187 Kentish Town Road
Sustainability and Energy Statement

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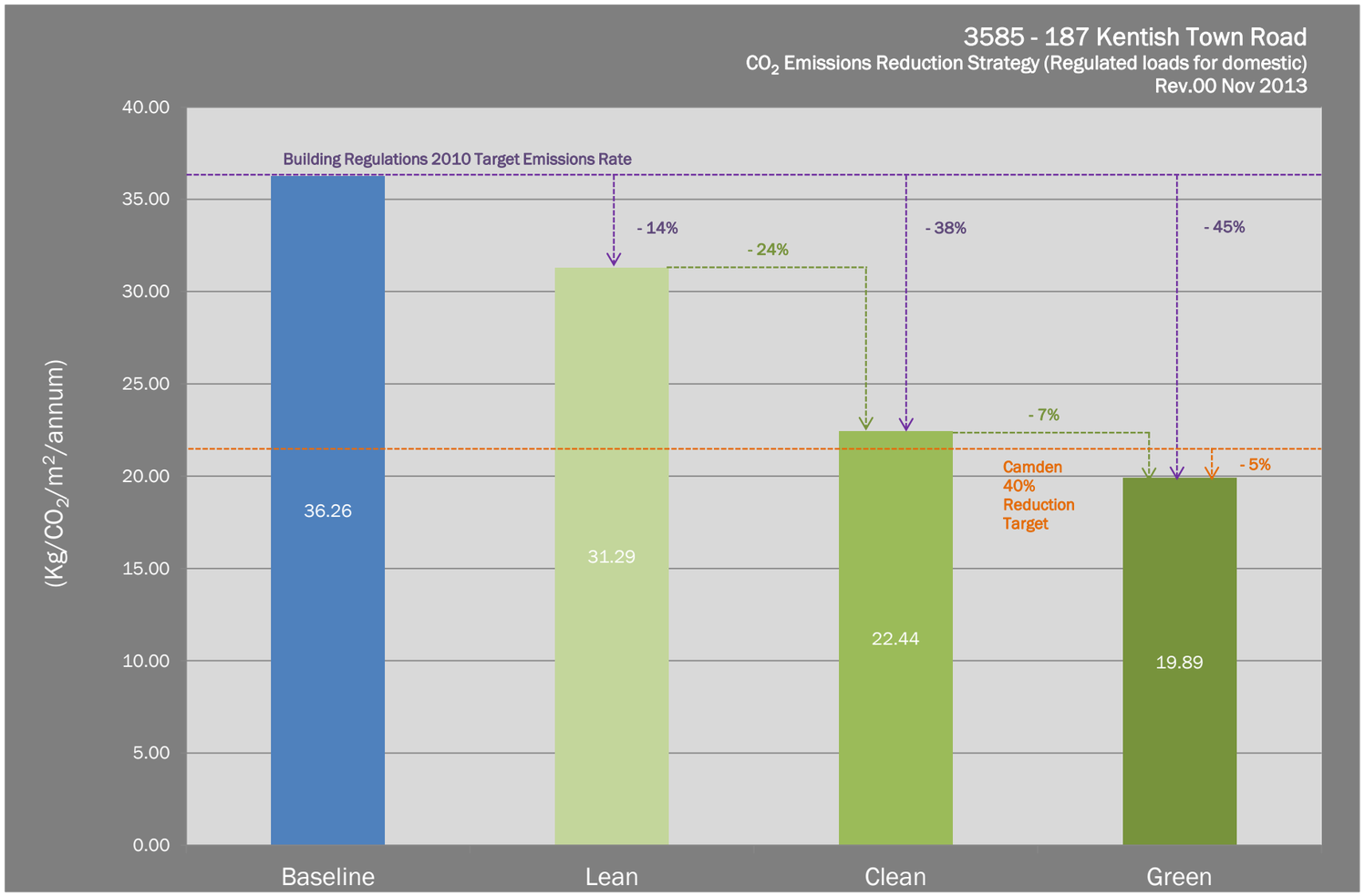

EXECUTIVE SUMMARY

This sustainability and energy statement is prepared in support of the planning application for the development at 187 Kentish Town Road on behalf of Redview Properties Ltd. Code for Sustainable Homes (CSH) pre-assessment is included in the benchmarking section of this report.

This statement summarises the policy drivers and benchmarking standards applicable to the proposed development at 187 Kentish Town Road in the London Borough of Camden. The existing building at 187 Kentish Town Road was a restaurant - a single volume with a mezzanine, but is now boarded up. The proposed development of 187 Kentish Town Road is mixed-use. The façade is to be retained and the ground floor refurbished into a core and shell retail unit. Above the retail unit three floors of residential apartments have been proposed. There will be 9 new dwellings in total.

Current regional and local planning policy stipulates that sustainability must be integral to any new development. Camden's Core Strategy, adopted in 2010, requires all new housing to achieve a CSH 'Level 4' (as of 2013). The retail unit is exempted by Camden Council from a BREEAM assessment as it was deemed too small (<500m^2) to be assessed under BREEAM scheme.

This restatement summarises the pre-assessment of the proposed new residential accommodation at 187 Kentish Town Road and presents how a CSH 'Level 4' rating will be achieved. This statement confirms that the development is expected to achieve CSH 'Level 4'.

The residential element is estimated to meet and exceed Building Regulations Approved Document L1A (2010) and achieve the 40% energy reduction over the TER set by regional and local planning policy. This has been achieved by implementing the Lean, Clean & Green energy hierarchy strategy as suggested by the London Plan. The residential element proposes to use separate packaged ASHPs for each dwelling in conjunction with an efficient immersion heater to accommodate the domestic hot water demand.

The retail unit on the ground floor is expected to meet the Building Regulations Approved Document L2A (2010) by a means of passive design measures and low energy building systems.

INTRODUCTION

Atelier Ten have prepared this sustainability and energy statement and Code for Sustainable Homes (CSH) pre-assessment report on behalf of Redview Properties Ltd. in support of the planning application for the proposed new development at 187 Kentish Town Road in the London Borough of Camden.

The development proposals consist of four storeys with the retention of the existing façade. The ground floor restaurant will be refurbished into a core and shell retail unit. In addition, the three floors above the retail unit will consist of nine new apartments on three floors.

This report sets out the sustainability strategy for the new development in response to the Borough of Camden planning requirements. By adopting a sustainable approach in design, construction and operation, the proposed development aims to meet the requirements of the local planning policies and exceed them wherever technically, functionally and economically feasible.

To demonstrate the sustainability performance of the proposed development, Atelier Ten has reviewed the development proposal using an appropriate sustainability assessment tool. The new housing units have been assessed under Code for Sustainable Homes (November 2010). The ground floor retail unit does not require assessment under the BREEAM benchmarking scheme because it is less than 500 m^2.

The Energy section of this report presents calculations demonstrating compliance with the Approved Document (AD) L1A for the new residential developments and Approved Document (AD) L2A for the new core and shell retail unit.

PANNING POLICY

The following planning policies are applicable to the proposed development at 187 Kentish Town Road. This section briefly assesses relevant policies and sustainability and benchmarking standards at the national, regional and local levels.

The development is not considered a major development because it proposes less than 10 dwellings to be constructed and therefore LP major development policies are not a requirement. As the retail unit is <500 m^2 it is only required to meet Building Regulations.

National Planning Policy Framework

The National Planning Policy Framework (NPPF) is a key part of the Government's reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. It sets out the Government's planning policies for England and how these are expected to be applied.

The London Plan

The London Plan (LP) 2011 with Revised Early Minor Alterations (REMA) 2013 sets out the spatial development strategy for London. It is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of the capital until 2031. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the LP, and its policies guide decisions on planning applications by councils and the Mayor.

The following policies only apply to major development however, effort will be made to meet the targets.

Policy 5.2: Minimising Carbon Dioxide Emissions requires all new residential buildings to achieve a 25% improvement on Part L (2010) of the Building Regulations between 2010 and 2013, 40% improvement between 2013 and 2016 and be carbon zero beyond 2019. It also requires all major new non-domestic buildings to achieve a 25% improvement on Part L (2010) of the Building Regulations between 2010 and 2013, 40% improvement between 2013 and 2016 and be carbon zero beyond 2019.

The minimum targets for residential buildings to be achieved by 2013 are equivalent to the minimum CO_2 emissions requirements for CSH 'Level 4'. The minimum targets for non-domestic buildings to be achieved by 2013 are approximately equivalent to the minimum CO_2 emissions requirements for BREEAM New Construction (NC) 'Excellent' rating, although this is not relevant to the 187 Kentish Town Road development.

Policy 5.7: Renewable Energy requires all major development proposals to provide a reduction in expected CO_2 emissions through the use of on-site renewable energy generation, where feasible.

In the LP 2011 there is a presumption that all major development proposals will seek to reduce CO_2 emissions by at least 20% through the use of on-site renewable energy generation, wherever feasible.

Policy 5.15: Water Use and Supplies requires designing all residential developments so that mains water consumption would meet a maximum target of 105litres/person/day. This target is equivalent to the minimum requirement for water consumption for CSH 'Level 3' and 'Level 4'.

London Housing Strategy (Feb 2010)

The London Housing Strategy (LHS) is London's first statutory housing strategy and was published in February 2010.

Policy 2.2D requires all new publicly funded homes to meet at least CSH 'Level 4' by 2011.

Policy 2.1B requires all new homes to be built to Lifetime Homes standards and at least 10% to be wheelchair accessible.

The LHS requires all homes developed with public funding to deliver high quality in line with the London Housing Design Guide from 2011.

Housing Supplementary Planning Guidance (Nov 2012)

The Housing Supplementary Planning Guidance (SPG) provides guidance on how to implement the housing policies in the LP 2011. As SPG, it is a material consideration in drawing up development plan documents and in taking planning decisions.

Standard 6.1.1 requires all new residential developments to achieve a minimum of CSH 'Level 4'.

London Borough of Camden (ADOPTED 2010)

The London Borough of Camden (LBC) Core Strategy (adopted 2010) with accompanying Development Policies (2010) is the main document in their Local Development Framework (LDF), the suite of documents which defines the borough's planning policy. The documents reflect both the wide national and regional sustainable design objectives alongside Camden's own goals for sustainable construction within the borough.

Camden's key sustainability objectives outlined the Core Strategy are:

- Making Camden more sustainable and tackling climate change, in particular improving the environment performance of buildings, providing decentralised energy and heating networks, and reducing and managing water use;
- Promoting a more attractive environment through securing high quality places, conserving the local heritage, providing parks and open spaces, and encouraging biodiversity;
- Dealing with the local waste and increasing recycling.

The issues that these key sustainability objectives raise are addressed within the following policies:

- Core Strategy CS13 – Tackling climate change through promoting higher environmental standards.
- Core Strategy CS14 – Promoting high quality places and conserving the heritage.
- Core Strategy CS15 – Protecting and improving our parks and open spaces and encouraging biodiversity.
- Core Strategy CS18 – Dealing with our waste and encouraging recycling.
- Development Policy DP22 – Promoting sustainable design and construction.
- Development Policy DP23 – Water.

Camden have also developed a companion document to their sustainability framework called "Camden Policy Guide 3: Sustainability" (CPG 3), published in 2011. CPG 3 gives further guidance on how proposals are expected to meet the high level policy for development.

CAMDEN PLANNING POLICIES –HEADLINE TARGETS

- New-build housing to meet Code for Sustainable Homes 'Level 4' including;
  - Achieve at least 50% of available credits in the Energy category of the CSH assessment.
  - Achieve at least 50% of the available credits in the Water category of the CSH assessment.
  - Achieve at least 50% of the available credits in the Materials category of the CSH assessment.
  - Schemes must incorporate green or brown roofs and green walls whenever suitable.
  - Developments over 10 units should include grey water recycling
- Housing developments (not new build) should achieve a BREEAM Domestic Refurbishment rating 'Very Good' ('Excellent' is encouraged) (not relevant to 187 Kentish Town Road).
- Non-domestic developments should achieve a "Very Good" BREEAM rating (not relevant to 187 Kentish Town Road).
- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies.
- Consider local energy generation and networks through a local energy generation and distribution system served by combined heat and power (CHP).
- Maximum potable water used in homes and workplaces should not exceed 50% of the total water demand.

GREEN ACTION FOR CHANGE

Green Action for Change 2011- 2020 replaced the sustainability plan Delivering a Sustainable Camden (2008-2012). It focuses on the key environmental issues on which the Council and additional partners can have the biggest impact:

- Reducing Camden's carbon emissions;
- Adapting to climate change;
- Reducing, reusing and recycling waste;
- Enhancing biodiversity, improving green spaces and involvement in gardening and food growing.

Summary of Targets for 187 Kentish Town Road

In line with the National, Regional and Local Planning Policies the following benchmarking standards are targeted:

- New-build housing to achieve CSH 'Level 4' rating (minimum 68 points).
- Achieve 40% improvement over ADL1A for new dwellings.
- Achieve compliance with Building Regulations AD2LA for core and shell retail unit on ground floor.

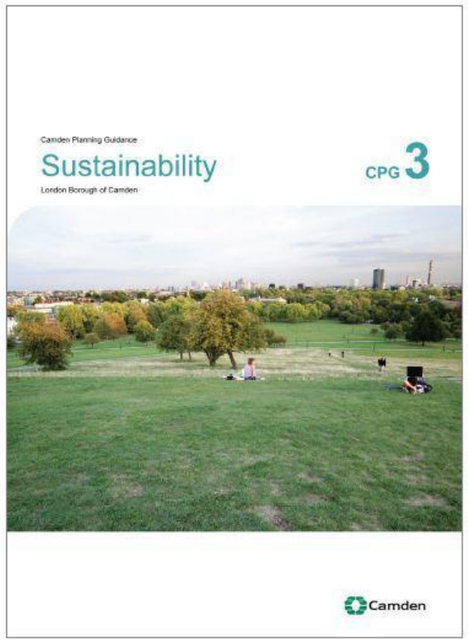

Figure 3 Camden Planning Guidance 3 – Sustainability

SUSTAINABILITY PROPOSALS

The sustainability strategy for the site is driven by planning policies relevant to the development on the site. The proposals covering the main sections of CSH are briefly discussed in this section. Full CSH targets are given in the appendices and summarised in subsequent sections.

MATERIALS

The façade of the building is being retained thus significantly reducing the embodied energy of the development. The re-use of the existing façade would more than comply with the Council's requirements to use 10% recovered and recycled materials. The design team aspires to source construction materials from local sources, wherever practicable. A detailed description of the construction materials used in the building has been provided in the Design and Access statement.

ECOLOGY

At present the site has minimal living/ecological elements to it. As part of the proposals outdoor space, garden decks and winter gardens are proposed to be provided. As well as being aesthetically pleasing, the gardens will be designed to provide indigenous planting suited to the location and aspect. Creation of green spaces and will reduce the urban heat island effect and will assist in stormwater attenuation, in addition to adding biodiversity to the area.

WATER

Water consumption will be minimised for the new development. This will be achieved through the use of water conserving appliances such as low flow wash hand basins and dual flush toilets. A number of water conservation strategies are being examined, which include grey water recycling and treatment systems. Measures to reduce the peak storm water runoff against the current entirely hard standing condition include the use of soft landscaping. Water baths are to be provided to reduce the use of potable water required for irrigation and watering plants on site.

TRANSPORT

187 Kentish Town Road is ideally placed to encourage the use of public transport and is well connected to local amenities, which reduces the need to travel long distances. Cycle storage facilities will also be provided.

WASTE

A Site Waste Management Plan (SWMP) will be developed and implemented. This will enable reduction and effective management of site construction waste. By reusing the existing building structure, usage of a significant amount of new construction materials has been avoided. At the same time it will result in a reduction in demolition waste. An adequate dedicated storage space for recyclable waste will be provided in the development. This will enable efficient waste sorting and storage during the building's operation.

ENERGY

An energy hierarchy of lean clean and green has been followed to reduce energy use in running the development. The building will be designed to minimise the CO_2 emissions associated with its operational energy consumption. Energy-efficient light fittings will be specified for internal and external areas of the building. Internal light fittings will be controlled through daylight and occupancy sensors according to the space type. External light fittings will be controlled through a time switch and daylight sensor to prevent operation during daylight hours.

Advanced low energy building services systems such as Air Source Heat Pumps and Photovoltaic Panels have been proposed to ensure that energy consumption is reduced to service the building. Efficiency measures can be found in the Energy section of this report.

Passive design has been prioritised with enhanced solar control integrated in the facades to reduce solar gains in summer and thereby reduce the energy consumed to cool the building. The highly insulated and air-tight building envelope will minimise heat losses and keep heating requirements to a minimum.

MANAGEMENT

The Considerate Constructors Scheme will be implemented and construction site impacts will be monitored and managed. A Home User Guide has been proposed for efficient aftercare and security of the buildings.

HEALTH & WELLBEING

New dwellings will be provided with private outdoor space to improve the occupiers' quality of life where feasible. Due to the nature of the development having to retain an existing facade, there are limitations to how feasible this is for some dwellings. Lifetime Homes will be adopted to ensure homes are accessible to everybody and the layout can easily be adapted to fit the needs of future occupants.

SURFACE WATER RUNOFF

The development site is in a low probability zone for river flooding. Surface water runoff will be assessed and the peak rate of runoff will be no greater than it was for the pre-development site events. The volume of runoff is potentially reduced using infiltration in the ecological aspects of the new development.

ENERGY

This part of the statement describes the current energy strategy being proposed for 187 Kentish Town Road. This energy strategy aims to ensure that services are reliable, self-sufficient and adopt low carbon solutions to meet the requirements of the current development. As part of the design, a number of measures have been incorporated into the proposals to maximise the energy efficiency of the development and minimise the associated carbon emissions. A hierarchy of measures have been followed which broadly equates to the following:

1. Passive Design Prioritisation
2. Active Systems Optimization
3. Renewable Energy Systems

The following sections outline the key proposals under each of the levels of the hierarchy noted above. With regards to passing UK Building Regulations - Approved Document Conservation of Fuel and Power in New Dwellings Part L1A 2010 – the proposed system is compliant on all levels regarding standards for building services and the envelope fabric. To comply with Code for Sustainable Homes level 4, carbon intensities must be reduced by 25% from the Target Emission Rate (TER) outlined in the Approved Document Part L1A.

In addition to this, Camden Council requires that all new residential developments must reduce the level of carbon emissions as a minimum of 40% over building regulations. This is consistent with the regional and local planning policy.

There are currently no specific energy reduction targets required by regional and local policy requirements for commercial spaces under the area of 500m2. It is required that commercial spaces of this size and scale must meet the requirements of UK Building Regulations - Approved Document Conservation of Fuel and Power in New buildings other than dwellings - Part L2A 2010.

The following sections will highlight the measures taken to reduce the dwelling emission rate and building emission rate to demonstrate compliance with policy requirements.

PASSIVE DESIGN MEASURES

The energy efficient building design of the development will minimise the need for energy in operation while maximizing the comfort of users during the lifetime of the building. The integration of passive design principles will enable the building to be less reliant on HVAC systems and minimise dependence on artificial lighting, taking advantage of natural energy flows to maintain thermal comfort.

To limit heat losses across a number of elements, measures have been implemented to improve fabric efficiency where technically and economically feasible. This includes high levels of insulation and airtightness. A list of the envelope target U-vaules are listed below.

Extensive design of the facades has been undertaken to maximise passive solar gains in wintertime, while minimising excessive sunlight penetration in summertime. This will also allow the flats to be naturally ventilated for comfort control. in summer and to reduce heating loads in winter. The development will target a design air permeability of 3m3/(h.m^2) at 50Pa through good detailing and high U-values to the facade of the proposed development. As well as improving the building fabric, efforts will be made to reduce and limit the level of cold thermal bridging at key junctions of the building façade. The proposed development is targeting a Thermal Bridging value of 0.1 (Y-value).

A secure drying space will be supplied to each dwelling. This provides a reduced energy means of drying clothes and avoid the use of tumble dryers. These measures are expected to drive significant energy and carbon savings for the overall building performance.

Assumed Fabric Parameters	
Element	
External Wall	0.14 W/m^2.K
Party Walls	0.10 W/m^2.K
Ground Floor	0.12 W/m^2.K
Roof	0.12 W/m^2.K
Windows, roof windows, rooflights, curtain walling and pedestrian doors	0.68 W/m^2.K
Vehicle access and similar large doors	0.7 W/m^2.K

ACTIVE SYSTEMS

By improving the energy efficiency of HVAC and DHW systems and lighting, the need for energy in operation during the lifetime of the development will be minimised. An individual packaged plant strategy is proposed to achieve higher efficiency, flexibility and security of supply throughout the development. A number of measures are proposed to minimise the energy consumption and consequential carbon emissions of the new build elements being constructed as part of the works. For the new build, these measures include the following:

- An efficient ventilation system with balanced heat recovery is proposed to ensure fresh air is distributed throughout each apartment to provide independent comfort for each tenant.
- Energy efficient lifts will be installed in the building.
- To further minimise the energy consumption, energy efficient internal and external lighting will be installed in each space and in the dwellings' winter gardens. The majority of fixed internal light fittings will be dedicated and energy efficient, i.e. Light Emitting Diodes (LEDs). All external space light fittings and security light fittings, including lighting in the common areas, will be dedicated, energy efficient and operated by control systems, such as Passive Infra Red (PIR) sensors and daylight cut-off sensors.
- To reduce the CO_2 emissions from appliance use in the dwellings, energy efficient labelled white goods will be supplied to each dwelling. Information on the EU Energy Efficiency Labelling Scheme of efficient white goods will be provided to each dwelling. Fridges and freezers or fridge-freezes will have an A+ rating, washing machines and dishwashers an A rating.
- Waste water heat recovery
- Energy display devices showing current electricity and gas consumption data will be installed in each dwelling, thus empowering occupants to reduce their energy use.

RENEWABLE AND LOW CARBON ENERGY

Despite pushing the passive and energy efficient systems of the building to near absolute technically feasibly limits, it is foreseen that the residential element of the development will not achieve the 40% improvement above the TER and hence not achieve the policy requirements that is required by Camden Council policy. It is therefore necessary to utilise renewable and low carbon energy to achieve the mandatory requirements.

In order to reduce the overall CO_2 emissions of the development in use, and meet and exceed the requirements set out by the current and future planning policies, the opportunities to effectively employ renewable technologies on the site have been examined. The following renewable and low carbon energy technologies are proposed for this project:

- Air Source Heat Pumps (ASHP)
- Photovoltaic Panels

The proposed development aims to comply with the ambitious targets of the Approved Document Conservation of Fuel and Power in New Dwellings (Part L1A) and to reach the minimum 25% reduction in carbon intensities compared to the TER as required by Code for Sustainable Homes ‘Level 4‘. In order to achieve this, a series of renewables and low carbon technologies are proposed.

In addition to the 25% energy reduction target required by CSH level 4, Regional and Local policy stipulate that all new residential dwellings must achieve a 40% improvement above Building Regulations Part L1A 2010.

In order to meet this ambitious target each dwelling will have a packaged ASHP - system proposed to meet the full heating capacity required for each dwelling independently.

A supplementary efficient electric immersion system will be used to provide supplementary domestic hot water heating.

A photovoltaic system will satisfy part of the electricity demand of the residential units. The effectiveness of the system is subject to the potential overshadowing from proposed surrounding buildings. It is expected that an area in the region of 16.32m^2 will be provided which will provide the dwellings with an approximate output of 3.1 kWp.

The use of solar thermal and wind power have been evaluated in detail. Due to the prioritisation of proposed technologies and the lack of space these technologies are not considered viable for the site.

Due to the concerns of Camden Council over air quality in the Borough, the use of biomass or biogas as a fuel has been disregarded. This is due to the high particulate matter and noxious emissions that can impact on local air quality.

CARBON REDUCTION CALCULATIONS

Part L and Policy Compliant Calculations

The carbon reduction calculations have been carried out to address the requirements of Part L 2010 of the Building Regulations as described in the Approved Documents L1A (ADL1A), L2A (ADL2A), Camden Council's and GLA's planning policies, SAP calculations have been undertaken for several typical residential apartments of the proposed development of 187 Kentish Town Road. The apartments modelled consist of two dwellings on the proposed 1st Floor of the development, and a flat on the top floor of the development. It is believed that this will give a worst case scenario for the development. The calculations do not include CO_2 emissions arising from cooking and appliances, and so the calculations primarily account for 'Regulated' loads to the proposed development.

The calculations for the residential element of the proposed development have been performed according to the most recent Government's Standard Assessment Procedure for Energy Rating of Dwellings (SAP 2009). A full list of results can be found on this page. Figure 1 (overleaf) shows the different scenarios and the respective carbon reduction of the Dwelling Emission Rate (DER) over the Target Emission Rate (TER). Figure 2 (overleaf) presents the proposed strategy and carbon emission reductions of the residential development including the contribution of renewables for the proposed development. A list of assumptions for the proposed design is shown as in Appendix B.

As the non-domestic areas of the development will be covered under ADL2A, an SBEM model has been created to demonstrate building regulations compliance. Allowance has been made to convert the associated equipment energy consumption (i.e non-Part L regulated in new buildings) into a carbon emission from the outputs of the software.

Residential Carbon Calculations

The Calculations show a series of steps in which are taken to meet the necessary sustainability criteria, achieve compliance to building regulations and a reduction of carbon emissions of the DER over the TER.

Be Lean – Passive Measures

To ensure that the building reduces dependency on natural resources, the carbon reduction associated with the proposed development has been reduced by adopting a 'Fabric First' approach. This will ensure that the proposed development will require less energy to heat the dwellings when required. By opting for a high performance building fabric and ensuring the dwelling is relatively air tight, the building will 'lose' less heat, making the dwelling a more comfortable and energy efficient building now and for the future.

With the impacts of Climate Change reported to substantially impact on the UK's traditional weather patterns, it is essential for all new buildings to be resilient to these impacts. It is expected that the average summer temperatures will rise over the next several decades.

By simply using better performing fabric parameters, than those proposed in ADL1A, the proposed development can achieve a reduction in the region of 14% below Building Regulations.

Be Clean – Active Systems

After firstly reducing the energy required to heat a dwelling, the next step in the energy hierarchy is to address the efficiency of how energy is distributed to each dwelling. It is assumed that through active measures to improve the efficiency of the building services, the proposed development can achieve a reduction in the region of 38% below Building Regulations. By using passive and active measures to reduce the carbon intensity of the development, the mandatory requirement to achieve CSH level for, 25% reduction, would be achieved.

Be Green – Renewable and Low Carbon Energy

As the development would not be policy compliant with simply maximising the efficiency of the building fabric and building systems, in order to achieve the minimum energy performance required under local Camden planning policy, it is mandatory to achieve a 40% reduction in Carbon emissions above TER. To achieve this, a packaged ASHP system with an efficient electric immersion for Domestic Hot Water is proposed for the development. A conservative coefficient of Performance (CoP) has been applied for the assumed contribution of the ASHP, a CoP of 3.5 with regard to heating has been targeted in conjunction with the optimised Passive & Active systems.

There is an opportunity to further reduce the DER by applying renewable energy in the form of PV panels as well as applying an ASHP system. Using available roof space for monocrystalline PV panels reduces the DER over the TER by approximately 45%, thereby achieving a target beyond the threshold required by Camden Council. This is indicated in Figure 1. From the initial SAP calculations carried out the renewable energy generated by the PV panels would account for an additional 7% reduction in comparison to passive and active measures. It is understood that Camden Council aim for all new developments to target a 20% contribution from renewable resources, however this is not a firm target. In the case of the proposed development of 187 Kentish Town Road, the developer has demonstrated commitment to this target; however it is not believed that it would be technically or financially feasible of a development of this nature to achieve the 20% target. It has been assumed that the PV Panels will be south facing at a slight 30 degree incline, so as not to intrude on the aesthetic nature of this sensitive area.

Retail Carbon Calculations

To assess the CO_2 emissions from the retail area, the areas have been divided into zones based on activity types, heating or cooling regime, natural daylight, occupancy types and equipment loads. Heating and cooling will be provided to the retail areas through a central air handling unit with heat recovery, variable speed VAV, in conjunction with fan coil units. In key areas of high occupancy, a displacement all air system is proposed. This is assumed to be a typical fit out for a core and shell development of this nature, however as the final tenant is not yet agreed, the systems that are currently assumed may not be used when fitted out. Energy efficient light fittings have been fitted in the retail units and presence detection lighting controls have been assumed for the circulation and storage areas. This is subject to change as the design development progresses at the detailed design stage.

Figure 3 shows the Target Emission (TER) rate for a retail unit of this nature, and the proposed Building Emission Rate (BER). Using the proposed fabric parameters and the suggested low energy systems, it is estimated that the retail unit will achieve compliance with Part L2A of the Building Regulations.

Total Site Carbon Reduction

The calculations that address Building Regulations have previous section. The Part L calculations for the domestic and non-domestic elements of the proposed development do not account for the unregulated loads associated with the building's use when completed. In order to accurately account for the total carbon footprint associated with unregulated loads, such as electricity use of appliances and gas from cooking, an estimated total carbon emissions calculation has been undertaken.

Based on the three dwellings modelled and the retail unit on the ground floor, it is estimated that the baseline total Carbon emissions would be in the region of 53,000 Kg/CO_2/annum. By implementing the proposed energy strategy across the development, it is estimated that the development will save in the region of over 10,000 Kg/CO_2/annum which equates to approximately 20%. Figure 4 shows the total site Carbon emissions reductions.

Residential Results – Part L1A compliance

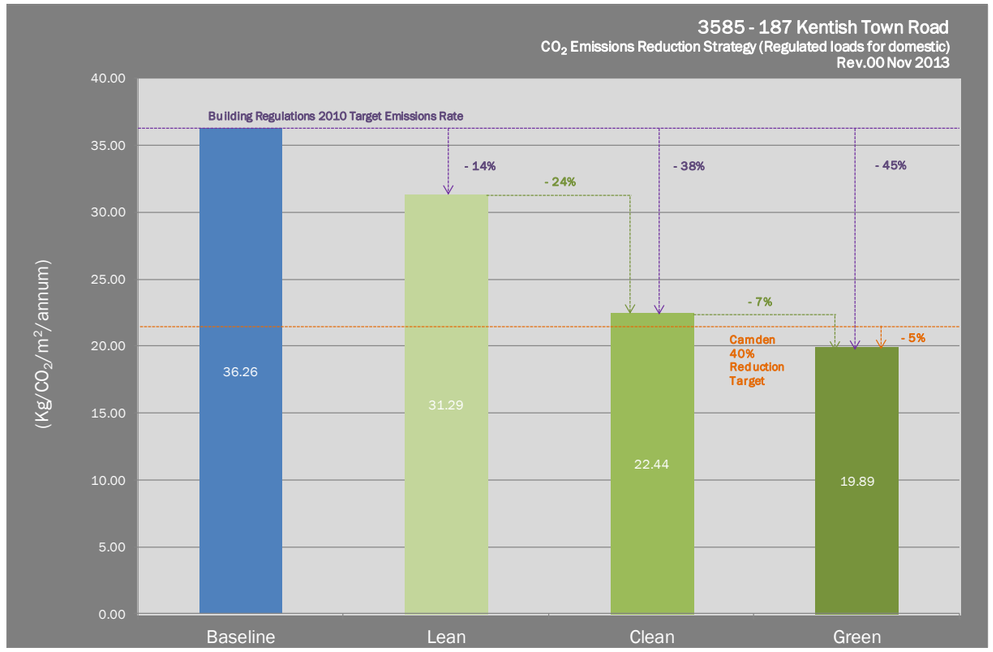

Figure 1 – Energy Hierarchy Part L1A Calculations

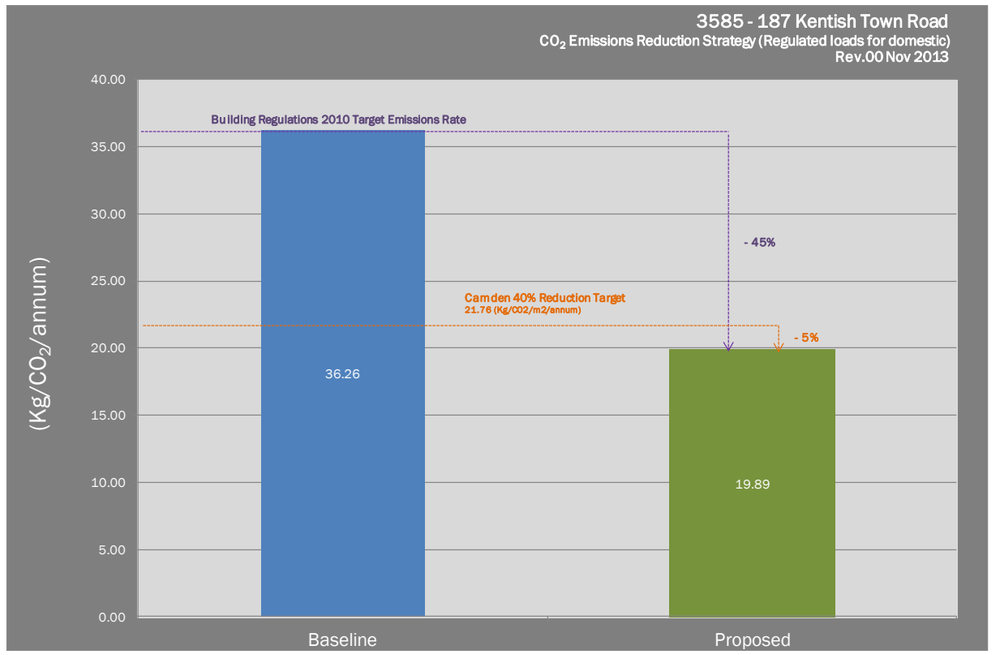

Figure 1 – Proposed Carbon Reductions - Part L1A Calculations

Retail Results – Part L2A compliance

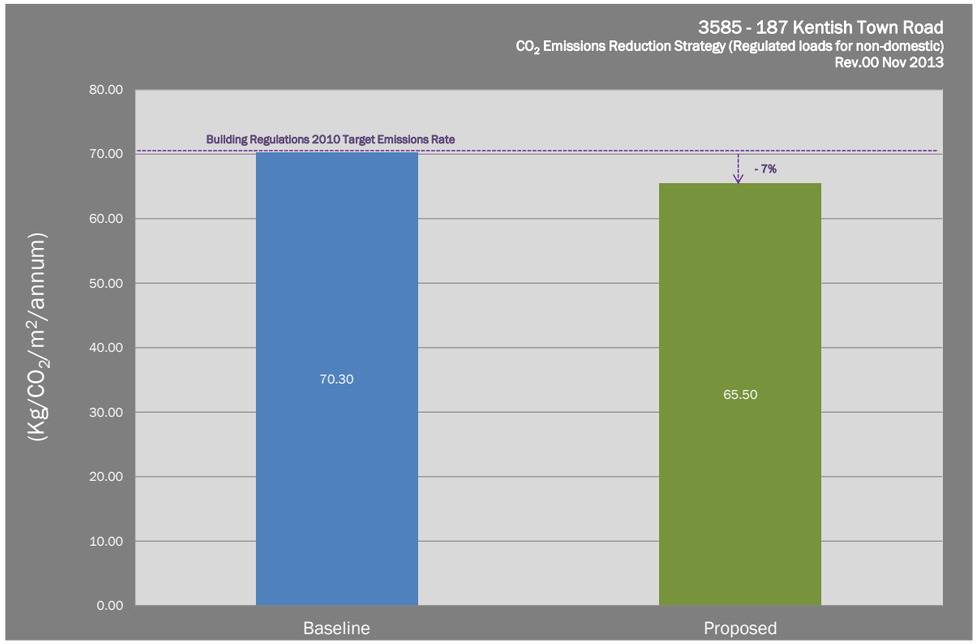

Figure 3 – Energy Hierarchy Part L2A Calculations

Total Site Carbon Emission Reductions

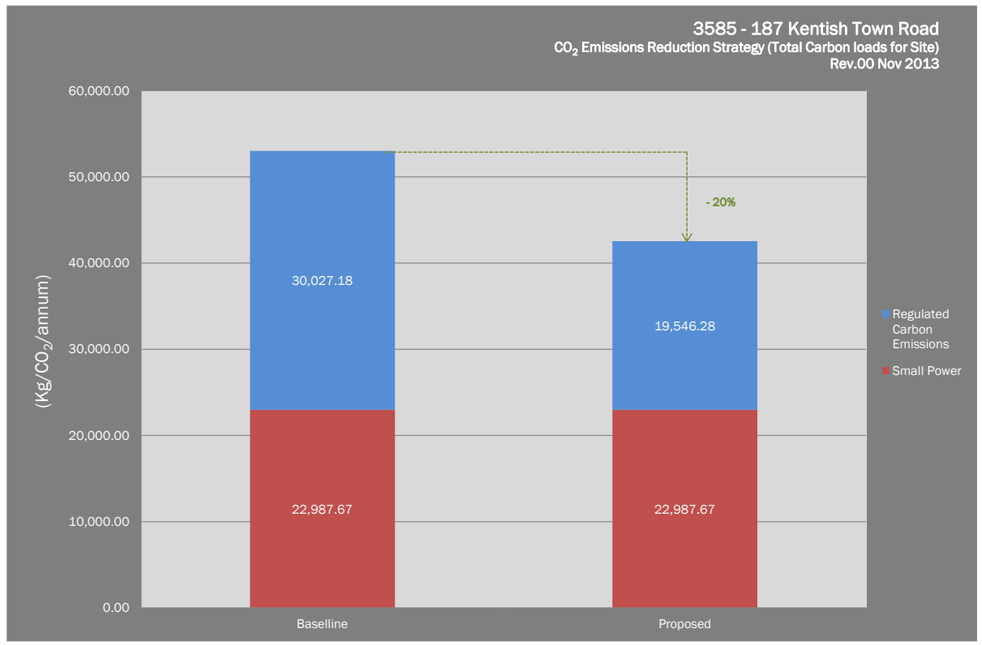

Figure 4 – Total Site Carbon Emissions – Including 'Regulated' and 'Unregulated' (small power) loads

CONCLUSION

The proposed development will achieve the mandatory 40% reduction in Carbon emissions above the TER by implementing passive design, sustainable active measures and renewables in the form of an Air Source Heat Pump and Photovoltaic Panels. All residential units will achieve Code for Sustainable Homes (CSH) Level 4. Details are highlighted in a CSH pre-assessment which can be found in Appendix A.

The design team has suggested additional measures beyond building regulation compliant requirements and it is predicted to reduce the carbon emissions compared to the TER considerably.

Using the proposed several typical apartments s representative of the overall residential development, the carbon intensity of the proposed development has been reduced by approximately 45% over the Target Emission Rate. Due to the nature of this development, all residential units are not identical and carbon emission reductions may differ greatly on a case by case basis as the design of the development evolves. The carbon savings are also based largely on the use of renewable technologies on this project, and projected and actual carbon reductions are likely to differ.

The commercial unit on the ground floor will meet the requirements set in the Building Regulations Part L Approved Document 2A (ADL2A).

The following are some of the key strategies and targets that are proposed to achieve this carbon reduction and provide facilities of a standard that reflect best practice in sustainable mixed-used design.

1. Passive design has been prioritised. The building envelope will have low U-values and high levels of air tightness to significantly lower energy loads.
2. Thermal Bridging will be minimised where technically possible, especially areas of balconies/winter gardens and in the party cavity between the adjacent buildings either side of the proposed development.
3. Extensive solar control strategies have been proposed for the glazed facades. Window sizes have been optimised, and solar controlled glazing will be specified to limit solar gains and over-heating in summer.
4. A combination of heating from an air source heat pump, in conjunction with efficient immersion water heater, will administer the space heating, domestic hot water.
5. It is proposed that the dwellings will not require mechanical cooling.
6. Each dwelling will have the possibility of be naturally ventilated.
7. PVs will also be incorporated to help satisfy part of the electricity demand of the residential units.
8. Use of energy efficient internal and external lighting will be installed in each space and in the dwellings' winter gardens.
9. Use of waste water heat recovery will be implemented where technically feasible.

CODE FOR SUSTAINABLE HOMES

The proposed development of 187 Kentish Town Road will retain the façade, however significant changes to the rest of the building are proposed. The 9 new apartments will therefore be assessed under Code for Sustainable Homes (CSH) as agreed with the sustainability office of Camden council, email date: 11th September 2013.

This section summarises the CSH pre-assessment of the new dwellings and demonstrates how Level 4 can be achieved. It should be read in conjunction with Code for Sustainable Homes Technical Guide November 2010.

The pre-assessment is limited to the Assessor's current knowledge of the details of the development and does not constitute a guarantee of the score that will be achieved in the formal assessment. It provides an example of a combination of targeted credits that, if awarded, would achieve a CSH 'Level 4' rating. The current score may change, and increase or decrease accordingly, as the design of the building is developed further.

As a minimum, all mandatory criteria to achieve CSH 'Level 4' have been targeted (Figure 1). Based on the available information the pre-assessment undertaken for 187 Kentish Town Road indicates that the targeted score of **68.18** is currently achievable, which is a CSH 'Level 4' rating in line with the LP and LBC's Core Strategy. Figures 2 and 3 summarise the scoring.

LBC planning suggests that in 2016, efforts should be made to achieve CSH Level 6 'zero carbon'. Therefore, credits have been maximised where seen technically and economically feasible and effort will be made to gain credits where possible throughout the design process. Full details of the CSH targets can be found in Appendix A.

The CSH rating achieved in the formal assessment will be dependent on the design team providing detailed evidence to meet the full credit compliance requirements, further details of which will be provided by the assessor during the assessment process and can be found in the CSH manual.

Mandatory credits	Mandatory requirements achieved	Level 4 requirement	Achievable Code Level					
ENE 1 Dwelling Emission Rate	Yes	25% reduction.	1	2	3	4	5	6
ENE 2 Fabric Energy Efficiency	Yes	Level 5 and 6 mandatory requirement.	1	2	3	4	5	6
WAT 1 Indoor Water Use	Yes	105 litres/person/day	1	2	3	4	5	6
MAT 1 Environmental Impact of Materials	Yes	Mandatory Green Guide rating for all Levels	1	2	3	4	5	6
SUR 1 Surface Water Run-off	Yes	Peak Rate of Runoff targets.	1	2	3	4	5	6
WAS 1 Storage of household waste	Yes	External storage space requirements.	1	2	3	4	5	6
HEA 4 Lifetimes Homes	Yes	Level 6 mandatory requirement.	1	2	3	4	5	6

Figure 1 Mandatory Targets

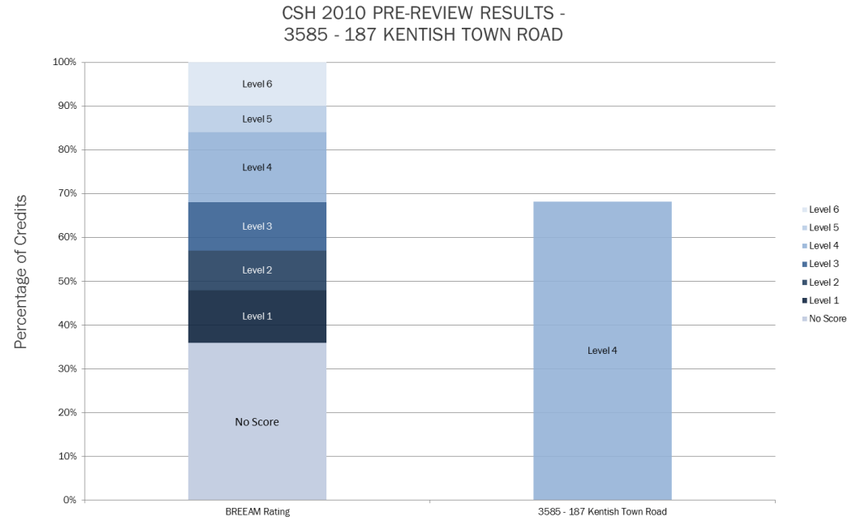

Figure 2 Code thresholds and target CSH score for 187 Kentish Town Road

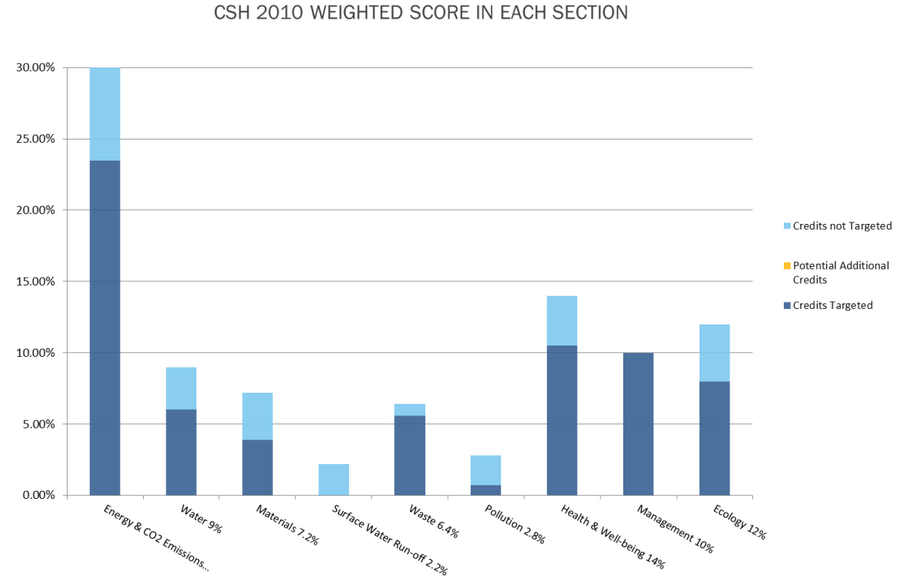

Figure 3 Score (weighted) awarded in each CSH section for 187 Kentish Town Road

SUMMARY OF CSH PRE-ASSESSMENT

A pre-assessment of the proposed development of 187 Kentish Town Road has been undertaken. The benchmarking scheme Code for Sustainable Homes has been used to assess the new apartments. No benchmarking assessment is required for the retail unit as it is under 500 m^2.

In line with the National, Regional and Local Planning Policies the following benchmarking standards are targeted:

- New-build housing to achieve CSH 'Level 4' rating (minimum 68 points).

The pre-assessment has demonstrated compliance with the following score is currently targeted for the new-build apartments:

- New-build housing: **68.18** points – CSH Level 4.

The details of the strategy and suggested credits targeted are presented in the appendices.

APPENDIX A: CODE FOR SUSTAINABLE HOMES PRE-ASSESSMENT CHECKLIST

3585 - 187 Kentish Town Road

Level 1 36 points **Level 2** 48 points **Level 3** 57 points **Level 4** 68 points **Level 5** 84 points **Level 6** 90 points

Credit Information			Current Target	LEVEL 4						
Credits Available	Credits Targeted	Credits Achieved	Percentage	68.18%						
			Credit Issue	Title	Mandatory Credits	Aim	Summary of Criteria	Comments	Responsible Party	Date Updated
			For full details of credit compliance requirements, refer to the CSH 2010 technical manual, which takes precedence to this document.							
31	20	0	**Energy**							
10	5		Ene 1	Dwelling Emission Rate	3 credits = Level 4 9 credits = Level 5 10 credits = Level 6	To minimise carbon dioxide emissions arising from the operation of a dwelling and its services	Up to 10 credits can be achieved for CO_2 emissions from the dwelling illustrating percentage improvement of DER over TER: 1 credit: 8% 2 credit: 16% 3 credits: 25% - mandatory for Level 4 4 credits: 36% 5 credits: 47% 6 credits: 59% 7 credits: 72% 8 credits: 85% 9 credits: 100% - mandatory for Level 5 10 credits: Zero Net CO_2 Emissions - mandatory for Level 6	Needs to be modelled, A+M stated Camden need 50% improvement.	A10	29/07/2013
9	4		Ene 2	Fabric Energy Efficiency	7 credits = Level 5 & 6	To improve fabric energy efficiency performance thus future-proofing reductions in CO2 for the life of the dwelling.	3 to 9 credits can be achieved for Fabric Energy Efficiency kWh/m^2/year (1st figure is for Apartment Blocks, Mid-Terrace; 2nd figure is for End Terrace, Semi- Detached & Detached) 3 credits: ≤ 48; ≤ 60 4 credits: ≤ 45; ≤ 55 5 credits: ≤ 43; ≤ 52 6 credits: ≤ 41; ≤ 49 7 credits: ≤ 39; ≤ 46 - mandatory for Levels 5 & 6 8 credits: ≤ 35; ≤ 42 9 credits: ≤ 32; ≤ 38	A10 to check policy for Camden FEE	A10 / DP9	29/07/2013
2	2		Ene 3	Energy Display Devices	N/A	To promote the specification of equipment to display energy consumption data, thus empowering dwelling occupants to reduce energy use.	1 credit: Current electricity OR primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device. 2 credits: Current electricity AND primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device OR current electricity consumption data is displayed to occupants by a correctly specified energy display device AND electricity is the primary heating fuel.	A10 confirmed this will be included in specification	A10	29/07/2013
1	1		Ene 4	Drying space	N/A	To minimise the energy required for drying clothes	Drying space with posts and footings or fixings capable of holding 4m+ of drying line for 1–2 bed dwellings, and 6m+ of drying line for 3+ bed dwellings. The space (internal or external) should be secure.	A+M confirmed this will be included in specification	A+M	29/07/2013
2	2		Ene 5	Energy Labelled White Goods	N/A	Encourage the provision / purchase of energy efficient white goods.	1 credit: Fridges and freezers or fridge-freezers: A+ rating 1 credit: Washing machines and dishwashers: A rating AND EITHER Washer-dryers or tumble dryers have a B rating OR washer-dryers or tumble dryers are not provided, information on the EU Energy Labelling Scheme is provided. 1 credit: If no white goods are provided, information on the EU Energy Efficiency Labelling Scheme is provided to each dwelling.	Client to confirm	Client	29/07/2013

2		Ene 6	External Lighting	N/A	Encourage provision of energy efficient external lighting	1 credit: Space Lighting is provided by dedicated energy efficient fittings. 1 credit: Security Lighting is designed for energy efficiency and are adequately controlled: All burglar security lights have maximum wattage of 150 W AND Movement detecting control devices (PIR) AND Daylight cut-off sensors. All other security lighting: has dedicated energy efficient fittings AND fitted with daylight cut-off sensors OR timers. OR 1 credit: No security lighting is installed OR 2 credits: Dual lamp luminaires with both space and security lamps can be awarded both credits provided they meet the criteria for energy efficiency.	A10 confirmed this will be included in specification	Team Member	yymmdd
1		Ene 7	Zero and Low Carbon Energy Technologies	N/A	To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources	1 credit: Energy is supplied from local renewable or low carbon energy sources or is designed and installed in a manner endorsed by a feasibility study AND 10% reduction in carbon emissions. 2 credits: 15% reduction in carbon emissions.	Potential target - 2 credits - A10 to confirm pending SAP calculations	Team Member	yymmdd
2		Ene 8	Cycle Storage	N/A	To encourage the use of bikes as transport to reduce the need for short car journeys.	1 credit: Studios, 1 bed – 1 cycle for every 2 dwellings 2-, 3 bed - 1 cycle per dwelling 4 bed and above – 2 cycles per dwelling 2 credits: Studios, 1 bed – 1 cycle per dwelling 2-, 3 bed - 2 cycles per dwelling 4 bed and above – 4 cycles per dwelling	A+M confirmed this will be included in specification	Team Member	yymmdd
1		Ene 9	Home Office	N/A	To reduce the need to commute to work.	2 double power sockets, 2 telephone points (or double telephone point) or 1 telephone point with cable or broadband, a window, 1.8m wall space, average daylight factor (DF) 1.5%, adequate ventilation in a suitable quiet room.	Daylighting consultant to confirm feasibility after testing	Team Member	yymmdd
		Ene section sub-totals	36.4%						
4	0	Water							
3		Wat 1	Indoor Water Use	1 credit = Level 1 & 2 3 credits = Level 3 & 4 5 credits = Level 5 & 6	To reduce the consumption of water in the home	1 credit:120 l/p/day - mandatory for Levels 1 & 2 2 credits: 110 l/p/day 3 credits:105 l/p/day - mandatory for Levels 3 & 4 4 credits: 90 l/p/day 5 credits: 80 l/p/day - mandatory for Levels 5 & 6	A10 to advise on flow rate to achieve 105 l/p/day	A10	29/07/2013
1		Wat2	External Water Use	N/A	To promote the recycling of rainwater and reduce the amount of mains potable water used for external water uses	Rainwater collection system: Terraces & patios – 100 litres; 1–2 bed with private garden – 150 litres; 3+ bed with private garden – 200 litres Requirements above can be halved if there is no planting provided and the whole of the external space is covered by a hard surface. Communal gardens: 1 litre/m^2 of land allocated to the dwelling with a minimum of 200 litres per communal garden. Requirements can be halved if planting requiring little water has been specified (following the recommendations by ecologist). If a swimming pool or other large water-consuming feature is present, 100% rainwater or grey water to be provided, water to comply with appropriate EU bathing water standards.	A+M confirm water butts to be provided in courtyard and terrace areas. A10 to show on drawings	A+M / A10	29/07/2013
		Wat section sub totals	9.0%						

24	13	0	Materials							
15	7		Mat 1	Environmental Impact of Materials	N/A	To encourage the use of materials with lower environmental impacts	Mandatory: Green Guide rating of between A+ & D for at least 3 of the following building elements: Roof, External Walls, Internal Walls (including separating walls), Upper and Ground Floors (including separating floors), Windows. Up to 15 credits available depending on GG ratings.	Contractor to confirm	Contractor, A+M	29/07/2013
6	4		Mat 2	Responsible Sourcing of Materials - Basic Building Elements	N/A	To recognize and encourage the specification of responsibly sourced materials for basic building elements	80% of materials are responsibly sourced used in: Frame, Ground floor, Upper floors (including separating floors), Roof, External walls, Internal walls (including separating walls), Foundation/substructure (excluding sub-base materials), Staircase. Materials: Brick, Resin-based composite materials, Concrete, Glass, Plastics and rubbers, Metals, Dressed or building stone, Timber, wood panel products and wood-based composites, Plasterboard and plaster, Bituminous materials, Other mineral-based materials, including fibre cement and calcium silicate, Products with recycled content Additionally, 100% of any timber in these elements must be legally sourced.	Contractor to confirm	Contractor, A+M	29/07/2013
3	2		Mat 3	Responsible Sourcing of Materials - Finishing Elements	N/A	To recognize and encourage the specification of responsibly sourced materials for finishing elements	80% of materials are responsibly sourced used in: Stair, Window, External & internal door, Skirting, Panelling, Furniture, Fascias, any other significant use. Materials: Refer list for Mat 2 credit Additionally, 100% of any timber in these elements must be legally sourced.	Contractor to confirm	Contractor, A+M	29/07/2013
			Mat section sub totals	7.2%						
4	0	0	Surface Water Run-off							
2	0		Sur 1	Management of Surface Water Run-off from Development	N/A	To reduce and delay water run off from hard surfaces to sewers and watercourses	Mandatory: Peak Rate of Runoff is no greater than it was for the pre-development site events AND Volume of Runoff is entirely reduced using infiltration AND / OR is made available for use is a replacement for potable water. Water Quality Criteria 1 credit: There is no discharge from the developed site for rainfall depths up to 5 mm 1 credit: The run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with The SUDs Manual to minimise the risk of pollution.	No Flood Risk Assessment to be undertaken	n/a	29/10/2013
2	0		Sur 2	Flood Risk	N/A	Encourage developments in low flood risk areas	2 credits: Site specific Flood Risk Assessment is undertaken AND Site in Zone 1 OR 1 credit: Site in Zones 2 and 3a AND finished ground floor level of all habitable areas and access routes are 600mm above the design flood level. AND FRA demonstrates to the satisfaction of the local planning authority and statutory body that the development is appropriately flood resilient and resistant, including safe access and escape routes, and that any residual risk can be safely managed.	No Flood Risk Assessment to be undertaken	n/a	29/10/2013
			Sur section sub totals	2.2%						

8	**7**	**0**	**Waste**							
4	**4**		Was 1	Household Waste Storage and Recycling Facilities	N/A	To recognise the importance of having internal and external storage for waste management	Mandatory: Provide external storage space with inclusive access and usability and containers are not stacked with largest volume EITHER: as per BS 5906 i.e. 100 litres for a 1-bedroom unit, further 70 litres for each additional bedroom, OR total volume of the external waste containers provided by the Local Authority. 2 credits: If there are 3 no. dedicated internal storage bins, minimum total capacity 60 litres and no LA collection scheme. 4 credits: A combination of internal AND LA scheme OR external storage.	A+M confirm Camden council will collect. 4 crdits targeted	A+M	29/07/2013
3	**2**		Was 2	Construction Site Management	N/A	To recognise the importance of a site waste management plan	1 credit: Compliant SWMP includes procedures and commitments for reducing waste generated. Includes target benchmarks for resource efficiency, i.e. m^3 of waste per 100 m^2 or tonnes of waste per 100 m^2; procedures and commitments to minimize non-hazardous construction waste at design stage in at least 3 waste groups along with monitoring of waste; procedures for minimising hazardous waste, monitoring, measuring and reporting of hazardous and non-hazardous site waste production according to the defined waste groups. 2credits: SWMP PLUS at least 50% by weight or by volume of non-hazardous construction waste generated by the project is diverted from landfill. OR 3 credits: SWMP PLUS at least 85% by weight or by volume of non-hazardous construction waste generated by the project is diverted from landfill.	Contractor to confirm	Contractor	29/07/2013
1	**1**		Was 3	Composting	N/A	To encourage developers to provide facilities to compost household waste	Individual home composting facilities OR a local communal or community composting service, which the LA runs or where there is a management plan in place OR a LA waste collection system. Facilities to be in a dedicated position, accessible to disabled people, have an information leaflet.	Not currently targeted, potential target. Client to Confirm	Client	29/07/2013
			Was section sub totals	6.4%						
4	**1**	**0**	**Pollution**							
1	**1**		Pol 1	Global Warming Potential (GWP) of Insulants	N/A	To reduce global warming from blowing agents emissions arising from manufacture, installation, use and disposal of foamed thermal and acoustic insulants	All insulating materials use substances that have a GWP < 5 (manufacture AND installation): Roofs: including loft access, Walls: internal and external including lintels and all acoustic insulation, Floors: including ground and upper floors, Hot water cylinder: pipe insulation and other thermal stores, Cold water storage tanks: where provided, External doors.	A+M to specify, Contractor to confirm	Contractor, A+M	29/07/2013
3	**0**		Pol 2	NOx emissions	N/A	To reduce nitrous oxide emitted into the atmosphere	1 credit: 100 mg/kWh (Dry NOx level), Boiler Class 4 (BS EN 297: 1994) 2 credits: 70 mg/kWh, Boiler Class 5 3 credits: 40 mg/kWh OR all space heating and hot water energy requirements are fully met by systems which do not produce NOX emissions. Note: No credits are awarded for open flue space and/or water heating systems.	Not feasible to achieve any credits with air source heat pump	A10	29/07/2013
			Pol section sub totals	2.8%						

12	9	0	Health & Well Being							
3	1		Hea 1	Daylighting	N/A	To improve quality of life in homes through good daylighting	1 credit: Kitchens - average DF of 2% 1 credit: Living rooms, dining rooms and studies (including home office room under Ene 9) - average DF of 1.5% 1 credit: 80% of the working plane in kitchen, living room, dining room and study (including home office room under Ene 9) receives direct light from the sky.	Daylighting Consultant to confirm feasibility	Daylighting Consultant, A+M	29/07/2013
4	4		Hea 2	Sound Insulation	N/A	To ensure the provision of sound insulation and reduce the likelihood of noise complaints.	1 credit: Values are 3dB higher better than Part E. 3 credits: Values are 5dB higher better than Part E OR attached dwellings with separating walls or floors between non habitable rooms only. 4 credits: Values are 8dB higher better than Part E OR detached dwellings. Above demonstrated through EITHER programme of pre-completion testing OR Use of Robust Details Limited (RDL).	Mach Acoutistic Consultants confirmed 4 credits are achieveable.	Mach	05/08/2013
1	0		Hea 3	Private Space	N/A	To improve the occupiers' quality of life by providing a private outdoor space.	Outdoor space (private or semi-private) is provided of a minimum size that allows all occupants to sit outside, allows easy access to all occupants, including wheelchair users, accessible only to occupants of designated dwellings.	Units on third and forth floors comply, first and second story units will not comply as balconies specified are too small due to retaining existing façade at these levels	A10	29/07/2013
4	4		Hea 4	Lifetime Homes	4 credits = Level 6	To encourage the construction of homes that are accessible to everybody and where the layout can easily be adapted to fit the needs of future occupants	3 credits: Where an exemption from Lifetime Homes criteria 2 and/or 3 is applied to selected pathways subject to a steeply sloping plot gradient, but all other principles of Lifetime Homes, applicable to the dwelling being assessed, have been complied with. 4 credits: All principles of Lifetime Homes, applicable to the dwelling being assessed, have been complied with. - mandatory for Level 6	A+M have confirmed compliance.	A+M	29/07/2013
			Hea section sub totals	14%						
9	9	0	Management							
3	3		Man 1	Home User Guide	N/A	To encourage the provision of guidance to enable owners/occupiers to understand and operate their home efficiently and to make the best use of local facilities	2 credits: Home User Guide, compiled using Checklist Man 1 Part 1 together with information that the guide is available in alternative accessible formats. 3 credits: Above PLUS guide also covers information relating to the site and its surroundings, compiled using Checklist Man 1 Part 2.	A+M confirm they will generate a Home User Guide	A+M	29/07/2013
2	2		Man 2	Considerate Constructors Scheme	N/A	To encourage that construction sites are managed in an environmentally and sociably considerate and accountable manner	1 credit: Achieving a score of at least 3 in every section, and a total score between 24 and 31.5 under CCS scheme. 2 credits: Achieving a score of over 32 under CCS scheme. Alternative locally or nationally recognised schemes can be used instead of CCS.	Contractor to confirm	Contractor	29/07/2013
2	2		Man 3	Construction Site Impacts	N/A	To encourage that construction sites are managed in a manner that mitigates environmental impacts	1 credit: Achieve 2 or more of the following items: Monitor, report and set targets for CO_2 production or energy use; Monitor and report CO_2 or energy use arising from transport; Monitor, report and set targets for water consumption; Adopt best practice policies in respect of air (dust) pollution; Adopt best practice policies in respect of water (ground and surface) pollution; 80% of site timber is reclaimed, re-used or responsibly sourced. 2 credits: Achieve 4 or more of the items listed above.	Contractor to confirm	Contractor	29/07/2013
2	2		Man 4	Security	N/A	To encourage the design of developments where people feel safe and secure	2 credits: An Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the local police force is consulted at the design stage and their recommendations are incorporated into the design of the dwelling. AND Section 2 – Physical Security from 'Secured by Design – New Homes' is complied with (Secured by Design certification is not required).	A+M have consulted with Adam Lindsay from CDPA for Camden on 11/11/13	A+M	29/07/2013
			Man section sub totals	10%						

9	6	0	Ecology							
1	1		Eco 1	Ecological Value of Site	N/A	To encourage development of sites of little or low ecological value	Site is defined as of low ecological value EITHER by meeting the criteria under Checklist Eco 1 OR confirmed by an ecologist (SQE) OR an independent ecological report of the site, prepared by a suitably qualified ecologist, confirms that the construction zone is of low or insignificant ecological value AND any land of ecological value outside the construction zone but within the development site will remain undisturbed by the construction works.	Need an ecologist to confirm	Ecologist	29/07/2013
1	1		Eco 2	Ecological Enhancement	N/A	To enhance the ecological value of the site	Suitably Qualified Ecologist is appointed to recommend appropriate ecological features that will positively enhance the ecology of the site AND adopt all key recommendations and 30% of additional recommendations in the report.	Need an ecologist to confirm	Ecologist	29/07/2013
1	1		Eco 3	Protection of Ecological Features	N/A	To protect existing ecological features	All existing features of ecological value are maintained and adequately protected during site clearance, preparation and construction works OR if the site has been classified as having low ecological value under credit Eco 1 AND no features of ecological value have been identified.	Need an ecologist to confirm	Ecologist	29/07/2013
4	3		Eco 4	Change in Ecological Value of Site	N/A	To reward steps taken to minimise reductions in ecological value.	The ecological value of site and change in species per hectare is: 1 credit: between –9 and less than or equal to –3 2 credits: greater than –3 and less than or equal to +3 3 credits: greater than 3 and less than or equal to 9 4 credits: greater than +9	Need an ecologist to confirm	Ecologist	29/07/2013
2	0		Eco 5	Building Footprint	N/A	To promote efficient use of the building footprint.	1 credit: Houses - NIFA: NIGFA ratio ≥ 2.5:1 OR Flats - NIFA: NIGFA ratio ≥ 3:1 OR combination of houses and flats - Total NIFA: NIGFA of all houses and flats is greater than the area weighted average of the two target ratios. 2 credits: Houses - ≥ 3:1 OR Flats - ≥ 4:1 OR combination of houses and flats, ratio is greater than the area weighted average of the two target ratios.	A+M have provided calculations. For the 4 storey option, the NIFA/NIGFA = 690/276 = 2.5. For the 5 storey option, the NIFA/NIGFA = 810/276 = 2.9. No credits can be targeted.	Ecologist, A+M	29/07/2013
			Eco section sub totals	12%						

APPENDIX B: MODEL ASSUMPTIONS

The table on this page shows the assumptions made for the residential element of the proposed development of 187 – Kentish Town Road.

At this early stage of the proposed development, this values are based on assumptions that may change as the detailed design of the project develops.

	1	2	3
	First floor (NW) 1 Bedroom	First floor (SE) 2 Bedroom	Fourth Floor (Top) 3 Bedroom
Description	**Assumption**	**Assumption**	**Assumption**
Sheltered sides	2	2	0
Opaque elements			
Thermal Bridging: y-Value	0.1	0.1	0.1
Wall U-value	0.14W/(m^2.K)	0.14W/(m^2.K)	0.14W/(m^2.K)
Roof U-Value	0.12W/(m^2.K)	0.12W/(m^2.K)	0.12W/(m^2.K)
Openings			
Window U-value	0.68 W/(m^2.K)	0.68 W/(m^2.K)	0.68 W/(m^2.K)
Glazing g-value	0.35	0.35	0.35
Frame type	Wood	Wood	Wood
Air gap	12mm	12mm	12mm
Overhang Depth			
Curtain Type	light-coloured venetian blind	light-coloured venetian blind	light-coloured venetian blind
Fraction curtains closed	0.7	0.7	0.7
Building Services			
Design air permeability	$3m^3/(h.m^2)$ @ 50Pa	$3m^3/(h.m^2)$ @ 50Pa	$3m^3/(h.m^2)$ @ 50Pa
Ventilation			
Mechanical ventilation	Balanced with heat recovery	Balanced with heat recovery	Balanced with heat recovery
Heat recovery efficinecy	91%	91%	91%
SFP	0.4	0.4	0.4
Ducting type	rigid	rigid	rigid
Duct insulation	Yes	Yes	Yes
Space Heating			
Heating system	Packages ASHP	Packages ASHP	Packages ASHP
Heating emitter	Underloor Heating	Underloor Heating	Underloor Heating
Heating controls	Charging system linked to use of community heating, programmer and TRVs	Charging system linked to use of community heating, programmer and TRVs	Charging system linked to use of community heating, programmer and TRVs
Heating fuel	Electricity	Electricity	Electricity
Heating efficiency			
Pumpd in heated space			
Boiler interlock			
Community heating			
ASHP efficiency	350%	350%	350%
Boiler 1 heat fraction			
Heat to power ratio			
Additional Heat Source			
Heating type	Electric Immersion	Electric Immersion	Electric Immersion
Heating fuel	Electricity	Electricity	Electricity
Heat fraction	1	1	1
Efficiency	100.00%	100.00%	100.00%
Secundary heating			
heating group	n/a	n/a	n/a
Sub group	n/a	n/a	n/a
heating type	n/a	n/a	n/a
heating fuel	n/a	n/a	n/a
Efficiency	n/a	n/a	n/a
Cooling			
Cooling system	Not Direct Cooling Proposed	Not Direct Cooling Proposed	Not Direct Cooling Proposed
Energy label class	n/a	n/a	n/a
EER	n/a	n/a	n/a
Compressor control	n/a	n/a	n/a
SEER	n/a	n/a	n/a
Cooled area	n/a	n/a	n/a
Lighting			
Low energy lights	100% of fixed light outlets	100% of fixed light outlets	100% of fixed light outlets
Renewable Technology			
PV	0.23 kWp	0.39 kWp	0.62 kWp
Overheating			
Cross ventilation	Yes	Yes	Yes
Windows fully opend	Yes	Yes	Yes
Effective Air change rate	3	3	3