DAEDALUS
ENVIRONMENTAL

Mercure Hotel, Bloomsbury
Camden

Sustainability Statement

November 2016

Daedalus Environmental Limited
P.O. Box 1268
Maidstone
Kent
ME14 9NH

T: 0777 9333543
E: info@daedalusenvironmental.co.uk
W: www.daedalusenvironmental.co.uk

Version	Final Draft	**Date**	10th November 2016
Authors	**Philip Jackson**		
Client:	**Fairview Hotels**		
Contact:			
Address:			

Contents

1 Introduction

1.1 Background

1.1.1 This Statement supports and forms part of the planning application documentation submitted for the proposed extension of the Mercure London Bloomsbury Hotel, on Southampton Row, Camden. It has been prepared on behalf of Fairview Hotels, the Applicant, and describes the approach to sustainable design for the site.

1.1.2 It describes the planning policy requirements for the site, and outlines the targets that the development will aim to achieve. The solutions provided are described in as much detail as is possible at this application stage. Where specifics have not been possible, the overall approach and design standards are explained.

1.2 Site Description

1.2.1 The proposed development comprises an extension and alterations to the existing hotel, providing the hotel with additional accommodation and expansion of existing facilities. The hotel is located within the Bloomsbury Conservation Area, and as a result the design of the extension has been informed by expertise from the Heritage Collective and pre-application advice from council officers. The size of the extension is 416m^2.

1.2.2 The extension to the building is predominantly in the rear – away from the main Southampton Row thoroughfare, and as such the visual impact from the proposals will be minimised. The extension primarily occupies the existing light well to the rear of the building, with alterations to the existing roof space to provide additional accommodation too, with alterations to the existing mechanical and electrical infrastructure/systems necessary.

1.2.3 A detailed set of drawings accompany the application, and the Planning Statement completed by Waller Planning describes the proposed changes in detail, and therefore we do not propose to provide them again here. An image of the existing building, and its location within Bloomsbury adjacent to Russell Square, are shown below.

Figure 1: Mercure Bloomsbury from Southampton Row

Figure 2: Location of proposed development

2 Sustainability Policy Review

2.1 National Level

2.1.1 The policy framework encouraging sustainable new development is comprehensive, at both a national and local level.

The National Planning Policy Framework (NPPF)

2.1.2 The NPPF contains a 'presumption in favour of sustainable development', which is defined by five principles as set out in the UK Sustainable Development Strategy described above. In order to clarify what sustainable development is, the Government has stated that it can play three critical roles:

- an economic role, contributing to a strong, responsive, competitive economy;
- a social role, supporting vibrant and healthy communities and;
- an environmental role, protecting and enhancing our natural, built and historic environment.

2.1.3 Emphasising design, the NPPF states that *"good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people*." The NPPF sets out 12 core planning principles which "should underpin both plan-making and decision-taking", and of which five are particularly relevant to this document. In this context planning should:

- Seek to secure a high-quality of design and a good standard of amenity for occupants;
- Support the transition to a low-carbon future, take account of flood risk and coastal change and encourage the reuse of existing and renewable resources;
- Help conserve and enhance the natural environment and reduce pollution, allocating land of "lesser environmental value";
- Manage development to make full use of public transport, walking and cycling; and
- Take account of local strategies to improve health, social, and cultural wellbeing.

2.1.4 The Planning Policy Guidance to accompany the NPPF contains further details in how to respond to the NPPF, in particular the following are relevant to this report:

- Climate Change: which 'advises how planning can identify suitable mitigation and adaptation measures in plan-making and the application process to address the potential impacts of climate change'.
- Renewable and Low Carbon Energy: which 'assists local councils in developing policies for renewable energy in their local plans, and identifies

the planning considerations for a range of renewable sources such as hydropower, active solar technology, solar farms and wind turbines'.

Building Regulations Standards

2.1.5 Part L Building Regulations 2013: the most recent changes to the Building Regulations took effect in April 2014, and the overall aim of the changes has been to deliver further reductions in CO_2 emissions resulting from new development. The changes result in a CO_2 saving of approximately 8-10% against 2010 Building Regulations standards. The most recent changes have introduced an additional fabric energy efficiency target, related to the heating energy performance of the buildings. This requires even more energy efficient design of the thermal envelope.

2.2 London Plan

2.2.1 The London Plan provides the overall planning framework for London, with local authorities interpreting this on a local basis within their own policy documentation / plans. Perhaps of most pertinence here is London Plan Policy 5.2, provided below:

> *A Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:*
>
> *Be lean: use less energy*
> *Be clean: supply energy efficiently*
> *Be green: use renewable energy*
>
> *B The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations [2010] leading to zero carbon residential buildings from 2016 and zero carbon non-domestic buildings from 2019.*
>
> *Residential buildings: 2013-2016 – 40%*
> *Non-Residential buildings: 2013-2016 – 40%*
>
> *C Major development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy.*
>
> *D As a minimum, energy assessments should include the following details:*
>
> > *a calculation of the energy demand and carbon dioxide emissions covered by Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the*

development, including plant or equipment, that are not covered by the Building Regulations (see paragraph 5.22) at each stage of the energy hierarchy

b proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services

c proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)

d proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

E The carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

2.2.2 The London Plan Sustainable Design and Construction SPD has updated this policy insofar as the target levels have been revised as a result of changes to Building Regulations in 2013/14. The SPG states that:

To avoid complexity and extra costs for developers, the Mayor will adopt a flat carbon dioxide improvement target beyond Part L 2013 of 35% to both residential and non-residential development.

2.2.3 However, this development does not fall within the category of major development. Indeed, and as shown in the next section, it falls below the threshold described in Camden's own policy guidance. Furthermore, as an extension to an existing building, connected into existing building services systems, located in a conservation area, the opportunities to address these targets are not only technically limited, but also the requirements for extensions of this type under Part L of the Building Regulations are considerably different to standalone new build development.

2.2.4 Therefore we suggest that the basis of assessment for sustainable development is driven by the local planning requirement rather than those implied by the London Plan.

Camden

2.2.5 The basis of the requirements for sustainable design and construction are within Camden Planning Guidance CPG 3 Sustainability, and this statement responds directly to the requirements of that document. It is therefore structured to address each of the relevant sections within CPG 3, which itself outlines the relevant requirements against a range of issues, including:

- The energy hierarchy
- Water efficiency
- Sustainable use of materials
- Sustainability assessment tools - BREEAM
- Green roofs, brown roofs and green walls
- Flooding
- Climate change adaptation
- Biodiversity
- Urban food growing

2.2.6 Rather than list the requirements here, each of the individual requirements is addressed in the relevant section below.

3 The Energy Hierarchy

RELEVANT KEY REQUIREMENTS FROM CPG3
- Energy strategies to follow the energy hierarchy, with energy demands to be assessed accordingly
- Reduction of carbon emissions – all new developments designed to minimise emissions by being as energy efficient as feasible and viable
- Consider use of natural systems before mechanical services are considered
- Details of heat pump systems (where installed) to be provided demonstrating lower emissions
- Buildings to be refurbished or updated, including extensions, as a guide should be spending 10% of the project cost on improvements that improve carbon performance, BUT special consideration is given to protected buildings
- Address viability of CHP/district heating networks
- 20% reduction in CO_2 emissions through renewable energy technology, with special consideration given to heritage buildings

3.1 Introduction / Background

3.1.1 The nature of this development – an extension to an existing hotel – coupled with the highly constrained nature of the site (both physically and in relation to the location within a conservation area) – mean that they usual range of design and technology options available to developers are simply not viable here.

3.1.2 Nevertheless, the Applicant recognises that there is a real need to ensure that the proposed extension is as thermally efficient as possible, and that building services are the most efficiency available, where installed to the extension. This section therefore addresses the Energy Hierarchy as far as possible, within the context of these challenges.

3.2 The Energy Hierarchy – Reducing Demand

3.2.1 The overall approach to energy is to reduce ***demand*** for energy as far as possible through the creation of a thermally efficient, easily controlled and well designed extension to the existing hotel. This represents the first step of the Energy Hierarchy.

3.2.2 There is no flexibility in the way the building extension is oriented – the majority extension fills the available space on the rear elevations of the building, and therefore designing for beneficial solar gain is generally not possible. The roof extension will of course be more accessible to direct sunlight, but again the proposals follow the line of the existing building. Of more importance, therefore, is the way in which the extension will be built, and how thermally efficient it is.

Thermal Specification

3.2.3 The integration of energy efficiency measures and improved thermal specifications will increase thermal performance of a building, but they also are a key consideration at design stage because they last the whole life of the building, unlike heating and renewable energy systems.

3.2.4 In addition, air tightness of a building is important in reducing heat loss, but also in the prevention of draughts that can ultimately mean warm temperatures feel uncomfortably cold. The target for the development will be to ensure it is built with an air tightness of $5m^3/m^2$@50Pa or less. This will help reduce the burden on the heating system, improve the building's lifespan, reduce sound transmission through the structure and finally reduce energy use and carbon emissions.

Element	Target U-value (W/m^2K)
Roof	0.10
Sloping ceiling / room in roof	0.15
External walls	0.2
Ground /exposed floors	≈0.12
Windows / glazing	1.4
Doors	1.0
Factor	**Recommended value**
Thermal bridging	0.08 (Accredited Construction Details)
Air tightness (where testable)	$5m^3/m^2$@50Pa

Table 1: Summary of U-values and specifications (indicative)

Lighting and Fixtures

3.2.5 Additional energy savings will be made by maximising the efficiency of lighting, fixtures and fittings. All electric lighting will be energy efficient – using LED fittings/spotlights. Other fixtures and fittings will be specified that reduce hot water consumption with low and/or aerated flows.

3.3 The Energy Hierarchy – Supplying Energy Efficiently

Space heating and domestic hot water

3.3.1 The proposals are for an extension to the existing building, and currently the plan is to connect the extension into the existing plant to supply space heating and hot water. The hotel has a plant room in the basement that includes a 400kW gas boiler system alongside a number of additional direct hot water heaters supplying hot water throughout the building. Cold water boosting plant is also located in the basement, with heavy duty pumps ensuring adequate pressure throughout the building.

3.3.2 There are currently no firm plans to change this arrangement for heating, although subject to planning permission a full M&E review will need to be

undertaken and a comprehensive design carried out to ensure that the services are fit for purpose and can be adapted accordingly. Should a replacement boiler be necessary, however, then this would provide a beneficial improvement to the energy performance of the whole site.

3.3.3 At the point of installation, the existing boiler efficiency was around 85%, but this will have inevitably deteriorated in the intervening period. A new boiler – if required – would potentially have an efficiency in excess of 92%, and thus result in a reduction in energy use, energy costs and associated carbon emissions.

Ventilation

3.3.4 Ventilation to rooms within the hotel is provided either by openable windows, or within bathrooms by fan extract. The existing communal areas – the restaurant for example – and the kitchen have dedicated mechanical extract to cope with the requirements of both the Building Regulations and those spaces. With the extension, it is likely that those mechanical systems will need to be adapted and/or extended given the location of the building works, but that is outwith the scope of this Statement.

3.3.5 We have therefore assumed that the approach to ventilation for the rooms, which make up the majority of the new floor space, will be similar to the existing arrangement, using openable windows and fan extract to bathrooms. Corridors however will need continuous mechanical extract systems of a form to be determined by the M&E engineer in due course.

Overheating Risk

3.3.6 CPG3 requires that all buildings over 500m^2 are modelled to demonstrate that they are not at risk of overheating. As this extension falls below that threshold this is strictly not a requirement of this application. However, it IS a requirement of CPG3 that natural systems are considered before mechanical, and to understand the background to that decision modelling is therefore ultimately necessary. It is therefore important to ensure that the need for mechanical cooling is minimised on a day-to-day basis, and moreover will reduce emissions and help minimise running costs in the future. Overheating also forms part of the requirements for Part L2 of the Building Regulations.

3.3.7 In order to complete this analysis we have used IES <Virtual Environment> software and associated modules to establish key data in relation to the risk. The basis for the overheating analysis is the CIBSE Guide *TM52: Limits of Thermal Comfort Avoiding Overheating in European Buildings* (CIBSE, 2013). Within TM52 there are 3 criteria against which overheating risk and impact are assessed, and in order to be compliant with the guidance **any given *occupied* space must pass two of these three**, which (drawn verbatim from the Guide) are:

(1) The first criterion sets a limit for the number of hours that the operative temperature can exceed the threshold comfort temperature (upper limit of the range of comfort temperature) by 1 K or more

during the occupied hours of a typical non-heating season (1 May to 30 September).

(2) The second criterion deals with the severity of overheating within any one day, which can be as important as its frequency, the level of which is a function of both temperature rise and its duration. This criterion sets a daily limit for acceptability.

(3) The third criterion sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

(CIBSE, 2013)

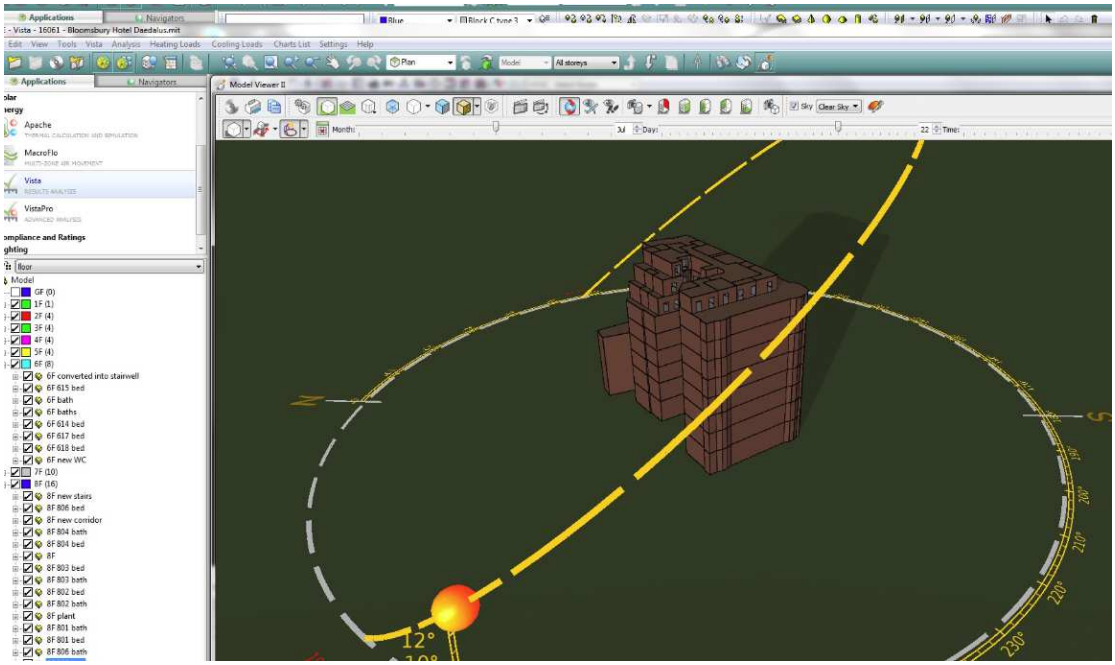

Table 2: IES VE model screenshot

3.3.8 Buildings are assessed on the basis of no cooling present, to understand how they perform under standard scenarios. The results of the assessment are as follows. Only 2 of the rooms failed the overheating test, and we retested these with an upgraded specification on the glazing, reducing the g-value (the amount of heat emitted through the glass reduces with a lower g-value), and these rooms passed the test. Therefore, a decision will need to be made in due course about the glazing, however given:

- only a very small proportion of rooms failed
- the availability of cooling and
- (more crucially) to maintain the glazing such that there is no heritage impact

3.3.9 … it may be that the risk in this particular case is deemed acceptable without the need for specification upgrades.

Passed - Baseline						
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
8F 806 bed	8F000003	100.0	2.5	8.0	2.0	2
8F 804 bed	8F000006	100.0	0.0	0.0	0.0	-
8F 803 bed	8F000009	100.0	0.1	1.0	1.0	-
8F 802 bed	8F00000B	100.0	1.0	4.0	1.0	-
8F 801 bed	8F00000D	100.0	2.8	10.0	2.0	2
7F 715 bed	TM000000	100.0	2.1	9.0	2.0	2
7F 712 bed	7F000004	100.0	0.0	0.0	0.0	-
7F 714 bed	7F000005	100.0	0.0	0.0	0.0	-
7F 716 bed	7F000006	100.0	0.0	0.0	0.0	-
7F 717 bed	7F000007	100.0	0.0	0.0	0.0	-
6F 614 bed	6F000001	100.0	0.0	0.0	0.0	-
6F 617 bed	6F000005	100.0	0.0	0.0	0.0	-
6F 618 bed	2F00000E	100.0	0.0	0.0	0.0	-
5F 518 bed	5F000001	100.0	0.0	0.0	0.0	-
5F 517 bed	2F00000B	100.0	0.0	0.0	0.0	-
4F 418 bed	4F000001	100.0	0.0	0.0	0.0	-
4F 417 bed	2F000008	100.0	0.0	0.0	0.0	-
3F 318 bed	3F000001	100.0	0.0	0.0	0.0	-
3F 317 bed	2F000005	100.0	0.0	0.0	0.0	-
2F 218 bed	2F000001	100.0	0.0	0.0	0.0	-
2F 217 bed	2F000000	100.0	0.0	0.0	0.0	-
Failed - Baseline						
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
8F 805 bed	8F00000E	100.0	6.1	19.0	5.0	1 & 2 & 3
6F 615 bed	6F000003	100.0	3.5	13.0	3.0	1 & 2
Passed - Enhanced Glazing						
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
8F 805 bed	8F00000E	100.0	1.5	7.0	2.0	2
6F 615 bed	6F000003	100.0	0.0	0.0	0.0	-

Table 3: Overheating Risk and Mitigation

Cooling Requirement

3.3.10 Each of the existing rooms within the hotel has the option to use mechanical cooling. This is currently provided by individual, external a/c units on the walls facing the lightwell (as shown here), or by larger joint systems depending on the floor/room in question. Heat pump systems provide cooling and heating to communal areas such as the restaurant.

Figure 3: Existing hotel external a/c units

3.3.11 The ability to mechanically cool the rooms is an important commercial requirement within hotel environments – especially in this location – and whilst we would anticipate the ability to cool would only be used relatively infrequently over the course of a year, guests do expect a hotel of this quality to provide the facility as and when required.

3.3.12 There are number of important considerations that need to be mentioned here. Firstly, the extension itself will require the alteration/removal/relocation of many of the existing individual cooling systems. Many of these are already difficult to access, clean and maintain, and therefore will not be operating at maximum efficiency.

3.3.13 Where these are removed / replaced, it would be sensible to consider a larger communal system to minimise number of systems, and to improve the overall energy efficiency of the existing building's infrastructure. However, locating a larger communal system will be challenging given the site constraints, and roof top plant we understand could have a visual impact that will need to be dealt with to the satisfaction of the heritage/conservation perspective. This will need to be resolved at a detailed design stage, but we suggest it would be prudent to assume this will be necessary in due course.

3.3.14 One potential energy supply option would be to provide a VRF heat pump system to the extension to provide space heating rather than to bolt into the existing boiler system. The VRF system would enable both heating and cooling to be provided, and to do so in a highly efficient manner, and would reduce the number of systems in the building (it would remove the need for radiators and associated pipework and provide both heating and cooling through the same ceiling cassette). It would need space and probably is best located on the roof, so that issue would remain, but from an efficient energy supply perspective this should be considered moving forwards.

3.4 The Energy Hierarchy – Renewable Energy & Low Carbon Systems

3.4.1 Heat pumps are regarded as low carbon and should these be pursued to provide both space heating and cooling, will contribute considerably to a reduction in energy demand in kWh terms against a standard gas boiler and air conditioning unit scenario. We have also considered a number of other technologies, and a brief summary is provided below:

- Biomass boilers are completely impractical for this location, from space, access, fuel storage and air quality perspectives
- Solar thermal panels would contribute to the hot water demand for the building, but only where the existing hot water boilers are being replaced, and only where sufficient additional plant room space was available. Neither of these are the case, and the distance from the roof to the plant room is such that heat losses would increase, therefore we would not recommend installation
- We do not recommend roof mounted wind turbines in any scenario
- Ground source heating is not feasible in this location
- Gas CHP – at a small scale is certainly an option for hotels, however in this case the space available for this plant in addition to peaking gas boilers is not available, and nor is it currently planned to replace the existing boiler system. Therefore it is not an option for this site
- Photovoltaics: there is a small amount of roof space on the development which could be used for PV mounted on a low pitch so as to minimise heritage / visual / conservation impact. However, the monthly electricity demand for the site is in excess of 40,000kWh, and a PV system of a few kW (for which there is space) would have a negligible impact. That in itself is insufficient a reason NOT to install it of course, however we would strongly recommend that the available roof space is left available for plant associated with HVAC systems described above.

3.4.2 The 20% renewable energy target was abolished as part of the amendments to the London Plan in 2013, which recognised that a prescriptive renewable energy target was often impractical, and in some cases lead to inappropriate application of technologies that were often redundant as soon as they were installed. The application of a renewable energy target in the case of this application we would

argue is impractical, based on the above description of renewable energy opportunities, taking account the highly constrained nature of the development.

3.4.3 We would therefore recommend that the approach should be entirely focused on ensuring the building is as thermally efficient as possible, and that the required mechanical and electrical services provide further opportunities for improvement. A 20% target – calculated according to the requirements of CPG 3 - simply cannot be achieved on this development.

3.5 A Note on District Heating

3.5.1 It has been briefly stated above that gas CHP is not feasible on this development, but we also appreciate the council's wider aim of expanding district heating facilities across the area. Nevertheless it would remain impractical at this stage to incorporate third party heating systems into the hotel services, unless there was a major overhaul planned of the existing plant room (which there isn't) that coincided with the availability of heat in this exact location from the heat network provider (which is currently unclear). The location and size of the existing of the plant room would not be conducive to heat network connection either. We do not think it would therefore be prudent or needed for the Applicant to explore this further.

3.6 Energy Hierarchy - Summary

3.6.1 Overall, therefore, the constraints of the site limit the number of options available to the Applicant, and much will depend on detailed M&E design at a later stage. The approach to energy, and in compliance with CPG 3, is to ensure that the extension itself is constructed as efficiently as possible, minimising heat loss. The installation of HVAC systems will reinforce the energy efficient nature of the building, and could also provide an overall improvement to the existing building too. Low carbon, rather than renewable energy systems, have been recommended for the extension (subject to M&E design), and we think this is a pragmatic approach to the requirements of the planning authority and wider the constraints of the site.

3.7 Energy Demands and Part L of the Building Regulations

3.7.1 The London Plan and CPG 3 use Part L of the Building Regulations as the basis for understanding energy demands and demonstrating compliance with carbon reduction targets. However, it should be noted here that the extension of a non-domestic building does not necessarily require full SBEM/BRUKL (the outputs of Part L calculations for new build non-domestic property), because compliance for extensions is generally achieved by following the requirements of Part L2B in terms of controlled fittings and new thermal elements. Based on the above specifications, the building would therefore comply with Regulations. There is also the possibility that a resulting EPC may not be necessary owing to the conservation area, but that will be decided ultimately by Building Control. This will therefore need clarification in due course.

3.7.2 We have however looked at 3 different scenarios in the process of modelling the building, and generated expected energy demands using the software, because an understanding of energy demands is still a requirement of CPG 3, and this is the most accurate means of assessment at this stage in the process.

Scenario 1 – Baseline Extension

Extension connected to existing boiler system, using same distribution (radiators, TRVs) in each room. Hot water connected to the existing system, but cooling using new individual AC units (reflecting existing).

Scenario 2 – Boiler Replacement

Extension connected to existing system but with replaced, high efficiency boiler system providing heating and DHW, using same distribution (radiators, TRVs) in each room. Cooling using new individual AC units (reflecting existing)

Scenario 3 – VRF Heat Pump System

Extension uses 'standalone' system, connected to multi-split VRF providing heating and cooling, DHW as existing. Heat/cooling distributed via ceiling cassette in each room.

Results

3.7.3 The results of the energy demand calculations are provided below.

ENERGY DEMANDS (MWh/a)								
	DHW	Space Heating	Total Gas	Chillers	Lights	Fans/pumps	Total electricity	Total energy
Scenario 1	41.88	4.31	**46.19**	1.83	15.42	0.73	**17.98**	**64.16**
Scenario 2	36.89	4.07	**40.96**	1.83	15.42	0.73	**17.98**	**58.94**
Scenario 3	41.88	0.73	**41.88**	0.96	15.42	0.58	**17.68**	**59.56**
CO_2 EMISSIONS ($kgCO_2/a$)								
	DHW	Space Heating	Total Gas CO_2	Chillers	Lights	Fans/pumps	Total electricity CO_2	Total CO_2
Scenario 1	9,045	931	**9,976**	949	8,001	380	**9,330**	**19,306**
Scenario 2	7,968	879	**8,847**	949	8,001	380	**9,330**	**18,177**
Scenario 3	9,045	380	**9,425**	498	8,001	299	**8,798**	**18,224**

Table 4: Energy demands and carbon emissions

Energy Demand Impact

3.7.4 Over the course of a month, the hotel currently uses a total of just over 40MWh of electricity, equating to 500MWh per year. In gas terms, the figure is far more variable over a year, with 90-100MWh/month in winter and 45-50MWh/month in summer. Annually, the demand equates to around 825MWh of gas. Therefore, whilst the floor area will increase by around 15%, overall annual energy demand (currently 1,325MWh) is only anticipated to increase by around 4-5% (60MWh).

3.8 Energy Summary

3.8.1 The approach described above deals with all of the requirements of CPG 3 in the most appropriate and reasonable way possible related to a proposal of this size. CPG 3 does suggest that 10% of the project cost of a refurbishment or extension should be spent on the existing building, although this is only a guide. Furthermore, special consideration of protected buildings, which we would assume includes those located in conservation areas, is also a factor. The Applicant cannot commit to spend 10% of the budget on improvements to the existing building, however by virtue of the fact that:

- the cooling system will need to be overhauled
- the roof space will be extended and its thermal performance will be far greater than that currently
- consideration will need to be given to efficient heating systems

3.8.2 ... it should be clear that these issues are being addressed through the design and construction process.

4 Sustainable Water Management

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** are to be water efficient, minimising water use and maximising re-use
- developments over 10 units or 1000sq m and/or intense water use developments, such as hotels, hostels, student housing etc to include a grey water harvesting system, unless the applicant demonstrates to the Council's satisfaction that this is not feasible.

4.1 Potable Water Consumption

4.1.1 The management of water in the proposed development will follow the principles of the water hierarchy:

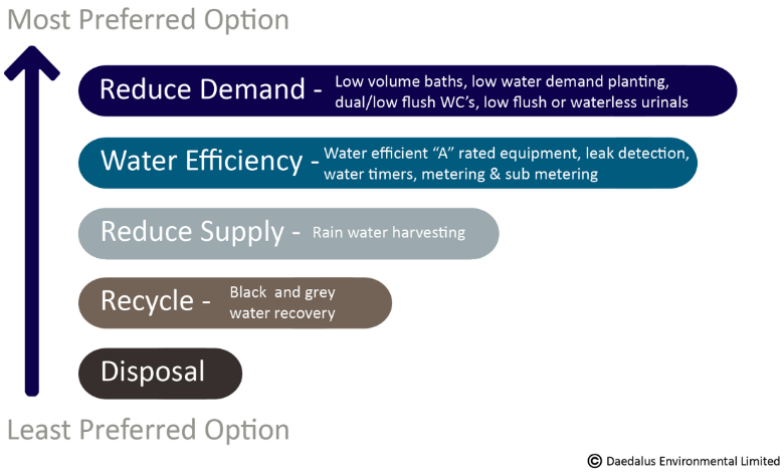

Figure 4: The water hierarchy

4.2 Water Reduction Measures

4.2.1 The Applicant is acutely aware of the need to minimise the impact of development of a resource which is becoming increasingly scarce. The means by which this will be achieved is through controlled flow fixtures and fittings, which will be specified as part of the fit out of the extension. Aerated taps and reduced flow showers are prime examples of the options available. Low and dual flush WCs will also be installed to all bathrooms, with 6/3l flush volumes.

4.2.2 The council requires intense water use developments to implement grey water recycling where viable. In this case, the planned hotel extension will be connected in to the existing water supply system. There is no space available to install a rain or greywater recycling system within the existing envelope of the hotel, and as the extension is to be built above existing development, there is no option to install grey/rainwater storage tanks below ground. Therefore in this case water recycling will not be installed within the proposals.

5 Sustainable Use of Materials

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** are to implement the principles of the Waste Hierarchy
- Use materials that are sourced responsibly and ensure they are safe to health
- 10% of the total value of materials to be derived from recycled and reused sources, with special consideration given to heritage buildings and features

5.1 Use of Materials

5.1.1 Materials can have a significant impact on environmental performance, both in construction, but also ongoing use. During construction, where those materials are sourced from, the means of extraction and manufacture, how far they travel and so forth all have varying effects on the environment.

Figure 5: The Waste Hierarchy

5.1.2 The sourcing and specification of materials has not yet been completed, although the architectural drawings and accompanying documentation provide far more detail in this regard. The site is again constrained by the conservation area and heritage aspects, and we would expect the sourcing decisions to be determined more by those considerations rather than by recycled or reclaimed content of materials. Where viable supply exists, the Applicant will source reclaimed or matching materials appropriate to the building where this does not compromise building function.

5.1.3 Where flexibility exists, the issue of environmentally sound materials will most probably be addressed through the use of A-C rated materials, as defined in the Green Guide to Specification, published by the BRE. Where possible and relevant

to do so, materials will also be sourced using suppliers that have environmentally focused accreditations and management systems, such as ISO:14001 and FSC.

5.2 Waste Management

5.2.1 The legislative requirements for construction waste management are founded in a number of EU Directives and have been actively implemented in the UK. The Applicant recognises that waste needs to be sustainably managed during the construction process, and will appoint licensed waste management contractors with a proven record of delivering high levels of recycling. In addition and in line with the Waste Hierarchy as required by CPG3, the Applicant will require contractors to implement strict management processes for waste on site, including:

- An efficient building form will minimise the amount of on-site manufactured components required to reduce waste generated.
- During construction planning, identifying suitable locations (if available) for the separation and storage of waste prior to removal from site, to encourage higher levels of recycling
- Strict management of waste by site operatives through site induction and ongoing training / site talks
- Proactively identifying opportunities for the on-site reuse of materials, identifying a key individual responsible for doing so. The individual will also be responsible for delivering the overall waste management strategy for the development
- Scaffolding, hoarding and other such materials to be removed from site for use on subsequent construction projects

5.2.2 From an operational perspective, the additional waste arising from the site will primarily be related to hotel rooms, and volumes will depend on occupancy levels, but is not expected to result in substantial additional waste. The hotel's existing waste removal provision/contract will be extended to cover any additional waste from the extension.

6 Sustainability Assessment Tools

RELEVANT KEY REQUIREMENTS FROM CPG3
- None, due to the size of the extension

6.1.1 The requirement for the building to be assessed under BREEAM applies for all development exceeding 500m^2. The extension is approximately 416m^2 and therefore this requirement does not apply, however it should be clear from the other sections within this statement that the Applicant is committed to ensuring that sustainable design features are incorporated wherever possible.

7 Brown & Green Roofs and Green Walls

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** should incorporate brown/green roofs and walls with special consideration given to historic buildings

7.1.1 Heritage and conservation area requirements are likely to preclude the use of green walls for this development, and indeed the extension is mostly shaded throughout the day and would not be conducive to successful and sustainable planting. Furthermore, introducing green roofs on the roof (given shape, maintenance access, structural challenges, drainage etc) will be highly problematic. However, subject to heritage feedback, structural assessment and the prioritised requirement for roof top equipment/plant identified above, it should be possible to implement a lightweight, very low maintenance brown roof on the proposed flat roof space.

7.1.2 By no means will this be intensively planted, or indeed planted at all, but rather involves the addition of recycled spoil materials that will encourage natural colonisation and improved biodiversity over the longer term.

Figure 6: Simple brown roof system

8 Flooding

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** required to prevent or mitigate against flooding, whilst managing drainage and surface water
- SUDS hierarchy to be followed

8.1.1 There is no increase in footprint nor is there any removal of green space as a result of the proposals. The impact on managing rainfall and flooding is therefore likely to be negligible, and as such the Applicant has not submitted a drainage report to accompany this application. This CPG 3 requirement is therefore not applicable for this particular proposal.

9 Adapting to Climate Change

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** required to consider the impact of future changes to the climate and incorporate relevant design and technological measures

9.1 Warmer Temperatures

9.1.1 The orientation and shading of the extension will mean that the potential impact of drier hotter summers – with more direct sunlight – will be minimal. As shown above in the overheating assessment, whilst we have not modelled future climate scenarios at this stage, we have been able to address the minimal issues with changes to the glazing specification.

9.1.2 The use of high thermal mass construction techniques – exposed concrete finishes etc – is also unfortunately impractical on this site, where a lightweight construction will probably be implemented. In addition to any improved glazing, we would also recommend that rooms with southerly orientations are fitted with blinds (we would recommend shutters as the best method of reducing solar gain in warmer climates, but this is highly unlikely to be approved from a heritage perspective).

9.2 Heavier Rainfall

9.2.1 In simple terms, we would also recommend rainwater downpipes that are slightly larger in cross section, enabling a greater volume of rainfall to be transported effectively from roof spaces in periods where we expect more frequent intensive rainfall events. The design of these fixtures will of course need to be in keeping with heritage requirements and the conservation area. Enabling this transportation reduces the risk of water ingress and damp, and unexpected penetration of construction details. The installation of a brown roof – if pursued – would also have a small mitigating impact on the volume of rainfall from the building, and also a small cooling impact on the structure during periods of sunshine.

9.3 Drier Summer Periods

9.3.1 The water section describes the approach to minimising potable water use, which is a responsibility of all parties as we move towards a changed climate with longer periods of drought. The site however has no landscaping or green space irrigation requirements, and so the focus will need to be entirely on the building and its internal uses. Over time and as the building is refurbished, the opportunity for introducing water saving appliances and fittings arises and it is at this point that the opportunity should be taken to further adapt to the changing climate.

10 Biodiversity

RELEVANT KEY REQUIREMENTS FROM CPG3
- **All developments** required to show how biodiversity considerations have been incorporated
- What mitigation measures are necessary and what positive biodiversity enhancing features to be included

10.1 Opportunity

10.1.1 There is no ecological value currently within the hotel boundary, and the levels of biodiversity are correspondingly negligible. The only current opportunity for introducing any level of biodiversity within the development is to implement the brown roof option, which will be subject to heritage and plant / equipment considerations described previously.

10.1.2 A brown roof will provide some level of opportunity for invertebrates, and as a result foraging opportunities will emerge for a variety of bird species. As a simple brown roof, left to self seed and colonise, the vegetation will not be of significant ecological value but will represent and improvement over the current scenario. It may be possible to add value to the vegetation through wildflower seed planting, but consideration will need to be given to any required maintenance as a result.

10.1.3 This approach to biodiversity we think is an appropriate and proportional response to the issue, maximising the opportunity within the constraints of the site itself.

11 Local Food Growing

RELEVANT KEY REQUIREMENTS FROM CPG3
- None of the requirements are relevant to this development

11.1.1 CPG 3 encourages new developments to explore opportunities for growing food wherever possible and suitable. Whilst the extension will provide a flat roof, access to the roof will be prohibited and what space is available will be used for other purposes. Therefore this will not be pursued by the Applicant.

12 Summary

12.1.1 Camden has developed a clear set of policies and guidance in relation to issues of Sustainable Design and Construction. Whilst many of the guidance notes often relate to different and specific forms of development – such as housing – many of the core principles apply across all building sectors. In addition, there is a significant demand for high quality visitor accommodation in the area, and the economic drivers and benefits of extending the existing premises are clear.

12.1.2 The above notwithstanding, the proposed extension at the Mercure Bloomsbury is highly physically constrained. The hotel is located within a conservation area, which brings design challenges from a heritage and conservation perspective, and the space available for the 416m^2 increase in floor area only exists at upper floors. Issues of architectural quality are dealt with in the Design and Access Statement accompanying the application, but a number of technical challenges remain, in particular in relation to services provision.

12.1.3 This Statement has sought to address these, and begin the process of identifying potential solutions, whilst examining wider opportunities for integrating sustainable design principles into the development. Indeed whilst the Applicant will have a number of technical issues to face, in many ways these actually offer potential improvements to the overall performance of the building, especially in energy terms, but also in its response to a changing climate, potentially improved biodiversity, and more efficient water use on a 'per head' basis. A detailed survey of existing, and design for new, services will be required in due course, and this will of course inform the final specification of plant, equipment, fixtures and fittings.

12.1.4 Within the broad context of the site's constraints, the Applicant is committed to ensuring the building is extended using these principles of sustainable design and construction, and the approach put forward is compliant with the requirements of Camden's planning policy framework.