be a/the major contributor to 'unregulated' energy use:		
Small power/plug in equipment?	No	
Swimming pool?	No	
Communal laundry?	No	
Data centre?	No	
IT-intensive operation areas?	No	
Residential areas?	No	
Healthcare?	No	
Kitchen and catering facilities?	No	

	Indicative compliance?	Credits available	Indicative credits achieved	Shell & Core option?
Will the significant majority contributor(s) to 'unregulated' energy use (above) meet the BREEAM criteria?	No	2	0	N/A

Total indicative BREEAM credits achieved	0
Total indicative contribution to overall building score	0.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Ene09 Drying Space

Assessment Issue Not Applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?

Total indicative BREEAM credits achieved	N/A
Total indicative contribution to overall building score	N/A
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

TRANSPORT	*Section Weighting*	8.00%	*Indicative Section Score*	6.86%

Tra01 Public Transport Accessibility

No. of BREEAM credits available	3	Available contribution to overall score	3.43%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	
What is the building type category (for the purpose of Tra01 issue assessment)?	Pre-school, School and/or Sixth form
What is the degree of public transport provision for the building's location?	Excellent provision of public transport, i.e. large urban/metropolitan city centre
Building's indicative Accessibility Index	18
Does the building have a dedicated bus service?	

Total indicative BREEAM credits achieved	3
Total indicative contribution to overall building score	3.43%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Tra02 Proximity to Amenities

No. of BREEAM credits available	1	Available contribution to overall score	1.14%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will the building be in close proximity of and accessible to applicable amenities?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.14%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Tra03 Cyclist facilities

No. of BREEAM credits available	2	Available contribution to overall score	2.29%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

What is the building type category (for the purpose of Tra03 issue assessment)?	Primary School

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will cycle storage spaces be provided?	Yes	2	1	N/A
Will cyclist facilities be provided?				N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.14%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Tra04 Maximum Car Parking Capacity

Assessment Issue Not Applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Building type category (for the purpose of Tra04 issue)?	
Buildings indicative Accessibility Index (sourced from issue Tra01)	

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will the building meet BREEAM's maximum parking capacity criteria for this building type/Accessibility Index?				

Total indicative BREEAM credits achieved	N/A
Total indicative contribution to overall building score	N/A
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Tra05 Travel Plan

No. of BREEAM credits available	1	Available contribution to overall score	1.14%

BREEAM 2011 New Construction Pre-Assessment Estimator

No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a transport plan based on site specific travel survey/assessment be developed?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.14%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

WATER	*Section Weighting*	6.00%	*Indicative Section Score*	4.00%

Wat01 Water Consumption

No. of BREEAM credits available	5	Available contribution to overall score	3.33%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

		Shell & Core option?
Select the level that corresponds closely to the target or likely water component specification?	Level 2 - Two credits	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.33%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Wat02 Water Monitoring

No. of BREEAM credits available	1	Available contribution to overall score	0.67%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will there be a water meter on the mains water supply to the building(s)?	Yes	1	1	N/A
Will metering/monitoring equipment be specified on the water supply to any relevant plant/building areas?	Yes			
Will all specified water meters have a pulsed output?	Yes			
If the site/building has an existing BMS connection, will all pulsed meters be connected to the BMS?	N/A			

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.67%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Wat03 Water Leak Detection and Prevention

No. of BREEAM credits available	2	Available contribution to overall score	1.33%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a mains water leak detection system be installed on the building's mains water supply?	Yes	1	1	N/A
Will flow control devices be installed in each sanitary area/facility?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.33%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Wat04 Water Efficient Equipment

No. of BREEAM credits available	1	Available contribution to overall score	0.67%
No. of BREEAM innovation credits available	No	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will water efficient irrigation methods and/or vehicle wash systems (if relevant) be installed?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.67%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

MATERIALS	*Section Weighting*	12.50%	*Indicative Section Score*	5.77%

Mat01 Life Cycle Impacts

No. of BREEAM credits available	6	Available contribution to overall score	5.77%
No. of BREEAM innovation credits available	1	Minimum standards applicable	No

Pre-Assessment question/criteria

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits to be achieved		
Select the number of BREEAM credits being targeted for the Mat01 issue	2	BREEAM Innovation credits	

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.92%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	N/A

Comments/notes:

Mat02 Hard Landscaping and Boundary Protection

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will ≥80% of all external hard landscaping and boundary protection achieve a Green Guide A or A+ rating?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.96%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Mat03 Responsible Sourcing

No. of BREEAM credits available	3	Available contribution to overall score	2.88%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits		
Select the number of BREEAM credits being targeted for the Mat03 issue	1	BREEAM Innovation credits	
Will all timber used on the project be sourced in accordance with the UK Govt's Timber Procurement Policy?	Yes		

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.96%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Mat04 Insulation

No. of BREEAM credits available	2	Available contribution to overall score	1.92%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Is the building targeting an insulating index of 2 or more?	Yes	1	1	N/A
Will the building's insulating materials be responsibly sourced?	No	1	0	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.96%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Mat05 Designing for Robustness

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will suitable durability/protection measures be specified and installed to vulnerable areas of the building?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.96%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

WASTE	*Section Weighting*	7.50%		*Indicative Section Score*	5.00%

BREEAM 2011 New Construction Pre-Assessment Estimator

Wst01 Construction Waste Management

No. of BREEAM credits available	4	Available contribution to overall score	5.00%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Pre-Assessment question/criteria

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits to be achieved		
Select the number of BREEAM credits being targeted for the Wst01 issue	3	BREEAM Innovation credits	

Total indicative BREEAM credits achieved	3
Total indicative contribution to overall building score	3.75%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

Wst02 Recycled Aggregates

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	1	Minimum standards applicable	No

Pre-Assessment question/criteria

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits to be achieved		
Select the number of BREEAM credits being targeted for the Wst02 issue	0	BREEAM Innovation credits	

Total indicative BREEAM credits achieved	0
Total indicative contribution to overall building score	0.00%
Total indicative BREEAM innovation credits achieved	0
Indicative minimum standard(s) level	N/A

Comments/notes:

Wst03 Operational Waste

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will appropriate facilities for the storage of operational recyclable waste volumes be provided?	Yes	1	1	N/A
If relevant, will a static waste compactor(s) or baler(s) be specified/installed?	N/A			N/A
If relevant, will a vessel for composting suitable organic waste be specified/installed?	N/A			N/A
Will there be a school recycling policy and operational procedures provided when the building is complete?	Yes			N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.96%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

BREEAM 2011 New Construction Pre-Assessment Estimator

Wst04 Speculative Floor and Ceiling Finishes

Assessment Issue Not Applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?

Total indicative BREEAM credits achieved	N/A
Total indicative contribution to overall building score	N/A
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

LAND USE & ECOLOGY	*Section Weighting*	10.00%	*Indicative Section Score*	8.00%

LE01 Site Selection

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will at least 75% of the proposed development's footprint be located on previously been developed land?	Yes	1	1	N/A
Is the site deemed to be significantly contaminated?	No	1	0	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

LE02 Ecological Value of Site and Protection of Ecological Features

No. of BREEAM credits available	1	Available contribution to overall score	1.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Can the land within the construction zone be defined as 'land of low ecological value'?	Yes	1	1	N/A
Will all features of ecological value surrounding the construction zone/site boundary be protected?	Yes			N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

LE03 Mitigating Ecological Impact

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

BREEAM 2011 New Construction Pre-Assessment Estimator

Pre-Assessment question/criteria	
What is the likely change in ecological value (plant species richness) as a result of the sites development?	No negative change or improvement in plant species richness

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	2.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	Pre-Assessment result indicates the minimum standards for Outstanding level

Comments/notes:

LE04 Enhancing Site Ecology

No. of BREEAM credits available	3	Available contribution to overall score	3.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will a suitably qualified ecologist be appointed to report on enhancing and protecting site ecology?	Yes	3	2	N/A
Will the suitably qualified ecologists general recommendations be implemented?	Yes			
What is the targeted/intended improvement in ecological value as a result of enhancement actions?	Small improvement in plant species richness			

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	2.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

LE05 Long Term Impact on Biodiversity

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will the building meet BREEAM's mandatory criteria for this BREEAM issue?	Yes	2	2	N/A
Will a Biodiversity Champion be appointed to monitor/minimise impacts of site activities on biodiversity?	Yes			
Will the contractor provide training for the site workforce on how to protect ecology during the project?	Yes			
Will the contractor record actions to protect biodiversity and monitor their effectiveness during construction?	Yes			
Will a new ecologically valuable habitat, appropriate to the local area, be created?	Yes			
Where flora/fauna habitats exist on site, will the contractor programme site works to minimise disturbance?	Yes			
Will a partnership be set up by the design team with a local group that has wildlife expertise?	Yes			

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	2.00%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

POLLUTION	*Section Weighting*	10.00%	*Indicative Section Score*	5.38%

Pol01 Impact of Refrigerants

No. of BREEAM credits available	3	Available contribution to overall score	2.31%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will refrigerant containing systems be installed in the assessed building?	Yes	2	0	N/A
Is the Global Warming Potential of the specified refrigerant(s) likely to be 10 or less?	No			
What is the target range Direct Effect Life Cycle CO_2eq. emissions for the system?	>1000	*kgCO2eq/kW coolth capacity*		
Will a refrigerant leak detection and containment system be specified/installed?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.77%

BREEAM 2011 New Construction Pre-Assessment Estimator

Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Pol02 NO_x Emissions

No. of BREEAM credits available	3	Available contribution to overall score	2.31%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response		Shell & Core option?
Please enter the target/maximum NO_x emission level for space heating/cooling system	59.00	*mg/kWh*	N/A
Please enter the target/maximum NO_x emission level for the water heating system	59	*mg/kWh*	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.54%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Pol03 Surface Water Run off

No. of BREEAM credits available	5	Available contribution to overall score	3.85%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
What is the actual/likely annual probability of flooding for the assessed site?	Low	2	2	N/A
Will a compliant Flood Risk Assessment be undertaken?	Yes			N/A
Will the site meet the BREEAM criteria for peak rate surface water run off?		1	0	N/A
Will the site meet the criteria for surface water run off volume, attenuation and/or limiting discharge?		1	0	N/A
Will the site be designed to minimise watercourse pollution in accordance with the BREEAM criteria?		1	0	N/A

Total indicative BREEAM credits achieved	2
Total indicative contribution to overall building score	1.54%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Pol04 Reduction of Night Time Light Pollution

No. of BREEAM credits available	1	Available contribution to overall score	0.77%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will the external lighting be designed to reduce light pollution?	Yes	1	1	N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.77%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

Pol05 Noise Attenuation

BREEAM 2011 New Construction Pre-Assessment Estimator

No. of BREEAM credits available	1	Available contribution to overall score	0.77%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved	Shell & Core option?
Will there be, or is there noise-sensitive areas/buildings within 800m radius of the development?	Yes	1	1	
Will a noise impact assessment be completed and, if applicable, noise attenuation measures specified?	Yes			N/A

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	0.77%
Total indicative BREEAM innovation credits achieved	N/A
Indicative minimum standard(s) level	N/A

Comments/notes:

INNOVATION	*Section Weighting*	10.00%	*Indicative Section Score*	1.00%

Inn01 Innovation

No. of BREEAM innovation credits available	10	Available contribution to overall score	10.00%
		Minimum standards applicable	No

Pre-Assessment question/criteria	Exemplary level achieved	Credits available	Indicative credits achieved
Man01 Sustainable Procurement	No	1	0
Man02 Responsible Construction Practices	Yes	1	1
Hea01 Visual Comfort	No	1	0
Ene01 Reduction of CO2 Emissions	No	5	0
Ene04 Low and Zero Carbon Technology	No	1	0
Ene05 Energy Efficient Cold Storage	N/A	N/A	N/A
Wat01 Water Consumption	No	1	0
Mat01 Life Cycle Impacts	No	1	0
Mat03 Responsible Sourcing of Materials	No	1	0
Wst01 Construction Waste Management	No	1	0
Wst02 Recycled Aggregates	No	1	0

Total indicative BREEAM credits achieved	1
Total indicative contribution to overall building score	1.00%
Indicative minimum standard(s) level	N/A

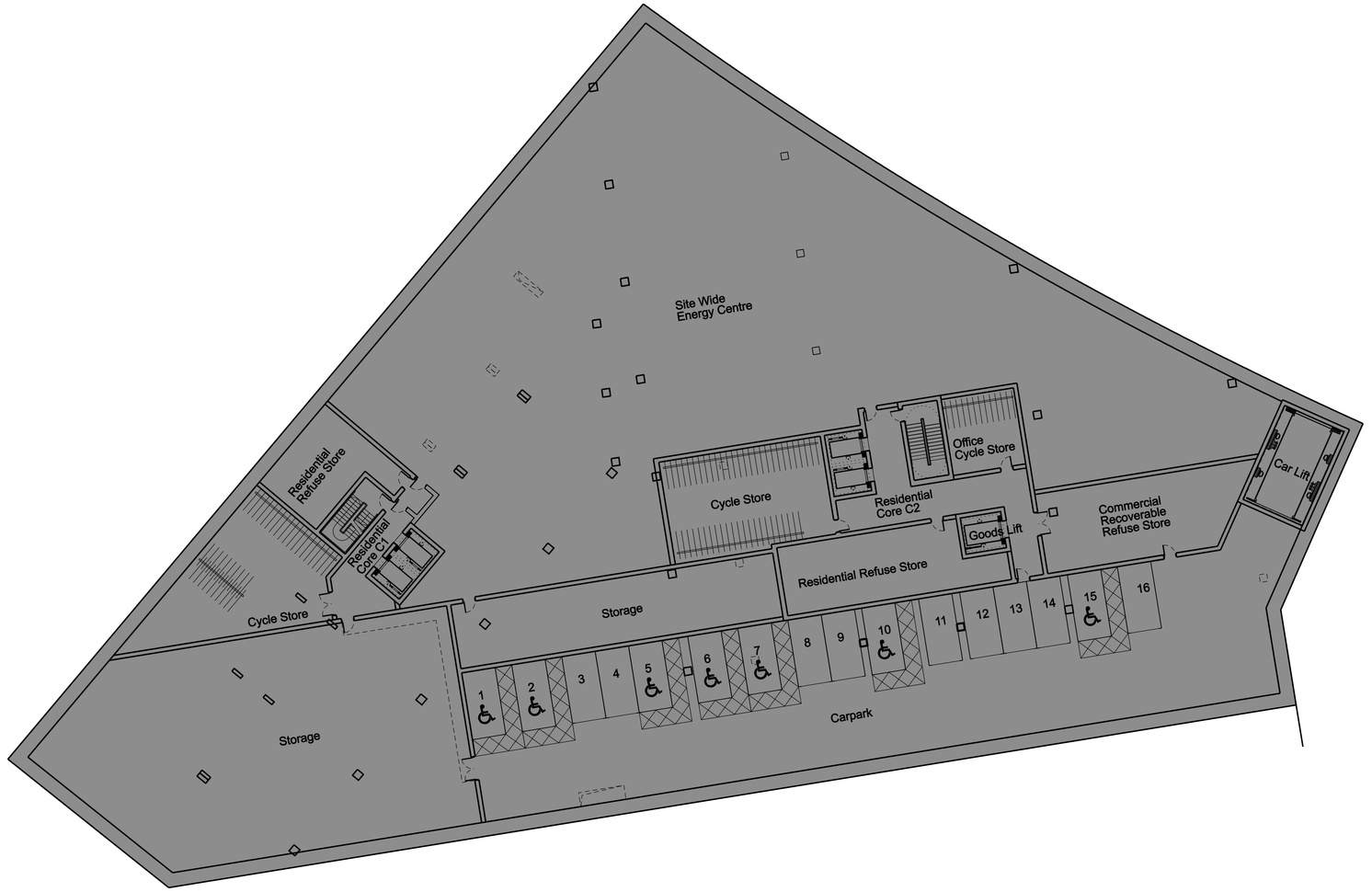
Comments/notes:

Technical Information

Appendix F – Energy Centre location

Area C Basement drawing identifying location of Site Wide Energy Centre

Site distribution of heating, cooling and electricity networks



1:200

0 2m 4m 6m 8m 10m 15m 20m

General Notes

1. Dimensions are in millimetres unless stated otherwise.
2. Levels are in metres AOD unless stated otherwise.
3. Dimensions govern. Do not scale off drawing.
4. All dimensions to be verified on site before proceeding.
5. All discrepancies to be notified in writing to make architects.

Rev	Date	Reason For Issue	Chk
A	18.04.11	Design Freeze	

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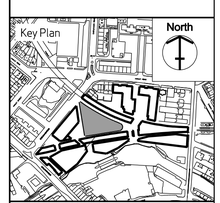
Client
Stanley Sidings Ltd
&
Chelsfield Ltd

Key Plan



Project
Camden Lock Village

Drawing Title
Site C
Level -02

Scale	Paper Size	Date
1:200	@A1	09.03.11

Project No.	Draw No.	Rev. No.
0180	P4998	A

LTHW primary distribution

CHW primary distribution

Cold water primary distribution

Electrical primary distribution

School boundary line
Subject to outline application

SCHOOL OUTLINE IS INDICATIVE ONLY FOR
MORE INFORMATION REFER TO OUTLINE APPLICATION DRAWINGS

Plant

Plant

1 Hawley Rd

Plant

B

School

C1

C2

Chillers

CHP

HV Intake

Boilers

Cold Water
Storage

A

A

Plant

D

REV	DESCRIPTION	BY	CH'K	APP	DATE
00	For Information	ILH	MMc	NDB	Sep 11

CLIENT
Stanley Sidings

ARCHITECT
Make / AHMM

PROJECT
Camden Village Market

TITLE
Site Services Distribution

ELEMENT			DISCIPLINE	
			M & E	
PROJECT NO.			SCALE	SHEET SIZE
8127			NTS	A0
DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
ILH	Sep 11	MMc	Sep 11	NDB	Sep 11

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E: BUILDING.SERVICES@GRONTMIJ.CO.UK
W: WWW.GRONTMIJ.CO.UK

GRONTMIJ LIMITED
REGISTERED OFFICE: GROVE HOUSE, MANSION GATE DRIVE
REGISTERED IN ENGLAND NO 2748664

DRAWING NO. 8127 C 8001

REV 00

Appendix G – Liquid Bio – Fuel Information

Email from Dresser-Rand re. CCHP warranty and maintenance
From: Abloom@Dresser-Rand.com
To: Martin.Lema-Trillo@rpreston.com
Sent: Tue 26/05/2011 13:31
Subject: FW: Bio-Diesel CCHP
Martin, further to your recent discussions with Joe Knowles I'm sure your aware of the biodiesel CHP Project we have recently installed at the PWC offices at 7 More, London. For this project we worked in conjunction with RPP to provide the zero carbon building the client was seeking. If you would like to visit this installation we can arrange. With regard to the operating parameters associated with Biodiesel we would advise as follows:
Manufacturer's Warranty: The standard Dresser-Rand warranty for all new equipment is 12 months from commissioning or 18 months from delivery, whichever is the sooner, and this applies to all CHP products including those fired with biodiesel B100 to BS En 14214. It should be noted however that Dresser-Rand can offer fully inclusive maintenance contracts on all CHP equipment covering all maintenance requirements and offering a guaranteed level of system availability. The maintenance contract is supported by 24/7 remote monitoring and control of the system, and emergency attendance designed to protect the customer asset and ensure the guaranteed availability and performance are achieved.
Maintenance Regime: The maintenance of biodiesel CHP can vary significantly from the more familiar natural gas fired CHP systems and all major differences relate to the fuel. In summary there are:

- Fuel condition must be maintained in storage to avoid degradation and to keep viscosity in the required range. Generally this requires the fuel temperature to be maintained between 15 and 25 degC, and never to be above 40 degC in the storage tanks, and for a degree of recirculation to be allowed to eliminate standing pockets of fuel. This recirculation can be provided by return of unburnt fuel from the engine system.
- Fuel will also deteriorate over time, and generally a maximum "shelf" life of six months is quoted. Careful design of the fuel storage, use and ordering processes are needed to ensure the fuel remains suitable for use in the engine.
- Over time, fuel can leach into the engine lubricating oil system which has the effect of destroying the lubrication properties of the oil. It is recommended that more frequent sampling of the oil be carried out to assess the degree and rate of contamination. In addition, Dresser-Rand offer an extended oil system which provides additional protection to the engine and minimises the number of oil changes required.
- The most vulnerable component of the engine when using biodiesel fuel are the injectors which are intolerant of poor quality and contaminated fuel. It can be anticipated that more frequent attention and replacement will be needed to these and other fuel system components.

Other components of the engine will experience similar maintenance requirements and wear to those of a normal diesel engine, and by using the extended lubrication system, service intervals in terms of hours run should also be similar. Overall maintenance costs will be marginally higher than for a standard diesel engine operating a similar regime.
Should you require any further information please don't hesitate to contact me.

Regards

Adam Bloom
Business Development Manager
CHP Solutions Business Unit
Dresser-Rand Company Ltd

Tel: +44 (0) 1733 292212
Fax: +44 (0) 1733 292300
Mobile: + 44 (0) 7983 588286
Email: abloom@dresser-rand.com
www.dresser-rand.com

Email from AL-BIOSCIENCES re. Fuel blend and delivery quantities

Email
From: al-bioservices@tiscali.co.uk
To: Martin.Lema-Trillo@rpreston.com
Sent: Sun 31/05/2011 20:43
Subject: Re: Bio –Diesel Availability

Hi Martin,
Just to confirm,
B100 to EN14213 standard as attached report made from UCO for CHP from our Essex depot Available 26,000 litres tanker delivery or IBC's approx price 0.99ppl delivered London.

Many thanks
Angela AL-BIOSERVICES

Attached Report

Date of Receipt:	Date of Report:	Report No: AL00
Customer:		
Job No:	PO No:	
Sample /Batch Number:-		
Sample Date:-		
Location:-		

TECHNICAL CENTRE:- UNIT 6A KAY BROW COMPLEX, KAY BROW, RAMSBOTTOM, BURY. BL0 9AY.
TEL: 01706 82 2521 / 07894071986. EMAIL:- al-bioservices@tiscali.co.uk www.al-bioservices.co.uk

Diglyceride content				0.20
Triglyceride content				0.20
Free glycerol				0.02
Cold Filter Plugging Point, ^{o}C		EN 116	Climate related	
Pour point, ^{o}C		ISO 3016		0
Net calorific value (calculated), MJ/kg		DIN 51900	35	

EN 14213:2003	Results	METHODS	Specification	
			Min	Max
Density @ 15^{o}C		EN ISO 12185	860	900
Viscosity @ 40^{o}C		EN ISO 3104	3.50	5.00
Flash Point		EN ISO 3679	120	-
Sulphur content		EN ISO 20846 EN ISO 20884	-	10
Carbon residue		EN ISO 10370	-	0.30
Sulphated ash		ISO 3987	-	0.02
Water content		EN ISO 12937	-	500
Total contamination		EN 12662	-	24
Oxidation stability, 110^{o}C		EN 14112	4.0	-
Acid value		EN 14104		0.50
Iodine value		EN14111		130
Polyunsaturated methyl esters		EN 14103		1
Ester content			96.5	
Monoglyceride content		EN 14105 / 6		0.80

Appendix H – Photovoltaics Information

Contents

INTERNAL LAYOUTS ARE ONLY INDICATIVE

AREA B BOUNDARY

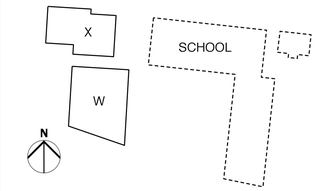
BOUNDARY OF OUTLINE APPLICATION

REV	DATE	
A	17/08/2011	Revisions from Access and M&E comments
-	26/06/2011	Detailed Residential Layouts for comment and co-ordination

NOTE

1. Do not scale from this drawing, other than for Planning purposes.
2. All dimensions to be checked on site by the contractor and such dimensions to be his responsibility.
3. Report all drawing errors, omissions and discrepancies to the architect.
4. This document may be issued in an uncontrolled CAD format to enable others to use it as background information to make alterations and/or additions. In that instance the file will be accompanied by a PDF version. It is for those making such alterations and additions to ensure that they make use of current background information. AHMM Ltd accepts no liability for any such alterations or additions to the background information or arising out of changes to background information which occur prior to alterations of additions being made.

LOCATION



ALLFORD HALL MONAGHAN MORRIS
ARCHITECTS Ltd
2ND FLOOR, BLOCK C, 5-23 OLD STREET LONDON EC1V 9HL
TEL 020 7251 5261 FAX 020 7251 5123 WEB WWW.AHMM.CO.UK

job title
HAWLEY WHARF

drawing title / location
PRELIMINARY ROOF PLAN

drawn by	checked	scale	status
MM	WL	1:200@A1; 1:400@A3	PRELIMINARY

project	zone	source	CI/SfB ref	drawing no.	revision
09175	S	-	P	B4009	A

Note:
Indicative internal layout

BB
P6200

AA
P6200

Roof Top Plant

1 2 3 4 5 6 7

1 2 3 4 5 6 7

1 2 3 4 5 6 7

1 2 3 4 5 6 7

1 2 3 4

1 2 3 4 5 6 7

1 2 3 4 5 6 7

1 2 3 4 5

1:200

0 2m 4m 6m 8m 10m 15m 20m

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Rev	Date	Reason For Issue	Chk

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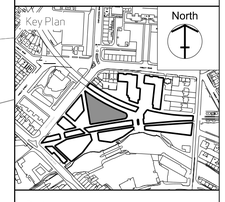
www.makearchitects.com

Client
Stanley Sidings Limited

Key Plan



Project
Camden Lock Village

Drawing Title
Area C
Building 2
Roof Plan

Scale	Paper Size	Date
1:200	@A1	30.09.11

Project No.	Draw No.	Rev. No.
0180	P6010	A