Grand Union House, London NW1

Sustainability Statement

December 2018

Camden Mixed Developments Limited

Grand Union House

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70009120

Public

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Sustainability Statement

PROJECT NO. 70009120

December 2018

WSP
70 Chancery Lane
London
WC2A 1AF

+44 (0) 20 7314 5000
+44 (0) 20 7314 5111

wsp.com

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1 EXECUTIVE SUMMARY

This Sustainability Statement is submitted in support of a detailed planning application ('the Application') made on behalf of Camden Mixed Developments Limited ('the Applicant') for the adaptive re-use, alterations and extensions ('the Proposed Development') to Grand Union House, 16-20 Kentish Town Road, London ('the Site').

WSP has been commissioned by the Applicant to develop the Sustainability Statement for the Proposed Development in Camden, which will be submitted as part of the planning application.

The proposed development comprises the partial demolition and redevelopment of the existing building, to provide a new office (Class B1) building with associated roof terraces, ground floor flexible town centre uses (Class A1 and/or A3 and/or D2), and 6 affordable housing units, along with associated landscaping works.

This Sustainability Statement has been produced to detail and demonstrate how the design of the development addresses the various issues that contribute to a sustainable development by following the below guidance documents:

- National Planning Policy Framework (updated in 2018);
- London Plan 2016 consolidated with alterations since 2011;
- Draft New London Plan 2018;
- Mayor's Housing Supplementary Planning Guidance (2016);
- Mayor's Sustainable Design and Construction SPG (2014);
- Mayor's Climate Change Adaptation Strategy (2011); and
- Camden Local Plan (2017).

This report summarises the status of the sustainable design progress and describes proposed initiatives planned for the detailed design and construction stages.

The Site was found to respond to the issues raised in the policy documents in the following areas as shown in Table 1-1:

Table 1-1 Summary of Proposed Measures for the development

KEY SUSTAINABILITY AREA	PROPOSED MEASURES
BREEAM	A BREEAM Pre-assessment has been carried out for the Proposed Development with an indicative score of 71% equating to a rating of 'Excellent'. Furthermore, as requested by Camden Local Plan all the minimum standard required per category for Energy, Water and Materials have been meet and/or exceeded.
Optimising the Use of Land	The Proposed Development is optimising the use of the existing site by ensuring that 100% of the development is located on previously developed land, and is optimising both the density and amenity space of the development. Access to private and communal amenity spaces has been given to tenants with potential for individual food growing. The Proposed Development will also increase the social and economic value of the local area while aiming to minimise its environmental impacts as much as possible.
Energy & CO_2 Emissions	The Proposed Development has made a significant contribution towards GLA and Camden's target in decreasing the national carbon dioxide emissions by reducing its own carbon emission by 110.92T CO_2 per annum a 35% saving following the London's Plan energy hierarchy.
Water Efficiency	The Proposed Development has maximised the opportunities of water saving measures which include the use of water saving fixtures and fittings, optimised water management through leak detection, reduced water flow rates and the installation of water meters in all tenant and residential units. Additionally, residential units have been designed to meet the water consumption rate of 105 l/p/d.
Materials	The Proposed Development has ensured that materials used on site will have a low embodied energy and all the timber used on site will be sustainably sourced from accredited FSC or PEFC sources. Additionally, a compliant BREEAM LCA has been carried out to establish the embodied carbon footprint of the development over a 60-year lifecycle and various design options to reduce carbon has been considered. Furthermore, the external materials will be specified to have low toxicity to humans and the environment, to be durable to cater for their level of use and exposure and the Proposed Development will maximise the use of pre-fabricated materials. A pre-demolition audit will be carried out prior to works commencing on site.
Waste	The Proposed Development has ensured that both construction and the operational waste is managed in accordance with the waste hierarchy; that most of the excavation and demolition waste is reused or recycled and 80% per volume non-hazardous waste will be diverted from landfill. Furthermore, the Proposed Development aims to provide sufficient internal space for the storage of recycled and compostable materials and waste in each building.
Climate Change Adaptation	The Proposed Development has been carefully designed to take the likely impacts of climate change into account. It has reduced its external heat rejection to the atmosphere; has incorporated some planting to combat the effects of climate change; and reduced its reliance on air conditioning systems by using solar control glazing, mechanical ventilation and reducing internal heat gains. A FRA was carried out to identified sustainable measures for water conservation and managing surface water runoff which should be included in the design. Currently due to access restriction there's no scope within the existing structure to incorporate any surface water attenuation.

Pollution Management	The Proposed Development has ensured that the development will minimise sources of noise and vibration. Dust and other air pollution will also be minimised during construction, enforced through the Considerate Contractors Scheme (CCS). An air quality assessment has been carried out to identify and minimise the impact on air quality and mitigate exceedance of air pollutants. Additionally, all external lighting will be designed in compliance with the ILE guidance note and sustainable measures have been used in the development to control surface water runoff.
Health & Wellbeing	The Proposed Development has included a variety of initiatives aimed at providing a healthy and safe environment to people working in and visiting the development alike such as increased ventilation provision over and above the regulatory requirements; choice of materials with low volatile organic compounds (VOC) or other chemical components, and good practice acoustic design. The building layout will be inclusive and accessible to all ages and different physical abilities and will incorporate the principles of 'Secured by Design' to design out crime.
Ecology & Biodiversity	An ecologist assessed the site to be of negligible ecological and biodiversity importance. Every effort has been taken into consideration to create opportunities for attracting biodiversity and habitat to improve the site ecological value through the inclusion of planters on the terraces located on level 3 and 4.
Transportation & Accessibility	The Proposed Development has ensured the development provides sufficient and appropriate cycle spaces, on-site changing facilities, including lockers and showers and access to low carbon modes of transportation such as the Santander Cycle Hire. Additionally, due to its PTAL excellent rating, the Proposed development will be 'car-free' and will have no negative impact on the neighbouring traffic congestion (albeit the 12 existing car parking spaces owned by the residents of Grand Union Walk that need to be retained at ground floor level).

2 APPROACH TO SUSTAINABILITY AT GRAND UNION HOUSE

Figure 2-1 CGI Image of Grand Union House

2.1 SUSTAINABILITY STRATEGY

Considering the principles of sustainability early in the design and planning process is a positive step to ensuring that the new development is sustainable in terms of construction, operation, the local community, the environment and its future occupation.

This Sustainability Statement appraises proposed design solutions which apply to Grand Union House (referred to Proposed Development hereafter) to ensure that they meet the current and relevant planning requirements. The appraisal identifies key legislative drivers, local planning policy and client targets regarding sustainable development and establishes how these objectives are met by the design.

A sustainable approach is presented as the desired result for human development as well as the means with which to balance current and future social, economic and environmental needs. It is important to acknowledge sustainable development as per the definition set out by the United Nations:

'…. development which improves people's quality of life within the carrying capacity of supporting ecosystems.'

The Proposed Development has therefore endeavoured to ensure that social, economic and environmental issues are dealt with in an integrated and equal manner. The sustainability of the design, construction and proposed community structure of the development has been assessed as well as considering its contribution to sustainable development within the local area.

2.2 DEVELOPMENT DESCRIPTION

PROPOSED DEVELOPMENT

The proposed development comprises the partial demolition and redevelopment of the existing building, to provide a new office (Class B1) building with associated roof terraces, ground floor flexible town centre uses (Class A1 and/or A3 and/or D2), and 6 affordable housing units, along with associated landscaping works.

The development will provide approximately 5,254m^2 of office space, 538m^2 of ground floor commercial space and 476m^2 of residential space, 6No. affordable units (3 x 2 Bed, 2 x 1 Bed and 1 x Studio).

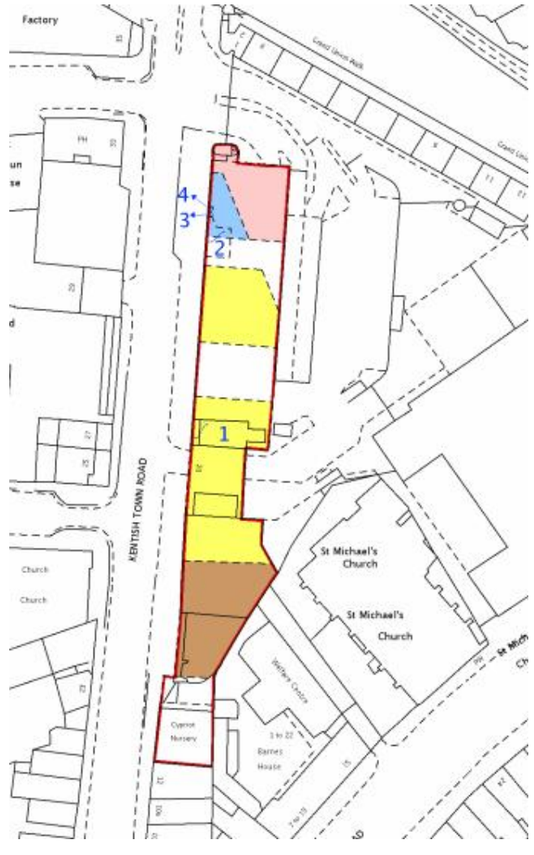


Figure 2-2: Site Plan

3 POLICY CONTEXT

Figure 3-1- London Borough of Camden map

3.1 OVERVIEW

The Proposed Development is designed in alignment with current national, regional and local policy.

The London Borough of Camden's approach to sustainable development is underpinned by policies from the National Planning Policy Framework (NPPF) and the London Plan set out within its current policies contained in the Local Plan.

3.2 NATIONAL POLICY

NATIONAL PLANNING POLICY FRAMEWORK (2018)

The National Planning Policy Framework (NPPF) was updated in July 2018, which replaces the 2012 NPPF. Plans and decisions should apply a presumption in favour of sustainable development.

The National Planning Policy Framework (NPPF) sets the planning context for sustainable design and construction. It states that there are three elements of sustainable development: economic, social and environmental, which are dependent on one another to achieve the aim of the planning policy.

It is this that Local Planning Policies are based on and adapted to account for regionally specific requirements.

The NPPF identifies three dimensions to sustainable development - economic, social and environmental – which should be applied jointly and simultaneously:

Economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

Social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

Environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

The NPPF promotes the pursuit of sustainable development by seeking positive improvements to the built and natural environment, and to people's quality of life. This will include:

- Delivering a sufficient supply of homes
- Building a strong, competitive economy
- Ensuring the vitality of town centres
- Promoting healthy and safe communities
- Promoting sustainable transport
- Supporting high quality communications
- Making effective use of land
- Achieving well-designed places
- Protecting green belt land
- Meeting the challenge of climate change, flooding and coastal change
- Conserving and enhancing the natural environment
- Conserving and enhancing the historic environment
- Facilitating the sustainable use of materials.

3.3 REGIONAL POLICY – GREATER LONDON AUTHORITY

THE LONDON PLAN 2016 CONSOLIDATED WITH ALTERATIONS SINCE 2011

The London Plan is the overall strategic plan for London and sets out a fully integrated economic, environmental, transport and social framework for the development of the Capital to 2036. The London Plan 2011 has been amended three times.

Revised Early Minor Alterations were published in October 2013. In March 2015 the Mayor published the Further Alterations to the London Plan (FALP) that form part of the development plan for London. In March 2016 Minor Alterations to the London Plan (MALP) have been prepared to bring the London Plan in line with the National Housing Standards and Car Parking Policy. The GLA's Guidance on Preparing Energy Assessments (published in March 2016) outlines the revised energy and carbon targets that the GLA will apply to applications received on or after the 1st October 2016.

The Proposed Development sustainability strategy has been designed to fully align with the objectives and aspirations of the London Plan 2016 consolidated with alterations since 2011, which sets out a comprehensive range of policies to underpin London's response to climate change, including underlying issues of resource management. An overview of the key requirements is provided in Table 3-1 below:

Table 3-1 – Summary of key London Plan sustainable development policies

Policy 5.2: Minimising CO2 Emissions	Develop an energy strategy based on the energy hierarchy of 'Be Lean – Be Clean – Be Green', and to achieve a minimum 35% carbon emissions improvement upon Building Regulations Part L 2013 minimum requirements for new development.
Policy 5.3: Sustainable Design and Construction	Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.
Policy 5.6: Decentralised Energy in Development Proposals	Development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites.
Policy 5.7: Renewable Energy	Major developments should provide a reduction in expected CO_2 emissions using on-site renewable energy generation, where feasible to do so.
Policy 5.9: Overheating and Cooling	Major development proposals should reduce the potential for overheating and reliance on air conditioning systems and demonstrate this in accordance with the cooling hierarchy:
Policy 5.10: Urban Greening	Development proposals should integrate green infrastructure from the beginning of the design process to contribute to urban greening, including the public realm.
Policy 5.11: Green Roofs and Site Environments	Major development proposals should be designed to include roof, wall and site planting, especially green roofs and walls where feasible.
Policy 5.13: Sustainable Drainage	Development should utilise sustainable urban drainage systems (SuDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy:
Policy 5.15: Water Use and Supplies	Development should minimise the use of mains water by: incorporating water saving measures and equipment

THE DRAFT NEW LONDON PLAN (2018)

THE SPATIAL DEVELOPMENT STRATEGY FOR GREATER LONDON – DRAFT FOR PUBLIC CONSULTATION

The draft new London Plan was published by the Mayor for consultation in December 2017. The New London Plan is not an alteration or update of the previous Plans, once adopted (circa 2019) the New London Plan will replace all previous versions. Minor suggested changed to the draft new London Plan were published in August 2018.

MAYOR'S HOUSING SUPPLEMENTARY PLANNING GUIDANCE (2016)

The Mayor's Housing Supplementary Planning Guidance (SPG) provides guidance on the implementation of housing policies in the 2015 London Plan and the 2016 Minor Alteration to the Plan. It replaces the 2012 Housing SPG.

Relevant parts of the Mayor's Housing SPG are:

- **Housing Quality** – Updates London housing standards to reflect the implementation of the Government's new national technical standards through the MALP.
- **Social infrastructure** – Enabling role of housing in facilitating new infrastructure provision through mixed use development.

SUSTAINABLE DESIGN AND CONSTRUCTION: SUPPLEMENTARY PLANNING GUIDANCE (2014)

The Sustainable Design and Construction SPG was published in May 2006 to provide additional information to support the implementation of the London Plan policies. A revised version of the Sustainable Design and Construction Supplementary Planning Guidance was issued in April 2014.

The SPG explains the principles of sustainable design and construction and how they should be implemented in London. It provides guidance on how to achieve the objectives of the local plan effectively and supports developers and local planning authorities in achieving sustainable development.

MAYOR'S CLIMATE CHANGE ADAPTATION STRATEGY (2011)

The Mayor's Climate Change Adaptation Strategy set out actions and policies to make London the best big city in the world by improving the quality of life of Londoners and making the city more sustainable. The Mayor's ambition is to put 'the village back into the city'.

The Mayor's strategies are built on three policy pillars:

- Retrofitting London.
- Greening London.
- Cleaner air for London.

MAYOR'S CLIMATE CHANGE MITIGATION AND ENERGY STRATEGY (2011)

The Mayor's climate change mitigation and energy strategy sets out the strategic approach for London to limit further climate change and secure a low carbon energy supply for London. The document looks to reduce London's CO_2 emissions by 60 percent from 1990 levels.

This document informed the production of the FALP. To facilitate delivering London's energy strategy the programmes and activities promoted across London to help achieve the targets set by this document includes:

- Reconnect low carbon zones in London aiming to reduce CO_2 emissions by 20% by 2012 across the community.

- Decentralised energy programme – aiming to supply 23% of London's energy from secure, low carbon local sources.
- Zero carbon target.

MAYOR'S WATER STRATEGY (2011)

The Mayor's water strategy is the first water strategy for London and provides a complete picture of London's water needs. The strategy calls for organisations involved in the city's management to:

- Invest in a water management and sewerage infrastructure system that's fit for a world class city and will create jobs.
- Support and encourage Londoners to take practical actions to save water, save energy and save money off their utility bills.
- Realise the potential of London's sewerage as an energy resource to help reduce greenhouse gas emissions.
- Work in partnership with the Mayor, boroughs and communities to see and develop opportunities to manage flood risk through enhancing London's green spaces.

3.4 LOCAL POLICY – LONDON BOROUGH OF CAMDEN

CAMDEN LOCAL PLAN (JUNE 2017)

The Camden Local Plan (adopted in June 2017) set out the Council's planning policies and its replace the current Core Strategy and Development Policies planning documents (adopted in 2010). It ensures that Camden continues to have robust, effective and up-to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities. The Local Plan will cover the period from 2016-2031. Key aspects are presented in Table 3-2.

Table 3-2 Camden Local Plan Key Policies

POLICY NUMBER	SUMMARY OF POLICY
Policy C1 – Health and Wellbeing	Positively contribute to creating high quality, active, safe and accessible places; and; Proposals for major development schemes to include a Health Impact Assessment (HIA).
Policy C5 – Safety and Security	Where a development has been identified as being potentially vulnerable to terrorism, the Council will expect counter-terrorism measures to be incorporated into the design of buildings and associated public areas to increase security.
Policy C6 – Access for all	The Council will seek to promote fair access and remove the barriers that prevent everyone from accessing facilities and opportunities.
Policy A2 – Open Space	The Council will protect, enhance and improve access to Camden's parks, open spaces and other green infrastructure.
Policy A3 – Biodiversity	The Council will protect and enhance sites of nature conservation and biodiversity. The Council will protect, and seek to secure additional, trees and vegetation.
Policy A4 – Noise and Vibration	The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration Thresholds
Policy CC1 – Climate Change mitigation	The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.
Policy CC2 – Adapting to Climate change	The Council will require development to be resilient to climate change. Any development with 500sq.m or more of any additional floor-space is required to demonstrate the above in a **Sustainability Statement**. Non-domestic developments of 500sq.m of floor-space or above to achieve **BREEAM "Excellent"**, **encouraging zero carbon in new development from 2019.**
Policy CC3 – Water and Flooding	The Council will seek to ensure that development does not increase food risk and reduces the risk of flooding where possible.
Policy CC4 – Air Quality	The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough. Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution.
Policy CC5 – Waste	The Council will seek to make Camden a low waste borough.
Policy T1 – Prioritising walking, cycling and public transport	The Council will promote sustainable transport by prioritising walking, cycling and public transport in the borough.
Policy T2 – Parking and car-free development	The Council will limit the availability of parking and require all new developments in the borough to be car-free.

Other relevant development plan documents to Grand Union House are:

- **Camden Planning Guidance 3** – Sustainability: This guidance provides information on ways to achieve carbon reductions and more sustainable developments.

As stated earlier the local plan requires that Sustainability Statements must be submitted with all planning applications to ensure that sustainability is integrated into designs for all development. They should include:

- BREEAM pre-assessment; (Included in the Appendix A of this report)
- Energy statement in line with London Plan requirements; (A separate Energy Statement has been produced)
- Demonstration of climate change resilience measures. (Included in Section 10 of this report)

As stated earlier this report serves as the Sustainability Statement for the Proposed Development, with the relevant environmental, social and economic aspects covered in the following chapters. The following chapters of this report will outline the design initiatives and methods used to comply in first instance with the Camden Local Plan (2017), the Camden Planning Guidance 3, the GLA London Plan policy (2016) and the Sustainable Design and Construction SPG (2014) detailed in section 4 – 14.

4.1 COMMERCIAL AREAS: BREEAM

BREEAM is a market-focused tool aimed at encouraging significant improvements in the performance of buildings through the recognition and demonstration of improvements made to those buildings.

The BREEAM score provides a means of measuring the environmental impact of a building throughout its life and so benchmarking this against other buildings. There are a number of key uses for the methodology, which provide the following benefits:

- Maximising the building's environmental performance during the design, construction and operation of new build, refurbishment and fit out schemes.
- Specifying environmental requirements in the procurement and management of developments.
- Providing an independently verifiable measurement tool for use within Environmental Management Systems.
- Providing an independently verifiable environmental label for marketing and promotional purposes.

The BREEAM rating is divided into five levels, with PASS, GOOD, VERY GOOD, EXCELLENT and OUTSTANDING being the achievable ratings. The percentage score achieved within the assessment is categorised accordingly, based on calculations in the BREEAM 2018 software.

Minimum score required for Design and Procurement Assessment are in the table below:

Table 4-1 – Rating Levels

RATING	PERCENTAGE REQUIRED
Pass	30%
Good	45%
Very Good	55%
Excellent	**70%**
Outstanding	85%

A minimum BREEAM score of 70% is required to achieve a BREEAM rating of excellent. Where the BREEAM score targeted throughout the assessment results in 70% or above accrued overall but fails to meet the mandatory requirements, the building will not be able to achieve BREEAM Excellent rating status.

Achieving Excellent typically requires all mandatory requirements for Excellent and targeted tradeable BREEAM issues to be achieved to accrue sufficient points overall.

REQUIREMENTS AND TARGETS

CAMDEN LOCAL PLAN

POLICY CC2 – SUSTAINABLE DESIGN AND CONSTRUCTION MEASURES

The Council will promote and measure sustainable design and construction by:

- ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
- encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
- Expecting non-domestic developments of 500 sqm of floor-space or above to achieve "Excellent" in BREEAM assessments and encouraging zero carbon in new development from 2019.
  - Minimum standard required (un-weighted credits) for these BREEAM categories are:
    - Energy 60%;
    - Water 60%; and
    - Materials 40%
- The submission of a pre-assessment report at the planning application stage. The report should summarise the design strategy for achieving your chosen level of BREEAM and include details of the credits proposed to be achieved.

4.3 PRELIMINARY ASSESSMENT

RESIDENTIAL UNITS

The design of the dwellings will be guided by the principles of Home Quality Mark and Passive Design Standards.

COMMERCIAL UNITS

Due to the majority of floor area being speculative office space we have carried out a high-level pre-assessment under BREEAM 2018 New Construction – office use. At this stage it is assumed that the office floor areas will be developed to a Shell and Core standard only, for future fit out by tenants.

The BREEAM Pre-assessment report has been produced by the project's BREEAM Accredited Professional (AP) informed through consultation with the client and the design team members. This has ensured the appropriateness and achievability of the credit targeted to attain the desired rating. This section of the report presents the proposed strategy for the Proposed Development to achieve as a minimum an 'Excellent' rating according to the Camden Local Plan.

This report summarises the indicative performance of the Proposed Development against BREEAM New Construction 2018 for Offices Shell & Core scheme. If requested, the Retail/leisure spaces could be assessed separately post planning.

The indicative target score for the Proposed Development at the current stage is 70% equating to a BREEAM Excellent rating. A further 4% has been identified as potential additional score, subject to further feasibility and cost review by the design team. As seen from the Table 4-2 Camden's minimum standard required for Energy (60%), Water (60%) and Materials (40%) categories have all been meet and exceeded.

It is important to note that at this stage of design the pre-assessment is not fixed and some credits may be replaced by others and additional credits may be targeted whilst the detailed design progresses. The BREEAM Pre-assessment report can be found in Appendix A.

A summary of the credits targeted is shown in Table 4-2 and Figure 4-1.

Table 4-2 – Pre-assessment Score Summary by Issue Category

Category	Section Weighting	Credits Available	Credits Targeted		Additional Identified		Minimum Standard Required
Management	11.0%	18	13	7.9%	0	0.0%	72%
Health & Wellbeing	8.0%	11	9	6.5%	0	0.0%	82%
Energy	14.0%	21	14	9.3%	0	0.0%	67%
Transport	11.5%	12	12	11.5%	0	0.0%	100%
Water	7.0%	9	6	4.7%	0	0.0%	67%
Materials	17.5%	14	7	8.8%	3	3.8%	50%
Waste	7.0%	11	4	2.5%	0	0.0%	36%
Land Use & Ecology	15.0%	13	12	13.8%	0	0.0%	92%
Pollution	9.0%	12	7	5.3%	0	0.0%	58%
Innovation	10.0%	10	0	0.0%	0	0.0%	0%
Total				**70.4%**		**3.8%**	

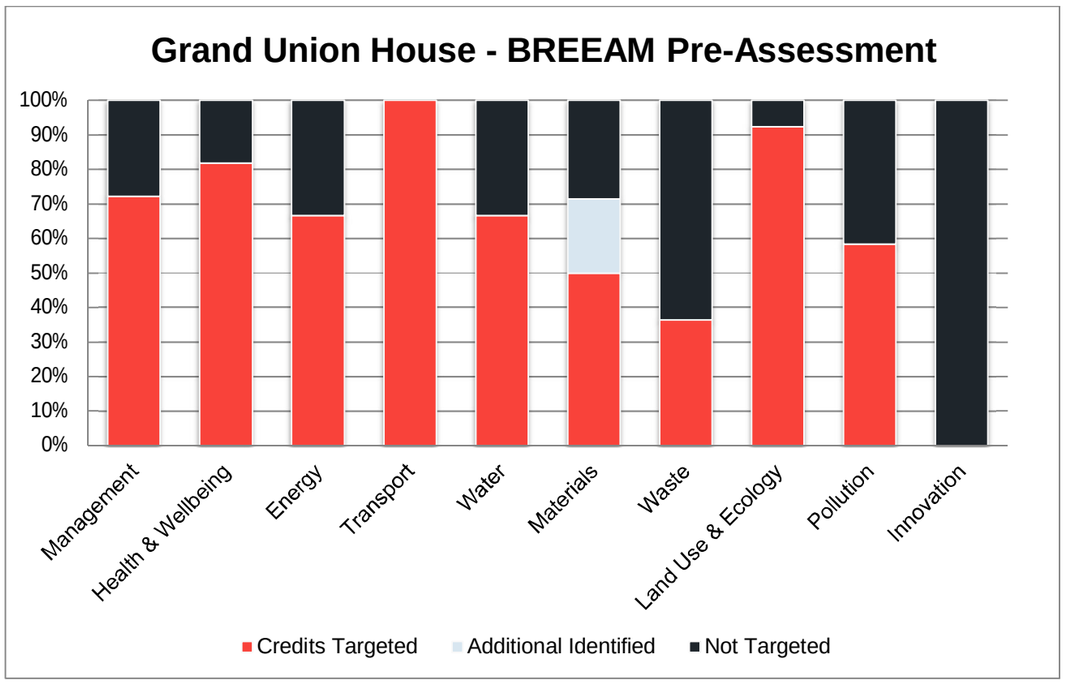


Figure 4-1 Pre-assessment Score Summary by Issue Category

4.4 SUMMARY

To demonstrate that sustainable design standards is integral to the design, construction and operation of the Proposed Development, as requested by Camden Local Plan, a BREEAM Pre-assessment has been carried out using the office scheme with an indicative score of 70% equating to a rating of 'Excellent', furthermore, all the minimum standard required per category for Energy, Water and Materials have been meet and/or exceeded.

5 OPTIMISING THE USE OF LAND

The south east of England has a large population and a comparatively small land area. Land is therefore a precious, finite resource which is even more the case for green spaces providing habitat to flora and fauna. The efficient use of land requires that: developments optimise the carrying capacity of land; that previously developed land is re-used; that green spaces within the South East are protected and opportunities for the provision of new open space are maximised.

5.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The London Plan and Mayor's SPG on Sustainable Design and Construction includes the following requirements:

OPTIMISING THE USE OF LAND

- 100% of development to be delivered on previously developed land.
- Development density should be maximised based on local context, design principles, open space provision and public transport capacity.
- Existing buildings reused where practicable, where the density of development and amenity are optimised.

LOCAL FOOD GROWING

- To provide space for individual or communal food growing, where possible and appropriate.
- To take advantage of existing spaces to grow food, including adapting temporary spaces for food growing.

CAMDEN LOCAL PLAN

POLICY A2 – NEW AND ENHANCED OPEN SPACE

- Ensure developments seek opportunities for providing private amenity space;
- Seek temporary provision of open space where opportunities arise.

5.2 DESIGN APPRAISAL

A separate Design and Access Statement has been prepared by Andrew Phillips Architects to accompany the Planning Submission of the Proposed Development and should be referred to in the first instance on information about the site layout, building design quality and social-economics benefits of the Proposed Development. Optimising the use of land.

OPTIMISING THE USE OF LAND

The Proposed Development has been designed to maximise the use of the existing site in accordance with the Mayor's SPG. This includes utilising 100% of the previously developed land and increasing the density of the development while maintaining the footprint of the existing site. Furthermore, the proposed mixed-use development will deliver circa 6,268 m² (GIA) of commercial space (Class A1, A3, B1, C3, and/or D2) and 6 residential units.

LOCAL FOOD GROWING AND PRODUCTION

All resident will have access to private amenity space such as winter gardens or/and private balconies where there is a potential for individual food growing.

SOCIAL AND ECONOMICAL VALUE

The Proposed Development will add positive benefits to the local area by delivering circa 5,792 m² (GIA) commercial space while having a minimal impact on local traffic as there will be no parking spaces provided on site. During the construction phase, the Proposed Development will help generate many direct and indirect employments. For further information, please refer to the Design and Access Statement report prepared by Philip Architects.

The development will also add positive benefits by delivering 6 affordable residential units which will increase the housing supply in Camden and help meet Camden's housing targets.

5.3 SUMMARY

The Proposed Development has complied with the London Plan, Mayor's Sustainable Design and Construction policy and the Camden Local Plan in optimising the use of the existing site, by ensuring 100% of the development is located on a previously developed land.

Access to private amenity space will be given to all residents with potential for individual food growing. The building's density and amenity space will be optimised, and the social and economic value of the local area will be increased whilst minimising its environmental impacts as much as possible.

6 ENERGY AND CO_2 EMISSIONS

Energy security is one of the key factors that ensures the successful operation of large cities like London. Finding alternative sources of energy, which are renewable, clean and allow a continuation of current living standards is vital.

The design of new developments and the choice of energy sources can contribute to energy security and the stimulation of the renewable energy sector by ensuring that energy will be used efficiently and sustainably.

The visible face of sustainable energy services includes the application of renewable technologies such as wind turbines, solar systems, heat pumps and biomass boilers. However, there are many elements that should be investigated first to reduce the base energy demand.

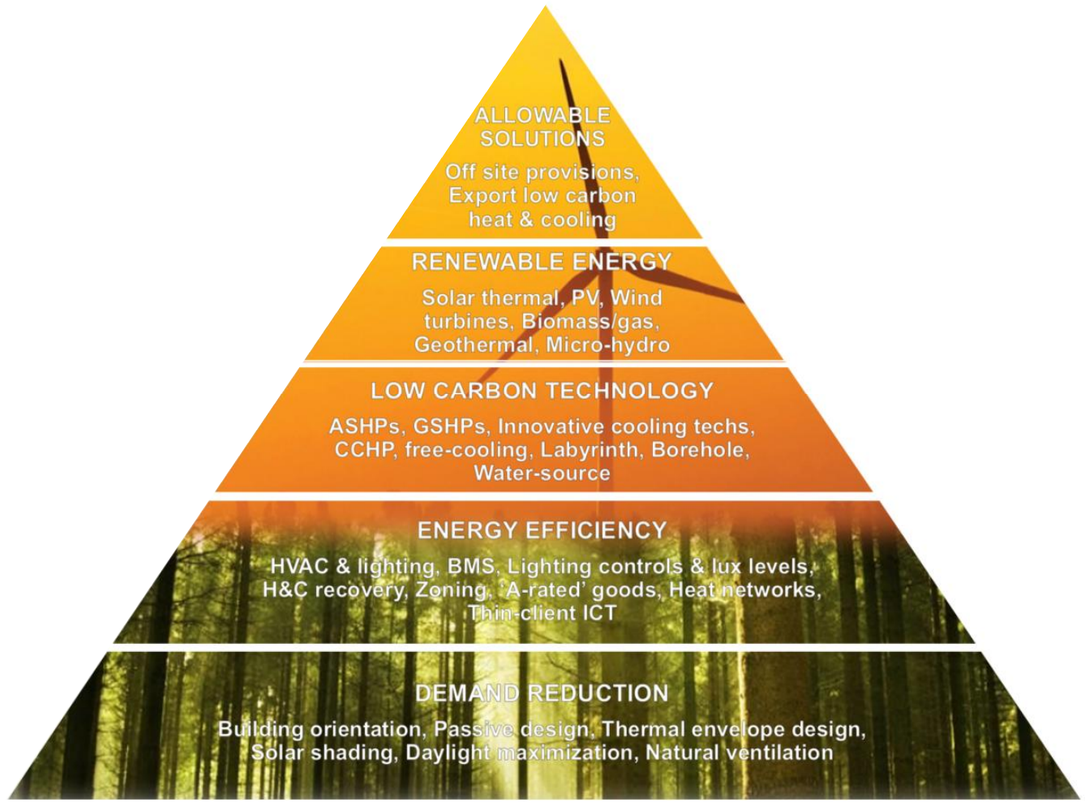


Figure 6-1 – Energy Hierarchy

6.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

ENERGY AND CARBON DIOXIDE EMISSIONS

- The overall carbon dioxide emissions from a development should be minimised through the implementation of the energy hierarchy.
- Development should be designing to meet the following Regulated carbon dioxide standards:
  - Residential buildings (2016-2031): Zero Carbon
  - Non-domestic building (2016-2019): 35% carbon emissions improvement upon Building Regulations Part L 2013
- Developments should contribute to ensuring resilient energy infrastructure and a reliable energy supply, including from local low and zero carbon sources.
- Developers are encouraged to include innovative low and zero carbon technologies to minimise carbon dioxide emissions with developments and keep up to date with rapidly improving technologies.

ENERGY DEMAND ASSESSMENT

- Applications are to be accompanied by an energy demand assessment

USE LESS ENERGY

- The design of developments should prioritise passive measures
- Developers should aim to achieve Part L 2013 Building Regulations requirements through design and energy efficiency alone, as far as is practical.

EFFICIENT ENERGY SUPPLY

- Developers should assess the potential for their development to:
  - Connect to an existing district heating or cooling network;
  - Expand an existing district heating or cooling network, and connect to it; or
  - Establish a site wide network, and enable the connection of existing buildings near the development

RENEWABLE ENERGY

- Major developments should incorporate renewable energy technologies to minimise overall carbon dioxide emissions, where feasible.

CARBON DIOXIDE OFF-SETTING

- Where developments do no achieve the Mayor's carbon dioxide reduction targets set-out, the developers should contribute to the local borough's carbon dioxide off-setting fund.

MONITORING ENERGY USE

- Developers are encouraged to incorporate monitoring equipment and systems where appropriate to enable occupiers to monitor and reduce their energy use.

SUPPORTING A RESILIENT ENERGY SUPPLY

- Developers are encouraged to incorporate equipment that would enable their schemes to participate in demand side response opportunities.

CAMDEN LOCAL PLAN

ENERGY HIERARCHY

- All development is expected to reduce their carbon dioxide emissions by the following the steps in the energy hierarchy to reduce energy consumption.
- Developments involving 500sq m (gross internal) floor-space or more are required to submit an energy statement which demonstrates how carbon dioxide emissions will be reduced in line with the energy hierarchy.

ENERGY EFFICIENCY: NEW BUILDINGS

- All new development is to be designed to minimise carbon dioxide emissions by being as energy efficient as is feasible and viable.
  - Natural systems
  - Preventing Overheating
  - Thermal Performance
  - Mechanical Systems
  - Other energy efficient technology
- Development will be expected to achieve 60% of the un-weighted credit in the Energy category of their BREEAM Assessment.

DECENTRALISED ENERGY NETWORKS AND COMBINED HEAT AND POWER

- Developments will aim to connect to a decentralised energy network and use the heat unless developers can demonstrate it is not technically feasible or financially viable.
- Where a development is not connecting immediately to a network the following measures need to be included in your scheme:
  - space in the plant room for a heat exchanger, any other plant and pipe and electricity connections; and
  - Pipes from the plant room to the property boundary where the decentralised energy pipe is most likely to be located.
- Financial Contribution: if your scheme does not connect to a Decentralised energy network or have a secure agreement to do so within 3 years, and does not include combined heat and power, a financial contribution may be required to enable expansion of the network and future connection.

RENEWABLE ENERGY

- To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.
- All developments are to target at least a 20% reduction in carbon dioxide emissions through the installation of on-site renewable energy technologies.
- When assessing the feasibility and viability of renewable energy technology, the Council will consider the overall cost of all the measures proposed and resulting carbon savings to ensure that the most cost-effective carbon reduction technologies are implemented in line with the energy hierarchy.

6.2 DESIGN APPRAISAL

A separate Energy Statement has been prepared by WSP to accompany the Planning Submission and should be referred to for full details, a summary is provided below.

Emphasis has been placed on maximising energy demand reduction for the building as well as reducing carbon emissions based on the energy hierarchy of ‘Be Lean – Be Clean – Be Green’.

An energy assessment has been carried out using detailed energy model of the whole building with performance compared to the notional building following the Part L2A (new construction) methodology. It can be expected that significantly greater reductions in carbon emissions would be achieved compared to the existing building rather than the new build equivalent.

The proposals for the scheme have been developed in accordance with the desire to achieve an energy efficient and sustainable development. The building will be designed to achieve optimum energy performance and will incorporate the following design features.

NON-RESIDENTIAL

- Significantly exceed the limiting fabric requirements of Part L2A (2013) of the Building Regulations.
- Energy efficient building services plant (including low specific fan power on floor air handling units with heat recovery and DC variable speed fan coil units) will be specified throughout where it is to be provided as part of the base building scheme.
- Low energy LED/fluorescent lighting incorporating daylight and motion controls will be specified throughout.

The non-residential will be served by a centralised heating system. Heating and cooling will be provided for the tenants’ use via chilled and low temperature hot water plate heat exchanges.

- It is not currently possible to serve the development from a district heating network as there are currently no existing networks near to the development.
- A CHP engine has not been proposed for the site as the true carbon savings of the technologies have diminished with the decarbonisation of the grid. Using up to date carbon emission factors for grid electricity causes CHP engines to produce more carbon than a standard boiler system.
- Therefore, the space heating and DHW demand shall be met with Air Source Heat Pumps (ASHPs).

- Subject to future legal and technical agreements, the energy centre will be designed for future connection into a district heating network through the provision of capped connections to the low loss header should a connection prove to be feasible.
- Chilled water will be distributed throughout and metered by hydraulic interface units located in each office tenancy. Chilled water will be generated by the ASHPs.
- A PV array is proposed to be located on the roof of the core of the building and the saw tooth roof. This will provide a further reduction in carbon emissions from the development.

Detailed MEP proposals will be developed further during the detailed design stages, or are subject to tenant fit out. At this stage, the following strategy is proposed:

- Office areas will be fitted to a BCO Category A standard with high performance MEP building services. Heating and cooling will be provided to all office areas by 4-pipe fan coil units. These will be connected to the site wide low temperature hot water (LTHW) and chilled water (CHW) systems.
- The flexible retail/leisure units will be completed to shell and core standard only, providing base services for future extension by tenants, who will be responsible for provision of services to suit their requirements. Flexible retail and leisure spaces to be served by individual direct expansion units, with adequate provision for installation by tenants provided. The retail/leisure areas will be separately metered.

RESIDENTIAL

- Significantly exceed the limiting fabric requirements of Part L1A (2013) of the Building Regulations.
- A CHP engine has not been proposed for the site as the true carbon savings of the technologies have diminished with the decarbonisation of the grid. Using up to date carbon emission factors for grid electricity causes CHP engines to produce more carbon than a standard boiler system.
- High efficiency combination boilers will be specified to all dwellings.
- 100% Low energy LED lighting will be specified throughout.

A PV array is proposed to be located on the roof of the residential block. This will provide a further reduction in carbon emissions from the development.

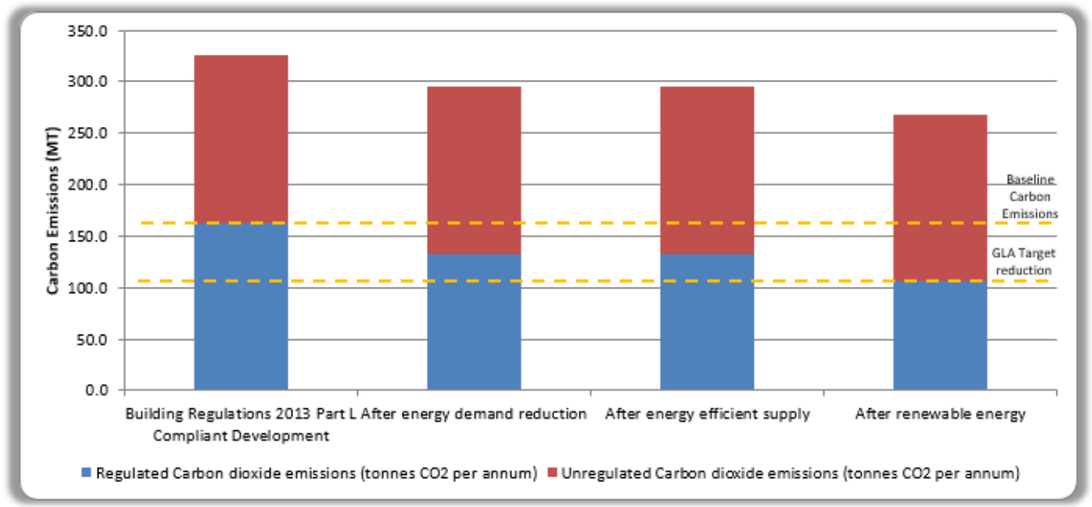


Figure 6-2 Summary of the estimated carbon emissions reductions for the non-residential elements of the Development

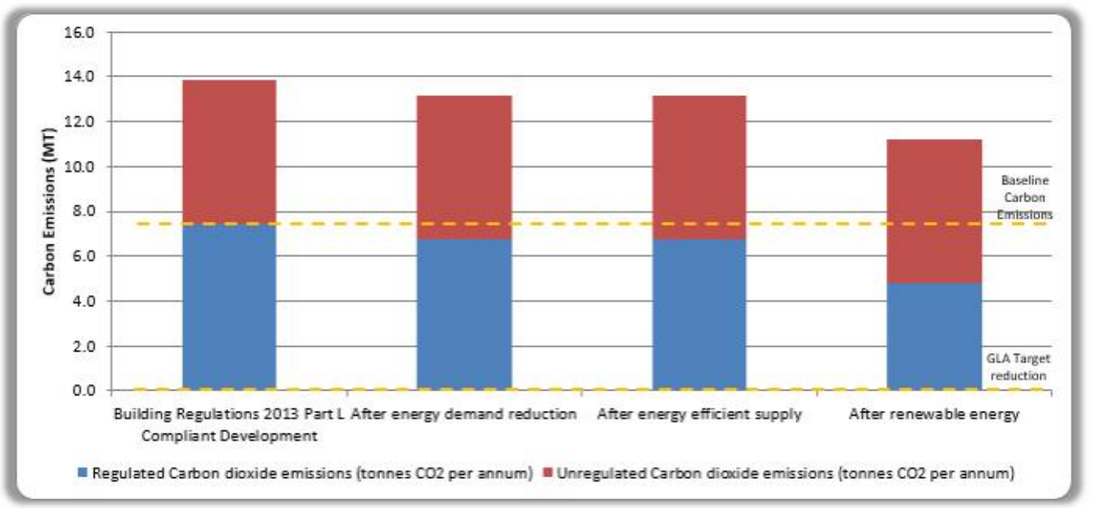


Figure 6-3 Summary of the estimated carbon emissions reductions for the residential element of the Development

TOTAL CARBON EMISSIONS REDUCTION

Overall, the development is shown to achieve a 35% reduction in carbon emissions compared to the Part L 2013 baseline. This is meets the target of a 35% reduction in carbon emissions from Part L 2013 for the non-residential element of the development.

The residential element falls short of the zero-carbon target with the shortfall to be met through the carbon offset payment. The proposed energy strategy for the development is a long term low carbon solution, has significant benefits relating to improving local air quality within the Camden and aligns with the Mayor's plans in the forthcoming New London Plan.

The overall carbon emissions after the application of the energy hierarchy measures are summarised in Table 6-1

Table 6-1 Carbon Emissions reductions

	TOTAL REGULATED EMISSIONS (MT CO_2)	UNREGULATED EMISSIONS (MT CO_2)	REDUCTION IN REGULATED EMISSIONS (%)
Part L 2013 Compliant Development	168.68	169.06	-
Be Lean	137.59	169.06	18.4%
Be Clean	137.59	169.06	18.4%
Be Green	108.84	169.06	35.5%

The non-residential element meets the 35% reduction target set in the London Plan. The residential element meets on-site reduction of 35.7%. However, the shortfall to the zero-carbon target will need to be made up via carbon offset payments or accepted off-site projects. Based on the figures above, the carbon offset payments would equate to approximately £8,600.

6.3 SUMMARY

The Proposed Development has made a significant contribution towards GLA and Camden's target in decreasing the national carbon dioxide emissions by reducing its own carbon emission by 110.92T CO_2 per annum a 35% saving following the London's Plan energy hierarchy.

7 WATER EFFICIENCY

Water consumption is an important issue to address. Not only does it carry a financial cost and large carbon footprint but climate change predictions also forecast irregular rainfall patterns, leading to either too much water in winter along with increasing flood risk, or water shortages in summer.

A 2014 research project[1] ranked London as the 15th most water-stressed city in the world. Thames Water is predicting that London is imminently facing a drinking water deficit that might escalate to a 40% deficit by 2040 if no action is taken. A responsible and prudent use of water is therefore a prime consideration of the Proposed Development.

7.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

WATER EFFICIENCY

- Developers should maximise the opportunities for the use of water saving measures and appliances in all developments, including the reuse and using alternative sources of water
- Developers should design residential schemes to meet a water consumption rate of 105 litres or less per person per day
- New non-residential developments, including refurbishments, should aim to achieve the maximum number of water credits in a BREEAM assessment or the 'best practice' level of the AECB (Association of Environment Conscious Building) water standards.
- All developments should be designed to incorporate rainwater harvesting.
- All residential units, including individual flats/apartments and commercial units should be metered.

CAMDEN LOCAL PLAN

POLICY CC3 - WATER

Camden Local Pan requires development to:

- incorporate water efficiency measures;
- avoid harm to the water environment and improve water quality;
- The Council expects all developments to be designed to be water efficient by minimising water use and maximising the re-use of water. This includes new and existing buildings.
- The Council will require buildings with gardens or landscaped areas that require regular maintenance to be fitted with water butts.

[1] A study carried out by The Nature Conservancy published in the Global Environmental Change Journal. http://www.sciencedirect.com/science/article/pii/S0959378014000880

7.2 DESIGN APPRAISAL

The Proposed Development will be designed to minimise water use and impact on urban drainage. Water supplied to the Proposed Development will not give rise to significant adverse effects to the environment as control and leak detection will be installed where appropriate. The Proposed Development will be designed to minimise water use through:

WATER CONSERVATION AND REUSE

The development employs best practice design regarding water conservation and will have reduced mains water demand over typical building performance. Proposed water saving features includes:

- Water efficient sanitary fittings such as low flush WCs and low flow taps and showers with flow regulators will be installed in the dwellings. A daily water consumption of 105 l/person/day will be targeted for the dwellings to be achieved through the provision of low flow sanitary fixtures and fittings.
- In the non-residential areas, the sanitary fittings will be specified such that a reduction over a notional building consumption is at least 25%.

As the design progresses, the Proposed Development (non-residential units) will aim to achieve the 'best practice' level of the AECB water standards as required by planning.

The development is currently targeting 6 out of 9 water credits in the BREEAM assessment, with a potential to reach 7 credits pending further feasibility study.

MANAGING WATER USE

To ensure ongoing sustainability performance during building operation, water use will be appropriately and effectively managed.

Water meters will be installed and it will encourage residents to monitor and reduce their water consumption.

Additionally, in non-residential areas water meters will be linked to a central Building Management System which will enable monitoring and evaluation of water usage by the building management team

LEAK DETECTION AND PREVENTION

Systems will be specified to detect a major water leak on the mains supply both within the building and between the building and the utilities water meter.

Proximity controls will be installed in the office toilet blocks to ensure that water supply is turned off when toilets are not in use.

WATER USE DURING CONSTRUCTION

Water consumption targets will be set for the construction site and usage will be monitored.

WATER RECYCLING

The provision of a rainwater attenuation is currently unfeasible due to the lack of access to the basement levels of the property. Therefore, rainwater harvesting is not incorporated into the design of the development.

7.3 SUMMARY

The Proposed Development has complied with London Plan and Camden's policies by ensuring the development has maximised the opportunities for incorporation water saving measures which include the use of water saving fixtures and fittings, optimised water management through leak detection, reduced water flow rates and the installation of water meters in all tenant and residential units. Additionally, residential units have been designed to meet the water consumption rate of 105 l/p/d. As design progresses the non-residential areas will aim to achieve 'best practice' level of the AECB water standards.

Due to restricted access to the basement, rainwater harvesting is not incorporated into the design of the development.

8 MATERIALS

On a global level and particularly in developed countries such as the United Kingdom, resource use is currently unsustainable and contributes a large proportion to human-made carbon emissions and has other environmental and social impacts.

The depletion of certain material resources along with the environmental impact of the materials' extraction, processing and manufacturing puts a huge burden on our planet. In the UK, according to Green Spec it is estimated that 7 tonnes of construction materials are used per person each year and 11.3 tonnes per person for the total consumption of all materials in the UK per year[2].

To address these issues, there is now an increased focus on 'embodied impacts' due to material use, a drive to use materials in a more efficient way and to select materials based on their environmental, health and ethical credentials. The careful choice and application of building materials does not only have a positive impact on the environment and the building occupants, it can also reduce costs over the lifetime of the building.

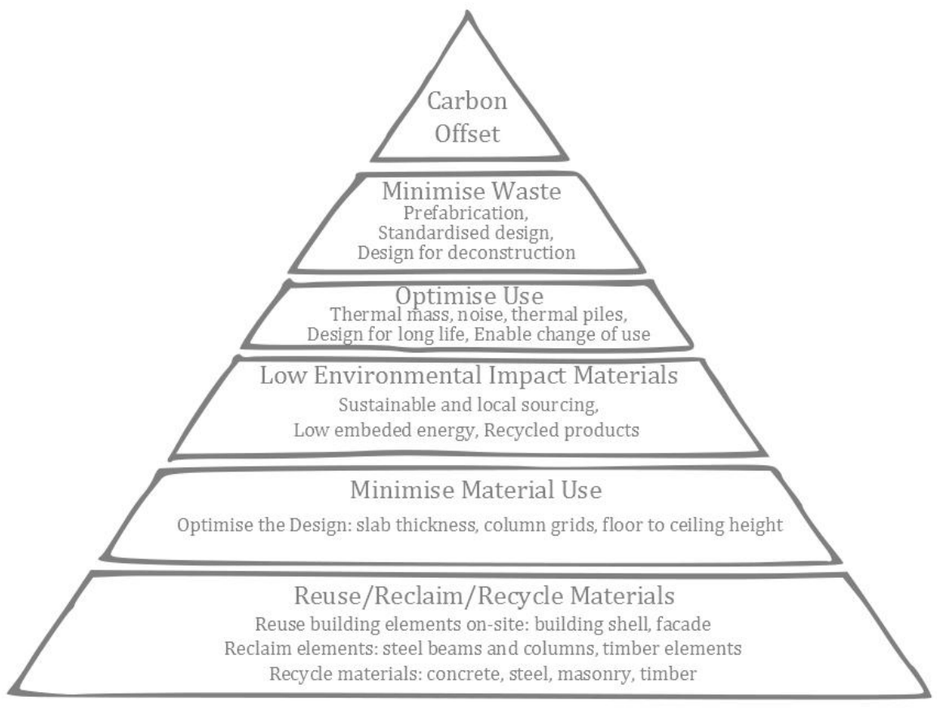


Figure 8-1 – Materials Design Hierarchy

8.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The London Plan and Mayor's SPG for Sustainable Design and Construction sets the following requirements regarding materials for new developments:

DESIGN PHASE

- Have a low embodied energy, including those that can be reused intact or recycled;
  - At least three of the key elements of the building envelope are to achieve a rating of A+ to D in the BRE's The Green Guide of specification
  - Be sustainably sourced: at least 50% of timber and timber products should be sourced from an accredited FSC or PEFC source;
  - Are durable to cater for their level of use and exposure;
  - Will not release toxins into the internal and external environment, including those that deplete stratospheric ozone.
- The design of developments should maximise the potential to use pre-fabrication elements.

CAMDEN LOCAL PLAN

- All developments should aim for at least 10% of the total value of materials used to be derived from recycled and reused sources.
- Major developments are anticipated to be able to achieve 15-20% of the total value of materials used to be derived from recycled and reused sources.
- A Construction Management Plan will be required and will help manage on site impact arising from demolition and construction processes.
- Where a 'site waste management plan' (SWMP) is required (in projects with an estimated construction cost of over £300,000) it should include a pre-demolition audit of materials completed by a qualified professional and submitted with an application, in accordance with the Demolition Protocol.

[2] https://www.hertfordshire.gov.uk/microsites/building-futures/a-sustainable-design-toolkit/technical-modules/materials/material-facts.aspx

8.2 DESIGN APPRAISAL

The Proposed Development addressed the following aspects:

ENVIRONMENTAL IMPACT

Material efficiency is a priority for the Design Team and one of the key considerations for detailed design. Potential measures for reducing the material demand and for designing out waste will be explored by all key design team disciplines at each design stage.

The environmental impact of the proposed materials palette has regard for selecting components that score well under the BRE's 'The Green Guide to Specification'[3]. Furthermore, the design team will review the wider environmental impact of the materials considered when choosing between different options. This will include reviewing Environmental Product Declarations.

Insulation materials to be used for the Proposed Development will be specified to have a low or zero Global Warming Potential (GWP) and low Ozone Depletion Potential (ODP).

Furthermore, a BREEAM Compliant environmental lifecycle analysis (LCA) has been carried out to establish the embodied carbon footprint of the development over a 60-year lifecycle. The baseline will provide a starting point against which to research various design options to reduce carbon emissions. These carbon-reduction-options could take many forms, including but not limited to alternative material specifications, resource efficiency initiatives or using alternative methods of construction.

REUSE & RECYCLED CONTENT

It is anticipated that a Demolition Audit will be carried out prior to works commencing on site to establish types and quantities of expected demolition materials, pending the appointment of a Contractor. The Contractor will be encouraged to utilise demolition materials directly on site if and where feasible, e.g. the use of crushed bricks and concrete for blinding concrete and mass concrete fill. The development's structural steel frame will be specified to contain some recycled content.

It is envisaged that most of the structure element on the ground floor will be retained. No new foundation is proposed at this stage of the design.

The Mayor's target of at least 10% total value of materials used to be derived from recycled and reused content is expected to be exceeded with the proposed design. This can be made up of demolition material from the site and/or specification of materials with recycled content. However, it is difficult to state exactly what percentage of reused materials will be utilised or what level of recycled content will be possible at this stage in the design. Nevertheless, we estimate the following recycled content percentages for the various building components, based on WRAP guidance[4] as shown in Table 8-1:

Table 8-1 - Estimated recycled content in construction materials

ELEMENT	BUILD UP	ESTIMATE RECYCLED CONTENT (%)
Foundations (commercial)	All foundations in the development will be retained.	n/a
Structural Frame (commercial)	Steel Frame	Structural steel sourced in the UK typically contains up to 40% recycled matter.
Structural Frame (Residential)	Concrete Frame	The steel reinforcement, when sourced in the UK, will typically be made from nearly 100% steel scrap. Concrete is likely to contain 5-10% recycled content (assume up to 50% Ground-granulated blast-furnace slag (GGBS), as well as up to 20% recycled and/or secondary aggregates).
Façade (commercial)	Double glazed curtain walling systems; Aluminium cladding	The aluminium/steel fixing system will have a high recycled content of 50% or above (depending on country of origin and production processes). Glazing elements is likely to contain low recycled content (<10%).
Façade (Residential)	Brick with mineral wool insulation Double Glazed windows	Clay Brick will typically contain 10% recycled materials or more. Mineral wool insulation to the curtain wall system is likely to contain at least 50% recycled material. Glazing elements is likely to contain low recycled content (<10%).
Internal Walls (Residential and/or office back of house)	Plasterboard on metsec framing system, concrete blockwork	Plasterboard could contain up to 84% recycled material, and Mineral wool will contain at least 50% recycled material. Metal stud could contain 60% recycled material. Blockwork can contain a high recycled material percentage depending on the type (density and compressive strength) required.
Floor / Ceiling finishes (offices)	Show room – assume carpet on raised access floor, on composite floor, and plasterboard suspended ceilings	Carpet will typically contain 25% recycled materials or more. OSB/plywood boards could have a high recycled content of 80% or more. Gypsum board ceiling tiles typically contain 30-80% recycled matter.
Floor / Ceiling finishes (Residential)	Mix of possible materials depending on areas (carpet, linoleum, vinyl, tiles) Paint	Carpet will typically contain 25% recycled materials or more, linoleum has a typical recycled content of 24%, vinyl usually has a recycled content of 25% and tiles could have a recycled content of up to 40% (if resin bonded).
Floor Finishes – Back of House (BOH)	Mix of possible materials depending on areas (carpet, linoleum, vinyl, tiles)	Carpet will typically contain 25% recycled materials or more, linoleum has a typical recycled content of 24%, vinyl usually has a recycled content of 25% and tiles could have a recycled content of up to 40% (if resin bonded).

[3] www.thegreenguide.org.uk
[4] http://www.wrap.org.uk/sites/files/wrap/Const%20Product%20Guide%20Version%204.1.pdf

RESPONSIBLE SOURCING

The responsible sourcing of materials will be a key consideration in the selection of suppliers, and a sustainable procurement strategy will be produced for the development prior to construction. Materials from suppliers who participate in responsible sourcing schemes such as the BRE BES 6001:2008 Responsible Sourcing Standard will be prioritised.

All timber specified will be sourced from schemes supported by the Central Point of Expertise for Timber Procurement such as Forest Stewardship Council (FSC) accreditation – which ensures that the harvest of timber and non-timber products maintains the forest's ecology and its long-term viability.

Where viable the design team will specify materials that are grown or made locally. Likewise, the appointed contractor will be asked to prioritise local sourcing of materials.

Natural resource depletion will be minimised throughout the development, and materials such as peat and natural weathered limestone will not be used in the buildings or landscape features.

HEALTHY MATERIALS

Internally, the design and specifications will ensure that environmentally sensitive (non-toxic) building materials are used throughout. Specifically, the design and specification of materials used internally will be based on the use of products that contain low levels of or no Volatile Organic Compounds (VOCs).

The selection criteria for external materials will include the specification of low toxicity to humans and the wider environment, especially those that deplete stratospheric ozone.

DESIGNING FOR DURABILITY AND RESILIENCE

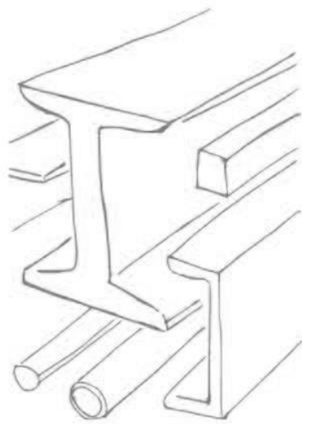
The non-residential development has been designed as a Shell and Core project and all interior office and flexible retail/leisure spaces are designed as open plan office/retail/leisure space. The design of its structural grid, dimensions and floor-to-floor height will allow for enough flexibility that will assist with future adaptations. The open plan spaces within the buildings will make it easier for occupants to use floor area more effectively as their needs change, or as their business expand.

8.3 SUMMARY

The Proposed Development has complied with the Mayor's Sustainable Design and Construction and Camden Local policy by ensuring, as far as practicable that materials used on site will have a low embodied energy; some of the key elements of the building envelope will achieve a rating of A+ to D in the BRE's 'The Green Guide' to specification and all the timber used on site will be sustainably sourced from accredited FSC or PEFC sources.

Additionally, a compliant BREEAM LCA has been carried out to establish the embodied carbon footprint of the development over a 60-year lifecycle and various design options to reduce carbon has been considered. Furthermore, the external materials will be specified to have low toxicity to humans and the environment, to be durable to cater for their level of use and exposure and the Proposed Development will maximise the use of pre-fabricated materials.

A pre-demolition audit will be carried out prior to works commencing on site.



9 WASTE

The UK construction industry is responsible for the consumption of 400 million tonnes of resources every year and produces 120 million tonnes of waste (source: Waste Recycle Action Plan, WRAP). This is a very large amount of largely finite, natural resources being consumed and of which, a third is thrown away. This is clearly not financially or environmentally responsible and organisations like WRAP are promoting a more sustainable approach to using natural resources.

The waste hierarchy identifies a methodical approach to dealing with waste to minimise the environmental impact and has been used to guide the early design. The waste hierarchy ranks the different ways in which waste can be treated so that it limits the amount of resources used and waste generated.

9.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The London Plan and Mayor's SPG for Sustainable Design and Construction sets the following requirements regarding waste for new developments:

CONSTRUCTION PHASE

- Developers should maximise the use of existing resources and materials and minimise waste generated during the demolition and construction process through the implementation of the waste hierarchy.

OCCUPATION PHASE

- Developers should provide sufficient internal space for the storage of recyclable and compostable materials and waste in their scheme.
- The design of the development should meet borough requirements for the size of location of recycling, composting and refuse storage and its removal.

CAMDEN LOCAL PLAN

POLICY CC5 – WASTE

- The Council will seek to make Camden a low waste borough.
- The Council will make sure that developments include facilities for the storage and collection of waste and recycling.

9.2 DESIGN APPRAISAL

The waste hierarchy, which is represented in Figure 9-1, identifies a methodical approach to dealing with waste to minimise the environmental impact and has been used to guide the early design. The waste hierarchy ranks the different ways in which waste can be treated so that it limits the amount of resources used and waste generated.

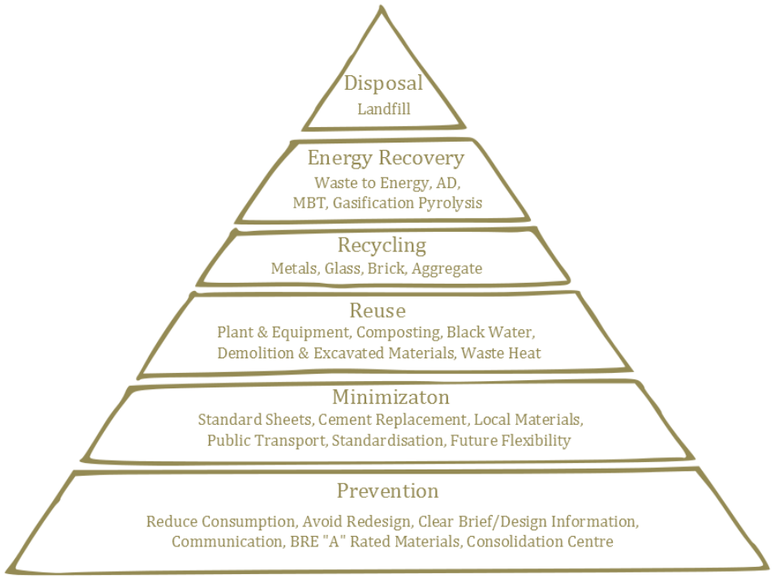


Figure 9-1 - Hierarchy to design out waste

CONSTRUCTION WASTE

The Proposed Development will incorporate best practice waste reduction measures developed in line with the waste hierarchy to reduce, reuse, and recycle. These include:

- Exploring the potential for using prefabricated and standardised modulation components
- As stated in the Section 8 Materials, a pre-demolition audit will be produced to understand the potential for salvaging components and recycling of demolition waste

A Resource Management Plan will be drafted during detailed design and later completed by the appointed contractor, including the following:

- Setting of a target benchmark for Construction Site Waste Management (in line with BREEAM Wst 01)
- Procedures and commitments for minimising non-hazardous waste in line with the benchmark.
- Procedures for minimising hazardous waste

- Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
- Procedures for sorting, reusing and recycling construction waste into defined waste groups.
- 80% per volume or 90% by tonnage non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled.

MANAGEMENT OF OPERATIONAL WASTE: COMMERCIAL WASTE

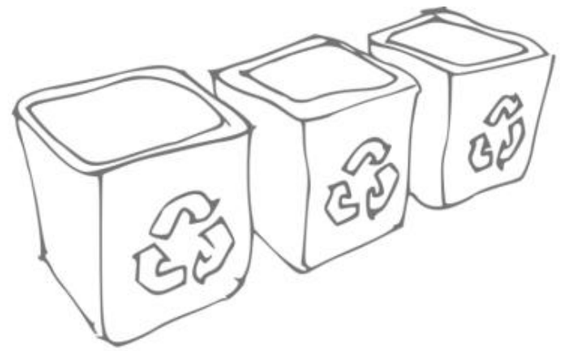
A Waste Management Strategy produced by WSP as part of the Transport Assessment will be submitted as part of the planning application submission, please refer to the report for further information, however a summary is provided below:

- Residents will be responsible for transporting their waste from their individual apartments directly to the residential waste store on the ground floor. The residential waste will be collected on a weekly basis by LBC waste collection operatives who will wheel out the bins to the refuse vehicle on Kentish Town Road.
- The waste storage areas will be where the waste produced by the individual flexible retail/leisure units will be sorted prior to collection. On collection days the collection operatives will collect the waste directly from the smaller retail/restaurant/café units to the refuse vehicle parked on Kentish Town Road.
- The office and larger flexible retail/leisure units will utilise the communal refuse yard which will be collected twice weekly. There is a clear path between the communal refuse yard and the location of the refuse vehicle on Kentish Town Road and bins can be brought out to a collection point prior to collection to ensure the dragging distance is kept to a minimum.

9.3 SUMMARY

The Proposed Development has complied with the Mayor's Sustainable Design and Construction and Camden local policy by ensuring that both the construction and the operational waste is managed in accordance with the waste hierarchy. Every effort has been taken to ensure most demolition waste is reused or recycled and 80% per volume non-hazardous waste will be diverted from landfill.

Moreover, the Proposed Development will also provide sufficient internal space and collection area for the storage of recycled and compostable materials and waste in the development.



10 CLIMATE CHANGE ADAPTATION

Climate change will affect the quality of life of all Londoners both positively and negatively. The effects of climate change can already be seen in UK weather patterns and it is prudent to consider the likely impact of changes for the design and operation of new developments.

Climate change adaptation measures will improve the resilience to changing climate. Their benefits include reduced carbon dioxide emissions, improved water and energy security. Furthermore, they can assist with tackling social inequality and boost the 'green' economy.

Acting to mitigate the effects of climate change will help future proof buildings and infrastructure, providing longevity and flexibility to the development and making it an attractive place to live, regardless of the climate. It is important that the buildings and spaces built today are suitable for occupation and use for their anticipated lifetime.

Particularly relevant for London is the urban heat island effect. This is the term given to the observed higher temperatures in cities and towns in comparison to rural areas. The predicted impact of climate change is to make the world warmer, particularly summers, which would exacerbate the urban heat island effect in London.

The latest UK Climate Projections 2009 (UKCP09) have helped inform the development of the London Plan. The UK Climate Projections 2009[5] data for London are presented in Table 10-1 below, showing predicted increased temperatures.

Table 10-1 Climate change impacts for London (UKCP09)

	2020'S	2050'S	2080'S
Summer Mean Temperature	+1.6°C	+2.7°C	+3.9°C
Summer Mean Daily Max. Temperature	+2.1°C	+3.7°C	+5.3°C
Winter Mean Precipitation	+6%	+14%	+19%
Summer Mean Precipitation	-7%	-19%	-23%

UKCP09 suggests that London could:

- By the 2020s, see an increase in summer mean temperature of 1.6°C, a decrease in mean summer rainfall of 7% and an increase in mean winter rainfall of 6%, all from a 1961 – 1990 baseline.
- By 2050s, see an increase in mean summer temperature of 2.7°C, an increase in mean winter rainfall of 14% and a decrease in mean summer rainfall of 19%
- By the 2080s, see an increase in mean summer temperature of 3.9°C, an increase of 19% in mean winter rainfall and a decrease in mean summer rainfall of 23%

The climate change data also show that along with warmer summers, rainfalls patterns are likely to change. This means that new developments should consider how they manage rainfall and use water carefully.

In February 2016 the Environmental Agency (EA) released new guidance on the application of climate change allowance in flood risk assessments (FRA). This guidance provides contingency allowances for potential increase in rainfall intensity. the Proposed Development is located within the urban catchment; therefore, the development allowance used for the FRA is 40% to allow for climate change for the lifetime of the scheme, as shown in Table 10-2.

Table 10-2 Peak rainfall intensity allowances in small and urban catchments (Sourced from EA.GOV, 2016)

APPLIES ACROSS ALL OF ENGLAND	TOTAL POTENTIAL CHANGE ANTICIPATED FOR 2020S (2015 – 2039)	TOTAL POTENTIAL CHANGE ANTICIPATED FOR 2050S (2040 – 2069)	TOTAL POTENTIAL CHANGE ANTICIPATED FOR 2080S (2070 – 2115)
Upper end	10%	20%	**40%**
Central	5%	10%	**20%**

Steps to tackle climate change are being set mainly by the Mayor through policies and programmes seeking to reduce London's carbon dioxide emissions. For development proposals the early design stages are the most cost effective to incorporate relevant design and technological measures, enabling proposals to realise their full potential to reduce carbon dioxide emissions and adapt to climate change.

10.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The Mayor's SPG on Sustainable Design and Construction 2014 includes the following requirements for adapting to climate change:

TACKLING INCREASED TEMPERATURE AND DROUGHT

OVERHEATING

- Developers should include measures, in the design of their schemes, in line with the cooling hierarchy to prevent overheating over the scheme's life-time.

HEAT AND DROUGHT RESISTANT PLANTING

- The design of developments should prioritise landscape planting that is drought resistant and has a low water demand for supplementary watering.

RESILIENT FOUNDATIONS

- Developers should consider any long-term potential for extreme weather events to affect a building's foundations and to ensure they are robust.

[5] http://ukclimateprojections.defra.gov.uk/

INCREASING GREEN COVER

URBAN GREENING

- Developers should integrate green infrastructure into development schemes, including by creating link with wider green infrastructure network.

TREES

- Developments should contribute to the Mayor's target to increase tree cover across London by 5% by 2025.
- Any loss of a tree/s resulting from development should be replaced with an appropriate tree or group of trees for the location, with the aim of providing the same canopy cover as that provided by the original tree/s.

FLOODING

SURFACE WATER FLOODING AND SUSTAINABLE DRAINAGE

- Developers should maximise all opportunities to achieve greenfield runoff in their developments.
- When designing their scheme developers should follow the drainage hierarchy set out in the London Plan 5.13.
- Developers should design Sustainable Drainage Systems (SuDS) into their schemes that incorporate attenuation for surface water runoff as well as habitat, water quality and amenity benefits.

FLOOD RISK MANAGEMENT

- Developments are designed to be flexible and capable of being adapted to and mitigating the potential increase in flood risk as a result of climate change.
- Where development is permitted in a flood risk zone, appropriate residual risk management measures are to be incorporated into the design to ensure resilience and the safety of occupiers.

OTHER SOURCES OF FLOODING

- All sources of flooding need to be considered when designing and constructing developments.

CAMDEN LOCAL PLAN

POLICY CC1 – CLIMATE CHANGE MITIGATION

- The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.
- The Council will promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
- ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
- support and encourage sensitive energy efficiency improvements to existing buildings;
- require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
- Expect all developments to optimise resource efficiency.

POLICY CC2 ADAPTING TO CLIMATE CHANGE

The Council will require development to be resilient to climate change.

All development should adopt appropriate climate change adaptation measures such as:

- the protection of existing green spaces and promoting new appropriate green infrastructure;
- not increasing, and wherever possible reducing, surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems;
- incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
- Measures to reduce the impact of urban overheating, including application of the cooling hierarchy.

FLOODING

- Developments must not increase the risk of flooding, and are required to put in place mitigation measures where there is known to be a risk of flooding.
- All sites in Camden over one hectare or 10,000sqm require a Flood Risk Assessment in line with the National Planning Policy Framework.
- The assessment should be site specific and concentrate on the management of surface water run-off, and / or ground water where applicable, and should address the number of impermeable surfaces resulting from the development and the potential for increased flood risk both on site and elsewhere within the catchment. These must be prepared by a suitably qualified professional and should be submitted with a planning application.
- All developments are expected to manage drainage and surface water on-site or as close to the site as possible, using Sustainable Drainage Systems (SUDS) and the drainage hierarchy.
- The Council will expect developments to achieve a greenfield surface water run-off rate once SUDS have been installed. As a minimum, surface water run-off rates should be reduced by 50% across the development.
- The Council will seek to ensure that development does not increase food risk and reduces the risk of flooding where possible.

10.2 DESIGN APPRAISAL

The Proposed Development has been carefully designed to take the likely impacts of climate change into account.

TACKLING INCREASED TEMPERATURE AND DROUGHT

URBAN HEAT ISLAND

The following proposed measures will help reduce external overheating and provide benefits in terms of balancing the microclimate:

- All air handling systems will be equipped with heat recovery systems to reduce as far as possible the amount of process heat expelled to the external environment.
- To further contribute to the adaptation and reduction of the effects of climate change, the Proposed Development will include planting on the pavement level, Level 3 and 4 terraces. Please refer initially to Section 13 ' in this report, and the Landscape Statement and Public Realm Strategy prepared by Turkington Martin for further details on plant species and their water demand.

OVERHEATING

In line with policy 5.9 of the London Plan, the residential units will be designed to reduce potential overheating and reliance on air conditioning systems. Refer to the Energy Statement for full details and overheating/solar gain results. A summary of the strategy for reducing overheating is as follows:

- 100% low energy lighting will be provided to reduce internal heat gains within the apartments.
- A highly efficient fabric and glazing is proposed incorporating glazing with low-e solar shield glass to protect the interior from solar gain.
- The apartments will have openable windows although these cannot be relied on due to acoustic and air quality restrictions.
- Within the apartments, mechanical ventilation will be provided via MVHR units with boost function will be provided to encourage air flow.

INCREASING TREE COVER

URBAN GREENING & TREES

The Proposed Development has endeavoured to increase the urban greening of the site by incorporating some element of greening which consist of new trees on pavement level, some heavy planting on L3 terrace area and L4 terrace will include some greenery but very limited due to loading restriction.

RESILIENT FOUNDATIONS

The foundations of the Proposed Development will be retained and no additional strengthen is required.

FLOOD RISK

SURFACE WATER FLOODING AND SUSTAINABLE DRAINAGE

The Proposed Development is located within Flood Zone 1 and is therefore considered to be at a low probability of tidal and fluvial flooding. In addition, no historic instances of tidal and fluvial flooding have been recorded on or within the vicinity of the Proposed Development. This zone comprises land assessed as having less that a 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%) so not liable to flood.

A Flood Risk Assessment (FRA) has been carried out for the development.

SURFACE WATER DRAINAGE STRATEGY & SUDS

There is no scope within the existing structure to incorporate any surface water attenuation, and due to lease restrictions regarding access under the ground providing attenuation within the new build area is also limited/restricted. Therefore, it is proposed that the development will mimic existing discharge rates with no formal attenuation provided.

Please note that foul and surface water from the site, will discharge to the local TW combined sewer which site within Kentish Town Road.

10.3 SUMMARY

The Proposed Development has complied with the London Plan and Camden local policy in ensuring it has reduced its external heat rejection to the atmosphere; has incorporated some planting to combat the effects of climate change; and reduced its reliance on air conditioning systems by using solar control glazing, mechanical ventilation and reducing internal heat gains.

A FRA was carried out to identify sustainable measures for water conservation and managing surface water runoff which should be included in the design. Currently due to access restriction there's no scope within the existing structure to incorporate any surface water attenuation.

11 POLLUTION MANAGEMENT

Due to their dense population and 24/7 activities urban areas such as London tend to have increased levels of pollution in regard to air quality, noise and night-time light pollution.

Treating wastewater, filtering air emissions, and creating landfills for solid waste are all methods of controlling pollution after it has been created. Pollution prevention means avoiding pollution at the source rather than trying to control it afterwards. A focus on pollution prevention or minimisation will benefit the health and comfort of London's inhabitants, the local and wider ecosystems and is usually also reducing operational costs.

During the construction and the operation of the building, there are many sources of pollution that should be addressed and minimised, such as:

- Air pollution: CO_2 emissions, particulates, dust, volatile organic compounds (VOCs) etc.
- Land pollution: spills and improper waste disposal
- Water pollution: spills accessing local water ways and the aquifer
- Light pollution
- Noise pollution

11.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The Mayor's SPG on Sustainable Design and Construction includes the following design requirements:

LAND CONTAMINATION

- Developers should set out how existing land contamination will be addressed prior to the commencement of their development.
- Potentially polluting uses are to incorporate suitable mitigation measures

AIR QUALITY

- Developers are to design their schemes so that they are at least 'air quality neutral'.
- Developments should be designed to minimise the generations of air pollution
- Developments should be designed to minimise and mitigate against increased exposure to poor air quality
- Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants.
- Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during construction and Demolition SPG when construction their development.

NOISE

- Areas identified as having positive sound features or as being tranquil should be protected from noise.
- Noise should be reduced at source, and then designed out of a scheme to reduce the need for mitigation measures.

LIGHT POLLUTION

- Developments and lighting schemes should be designed to minimise light pollution.

WATER POLLUTION

SURFACE WATER RUNOFF

- In their aim to achieve a greenfield runoff rate, developer should incorporate SuDS into their schemes which also provide benefits for water quality.
- Encourage good environmental practices to help reduce the risk from business activities on the London water environment.
- Encourage those working on demolition and construction sites to prevent pollution by incorporating prevention measures and following best practices.

WASTEWATER TREATMENT

- Commercial developments discharging trade effluent should connect to the public foul sewer or combined sewer network where it is reasonable to do so subject to a trade effluent consent from the relevant sewerage undertaker.
- Developments should be properly connected and post-construction check should be made by developers to ensure that misconnections do not occur.

CAMDEN LOCAL PLAN

POLICY CC4 – AIR QUALITY

- The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.
- Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution.

POLICY A4 NOISE AND VIBRATION

- The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration Thresholds.

11.2 DESIGN APPRAISAL

LAND CONTAMINATION

The Proposed Development is in a previously developed land and the existing foundation will be retained, therefore it is assumed the land is not contaminated and a preliminary risk assessment is not required to be carried out.

AIR QUALITY

An Air Quality assessment has been carried out by WSP with the aim to minimise air pollution. Please refer to the report for full details, a summary of the findings is provided below. A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology.

- This identified that there is a medium to low risk for both dust soiling impacts and particulate matter concentrations due to construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM_{10} releases would be significantly reduced. The residual effect of dust and PM_{10} generated by construction activities on air quality are therefore not significant. The residual effect of emissions to air from construction vehicles and plant on local air quality is not significant.
- An assessment of the exposure of the future users of the Proposed Development to potentially elevated pollutant concentrations has also been undertaken. All future receptors at all floors are expected to exceed the NO_2 annual mean limit value. PM_{10} and $PM_{2.5}$ were identified to be within the air quality limit values. Details of the ventilation strategy will be made available at detailed design stage.
- In accordance with the requirements of the Greater London Authority, the assessment shows that the Proposed Development is air quality neutral with regards to both building and transport emissions.
- Providing that mitigation measures are in place for the construction and operational phases, it is considered that the development proposals comply with national and local policy for air quality.

NOISE

During the period of construction, the requirements defined in the CCS scheme limit the noise impacts allowed by construction activities. These requirements suggest that noisy construction activities should be restricted and should be appropriate to the area and time of day.

Throughout the construction phases the applicant and the principal contractors will select equipment that will minimise the noise and vibration effects, wherever feasible.

Furthermore, a noise assessment has been carried out which also makes recommendations for plant location and noise attenuation for further details please refer to the Acoustic Assessment report prepared by WSP.

LIGHT POLLUTION

Due cognisance has been given to the impact on light pollution. The lighting scheme/intelligent building features for the Proposed Development will be designed so that it does not produce unacceptable levels of light pollution. The proposed design minimises light spillage to the night sky in the following ways:

- The external lighting design will follow the guidance in the Institution of Lighting Engineers (ILE) Guidance notes for the reduction of obtrusive light, 2005.

WATER POLLUTION

SURFACE WATER RUNOFF

The building's rainwater drainage systems will be designed to BS EN 12056pt3:2000. Design rainfall intensities have been selected for the roof types and the associated risk of flooding to the building as:

- Category 1- for pitched roof areas of the development where there will be no risk to the building in the event of blockages.
- Category 2 - for roof areas of the development where the build-up of water is not acceptable or there is a possible risk to the building (e.g. flat roof areas).

Rainwater will be collected from all roof surfaces of the development. Rainwater will be conveyed from all roof areas by gravity.

Rainwater outlets at the top of the building shall be untapped to ensure the rainwater drainage system is vented. Where pipes are required to run internally, they will be insulated to eliminate noise and condensation. Access will be provided at all changes of direction, branches and connections to the drainage system.

Rainwater outlets at roof levels will drain into high level rainwater pipes and, where possible, combine in central rainwater down pipes located within the core risers.

The drainage offsets will be routed at ground level where the floor heights can accommodate longer runs of horizontal drainage.

The location of rainwater pipes and roof outlets will be developed further during the next phase of the design. The current scheme is for the rainwater drainage to be at high level within the offices beneath the roof levels. For the high-level drainage to be removed from these spaces, the roof will require falls across its entire span to fall to outlets at the cores.

11.3 SUMMARY

The Proposed Development has complied with the Mayor's Sustainable Design and Construction and Camden local policy by ensuring that the development will minimise sources of noise and vibration. Dust and other air pollution will also be minimised during construction, enforced through the Considerate Contractors Scheme (CCS). An air quality assessment has been carried out to identify and minimise the impact on air quality and mitigate exceedance of air pollutants. Additionally, all external lighting will be designed in compliance with the ILE guidance note and sustainable measures have been used in the development to control surface water runoff.

12 HEALTH AND WELLBEING

Humans in developed countries spend as much as 90% of their time inside buildings. It is therefore vital that new developments are designed with human health in mind. Internal spaces should have adequate levels of space and natural light whilst external areas provide pleasant areas of public realm, which are safe and easily accessible for all.

12.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The Mayor's SPG on Sustainable Design and Construction includes the following design requirements:

- Ensure developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions
- Inert or low emission finishes, construction materials, carpets and furnishings should be used wherever practical.
- Developments should incorporate principles of "Secured by Design".
- All developments should meet the principles of inclusive design, adopting the principles of SPG Accessible London: Achieving an Inclusive Environment.

POLICY 7.3 – DESIGNING OUT CRIME

- Developments should reduce the opportunities for criminal behaviour and contribute to a sense of security without being overbearing or intimidating.

CAMDEN LOCAL PLAN

POLICY C1 – HEALTH AND WELLBEING

The Council will improve and promote strong, vibrant and healthy communities through ensuring a high-quality environment with local services to support health, social and cultural wellbeing and reduce inequalities.

Measures that will help contribute to healthier communities and reduce health inequalities must be incorporated in a development where appropriate.

The Council will require:

- development to positively contribute to creating high quality, active, safe and accessible places; and

POLICY C5 – SAFETY AND SECURITY

The Council will aim to make Camden a safer place.

- require developments to demonstrate that they have incorporated design principles which contribute to community safety and security, particularly in wards with relatively high levels of crime, such as Holborn and Covent Garden, Camden Town with Primrose Hill and Bloomsbury;
- require appropriate security and community safety measures in buildings, spaces and the transport system;
- promote safer streets and public areas;
- Where a development has been identified as being potentially vulnerable to terrorism, the Council will expect counter-terrorism measures to be incorporated into the design of buildings and associated public areas to increase security.

POLICY C6 ACCESS FOR ALL

The Council will seek to promote fair access and remove the barriers that prevent everyone from accessing facilities and opportunities.

The Council will:

- expect all buildings and places to meet the highest practicable standards of accessible and inclusive design so they can be used safely, easily and with dignity by all;
- expect spaces, routes and facilities between buildings to be designed to be fully accessible;
- encourage accessible public transport; and
- Secure car parking for disabled people.

The Council will seek to ensure that development meets the principles of lifetime neighbourhoods.

12.2 DESIGN APPRAISAL

The Proposed Development will incorporate best design practice to promote health and wellbeing among the occupants, these measures include:

SECURITY

The architectural design of the Proposed Development will provide safe and comfortable environments for office, retail/leisure staff, resident and visitors. The design team have actively liaised with the Local Security Officer to assist with creating a development which offers minimum risk for terrorist activities, design out crime, anti-social behaviour and where practical, the principles of "Secured by Design" have been incorporated. For more information on how principles of Secured by Design have been implemented in the development please refer to the Design and Assess Statement prepared by Andrew Philips Architects.

INDOOR COMFORT AND CONTROL

Specialist consultants have assisted with the development of the design to ensure that comfortable conditions will be provided for all types of occupant as well as visitors:

- Thermal comfort provision and appropriate controls are a key design consideration as detailed in the Energy Statement and are confirmed through thermal modelling of the building.
- Good access to daylight and views out has informed the space layouts and specification of the façade, primarily aided by the placement of the lift cores to one side.
- The proposed design includes good practice acoustic design with improvement in sound insulation levels over the limits set by Building Regulations Part E.

INDOOR AIR QUALITY

Commercials: The building services strategy ensures that air is supplied through mechanical ventilation with heat recovery systems to provide a constant supply of tempered fresh air. These will be designed to provide increased levels of ventilation compared to the minimum requirements of the Building Regulations.

Residential: Each apartment will be provided with a mechanical ventilation heat recovery (MVHR) unit to provide whole apartment ventilation. The MVHR will operate continuously by supplying air to living areas and bedrooms, and extracting via the kitchen and bathrooms

HEALTHY MATERIALS

As stated earlier, internal the external materials will be specified to have low toxicity to humans and the environment. The design and specifications of materials will ensure that environmentally sensitive (non-toxic) building materials are used throughout. Specifically, the design and specification of materials used internally will be based on the use of products that contain low levels of or no Volatile Organic Compounds (VOCs).

ACCESS AND INCLUSIVE DESIGN

Design proposals have taken into consideration external and internal accessibility requirements for all elements of the building. The Proposed Development will cater for occupants of all ages and physical abilities.

Excellent public transport, road network connectivity and lifts will ensure easy access to all amenities within the development as detailed in the Design and Assess Statement prepared by Andrew Philips Architects.

12.3 SUMMARY

The Proposed Development has complied with the Mayor's Sustainable Design and Construction and Camden local policy by ensuring the development provides a comfortable environment for its occupants with the use of appropriate building fabric, building systems and controls, which includes low levels of VOCs materials in the development; the development is inclusive and accessible to all ages with different physical abilities and has incorporated principles of 'Secured by Design' to design out crime.

13 ECOLOGY AND BIODIVERSITY

Man-made climate change and the removal of natural habitat through the built environment put a huge strain on biodiversity on a global and local level. Furthermore, the south east of England has a large population and a comparatively small land area. The efficient use of land means optimising the carrying capacity of land used for new developments, re-using land that has been previously developed whilst also protecting green spaces and maximising opportunities for the provision of new open space.

Following the Earth Summit in Rio in 1992, the UK government launched a national Biodiversity Action Plan (BAP) in 1994 and in 2007 a new List of Priority Species and Habitats was published. This list consists of 1120 species and 65 habitats covering terrestrial, freshwater and marine biodiversity.

Local Biodiversity Action Plans (LBAPs) are produced by local partnerships made up of key nature conservation organisations. The partnerships identify local priorities and determine the contribution they can make to the delivery of the national Species and Habitat Action Plan targets. Local BAPs are a very good starting point for identifying the most vulnerable and important habitats and species in an area. Often, but not always, LBAPs conform to local authority boundaries[6].

13.1 REQUIREMENTS AND TARGETS

LONDON PLAN & SUSTAINABLE DESIGN AND CONSTRUCTION SPG

NATURE CONSERVATION AND BIODIVERSITY

- There is no net loss in the quality and quantity of biodiversity
- Developers contribute to biodiversity on their development site.

CAMDEN LOCAL PLAN

POLICY A3 - BIODIVERSITY

The Council will:

- Protect and enhance sites of nature conservation and biodiversity.
- require the demolition and construction phase of development, including the movement of works vehicles, to be planned to avoid disturbance to habitats and species and ecologically sensitive areas, and the spread of invasive species;
- secure management plans, where appropriate, to ensure that nature conservation objectives are met; and
- Work with The Royal Parks, The City of London Corporation, the London Wildlife Trust, friends of park groups and local nature conservation groups to protect and improve open spaces and nature conservation in Camden.
- Ecological surveys carried out in accordance with this guidance are expected to be submitted upfront with any planning application, and will be used to assess the impact of the development on biodiversity, within the site, the locality, or where appropriate, on the regional or national resource.
- Lighting can have negative impacts on biodiversity. Unnecessary lighting should be avoided. Where lighting may harm biodiversity timers or specific coloured lighting will be required to minimise any disturbance.

TREES AND VEGETATION

The Council will protect, and seek to secure additional, trees and vegetation.

The Council will:

- require trees and vegetation which are to be retained to be satisfactorily protected during the demolition and construction phase of development in line with BS5837:2012 ‘Trees in relation to Design, Demolition and Construction’ and positively integrated as part of the site layout;
- expect replacement trees or vegetation to be provided where the loss of significant trees or vegetation or harm to the wellbeing of these trees and vegetation has been justified in the context of the proposed development;
- Expect developments to incorporate additional trees and vegetation wherever possible.
- The Council will expect all developments to incorporate brown roofs, green roofs and green walls unless it is demonstrated this is not possible or appropriate. This includes new and existing buildings.

[6] http://www.biodiversityplanningtoolkit.com/stylesheet.asp?file=217_local_biodiversity_action_plans

13.2 DESIGN APPRAISAL

BIODIVERSITY & ECOLOGY

An ecological desk study and an extended Phase 1 habitat survey were carried out on the existing site. The survey included an external inspection to assess the potential of the existing building on site to support roosting bats. The site study concluded that the existing site is of negligible ecological and biodiversity value and no roosting bats were discovered.

GREEN INFRASTRUCTURE

The Proposed Development has maximised all opportunities to incorporate greening into the design of the development.

The design has been carefully developed to accommodate external green open terraces on Level 3 and 4 which will include some seating areas. For full detailed information about the plant species and ecological value please refer to the Design and Assess Statement prepared by AP Architects and the Landscape Statement and Public Realm Strategy prepared by Turkington Martin.

13.3 SUMMARY

The Proposed Development has complied with all the Mayor's Sustainable Design and Construction and Camden local policy. An ecologist assessed the site to be of negligible ecological and biodiversity importance. Every effort has therefore been taken into consideration to create opportunities for attracting biodiversity and habitat to improve the site ecological value through the inclusion of trees on the pavement level and green terraces on level 3 and 4.

14 TRANSPORTATION AND ACCESSIBILITY

Road transport accounts for 22% of total UK emissions of carbon dioxide (CO_2) – the major contributor to climate change. The EU has agreements with motor manufacturers that aim to reduce average CO_2 emissions from new cars. However, as traffic levels are predicted to increase, road transport will continue to be a significant contributor to greenhouse gas emissions.

Air pollutants from transport include nitrogen oxides, particulates, carbon monoxide and hydrocarbons. All have a damaging impact on the health of people, animals and vegetation locally. Air quality in the UK is slowly improving, but many areas still fail to meet the health based national air quality objectives and European limit values – especially for particulates and nitrogen dioxide. The result is that vehicles are responsible for most local pollution.

Road traffic also creates noise pollution and vehicle use can affect local quality of life as busy roads are dangerous and intimidating, dividing communities and making street life unpleasant. Sustainable transport means addressing these problems by facilitating alternatives for travelling to and from the Proposed Development. The main alternatives are:

- **Car sharing** - reducing the number of single occupant journeys can have a huge impact on pollution and congestion
- **Green travel plans** - When businesses create a travel plan, they can make a real difference to the transport choice their employees and visitors make
- **Cycling** – Traffic free cycle routes can promote cycle use which not only reduces transport emissions but promotes a healthy lifestyle.

14.1 REQUIREMENTS AND TARGETS

LONDON PLAN (MARCH 2016)

CYCLE

Developments should:

- → Provide secure, integrated convenient and accessible cycle parking facilities.
- → Provide on-site changing facilities and showers for cyclists
- → Provide links to existing and planned cycle infrastructure

PARKING

- → Ensure that 1 in 5 spaces (both active and passive) provide an electrical charging point to encourage the uptake of electric vehicles.
- → Provide parking for disable people

PEDESTRIAN

- → Ensure high quality pedestrian environments and emphasise the quality of the pedestrian and street space.

CAMDEN LOCAL PLAN

POLICY T1 – PRIORITISING WALKING, CYCLING AND PUBLIC TRANSPORT

- The Council will promote sustainable transport by prioritising walking, cycling and public transport in the borough.

POLICY T2 – PARKING AND CAR-FREE DEVELOPMENT

- The Council will limit the availability of parking and require all new developments in the borough to be car-free.

14.2 DESIGN APPRAISAL

A separate Transport Statement (including Servicing Management Plan) and Travel Plan has been prepared by WSP to accompany the planning submission and should be referred to in the first instance on information relating to transportation and accessibility, a summary is provided below:

PUBLIC TRANSPORT ACCESS

The nearest station is Camden Town Underground Station which is served by both branches of the Northern Line. It is located within Zone 2 and provides frequent and fast services into Central London. The site has a PTAL of 6b and therefore employees, residents and visitors will be encouraged to travel to the site by public transport wherever possible. The site is also located in an area with good cycle and pedestrian infrastructure.

PEDESTRIAN & CYCLE ACCESS

The proposed pedestrian access will be reviewed and any improvements such as future public realm improvements will be presented within the Transport Assessment and Travel Plan. A proposed zebra crossing will be provided on Kentish Town Road outside of the site, providing pedestrian access to the new Camden Town underground station entrance, providing excellent accessibility for those travelling to and from the site.

CYCLE STORAGE & FACILITIES

The proposed on-site cycle parking provision which will be covered and secure located at a dedicated mezzanine level. The cycle parking provision will adhere to London Borough Camden (LBC) and Draft London Plan cycle parking standards for all land uses.

Figure 14-1 Draft London Plan Long-Stay Cycle Standards and Requirements

LAND USE	MINIMUM STANDARDS	UNITS/AREA	LONG-STAY
A1 (food)	1 space per 175sqm (from a threshold of 100sqm GEA)	602	3
A1 (non-food)	1 space per 250sqm (from a threshold of 100sqm GEA)	602	2
A3 Retail	1 space per 175sqm (from a threshold of 100sqm GEA	602	3
B1 Office	inner/central London: 1 space per 75sqm GEA	5,254	74
C3 Residential	1 space per studio, 1.5 spaces per 1-bedroom unit 2 spaces per all other dwellings	6 units	10
D2 Leisure	1 space per 8 FTE staff	289	2

Figure 14-2 Draft London Plan Short-Stay Cycle Standards and Requirements

LAND USE	MINIMUM STANDARDS	UNITS/AREA	SHORT-STAY
A1 (food)	1 space per 20sqm (from a threshold of 100sqm GEA)	602	30
A1 (non-food)	1 space per 60sqm (from a threshold of 100sqm GEA)	602	10
A3 Retail	1 space per 20sqm (from a threshold of 100sqm)	602	30
B1 Office	1 space per 500sqm GEA	5,254	11
C3 Residential	1 space per 40 units	6 units	1
D2 Leisure	1 space per 8 FTE staff	289	3

Showers, changing facilities and lockers will be provided separately for the commercial uses.

CAR & MOTORCYCLE PARKING PROVISION

The development will be 'car-free' albeit that 12 existing car parking spaces owned by the residents of Grand Union Walk need to be retained at ground floor level.

LBC's Local Plan states that parking for disabled people for both residential and non-residential developments should be provided where it can be demonstrated as necessary, considering existing availability of on-street parking for Blue Badge holders. Considering there are on street spaces near to the Site Which Blue Badge holders can use for free with no time limit, which are within appropriate distance of the entrances to the residential, office and ground floor flexible uses of the proposed building, there is no need to provide blue badge car parking on Site. However, one Blue Badge bay will be provided on street on Kentish Town Road.

CYCLE HIRE DOCKING STATION

The nearest Santander Cycle Hire docking station is the 'Greenland Road' and 'Hawley Crescent' located 220m and 120m respectively from the Proposed Development and accommodates 33 docking points combined.

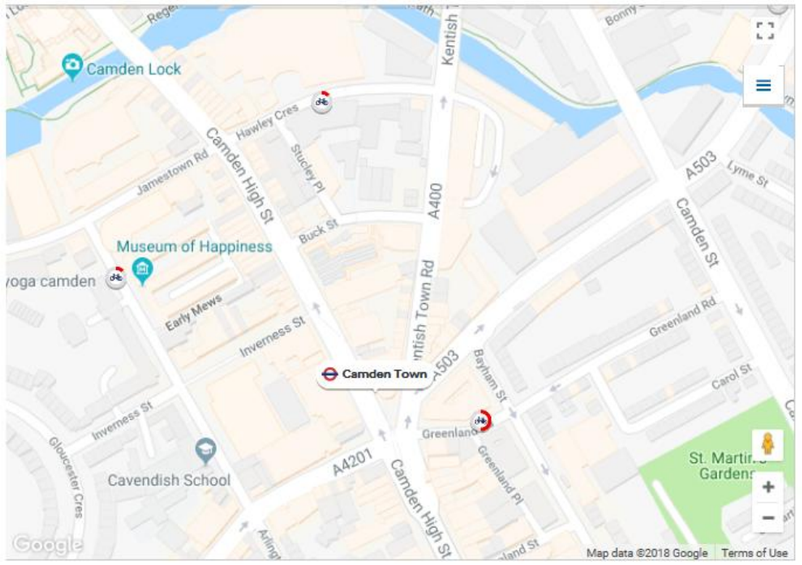
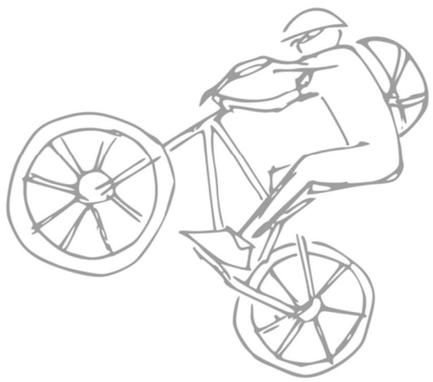


Figure 14-3 Santander Cycle Map of the Proposed Development- Taking from TFL website (05/09/2018)

14.3 SUMMARY

The Proposed Development has complied with the Mayor's Sustainable Design and Construction, London Plan Policy and Camden local planning policy by ensuring the development provides sufficient and appropriate cycle spaces, on-site changing facilities, including lockers and showers and access to low carbon modes of transportation such as the Santander Cycle Hire. Additionally, due to its PTAL excellent rating, the Proposed development will be 'car-free' and will have no negative impact on the neighbouring traffic congestion (albeit the 12 existing car parking spaces owned by the residents of Grand Union Walk that need to be retained at ground floor level).



15 CONCLUSION

Considering the principles of sustainability early in the design and planning process is a positive step to ensuring that the Proposed Development is sustainable in terms of construction, operation, the local community, the environment and its future occupation.

A review of national, regional and local planning policies was undertaken, with emphasis on the 2018 National Planning Policy Framework (NPPF), the London Plan 2016 consolidated with alterations since 2011, the draft London Plan (2018), the Mayor's Sustainable Design and Construction SPG (2014) and the Camden local planning policy (2017).

The Proposed Development responds to the issues raised in the policy documents in the following areas:

BREEAM PRE- ASSESSMENT

A BREEAM Pre-assessment has been carried out for the Proposed Development with an indicative score of 71% equating to a rating of 'Excellent'.

Furthermore, as requested by Camden Local Plan all the minimum standard required per category for Energy, Water and Materials have been meet and/or exceeded.

OPTIMISING THE USE OF LAND

The Proposed Development is optimising the use of the existing site by ensuring that 100% of the development is located on previously developed land, and is optimising both the density and amenity space of the development. Access to private and communal amenity spaces has been given to most tenants with potential for individual food growing.

The Proposed Development will also increase the social and economic value of the local area while aiming to minimise its environmental impacts as much as possible.

ENERGY AND CO2 EMISSIONS

The Proposed Development has made a significant contribution towards GLA and Camden's target in decreasing the national carbon dioxide emissions by reducing its own carbon emission by 110.92T CO_2 per annum a 35% saving following the London's Plan energy hierarchy.

WATER EFFICIENCY

The Proposed Development has maximised the opportunities of water saving measures which include the use of water saving fixtures and fittings, optimised water management through leak detection, reduced water flow rates and the installation of water meters in all tenant and residential units.

Additionally, residential units have been designed to meet the water consumption rate of 105 l/p/d.

MATERIALS

The Proposed Development has ensured that materials used on site will have a low embodied energy and all the timber used on site will be sustainably sourced from accredited FSC or PEFC sources.
Additionally, a compliant BREEAM LCA has been carried out to establish the embodied carbon footprint of the development over a 60-year lifecycle and various design options to reduce carbon has been considered.
Furthermore, the external materials will be specified to have low toxicity to humans and the environment, to be durable to cater for their level of use and exposure and the Proposed Development will maximise the use of pre-fabricated materials.

A pre-demolition audit will be carried out prior to works commencing on site.

WASTE

The Proposed Development has ensured that both construction and the operational waste is managed in accordance with the waste hierarchy; that most of the excavation and demolition waste is reused or recycled and 80% per volume non-hazardous waste will be diverted from landfill.

Furthermore, the Proposed Development aims to provide sufficient internal space for the storage of recycled and compostable materials and waste in each building.

CLIMATE CHANGE AND ADAPTATION

The Proposed Development has been carefully designed to take the likely impacts of climate change into account. It has reduced its external heat rejection to the atmosphere; has incorporated some planting to combat the effects of climate change; and reduced its reliance on air conditioning systems by using solar control glazing, mechanical ventilation and reducing internal heat gains.
A FRA was carried out to identified sustainable measures for water conservation and managing surface water runoff which should be included in the design. Currently due to access restriction there's no scope within the existing structure to incorporate any surface water attenuation.

POLLUTION MANAGEMENT

The Proposed Development has ensured that the development will minimise sources of noise and vibration. Dust and other air pollution will also be minimised during construction, enforced through the Considerate Contractors Scheme (CCS). An air quality assessment has been carried out to identify and minimise the impact on air quality and mitigate exceedance of air pollutants. Additionally, all external lighting will be designed in compliance with the ILE guidance note and sustainable measures have been used in the development to control surface water runoff.

HEALTH AND WELLBEING

The Proposed Development has included a variety of initiatives aimed at providing a healthy and safe environment to people working in and visiting the development alike such as increased ventilation provision over and above the regulatory requirements; choice of materials with low volatile organic compounds (VOC) or other chemical components, and good practice acoustic design.

The building layout will be inclusive and accessible to all ages and different physical abilities and will incorporate the principles of 'Secured by Design' to design out crime

ECOLOGY AND BIODIVERSITY

An ecologist assessed the site to be of negligible ecological and biodiversity importance. Every effort has been taken into consideration to create opportunities for attracting biodiversity and habitat to improve the site ecological value through the inclusion of planters on the terraces on level 3 and 4.

TRANSPORTATION & ACCESSIBILITY

The Proposed Development has ensured the development provides sufficient and appropriate cycle spaces, on-site changing facilities, including lockers and showers and access to low carbon modes of transportation such as the Santander Cycle Hire.

Additionally, due to its PTAL excellent rating, the Proposed development will be 'car-free' and will have no negative impact on the neighbouring traffic congestion (albeit the 12 existing car parking spaces owned by the residents of Grand Union Walk that need to be retained at ground floor level).

APPENDIX A

BREEAM PRE-ASSESSMENT

Camden Mixed Development Ltd

Grand Union House - Commercial Areas

BREEAM Pre Assessment Report

BREEAM New Construction 2018

PROJECT NO. 70009120

05 December 2018

WSP
70 Chancery Lane
London
WC2A 1AF

+44 (0) 20 7314 5000
+44 (0) 20 7314 5111

wsp.com

QUALITY CONTROL

Issue / revision	First Issue	Revision 1	Revision 2	Revision 3
Remarks	For Planning			
Date	05/12/2018			
Prepared by	Hope Bootle (BREEAM AP)			
Signature				
Checked by	Jacob Cox			
Signature				
Authorised by	Stephen Gallacher			
Signature				
Project number	70009120			
Report Number				
File Reference				

PRODUCTION TEAM

Client	Camden Mixed Development Ltd
Planning Consultant	Gerald Eve
Project Manager	JLL
Cost Consultant	Core Five
Architect	Andrew Phillips
BREEAM AP	WSP
MEP Engineer	WSP
Air Quality	WSP
Vertical Transport	WSP
Transport	WSP
Acoustics	WSP
FRA	WSP
Ecology	WSP
Structural Engineer	WSP

CONTENTS

1 EXECUTIVE SUMMARY

WSP has been appointed to undertake a BREEAM New Construction 2018 Pre Assessment for Grand Union House - Commercial Areas 16-20 Kentish Town Road ('The Proposed Develpoment').

Planning permission is sought for the partial demolition and redevelopment of the existing building, to provide a new office (Class B1) building with associated roof terraces, ground floor flexible town centre uses (Class A1 and/or A3 and/or D2), and 6 affordable housing units, along with associated landscaping works.

This BREEAM Pre-assessment report has been produced to demonstrate how the design of the Proposed Development aims to achieve BREEAM Excellent rating as a minimum. This is the BREEAM target set by the local authority and requires a score of 70% to be achieved. This report summarises the indicative performance of the Proposed Development against BREEAM New Construction 2018 for Offices Shell & Core scheme. IF required by the Local Authority the Retail and leisure spaces will be assessed separately post planning.

It should be noted that this pre-assessment has been completed by a BREEAM 'Accredited Professional' Hope Bootle (No. 1000332) based on the initial guidance of the Project Team. The design ensures that all mandatory elements required for a BREEAM Excellent rating have been achieved.

The summary of the online BREEAM Pre-assessment report has been provided in Section 10 for reference.

The pre-assessment is currently resulting in an indicative score of 70.4% which equates to a rating of Excellent.

Based on the guidance provided by the Design Team and the subsequent evaluation by the BREEAM Consultant the following scoring scenarios are shown:

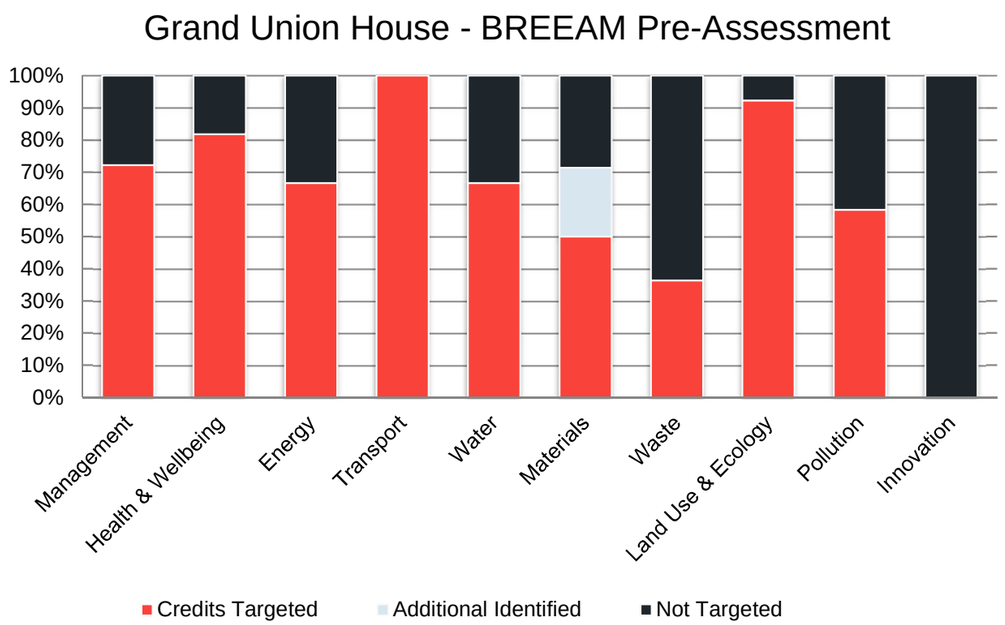


Table 1.1 Pre-assessment score summary by Issue category

Category	Section Weighting	Credits Available	Credit worth	Credits Targeted		Additional Identified	
Management	11.0%	18	0.6%	13	7.9%	0	0.0%
Health & Wellbeing	8.0%	11	0.7%	9	6.5%	0	0.0%
Energy	14.0%	21	0.7%	14	9.3%	0	0.0%
Transport	11.5%	12	1.0%	12	11.5%	0	0.0%
Water	7.0%	9	0.8%	6	4.7%	0	0.0%
Materials	17.5%	14	1.3%	7	8.8%	3	3.8%
Waste	7.0%	11	0.6%	4	2.5%	0	0.0%
Land Use & Ecology	15.0%	13	1.2%	12	13.8%	0	0.0%
Pollution	9.0%	12	0.8%	7	5.3%	0	0.0%
Innovation	10.0%	10	1.0%	0	0.0%	0	0.0%
Total					**70.4%**		**3.8%**

Grand Union House - Commercial Areas	
Targeted	**70.4%**
Including Additional	**74.1%**

It should be noted that targeted credits are those performance requirements which it is anticipated will be achieved with the production of suitable documentary evidence. Additional credits are those where further investigation, costs or design works are required to be achieved.

Minimum Standards

In addition, performance against the minimum standards for Excellent rating is summarised below:

Issue	Targeted
Man 03 - Responsible Construction Practices	✓
Man 04 - Commissioning and handover - Commissioning test schedule and responsibilities	✓
Man 04 - Commissioning and handover - Building User Guide	✓
Ene 01 - Reduction of energy use and carbon emissions	✓
Ene 02 - Energy Monitoring	✓
Wat 01 - Water Consumption	✓
Wat 02 - Water Monitoring	✓
Mat 03 - Responsible sourcing of construction products	✓
Wst 03 - Operational Waste	✓

2 INTRODUCTION TO PROJECT

Figure 2.1 - CGI Image of the Proposed Development

2.1 DEVELOPMENT DESCRIPTION

The Proposed Development is located on Kentish Town Road in the London Borough of Camden. The property is adjacent to the existing Sainsbury's supermarket and St. Michaels Church and diagonally opposite Camden Town London Underground station.

The proposed redevelopment consists of the following:
- Demolition of the existing structure above the first-floor level. The ground floor slab, ground floor columns, and first floor slab are to be retained creating a so-called "table-top" structure upon which the new structure will be built.

- The existing Ground floor areas will be refurbished to provide retail/leisure space, an office entrance lobby, and a new electrical transformer.

- The existing ground floor will retain twelve car parking spaces for the residents of Grand Union Walk (these car parking spaces are owned by the resident of Grand Union Walk and must therefore be retained).

- A new ground floor mezzanine level will be created for the housing of cycle facilities, building services plant and equipment.

- Four new floors of office accommodation from the first floor to the fourth floor.

- Three new floors of residential accommodation from the first floor to the third floor.

2. 1 REQUIREMENTS AND TARGET

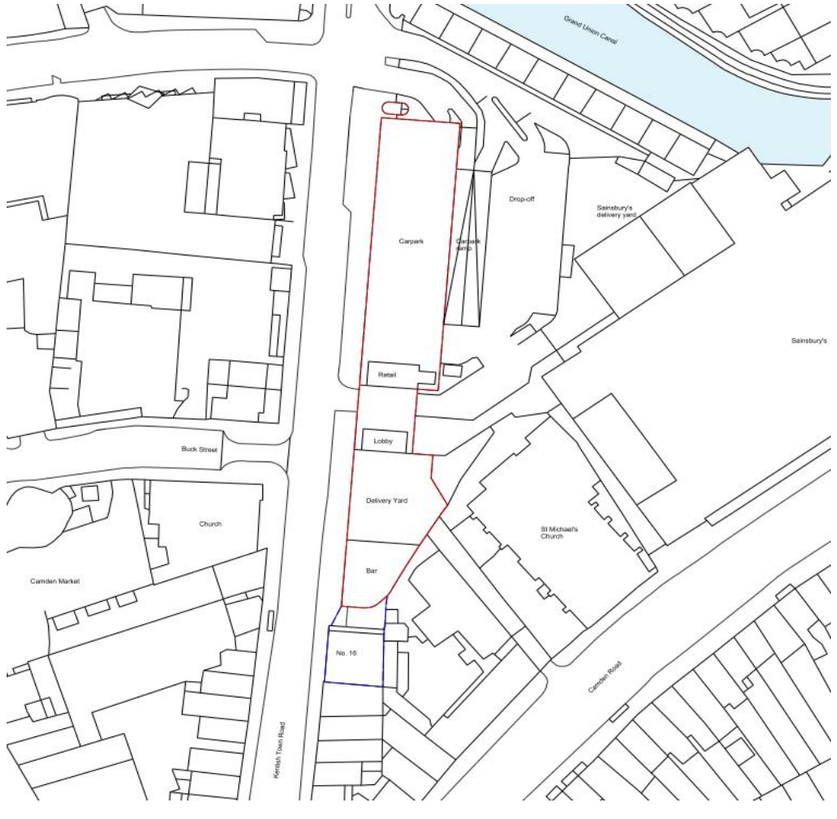
CAMDEN LOCAL PLAN

POLICY CC2 – SUSTAINABLE DESIGN AND CONSTRUCTION

The Council will promote and measure sustainable design and construction by:

- Ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;

- Expecting non-domestic developments of 500 m² of floor-space or above to achieve "Excellent" in BREEAM assessments and encouraging zero carbon in new development from 2019.
- For development over 500 m², a minimum standard for categories is required: Energy 60%, Water 60% and Materials 40% of un-weighted credits.
- A submission of a pre-assessment report at the planning application stage. The report should summarise the design strategy for achieving your chosen level of BREEAM and include details of the credits proposed to be achieved.



3 BACKGROUND TO BREEAM

3. 1 INTRODUCTION TO BREEAM

BREEAM is the world's first and leading sustainability assessment and certification scheme for the built environment. It is an international standard that is locally adapted, operated and applied through a network of scheme operators, assessors and industry professionals.

Through its application, BREEAM recognises and reflects the value in higher performing assets and aims to inspire and empower change by rewarding and motivating sustainability across the life cycle of master-planning projects, infrastructure and buildings.

Launched in 1990, to date, BREEAM has been used to certify over 590,000 assessments of buildings across the building life cycle and is being applied in over 78 countries.

3.2 BREEAM AIM AND OBJECTIVES

BREEAM assesses, encourages and rewards environmental, social and economic sustainability throughout the built environment. The BREEAM schemes:

- Encourage continuous performance improvement and innovation by setting and assessing against a broad range of scientifically rigorous requirements that go beyond current regulations and practice,
- Empower those who own, commission, deliver, manage or use buildings, infrastructure or communities to achieve their sustainability aspirations,
- Build confidence and value by providing independent certification that demonstrates the wider benefits to individuals, business, society and the environment.

3.3 BREEAM RATING BENCHMARK

There are a number of elements that determine the overall performance of a new construction project assessed using BREEAM. They are:

1. 'The BREEAM rating level benchmark
2. 'The minimum BREEAM standards
3. 'The environmental section weightings
4. 'The BREEAM assessment issues and credits

The BREEAM rating benchmark is divided into six levels, with UNCLASSIFIED, PASS, GOOD, VERY GOOD, EXCELLENT and OUTSTANDING being the achievable ratings. The percentage score achieved within the assessment is categorised accordingly, using the 2018 version of BREEAM UK New Construction:

Table 3.1 Rating Levels

Rating	Percentage Required
UNCLASSIFIED	< 30
PASS	≥ 30
GOOD	≥ 45
VERY GOOD	≥ 55
EXCELLENT	**≥ 70**
OUTSTANDING	≥ 85

BREEAM rating benchmarks enable client and all other stakeholders to compare the performance of a newly constructed building with other BREEAM rated buildings, and the typical sustainability performance of a stock of new non-domestic buildings in the UK.

In this respect each BREEAM rating broadly represents performance equivalent to:

1. Outstanding: Less than the top 1% of UK new non-domestic buildings (innovator)
2. Excellent: Top 10% of UK new non-domestic buildings (best practice)
3. Very Good: Top 25% of UK new non-domestic buildings (advanced good practice)
4. Good: Top 50% of UK new non-domestic buildings (intermediate good practice)
5. Pass: Top 75% of UK new non-domestic buildings (standard good practice)

3.4 CATEGORY WEIGHTINGS AND CREDIT PERCENTAGES

The categories within BREEAM schemes are weighted according to importance by BRE. Within each category there are a different number of credits, therefore, individual credits carry specific percentage weightings, as a percentage of the overall total.

The number of credits available is based on the scoping of appropriate assessment criteria available within BRE's online assessment tool, which is based on the type of building and room functions within the development.

Table 3.2 - BREEAM Environmental section weightings for the Proposed Development (Office: Shell & Core)

Environmental Issue	Section Weighting (Shell and Core)	Credits Available*	Percentage Worth of each Credit
Management	11.00%	18	0.61%
Health & Wellbeing	8.00%	11	0.73%
Energy	14.00%	21	0.67%
Transport	11.50%	12	0.96%
Water	7.00%	9	0.78%
Materials	17.50%	14	1.25%
Waste	7.00%	11	0.64%
Land Use & Ecology	15.00%	13	1.15%
Pollution	9.00%	12	0.75%
Total	100.00%	121	
Innovation (additional)	10.00%	10	1.00%

BREEAM 2018 incorporates a mechanism whereby schemes achieving exemplar performance in a particular area or demonstrating innovation can achieve an additional 1% for each item up to a maximum of 10. The innovation section is shown at the end of the main assessment table.

3.5 MINIMUM STANDARDS

To ensure performance against fundamental environmental issues is not overlooked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas, e.g. energy, water, waste etc. The majority of BREEAM credits can, however, be traded, so non-compliance in one area can be offset through compliance in another to achieve the target BREEAM rating.

The minimum acceptable levels of performance for each rating are summaries in Table 3.3

Table 3.3 Minimum Standard Requirements by rating level

Rating level	BREEAM Issue	Minimum BREEAM Standard
Pass	Mat 03	Pre-requisite: All timber and timber based products are 'Legally harvested and traded timber'
Good	Wat 01	One Credit -
	Wat 02	Criteria only - Water meter on the mains water supply to each building
Very Good	Man 04	One Credit - Commissioning testing schedule and responsibilities
	Man 04	Criteria only - Handover - Technical and non-technical building user guide
	Ene 02	One Credit - Sub-metering of end use categories
Excellent	Man 03	One Credit - Responsible construction management
	Man 05	One Credit - Commissioning implementation
	Ene 01	Four Credits - EPR Credits
	Wst 03	One Credit
Outstanding	Man 03	Two Credits- Responsible construction management
	Ene 01	Four credits - Operational energy performance credits
	Ene 01	Six credit - EPR credits
	Wat 01	Two Credits

4 BREEAM UK NEW CONSTRUCTION

The BREEAM UK New Construction scheme is a performance-based assessment method and certification scheme for new buildings. This report has been prepared based on most current applicable version BREEAM UK NC 2018.

The primary aim of BREEAM UK New Construction is to mitigate the life cycle impacts of new buildings on the environment in a robust and cost-effective manner. This is achieved through integration and use of the scheme by clients and their project teams at key stages in the design and construction process as shown in Figure 4.1.

Early engagement with the BREEAM UK New Construction scheme and appointment of a licensed BREEAM Assessor and/or an Advisory Professional is important to achieve optimal integration of the methodology into the new-build procurement process. At this early stage, the performance of the building and the desired BREEAM rating can be achieved while there is greater flexibility and choice in design solutions and spending decisions.

BREEAM primarily reflects the overall performance of the building rather than just the opportunities or limitations placed on specific stakeholders involved in the process. In the case of new builds, this means that the client, design team, principal contractor and BREEAM Assessor, as well as other specialist disciplines, have an important role to play throughout the procurement process, if the desired performance level is to be achieved and reflected through the certified BREEAM rating.

BRE recommends that clients and their project teams engage with a licensed BREEAM Assessor or BREEAM Advisory Professional no later than the Preparation and Brief stage (RIBA Stage 1 or equivalent) and ideally sooner. This will ensure that realistic targets are set and can be met, appropriate responsibilities can be defined and understood and low or no cost solutions to environmental impacts can be sought and applied wherever possible. This report has been prepared by a BREEAM AP.

The stages of a BREEAM assessment require as a minimum a Construction Stage assessment in order to receive a final BREEAM certificate. It is strongly recommended that a three stage process is undertaken to maximise the efficiency of achieving the required rating as illustrated in Figure 4.1

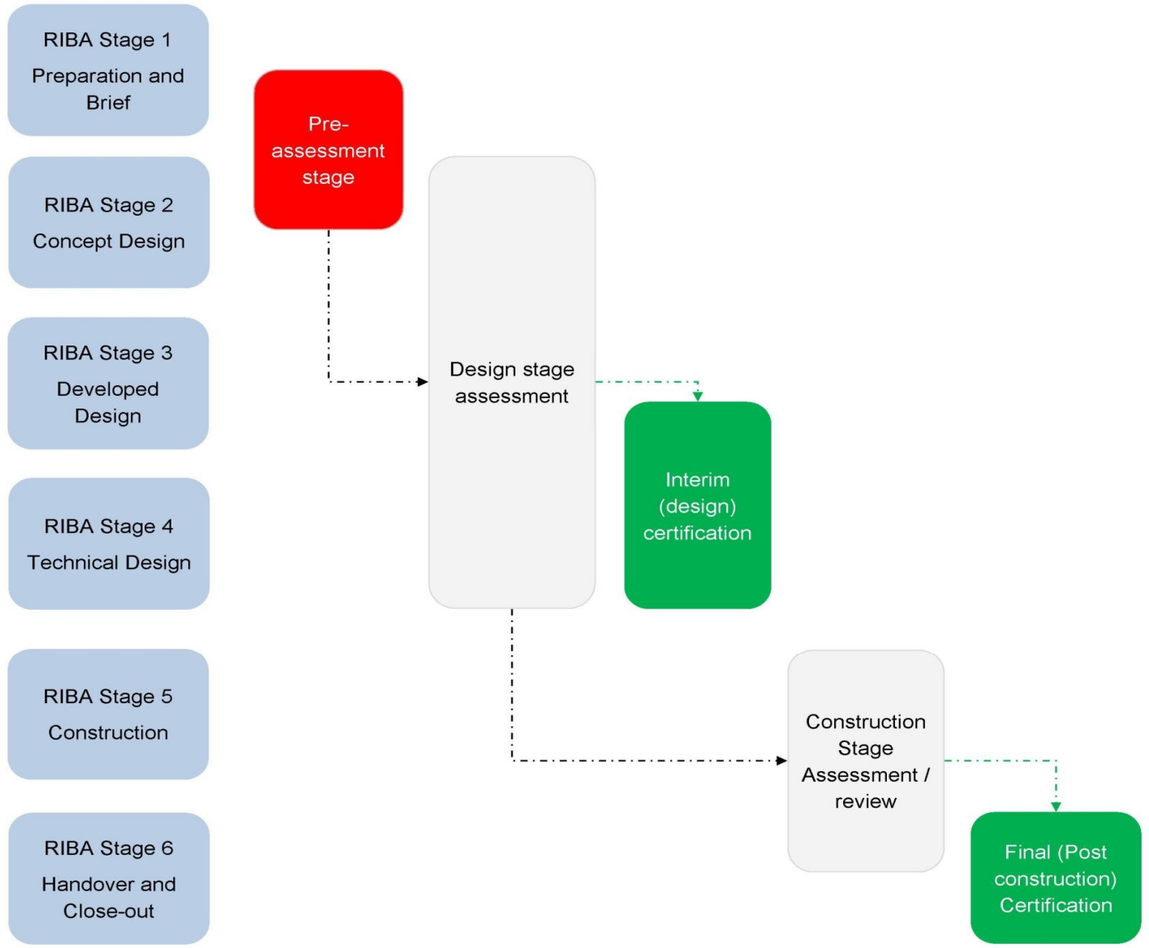


Figure 4.1 BREEAM assessment and certification stages Outline Plan

5 ROLES AND RESPONSIBILITIES

BREEAM Assessors and BREEAM AP must act in accordance with their “BREEAM License Agreement” with BRE Global Ltd; the owner, managing body and certification authority for all BREEAM schemes.

This report has been prepared by a qualified BREEAM AP.

The design/ construction team will be required to demonstrate “achievement” of the various BREEAM performance requirements through the presentation of documentary evidence as listed by BRE and conveyed by a Licensed Assessor. This audit material often requires specific responses/ reporting to demonstrate compliance.

Appointment of a Licenced BREEAM Assessor will be a requirement of the client in order to progress formal certification.

Note: It is acceptable that the Assessor/ AP is part of the same organisation as a member or members of the design team who are responsible for information production).

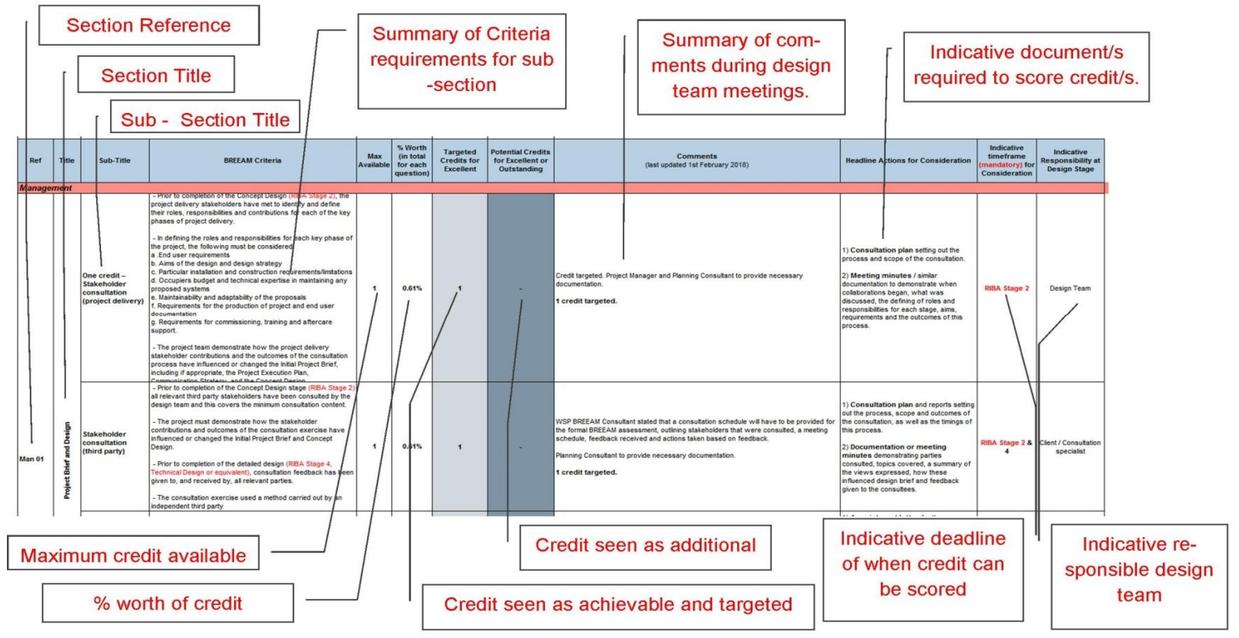
6 DISCLAIMER

WSP (qualified BREEAM AP) has undertaken the following BREEAM Pre Assessment Report for the Proposed development, with input from the Project Team. All information provided has been accepted in good faith as being accurate and representative of the proposed scheme at the time of review.

The credits and credit requirements are based on the BREEAM for New Construction 2018 (version 1.2) methodology.

The BREEAM AP (for him/herself and as agent for his/her staff) shall not be liable whether in Contract or in Tort or otherwise for any loss or damage sustained as a result of using or relying on the information contained in this report.

7 REPORT FORMAT - SECTION 9



Ref	Title	Sub-Title	BREEAM Criteria	Max Available	% Worth (in total for each question)	Targeted Credits for Excellent	Potential Credits for Excellent or Outstanding	Comments (last updated 1st February 2018)	Headline Actions for Consideration	Indicative timeframe (mandatory) for Consideration	Indicative Responsibility at Design Stage
Management											
Man 01	Project Brief and Design	One credit – Stakeholder consultation (project delivery)	- Prior to completion of the concept design (RIBA Stage 2), the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery. - In defining the roles and responsibilities for each key phase of the project, the following must be considered: a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Occupiers budget and technical expertise in maintaining any proposed systems e. Maintainability and adaptability of the proposals f. Requirements for the production of project and end user documentation g. Requirements for commissioning, training and aftercare support. - The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the initial Project Brief, including if appropriate, the Project Execution Plan,	1	0.61%	1	-	Credit targeted. Project Manager and Planning Consultant to provide necessary documentation. **1 credit targeted.**	1) **Consultation plan** setting out the process and scope of the consultation. 2) **Meeting minutes** / similar documentation to demonstrate when collaborations began, what was discussed, the defining of roles and responsibilities for each stage, aims, requirements and the outcomes of this process.	RIBA Stage 2	Design Team
		Stakeholder consultation (third party)	- Prior to completion of the Concept Design stage (RIBA Stage 2) all relevant third party stakeholders have been consulted by the design team and this covers the minimum consultation content. - The project must demonstrate how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the initial Project Brief and Concept Design. - Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), consultation feedback has been given to, and received by, all relevant parties. - The consultation exercise used a method carried out by an independent third party	1	0.61%	1	-	WSP BREEAM Consultant stated that a consultation schedule will have to be provided for the formal BREEAM assessment, outlining stakeholders that were consulted, a meeting schedule, feedback received and actions taken based on feedback. Planning Consultant to provide necessary documentation. **1 credit targeted.**	1) **Consultation plan** and reports setting out the process, scope and outcomes of the consultation, as well as the timings of this process. 2) **Documentation or meeting minutes** demonstrating parties consulted, topics covered, a summary of the views expressed, how these influenced design brief and feedback given to the consultees.	RIBA Stage 2 & 4	Client / Consultation specialist

8 COPYRIGHT

9 BREEAM PRE-ASSESSMENT

Date 05/12/2018
Revision 01
Prepared by HB

Highlighted Purple Cell	Mandatory levels required for Excellent rating and Outstanding rating
RED TEXT	Time sensitive

Excellent	Excellent
70.38%	74.13%

Ref	Title	Sub-Title	BREEAM Criteria	Max Available	% Worth (in total for each question)	Targeted Credits for Excellent	Potential Credits for Excellent or Outstanding	Initial comments from meeting dated 05/07/2018 and then later updated on 09/11/2018	Summary Headline Actions for Design Team (Detailed requirements must be referred to in the BREEAM manual)	Indicative timeframe (mandatory) for Consideration	Indicative Responsibility at Design Stage
Management											
Man 01	Project Brief and Design	**Project delivery planning**	1) Prior to completion of the Concept Design (RIBA Stage 2), the project delivery stakeholders meet to identify and define for each of the key phases of project delivery: 1.a Roles, 1.b Responsibilities 1.c Contributions 2) Consider each of the following items when defining roles, responsibilities and contribution for each key phase of the project: 2.a End user requirements 2.b Aims of the design and design strategy 2.c Particular installation and construction requirements/limitations 2.d Occupiers budget and technical expertise in maintaining any proposed systems 2.e Maintainability and adaptability of the proposals 2.f Operational Energy 2.g Requirements for the production of project and end user documentation 2. h Requirements for commissioning, training and aftercare support. 3) The project team demonstrate how the project delivery stakeholder contributions and the consultation process outcomes influence the following: 3.a Initial Project Brief, 3.b Project Execution Plan, 3.c Communication Strategy, 3.d Concept Design.	**1**	**0.61%**	**1**	**-**	Project Manager and Planning Consultant to provide necessary documentation. **1 credit targeted.**	1) **Consultation plan** setting out the process and scope of the consultation. 2) **Meeting minutes** / similar documentation to demonstrate when collaborations began, what was discussed, the defining of roles and responsibilities for each stage, aims, requirements and the outcomes of this process.	RIBA Stage 2	Design Team
		Stakeholder consultation (interested parties)	- Prior to completion of the Concept Design stage (RIBA Stage 2) all interested parties on matters that covers the minimum consultation content. - Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design. - Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties give and receive consultation feedback.	**1**	**0.61%**	**1**	**-**	WSP BREEAM Consultant stated that a consultation schedule will have to be provided for the formal BREEAM assessment, outlining stakeholders that were consulted, a meeting schedule, feedback received and actions taken based on feedback. Planning Consultant to provide necessary documentation. **1 credit targeted.**	1) **Consultation plan** and reports setting out the process, scope and outcomes of the consultation, as well as the timings of this process. 2) **Documentation or meeting minutes** demonstrating parties consulted, topics covered, a summary of the views expressed, how these influenced design brief and feedback given to the consultees.	RIBA Stage 2 & 4	Client / Consultation specialist
		Pre-requisite for BREEAM Advisory Professional credits (concept and Developed Design)	The project team, including the client, formally agree strategic performance targets early in the design process (with the support of the BREEAM AP where appointed)	**-**	**-**	**Yes**	**-**	The Project team, along with the Project Manger (PM) acting on behalf of the Client, has formally agreed that the development will need to achieve a BREEAM rating of Excellent as required from the Local Authority (London Borough of Camden) on the 22 September 2017 and then subsequently on the 5th of July 2018.	1) Appointment letter for the BREEAM AP defining the scope of their role and responsibilities 2) Meeting minutes and/or invites confirming the BREEAM AP attended or invited to project team meeting where BREEAM targets were discussed and set at key Design Stages . 3) Copies of BREEAM AP's Status or monitoring reports at key stages.	**RIBA Stage 1**	
		BREEAM AP (Concept Design)	Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets agreed (pre-requisite credit) throughout all stages after their appointment where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	**1**	**0.61%**	**1**	**-**	WSP (Hope Bootle) has acted as the BREEAM AP from Feasibility Stage (RIBA Stage 1) until Concept Design Stage (RIBA Stage 2). **1 credit targeted.**		**RIBA Stage 2**	Client / Sustainability Champion

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		BREEAM AP (Developed Design)	- The Pre-requisite credit and BREEAM AP (Concept Design) credit are achieved. - Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Developed Design. b. Monitor progress against the performance targets agreed (pre-requisite credit) throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	**1**	**0.61%**	**1**	**-**	The PM confirmed that during Develop Design Stage (RIBA Stage 3) a BREEAM AP will be appointed. **1 credit targeted.**	**same as above.**	RIBA Stage 3 & 4	Client / Sustainability Champion
Man 02	**Life cycle cost and service life planning**	**Elemental life cycle cost (LCC)**	- A competent person carries out an outline, entire asset LCC plan, at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. - The elemental LCC plan: a: Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years); b: Includes service life, maintenance and operation cost estimates. - Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.	**2**	**1.22%**	**-**	**-**	This credit is not targeted as confirmed by the Client on the 7th of August 2018.	1) A copy of a compliant **Elemental LCC plan** with supporting documentation of analysis of alternative options and the benefits of the chosen option.	**RIBA Stage 2**	Cost Consultant / Design Team / Client
		Component level life options appraisal	A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 and includes the following component types (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source, cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.	**1**	**0.61%**	**-**	**-**	This credit is not targeted as confirmed by the Client on the 7th of August 2018.	1) A copy of the compliant **Component level LCC option appraisal plan** with supporting documentation of analysis of alternative options and the benefits of the chosen option.	RIBA Stage 4	
		Capital cost reporting	Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/ m²) as part of the submission to BRE.	**1**	**0.61%**	**1**	**-**	The capital cost (£k/m2) for the building will be reported to the BRE. **1 credit targeted.**	1) **Predicted capital cost** via BREEAM Projects	RIBA Stage 4	Cost Consultant / Design Team / Client

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Man 03	Responsible construction practices	Site timber	**Pre-requisite** All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber	Yes	No	Yes	-	These requirements should be included in the Contractor's Requirements for tender. It is believed that these requirements are standard practice for medium - high sized contractors operating within Central London, however confirmation of the credit should be sort once a contractor is appointed.	1) A formal **letter of commitment or contractual requirements document** confirming the actions that will be undertaken as part of site works.	RIBA Stage 4	Client / Sustainability Champion / Contractor
		Environmental management	- All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: 3.a Be third party certified, to ISO 14001: 20151, EMAS (EU Eco-Management and Audit Scheme) or equivalent standard; OR 3.b In compliance with BS 8555: 2016 have: 3.b.i Appropriate structure 3.b.ii Reached implementation stage phase four 'implementation and operation of the environmental management system' 3.b.iii Completed defined phase audits one to four. - All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.	1	0.61%	1	-				
		BREEAM AP (Site)	- **Pre-requisite for the BREEAM AP Credit:** The Client and the contractor formally agree performance targets. - Involve a BREEAM AP in the project at an appropriate time and level to: 6.a Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. 6.b Monitor construction progress against the performance targets agreed under criterion 5 throughout all stages where decisions critically impact BREEAM performance. 6.c Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed. 6.d Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. 6.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	1	0.61%	1	-				
		Responsible construction management	One Credit for Excellent rating Achieve items listed as required for one credit in Table 4.1 'Responsible Construction management items' found in the BREEAM Manual. Two Credits for Outstanding rating In addition to the above, achieve six additional items in Table 4.1	2	1.22%	1	-	'**This credit is MANDATORY to achieve an Excellent rating.**			

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Man 03	Responsible construction practices	**Monitoring of construction site impacts**	- Assign responsibility to an individual for monitoring, recording and reporting energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role. **Energy consumption** - Set targets for the site energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation. - Monitor and record data for the energy consumption described above - Report the total carbon dioxide emissions (total kgCO2/project value) from the construction process via BREEAM Projects. **Water consumption** - Set targets for the potable water consumption (m³) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation. - Monitor and record data for the portable water consumption described above - Use the collated data to report the total net water consumption (m³), i.e. consumption minus any recycled water use from the construction process via BREEAM Projects	1	0.61%	1	-	These requirements will be included in the Contractor's Requirements for tender. It is believed that these requirements are standard practice for high - medium sized contractors operating within Central London. **5 credits targeted and 1 seen as additional.**	1) A formal **letter of commitment or contractual requirements document** confirming the actions that will be undertaken as part of site works.	RIBA Stage 4	Client / Sustainability Champion / Contractor
		Monitoring of construction site impacts	- Assign responsibility to an individual for monitoring, recording and reporting energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role. **Transport of construction materials and waste** - Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover: a: transportation of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply (see Definitions). Monitor as a minimum: a.i Materials used in major building elements (i.e. those defined in BREEAM issue Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)). a.ii Ground works and landscaping materials. b: transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan. - Monitor and record data for the transportation movements as described above. - Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions ($kgCO_2$-eq), plus total distance travelled (km) via BREEAM Projects	1	0.61%	1	-				

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Man 04	**Commissioning and handover**	**Commissioning - testing schedule and responsibilities**	Mandatory for a Very Good rating an above - Prepare **a schedule** of commissioning and testing. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric. - All commissioning activities are carried out in accordance with current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standards, where applicable. - Where a building management system (BMS) is specified: a: Carry out commissioning of air and water systems when all control devices are installed, wired and functional b: Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in commissioning results c: The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover d: All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover e: Fully train the occupier or facilities team in the operation of the system. - Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include re-commissioning activities on behalf of the client. -The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover.	**1**	**0.61%**	**1**	**-**	**<u>This credit is MANDATORY to achieve an Excellent rating.</u>** The PM confirmed that a Commissioning Manager will be appointed before the end of Technical Design Stage (RIBA Stage 4) to manage and programme all commissioning works in accordance with BREEAM criteria. WSP MEP confirm that commissioning specs will be included in their reports. **1 credit targeted.**	1) **Specification or written confirmation** confirming commissioning standards, responsibilities and schedule	RIBA Stage 4	Client / Commissioning Manager / MEP
Man 04	**Commissioning and handover**	**Commissioning - Design and Preparation**	- The commissioning - testing schedule and responsibility credit is achieved. - During the design stage, the client or the principal contractor appoints an appropriate project team member, provided they are not involved in the general installation works for the building services systems, with responsibility for: a: Undertaking design reviews and giving advice on suitability for ease of commissioning. b: Providing commissioning management input to construction programming and during installation stages. c: Management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager	**1**	**0.61%**	**1**	**-**	The PM confirmed that a Commissioning Manager will be appointed before the end of Technical Design Stage (RIBA Stage 4) to manage and programme all commissioning works in accordance with BREEAM criteria. WSP MEP confirm that commissioning specs will be included in their reports. **1 credit targeted.**	1) **Specification or written confirmation** confirming commissioning standards, responsibilities and schedule	RIBA Stage 4	Client / Commissioning Manager / MEP
Man 04	**Commissioning and handover**	**Testing and inspecting building fabric**	- The commissioning - testing schedule and responsibility credit is achieved. - Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. - Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage.	**1**	**0.61%**	**-**	**-**	Due to the impact this credit might have on the delivery schedule, this credit is not sort at this moment (RIBA Stage 2). This credit can be revisited as Design Progresses.	1) A formal **letter of commitment or specification document** confirming the actions that will be undertaken in the performance testing of the building fabric. 2) **Project programme** confirming inclusion of thermographic survey and air leakage testing.	RIBA Stage 4	Client / Commissioning Manager / Contractor

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	Co	**Handover**	Mandatory for a Very Good rating and above - Prior to handover, develop **TWO building user guides** (BUG) for the following users: a: A non-technical user guide for distribution to the building occupiers. b: A technical user guide for the premises facilities managers. A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. - Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: a: A non-technical training schedule for the building occupiers. b: A technical training schedule for the premises facilities managers.	**1**	**0.61%**	**1**	**-**	**<u>This credit is MANDATORY to achieve an Excellent rating.</u>** The BREEAM AP suggested that these requirements should be included in the Contractor's Requirements for Tender. The input of the Architect and the MEP will be needed to help develop the BUG. **1 credit targeted.**	1) **Specification or written confirmation** confirming that the two BREEAM compliant building user guide will be produced and handed over.	RIBA Stage 4	Client / Main Contractor
Health & Wellbeing											
Hea 01	**Visual Comfort**	**Daylighting**	All occupied office areas should have an average daylight factor of 2% in 80% of the space AND either (a) OR items (b and c) below are achieved: a. A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the relevant average daylight factor value b. At least 80% of the room has a view of sky from desk or table top height c. The room depth criterion d/w +d/HW < 2/(1-RB) is satisfied (Retail) At least 35% of all retail sales areas the point daylight factors should be 2% or more. - **1 Credit available for retail units** **Alternatively** At least 80% of the relevant building areas are to meet good practice average and minimum point daylight illuminance criteria as outlined below: - Average daylight illuminance (averaged over entire space) of at least 300 lux for 2000 hours per year or more, AND - Minimum daylight illuminance at worst lit point of at least 90 lux for 2000 hours per year or more (Retail) In addition, in at least 35% of all retail sales at least 200 lux point daylight illuminances for 2650 hours per year or more are achieved.	**2**	**1.45%**	**2**	**-**	The Architect confirmed that majority of the occupied office area will reach and exceed the average daylight factor. Likely credit targeted pending outcome of modelling. **2 credits targeted.**	1) **Specialist daylight report** / calculation / modelling results demonstrating that the daylight values can be achieved in all relevant areas. 2) **GA drawings** demonstrating the designs, arrangement and location of windows modelled for daylighting.	RIBA Stage 3	Architect / Daylighting Consultant
		View out	- 95% of the floor area in 95% of spaces for each relevant building area is within 8 m of an external wall. The external wall has a window or permanent opening that provides an adequate view out. - The window or opening must be ≥ 20% of the surrounding wall area. Where the room depth is greater than 8 m, compliance is only possible where the percentage of window or opening is the same as, or greater than, the values in Table 1.0 of BS 8206: part 21.	**1**	**0.73%**	**1**	**-**	The Architect confirmed that majority of the occupied office floor is within 8m of an external wall. Likely credit targeted pending outcome of modelling. **1 credit targeted.**	1) **Drawings** (and, if required, supporting calculations) demonstrating that the relevant floor areas are within the required distances. 2) **Drawings** demonstrating that the windows/openings account for ≥ 20% of the surrounding wall area.	RIBA Stage 3	Architect
		Internal and external lighting levels, zoning and control	**External lighting:** All external lighting within the construction zone is specified in accordance with BS 5489-1:2013 'Code for the practice for the design of road lighting'. Lighting of roads and public amenity areas4 and BS EN 12464-2:20145 Light and lighting - Lighting of work places - Part 2: Outdoor work places. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. - Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and the credit can be awarded	**1**	**0.73%**	**1**	**-**	WSP MEP confirmed that all external lighting (if any) will be specified in accordance with BS 5489-1:2013 and BS EN 12464-2:2014. **1 credit targeted.**	1) **Specification** confirming compliance with the relevant CIBSE, BS and zoning requirements. 2) **Marked up drawings** confirming the zoning and control of internal and external lighting.	RIBA Stage 3	Architect / MEP Engineer

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Hea 02	Indoor Air Quality	**Pre-requisite - Indoor Air Quality (IAQ) Plan**	- A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. The plan must be produced no later than the end of Concept Design (RIBA Stage 2). The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following: 1.a: Removal of contaminant sources 1.b: Dilution and control of contaminant sources: 1.b.i Where present, consideration is given to the air quality requirements of specialist areas such as laboratories 1.c: Procedures for pre-occupancy flush out 1.d: Third party testing and analysis 1.e: Maintaining good indoor air quality in-use.	**Yes**	**No**	**No**	-	This credit is not targeted as confirmed by the Client on the 7th of August 2018.	1) Copy of the **indoor air quality plan**	**RIBA Stage 2**	Client / Air Quality Specialist
		Ventilation	- The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows: 2.a: Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation 2.b: Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building 2.c: Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3. The specified filters should achieve a minimum Indoor Air Quality of IDA2 2.d: Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO_2) or air quality sensors specified and: 2.d.i In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space For more info about natural ventilated spaces please use the BREEAM Manual	**1**	**0.73%**	-	-	This credit can't be achieved if the Indoor Air Quality (IAQ) Plan is not carried at RIBA Stage 2.	1) **Design drawings/specifications** demonstrating how the building has been designed to minimise the indoor concentration and recirculation of pollutants in the building 2) Where applicable, **specification** confirming that building areas subject to large and unpredictable or variable occupancy patterns have carbon dioxide or air quality sensors	RIBA Stage 2	MEP Engineer
Hea 04	Thermal Comfort	**Thermal modelling**	- Thermal modelling has been carried out using software in accordance with CIBSE AM11. - The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. - The modelling demonstrates that summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). - For air-conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool. For more info about natural ventilated spaces please use the BREEAM Manual	**1**	**0.73%**	**1**	-	WSP AP advice that thermal modelling should be carried out to inform the design and specifications, in line with BREEAM requirements at RIBA Stage 3. **1 Credit targeted.**	1) **Thermal modelling** (or an analytical measurement of the thermal comfort levels of the building) in accordance with CIBSE AM11 2) **Reporting:** a) **internal winter and summer temperature ranges** in accordance with CIBSE Guide A Environmental design, Table 1.5 b) **Limit the risk of overheating** in accordance with CIBSE TM55:The Limits of thermal comfort: avoiding overheating in European buildings. c) For air-conditioned buildings, the **PMV and PPD indices**	RIBA Stage 3	MEP Engineer
		Design for future thermal comfort	- The first credit is achieved. - The thermal modelling demonstrates that the relevant requirements set out in criterion 3 are achieved for a projected climate change environment. - Where the above criterion is not met, the project team demonstrates how the building has been adapted, or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under the criterion. - For air-conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	**1**	**0.73%**	**1**	-	WSP AP advice that thermal modelling with project climate change scenarios should be carried out to inform the design and specifications, in line with BREEAM requirements at RIBA Stage 3. Credit targeted pending modelling results. **1 Credit targeted.**	1) As above plus reporting showing how the building has been design to easily adapt in future using passive design solution.	RIBA Stage 3	

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Hea 05	Acoustic Performance		The building meets the appropriate acoustic performance standards and testing requirements defined in the checklists and tables section which defines criteria for the acoustic principles of: a. Indoor ambient noise criteria **or** A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea 05 Acoustic performance, setting out the performance requirements for each and the testing regime required. Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014. A programme of acoustic measurements is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in BREEAM Manual	1	0.73%	1	-	A suitably qualified acoustician (SQA) must carry out a quantifiable assessment of the specification of the build form, construction and any external factors that are likely to affect the indoor ambient noise levels. From this assessment, the SQA must confirm that given a typical arrangement and fit-out specification for the building type, the development is likely to meet the levels required to demonstrate compliance with the BREEAM criteria. WSP Acoustician confirmed compliance will be sort. **1 credit targeted.**	1) **Acoustician's report** confirming early design advice to meet the required performance standards, and the design is capable achieving the relevant acoustic performance criteria. 2) A formal **letter of commitment** or specification from the design team confirming the recommendations made by the Acoustician will be implemented to achieved the performance standards. 3) A copy of the **Acoustician's CV** to confirm they meet the BRE's definition of a Suitably Qualified Acoustician	RIBA Stage 2	Acoustician Design Team
Hea 06	Security		- A suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design **(RIBA Stage 2 or equivalent)**. The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development . - The SQSS develops a set of security controls and recommendations for incorporation into the proposals. Those controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA. - The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.	1	0.73%	-	-	Credit will be considered as design progresses.	1) **Correspondence / report** from the ALO/CPDA/SABRE/Security consultant 2) Design drawings demonstrating how the recommendation from the Security Consultant have been implemented in the development.	**RIBA Stage 2**	Architect
Hea 07	Safe and healthy surroundings	**Safe Access**	- Where external site areas form part of the assessed development the following apply: 1 Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2 Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: 2.a: The site entrance to the building entrance, 2.b: Car parks (where present) to the building entrance 2.c: The building to outdoor space 2.d: Connecting to off-site paths where applicable. 3 Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply: 4 Delivery areas are not accessed through general parking areas and do not cross or share the following: 4.a: pedestrian and cyclist paths 4.b: outside amenity areas accessible to building users and general public. 5 There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 6 Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.	1	0.73%	1	-	The development has no external areas but does have a covered parking facility. The Architect confirmed that a dedicated and separate entrance for the Cars and the cyclist have been provided. **1 credit targeted.** BREEAM Notes: *Where the assessed building has no external areas but does have a covered parking facility, and cyclists, pedestrians or delivery vehicles access the building via this area, then the relevant safe access criteria apply and this area must be assessed against those criteria.*	1) Design drawings demonstrating that the site meets the safe access requirements. 2) Specification / letter of commitment confirming that the lighting will be in accordance with the lighting standards detailed in Hea 01 and, where relevant, BS 5489-1:2013 Lighting of roads and public amenity areas. 3) Completed and signed NCN checklist for any cycle lanes to be included in the design	RIBA Stage 3	Architect / Transport Consultant
		Outside space	- There is an outside space providing building users with an external amenity area. 'The outside space must: • be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky • have appropriate seating areas and be non-smoking, • be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).	1	0.73%	1	-	The Architect (AP) confirmed that an outside space has been provided and will comply with BREEAM requirements. *Please note that non-smoking designation must be given to the space.*	1) Design drawings demonstrating that the site have access to external amenity area.	RIBA Stage 3	Architect

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Energy											
Ene 01	**Reduction of energy use and carbon emissions**	**Energy Performance**	Up to nine credits where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO_2 emissions. This is based upon the Energy Performance Ratio for New Constructions. Four credits mandatory for an Excellent rating Six credits mandatory for an Outstanding rating	**9**	**6.00%**	**4**	**-**	**4 credits are MANDATORY to achieve an Excellent rating.** 'Based on initial modelling carried out by WSP Energy Specialist (July 2018) 4 credits are targeted with a carbon reduction of approx. 35% better than Part L 2013. Proposed Systems: Air source Heat Pump system. **4 credits targeted.** **1 credit seen as additional.**	1) As-designed **BRUKL Input (.inp) and Output (pdf)** report. 2) Details of the **Energy Specialist Accreditation.**	RIBA Stage 2	Accredited 'Energy Specialist
		Prediction of operational energy consumption	**Pre-requisite** Prior to completion of the **Concept Design** (RIBA 2), relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.	**Yes**	**No**	**Yes**	**-**	A Design workshop focusing on operational energy performance will be carried out by the WSP Energy Specialist.	1) Workshop minutes, agreed outcomes.	**RIBA Stage 1/2**	Design Team
			Energy modelling and reporting - Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures - Report predicted energy consumption targets by end use, design assumptions and input data (with justifications). - Carry out a risk assessment to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process.	**4**	**2.67%**	**4**	**-**	WSP Energy Specialist confirm that following the Operational Energy performance workshop, an additional energy modelling for predicted operational energy consumption and reporting will be undertaken in line with BREEAM requirements	2) Predicted energy consumption values, design assumptions, input data and risk assessments reported as detailed in the Energy Prediction and Post-occupancy guidance available from the BREEAM website. 3) Confirmation of suitably qualified energy modeller's qualifications and experience.	**RIBA Stage 1/2**	Accredited 'Energy Specialist
Ene 02	**Energy Monitoring**	**Sub-metering of end-use categories**	- Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories - Meter the energy consumption in buildings according to the total useful floor area: 2.a: If the area is greater than 1,000 m², by end-use category with an appropriate energy monitoring and management system. 2.b: If the area is less than 1,000 m², use either: 2.b.i an energy monitoring and management system or 2.b.ii separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system (see Definitions). - Building users can identify the energy consuming end uses, for example through labelling or data outputs. Mandatory for a Very Good rating an above	**1**	**0.67%**	**1**	**-**	**This credit is MANDATORY to achieve an Excellent rating.** ' WSP MEP confirmed energy metering systems will be specified for the development. **1 credit targeted.**	1) **Specification / metering schematic** confirming metering of relevant systems.	RIBA Stage 3	MEP Engineer / Contractor
		Sub-metering of high energy load and tenancy areas	- Monitor a significant majority of the energy supply with: 4.a: An accessible energy monitoring and management system for: 4.a.i tenanted areas or 4.a.ii relevant function areas or departments in single occupancy buildings. **OR** 4.b: Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for: 4.b.i tenanted areas or 4.b.ii relevant function areas or departments in single occupancy buildings. - Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogeneous function, for example hotel bedrooms, offices.	**1**	**0.67%**	**1**	**-**	WSP MEP confirmed energy metering systems using a pulsed output meter will be specified for the development. (Office) Areas that needs to be sub metered: 1. Office areas (metering by floor plate) - **YES** 2. Catering (if present) - **YES** (Retail) Areas that needs to be sub metered: 1. Sales area (if present) **- YES** 2. Catering (if present) **- YES** **1 Credit targeted.**	1) **Written confirmation** of the systems that have been metered using a pulsed output meter, including: a. Space Heating b. Domestic Hot Water c. Humidification d. Cooling e. Fans (major) f. Lighting g. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department). h. Other major energy-consuming items where appropriate	RIBA Stage 3	

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Ene 03		External Lighting	- No external lighting (which includes lighting on the building, at entrances and signs). OR 2 External light fittings within the construction zone with: 2.a: Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt 2.b: Automatic control to prevent operation during daylight hours 2.c: Presence detection in areas of intermittent pedestrian traffic.	1	0.67%	1	-	WSP MEP confirmed that compliant external lighting will be specified (if required). **1 Credit targeted.**	1) **Specification** confirming compliance with the relevant energy efficient lighting and lighting control criteria. 2) **Drawings** showing the extent of the external lighting and the type of fittings. 3) **Manufacturers literature/datasheets** for the specified external light fittings (if known at	RIBA Stage 3	Electrical Engineer
Ene 04	Low carbon design	Passive design	**Passive design analysis** - Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. - The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures - Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. - Quantify the reduced total energy demand and carbon dioxide (CO_2) emissions resulting from the passive design measures.	1	0.67%	-	-	WSP Energy Specialist confirmed a Passive Design Analysis study will be carried out by the end of RIBA Stage 2. Credit is unlikely to be achieved and not sort at this stage.	1) A copy of the **Passive Design Analysis report.** 2) **Drawings / specifications** demonstrating the inclusion of any passive design measures resulting from the findings of the passive design analysis. 3) **Calculations** confirming the meaningful reduction of the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive design analysis as a result of implementing passive design measures.	RIBA Stage 2	Accredited 'Energy Specialist
			Free cooling - Achieve the passive design analysis credit. - Include a free cooling analysis (see Free cooling analysis) in the passive design analysis carried out. - Identify opportunities for the implementation of free cooling solutions. -The building is naturally ventilated or uses any combination of the free cooling strategies listed in Free cooling analysis.	1	0.67%	-	-	Credit not achievable and not sort.			
		Low and zero carbon technologies	Low zero carbon feasibility study - An energy specialist completes a feasibility study by the end of Concept Design. - Establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development based on the feasibility study. - Specify local LZC technologies for the building or development in line with the feasibility study recommendations. - Quantify the reduced regulated carbon dioxide (CO_2) emissions resulting from the feasibility study.	1	0.67%	1	-	WSP Energy Specialist confirmed LZC study will be carried out by the end of RIBA Stage 2. A LZC technology/technologies should be specified in line with the recommendations of the feasibility study which will result in energy and carbon savings. Based on Proposed Energy Strategy BREEAM AP believes this credit should be targeted. **1 credit targeted.**	1) BREEAM compliant **LZC feasibility study**. 2) **BRUKL Output report** for designed and standard case building and associated calculations to demonstrate the reduction in CO2 emissions. 3) **Drawings / specifications** demonstrating the inclusion of the recommended LZC technology.	RIBA Stage 2	Accredited 'Energy Specialist
Ene 06	Energy Efficient Transportation Systems	Energy consumption	- For specified lifts, escalators or moving walks (transportation types): 1.a: Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators or moving walks 1.b: Calculate the energy consumption in accordance with BS EN ISO 25745 Part 2 or Part 3 for one of the following: 1.b.i At least two types of system for each transportation type required OR 1.b.ii An arrangement of systems, for example for lift systems, hydraulic, traction, machine room-less lift (MRL) OR 1.b.iii A system strategy that is 'fit for purpose' 1.c: Consider the use of regenerative drives, subject to the requirements in Regenerative drives 1.d: Specify the transportation system with the lowest energy consumption.	1	0.67%	1	-	BREEAM AP believes this credit is easily achievable and should be targeted but VT scope to included relevant demand and energy consumption calculations. **1 credit targeted.**	1) The **professional study** of transportation analysis and energy consumption comparison of systems/strategies. 2) Specification confirming implementation of lowest energy consuming lift system/strategy.	RIBA Stage 4	Lift Consultant
		Energy efficient features	**One Credit - Lifts** '- The above credit (Energy Consumption) is achieved. - Specify the following three energy efficient features for each lift: a: A standby condition for off-peak periods b: The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of > 70 luminaire lumens per circuit Watt c: Use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. - Specify regenerative drives where their use is demonstrated to save energy.	1	0.67%	1	-	same as above	1) **Specification** confirming implementation of lifts with three energy efficient features. 2) Manufacturer datasheet for the specified lift demonstrating the energy efficient features.		

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Transport											
Tra 01	**Travel plan**		- During the feasibility and design stages (RIBA Stage 1) develop a travel plan based on a site-specific travel assessment or statement. - The site-specific travel assessment or statement covers as a minimum: 2.a: Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant 2.b: Travel patterns and transport impact of future building users 2.c: Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children) 2.d: Reporting of the number and type of existing accessible amenities, see Table 7.1, within 500m of the site 2.e: Disabled access (accounting for varying levels of disability and visual impairment) 2.f: Calculation of the existing public transport Accessibility Index (AI), see Methodology 2.g: Current facilities for cyclists - The travel plan includes proposals to increase or improve sustainable modes of transport and movement of people and goods during the building's operation and use, see Methodology. - If the occupier is known, involve them in the development of the travel plan. - Demonstrate that the travel plan will be implemented post construction and be supported by the building's management in operation.	**2**	**1.92%**	**2**	**-**	WSP Transport Engineers confirmed that a BREEAM compliant Travel Plan will be/has been produced. **2 credits targeted.**	1) A copy of the Travel Plan or Statement. 2) Written confirmation that the measures outlined in the plan will be implemented post construction.	**RIBA Stage 1/2**	Transport Consultant / Client
			Pre-requisite Tra 01 credit has been achieved.	**Yes**	**No**	**Yes**	**-**	**Yes**			
Tra 02	**Sustainable Transport Measures**		**Transport options implementations** MAX of 10 Credits - Award credits according to the Accessible Index (AI) of the project, and the total number of points achieved for the options implemented. See 'Transport Section' TAB for additional information. Summary below: AI < 25 = 10 max points = 10 credits 25 ≤ AI < 40 = 8 max points = 10 credits (urban centres) AI of ≥ 40 = 6 max points = 10 credits (metropolitan centre locations)	**10**	**9.58%**	**10**	**-**	Based on the calculated AI of ≥ 40, 6 points are required to achieve **10 credits**. The following Sustainable transport measures options have been targeted to achieve the desired points: **Option 3 - 1 point -** Provide a public transport information system in a publicly accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities. **YES** **Option 7 - 1 point** - Install compliant cycle storage spaces to meet the minimum levels (1 for every 10 staff) **YES** **Option 8 - 1 point**- option 7 has been achieved. Provide at least two compliant cyclist facilities for the building user. Showers and/or Changing facilities and/or Lockers and/or Drying spaces. **YES** **Option 9 - 1 point**- At least three existing accessible amenities are present. 500m from: **~ Access to cash (Sainsbury's store)** ~ Postal facility **~ Food outlet (Sainsbury's Store)** ~ Community facilities **~ Pharmacy (Sainsbury's store)** ~ Child Care ~ Access to outdoor open space ~ Access to recreation or leisure/sport facilities **Option 10 - 2 points** - Ensure a minimum of one new accessible amenity is provided. **~ Access to outdoor open space**	1) Design plan confirming location and number of cycle spaces. 2) Design plan confirming location and number of showers and changing facilities. 3) Manufacturer datasheet for cycle racks. 4) Written confirmation of actual or nominal building occupancy - Nominal numbers can be calculated based on calculation ratios provided in the BREEAM technical manual. 5) Specification / drawings to confirm the security and lighting standards comply with requirements.	RIBA Stage 2	Architect / Transport Consultant

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Water											
Wat 01		**Water Consumption**	Up to five credits where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings. Credits are awarded based on the following improvement over the notional baseline: - One credit - 12.5% improvement - Two credits - 25% improvement - Three credits - 40% improvement - Four credits - 50% improvement - Five credits - 55% improvement The calculations is based upon the following sanitary fittings: a) WCs b) Urinals c) Taps d) Showers e) Baths f) Dishwashers g) Washing machine h) Kitchen pre-rinse nozzles *One credit is mandatory to achieve a BREEAM rating of Good or above* *Two credit is mandatory to achieve a BREEAM rating of Outstanding*	**5**	**3.89%**	**2**	**-**	**<u>One credit is MANDATORY to achieve an Excellent rating.</u>** 'WSP BREEAM AP suggested that by using the following flow and flush rates the development could achieve <u>2 credits</u>: o WCs: 4 litres effective flush volume (Dual flush 6l & 3l) o Urinals: 1.5 l/flush/bowl assuming a total of 9 urinals bowls o Wash hand basin taps: 5 l/m or less o Showers: 8 l/m or less o Kitchenette tap: 6 litres/min o Kitchenette dishwasher: 13 litres/cycle or less There's a potential to achieve 1 additional credit if greywater (from the showers) and rainwater (roof) is effectively collect and reuse to flush approx. 40% of the development WC's. **2 credits targeted.**	1) **Specification / sanitary schedule** confirming number of fittings and water efficiency figures for the following: a) WCs (litres per flush) b) Urinals (litres per cistern and per bowl) c) Taps (flow rate at 3 bar) d) Showers (flow rate at 3 bar and 37oC e) Baths (litres to overflow) f) Dishwashers (litres per cycle) g) Washing machines (litres per use) *Note: this should include any flow control devices to be fitted.*	RIBA Stage 2	Public Health Engineer
									2) **Manufacturer datasheet** confirming the water efficiency figures in the specification can be delivered.		Public Health Engineer
Wat 02		**Water monitoring**	- Specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source. 2 For water-consuming plant or building areas consuming 10% or more of the building's total water demand: 2.a: Fit easily accessible sub-meters OR 2.b: Install water monitoring equipment integral to the plant or area. 3 For each meter (main and sub): 3.a: Install a pulsed or other open protocol communication output AND 3.b: Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post-Construction stage, award credits provided that the system used enables connection when the BMS becomes operational. 4 In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels. 5 In buildings containing laboratories, fit a separate water meter on the water supply to any process or cooling loop for 'plumbed-in' laboratory process equipment, irrespective of their water consumption levels. Additionally for those pursuing a post occupancy stage certification: 6 The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (litres/person/day), if a post occupancy stage certification is sought. *This credit is mandatory to achieve a BREEAM rating of Good or above*	**1**	**0.78%**	**1**	**-**	**<u>This credit is MANDATORY to achieve an Excellent rating.</u>** 'WSP MEP confirmed that water meter with pulsed output will be installed on the mains supply to the development. Compliance must be demonstrated for water-consuming plant/building areas identifiable by the developer. Water-consuming plant/building areas to be added/installed by the tenant do not need to be assessed for this issue. **1 Credit targeted.**	1) **Specification** confirming the provision of a water meter and its connection to BMS.	RIBA Stage 3	Public Health Engineer
									2) **Design plan** confirming location of water meter and BMS display.		Public Health Engineer
									3) **Written confirmation** that water consuming plant or areas consuming 10% or more of the building's water use.		Public Health Engineer

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Wat 03	Major leak detection	Leak detection system	- Install a leak detection system capable of detecting a major water leak: 1.a: On the utilities water supply within the buildings, to detect any major leaks within the buildings AND 1.b: Between the buildings and the utilities water supply, to detect any major leaks between the utilities supply and the buildings under assessment. 2 The leak detection system is: 2.a: A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks 2.b: Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system 2.c: Able to identify different flow and therefore leakage rates, e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owner's or occupier's usage patterns. 2.d: Programmable to suit the owner's or occupier's water consumption criteria 2.e: Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. Where there is physically no space for a leak detection system between the utilities water meter and the building, alternative solutions can be used, provided that a major leak can still be detected.	1	0.78%	1	-	WSP MEP confirmed specification will be included in the MEP Stage 3 report. **1 Credit targeted.**	1) **Specification** confirming the inclusion of the leak detection system and its capabilities as listed in the BREEAM Criteria column.	RIBA Stage 3	Public Health Engineer
		Flow control device	- Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework.	1	0.78%	1	-	WSP MEP confirmed specification will be included in the MEP Stage 3 report. **1 Credit targeted.**	1) **Specification** confirming the inclusion of flow control devices. 2) Design plan / schematic confirming location of solenoid valves and PIRs to WC areas.	RIBA Stage 3	Public Health Engineer
Wat 04		Water efficient equipment	- Identify all water demands from uses other than those listed under Wat 01 Water consumption that could be realistically mitigated or reduced. *Where there is no water demand from uses other than domestic-scale, sanitary use components in the building, this issue is not applicable.* - Identify systems or processes to reduce the relevant water demand (criterion 1), and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.	1	0.78%	1	-	Architect confirmed development will have some planting on the terraces which might require an irrigation systems. Process to reduce the water demand will be look at as design progresses. **1 Credit targeted.**	1) **Written confirmation** of the irrigation strategy. 2) Datasheets and drawings from any irrigation system to be installed to confirm compliance with the requirements. (if applicable / known)	RIBA Stage 2	Architect / Public Health Engineer

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Materials											
Mat 01	**Environmental Impacts from Construction products - Building life cycle assessment (LCA)**	**Superstructure**	**Comparison with the BREEAM benchmark during Concept Design** **-** During the Concept Design, demonstrate the environmental performance of the building as follows: 1.a: Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology. 1.b: Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). **Comparison with the BREEAM benchmark during Technical Design** - During Technical Design, demonstrate the environmental performance of the building as follows: 2.a: As criterion 1.a 2.b: Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. *Where a project has not achieved criterion 1, criterion 2 may still be achieved.*	**6**	**7.50%**	**4**	**2**	This credit has been targeted and Mat 01/02 Results Submission Tool was submitted to the BRE (Uploaded to BREEAM Project by an Accredited Assessor) before Planning Permission was applied for. **4 credits targeted and 2 credit seen as additional**	1) The Mat 01/02 Results Submission Tool	**RIBA Stage 2** & RIBA Stage 4	LCA Consultant
			Option appraisal during Concept Design - During Concept Design, identify opportunities for reducing environmental impacts as follows: 4.a: Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage). 4.d Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document. **Options appraisal during Technical Design** **-** During Technical Design identify opportunities for reducing environmental impacts as follows: 5.a: Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage)						1) The Mat 01/02 Results Submission Tool 2) The options appraisal summary document 3) Evidence that the LCA options appraisal summary document has been received by the design team and client (meeting minutes, letter of acknowledgement) 4) Evidence of how the LCA design options have informed the design decision-making process (e.g. meeting minutes, documented design development showing how the LCA options have affected the design).	**RIBA Stage 2** & RIBA Stage 4	LCA Consultant
		Substructure	**Substructure and hard landscaping options appraisal during Concept Design** **-** Superstructure credit is achieved. 7 During Concept Design identify opportunities for reducing environmental impacts as follows: 7.a: Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping). 7.b: Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design)	**1**	**1.25%**	**1**	**-**	Due to the fact that the development doesn't have any substructure, BRE are happy for us to scope it out, however an LCA will still have to be carried for the small hard landscaping area for this credit to be achieved. 'This credit has been targeted and Mat 01/02 Results Submission Tool was submitted to the BRE (Uploaded to BREEAM Project by an Accredited Assessor) before Planning Permission was applied for. **1 credit targeted.**	1) As above 2) The LCA options appraisal summary document includes substructure and hard landscaping according to the criteria.	**RIBA Stage 2** & RIBA Stage 4	LCA Consultant
Mat 02	**Environmental impacts from construction products – Environmental Product Declarations (EPD)**		- Specify construction products with EPD that achieve a total EPD points score of at least 20. ~ EPD applicable to a single product, and a single manufacturer (the product may be manufactured in more than one location) = 1.5 EPD points ~ EPD applicable to more than one product in the same product category, and a single manufacturer. = 0.75 points ~ EPD applicable to more than one product in the same product category, and a more than one manufacturer = 0.5 points	**1**	**1.25%**	**-**	**1**	The BREEAM AP advise the Architect to include the EPD requirement in the Contractor's Requirements for Tender. *EPD should be required for the following construction products (A full list could be made available after the LCA has been carried out):* *~ Concrete mix or (Cement, aggregates or any recycled materials used)* *~ Timber* *~ Steel reinforcement and Structural Steel* *~ Plasterboard gypsum board* *~ concrete screed / levelling products* *~ Facade (Opaque and glazed)* **1 credit seen as additional.**	1) The Mat 01/02 Results Submission Tool 2) Copies of EPD Certificates	RIBA Stage 4	Architect

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Mat 03	Responsible sourcing of construction products	Pre requisite	All timber and timber-based products used on the project are legally harvested and traded timber as per the UK Government's Timber Procurement Policy (TPP)	Yes	No	Yes	-	It is considered achievable and to be included in the Contractor's Requirements for Tender. **Pre-requisite considered achievable.**	1) **Specification** confirming that all timber will be sourced in accordance with the UK Government's Timber Procurement Policy. 2) A copy of a **BREEAM compliant Sustainability Procurement Plan**	RIBA Stage 1	Client / Architect
		Enabling Sustainable Procurement	- A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: 2.a: *Be in place before Concept Design.* 2.b: Include sustainability aims, objectives and strategic targets to guide procurement activities. Note: targets do not need to be achieved for the credit to be awarded but justification must be provided for targets that are not achieved. 2.c: Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. 2.d: Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. In addition, if the plan is applied to several sites or adopted at an organisational level it must: 2.e: Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:20171.	1	1.25%	-	-	It is not expected this plan will be developed before conclusion of concept design and therefore the credit is not targeted.			
		Measuring responsible sourcing	Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved: - 3 credits - ≥30% - Superstructure, Internal Finishes, Substructure and Hard Landscaping - 2 credits - ≥20% - as above - 1 credit - ≥10% - only Superstructure	3	3.75%	1	-	The BREEAM AP suggest that the Responsible sourcing requirements should be included in the Contractor's Requirements for Tender. **1 credit targeted.**	1) Evidence of level of responsible sourcing achieved for each construction product. For example, certificates. 2) Completed copy of the Mat 03 Calculator tool. 3) Evidence to show how the Mat 03 calculator tool has been completed.	RIBA Stage 4	Architect / Structural Engineer
Mat 05	Designing for durability and resilience		**Protecting vulnerable parts of the building from damage.** Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against: 1.a: Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.). 1.b: Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. 1.c: External building fabric damage by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building façade and where delivery areas or routes are within 2 metres of the façade, i.e. specifying bollards or protection rails. 1.d: Potential malicious damage to building materials and finishes, in public and common areas where appropriate. **Protecting exposed parts of the building from material degradation** - Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: 2.a: The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14. If none are available, use BS 7543:20151 as the default appropriate standard OR 2.b: A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors. - Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.	1	1.25%	1	-	The Architect and Structure Engineer confirmed that protection and degredation measures will be incorporated into the building's design in compliance to BREEAM requirements. **1 credit targeted.**	1) **Design plan** marked-up to confirm: a. areas of vulnerability b. protection from the effects of high pedestrian traffic c. protection against any internal vehicular/ trolley movement d. protection against or prevention from any potential vehicular collision where vehicular parking and manoeuvring occurs.	RIBA Stage 4	Architect

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Mat 06		Material efficiency	- At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages: **a. Preparation and Brief** **b. Concept Design** c. Developed Design d. Technical Design e. Construction. Develop and record the implementation of material efficiency during: a. Developed Design b. Technical Design c. Construction. - Report the targets and actual material efficiencies achieved.	1	1.25%	-	-	It is not expected that Material efficiency targets and reporting have been / will be carried out during RIBA Stage 1 & 2. Credit not sort.	1) **Material efficiency design notes / report** revisions for each key RIBA stage reached to date, identifying opportunities for and appropriate measures taken to optimise the use of materials in building design, procurement, construction, maintenance and end of life. 2) **Supporting documentary evidence** of implementing measures for optimising the use of materials (e.g. specifications, drawings, etc...)	**RIBA Stage 1** **RIBA Stage 2** RIBA Stage 3 RIBA Stage 4	Architect
Waste											
Wst 01	Construction Waste Management	**Pre-Demolition Audit**	- Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of Pre-demolition audit scope and: 1.a: Be carried out at **Concept Design stage (RIBA Stage 2)** by a competent person prior to strip-out or demolition works 1.b: Guide the design, consider materials for reuse and set targets for waste management 1.c: Engage all contractors in the process of maximising high grade reuse and recycling opportunities 1.d: Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets. - Make reference to the audit in the resource management plan (RMP) Mandatory for an Outstanding rating	1	0.64%	-	-	The PM confirmed that a demolition contractor will not be appointed until after Stage 2. This credit could be considered at a later stage & pre-demo audit to be reviewed once more details are available.	1) Where the development involves demolition, provide a copy of **pre-demolition audit** carried out at Concept Design Stage.	**RIBA Stage 2**	Demolition Contractor / Client
		Construction resource efficiency	- Prepare a compliant Resource Management Plan (RMP) covering: 3.a: Non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication, see Definitions), including demolition and excavation waste 3.b: Accurate data records on waste arisings and waste management routes. - Meet or improve upon the benchmarks for non-hazardous construction waste, excluding demolition and excavation waste. One Credits for ≤ 13.3 m³ or (11.1 tonnes) per 100m² GIA	1	0.64%	1		'Requirements recommended to be included in the Contractor's Requirements for Tender. **1 credit targeted.**	1) Written commitment to produce a **BREEAM compliant Resource Management Plan** containing: - the target benchmark for resource efficiency as per the figures noted - procedures and commitments for minimising non-hazardous waste in line with the benchmark - procedures for minimising hazardous waste - procedures for monitoring, measuring and report hazardous and non-hazardous site waste - procedures for sorting, reusing and recycling construction waste into defined waste groups either on site or through a licensed external contractor - the individual responsible for implementing this policy	RIBA Stage 4	Contractor
			Two credits for <7.5m³ (or 6.5 tonnes) per 100m² GIA	1	0.64%	-	-				
			Three credits for < 3.4m³ (or 3.2 tonnes) per 100m² GIA	1	0.64%	-	-				
		Diversion of resources from Landfill	One further credit where evidence provided demonstrates that 80% by volume or 90% by tonnage non-hazardous construction and demolition waste generated by the development will be diverted from landfill and reused or recycled. - Sort waste materials into separate key waste groups, either on-site or through a licensed contractor for recovery.	1	0.64%	1	-	These requirement will be included in the Contractor's Requirements for Tender. **1 credit targeted.**			Contractor
Wst 02		**Use of recycled and sustainably sourced aggregates**	**Pre-requisite** - If demolition occurs on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Wst 01 Construction waste management Predemolition audit.	Yes	No		No	A Pre-demolition audit hasn't been carried at Concept Design Stage therefore this credit can't be targeted. This credit could be considered at a later stage if required.			
			Project Sustainable Aggregate Points **-** Identify all aggregate uses and types on the project. - Determine the quantity in tonnes for each identified use and aggregate type. - Identify the region in which the aggregate source is located. - Calculate the distance in kilometres travelled by all aggregates by transport type.	1	0.64%	-	-	The Project Team agreed that this credit will not be targeted. Unlikely the project will be able to achieve this.	1) A completed copy of the Wst 02 calculator. 2) Documentary evidence supporting the data used to complete the Calculator tool.	RIBA Stage 4	Civil Engineer / Contractor

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Wst 03	**Operational Waste**		- Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: 1.a: Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams 1.b: Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors 1.c: Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily or weekly operational activities and occupancy rates. - For consistent and large amounts of operational waste generated, provide: 2.a: Static waste compactors or balers; situated in a service area or dedicated waste management space 2.b: Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility 2.c: A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site. This credit is mandatory to achieve a BREEAM rating of Excellent and above	**1**	**0.64%**	**1**	**-**	**This credit is MANDATORY to achieve an Excellent rating.** Architect confirmed a dedicated BREEAM compliant spaces will be provided. **1 credit targeted.**	1) **Design plan** confirming location and area (m²) of storage area. 2) **Written confirmation** that the dedicated space conforms to the BREEAM requirements.	RIBA Stage 2	Architect / Waste Consultant
Wst 04		**Speculative Finishes**	- For tenanted areas, where the future occupant is not known and carpets or other floor or ceiling finishes are installed, these must be limited to a show area only. - Only install floor and ceiling finishes selected by the known occupant of a development. Alternatively, where only ceiling finishes and no carpets are installed, the building owner confirms that the first tenants will not be permitted to make substantial alterations to the ceiling finishes.	**1**	**0.64%**	**1**	**-**	The Architect confirmed on behalf of the Client that if present, floor and ceiling finishes will not to be removed/replaced during fit-out. **1 credit targeted.**	1) Written confirmation that no Speculative finishes will be specified or only limited to a show area 2) Written confirmation that If ceiling finishes were to be specified, the first tenants will not be permitted to make substantial alterations.	RIBA Stage 3	Architect / Client
Wst 05	**Adaptation to climate change**	**Resilience of structure, fabric, building services and renewables installation**	- Conduct a climate change adaptation strategy appraisal using: 1.a: A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes: 1.a.i Hazard identification 1.a.ii Hazard assessment 1.a.iii Risk estimation 1.a.iv Risk evaluation 1.a.v Risk management. - Develop recommendations or solutions based on the climate change adaptation strategy appraisal, **before or during Concept Design**, that aim to mitigate the identified impact. - Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.	**1**	**0.64%**	**-**	**-**	The Project Team agreed that this credit will not be targeted. The BREEAM AP explain how time sensitive this credit is.	1) A copy of the **Climate change adaptation strategy appraisal report** developed at RIBA Stage 2	**RIBA Stage 2** & RIBA Stage 4	Architect / MEP Engineer / Structural Engineer
Wst 06	**Design for disassembly and adaptability**	**Design for disassembly and functional adaptability - recommendations**	- Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of **Concept Design**. - Develop recommendations or solutions based on the study, during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.	**1**	**0.64%**	**-**	**-**	The Project Team agreed that this credit will not be targeted. The BREEAM AP explain how time sensitive this credit is.	1) A copy of the Disassembly and Functional adaptability study by the end of RIBA Stage 2	**RIBA Stage 2**	Design Team, Client
		Disassembly and functional adaptability - implementation	- Achieve the above credit - Provide an update, during Technical Design, on: 4.a: How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. 4.b: Changes to the recommendations and solutions during the development of the Technical Design. - Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	**1**	**0.64%**	**-**	**-**	The Project Team agreed that this credit will not be targeted. The BREEAM AP explain how time sensitive this credit is.	1) **Implementation Plan report** 2) **Building adaptability and disassembly guide**	RIBA Stage 4	Design Team, Client

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Land Use & Ecology											
LE 01	**Site Selection**	**Previously occupied land**	At least 75% of the proposed development's footprint is on an area of land which has previously been occupied	**1**	**1.15%**	**1**	**-**	Development is over 75% located on previously developed land. **1 credit targeted.**	1) **Drawing** which shows the site and its land use prior to development overlaid with a site boundary for the new works.	RIBA Stage 0	Architect
		Contaminated Land	- A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: 2.a: The degree of contamination 2.b: The contaminant sources or types 2.c: The options for remediating sources of contamination which present an unacceptable risk. - The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional	**1**	**1.15%**	**-**	**-**	It is believed that the site is not contaminated. Credit can't be targeted.	1) **Remediation report** confirming scale of contamination and recommended remedial measures. 2) **Documentation** confirming that the site was adequately remediated.	RIBA Stage 2 RIBA Stage 5	Contaminated Land Consultant Contractor
LE 02	**Identifying and understanding the risks and opportunities for the project**	**Pre-requisite**	- An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist. - Project team member route (Route 1) = 1 credit available - Ecologist route (Route 2) = 2 credits available - The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	**Yes**	**No**	**Yes**	**-**	WSP Ecologist has been appointed at RIBA Stage 2. Ecologist route (Route 2) will be pursued.			
		Survey and evaluation	**Route 1 (1 credit)** - Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment **Route 2 (2 credits)** - An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions. - Prior to the completion of the *preparation and brief* , an appropriate level of survey and evaluation has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish: 5.a: Current and potential ecological value and condition of the site, and related areas within the zone of influence. 5.b: Direct and indirect risks to current ecological value 5.c: Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence. - Data are collated and shared with project team to inform the site preparation, design or construction works.	**2**	**2.31%**	**2**	**-**	Based on initial assessment by WSP Ecologist this credit should be targeted. **2 credits targeted.**	Route 1 1) A submission of the BREEAM Guidance Note **GN34 BREEAM Ecological Risk Evaluation Checklist** Route 2 1) **Ecologist qualifications and appointment letter** 2) **Site survey and evaluation report** carried out at RIBA Stage 1 3) Correspondence with stakeholders	**RIBA Stage 1**	Suitably Qualified Ecologist / Client
		Determining the ecological outcomes for the site (Routes 1 and 2)	- Survey and evaluation criteria relevant to the chosen route have been achieved - During **Concept Design**, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites (appropriate to the scale and type of development) for the project. - When determining the ecological outcome for the site, this must involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. This must be done in accordance with the following hierarchy of action: 9.a: avoidance 9.b: protection 9.c: reduction or limitation of negative impacts 9.d: on site compensation and, 9.e: enhancement, considering the capacity and feasibility within the site, or where viable, off-site. - Following this the optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team.							**RIBA Stage 2**	

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LE 03	Managing negative impacts on ecology	Pre-requisite	- LE 02 has been achieved - The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site - **Project team member route (Route 1)** = 2 credits available - **Ecologist route (Route 2)** = up to 3 credits available	Yes	No	Yes	-	WSP Ecologist has confirm that compliance is monitored against all relevant UK and EU legislation relating to the ecology of the site.	Route 1 1) A submission of the BREEAM Guidance Note **GN34 BREEAM Ecological Risk Evaluation Checklist** Route 2 1) **Ecologist qualifications and appointment letter** 2) **Site survey and evaluation report** carried out at RIBA Stage 1 3) Correspondence with stakeholders	RIBA Stage 1	Suitably Qualified Ecologist Contractor
		Planning, liaison, implementation and data	- Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief. - Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs. - The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected (see LE 02 Identifying and understanding the risks and opportunities for the project), during site preparation and construction works.	1	1.15%	1	-	Based on initial assessment by WSP Ecologist this credit should be targeted. **1 credit targeted.**			
		Managing negative impacts of the project	**Route 1 (One credit)** - Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net impact has resulted. **Route 2 (up to two credits)** - Negative impacts from site preparation and construction works have been managed according to the hierarchy and either: 7.a: No overall loss of ecological value has occurred (2 credits) OR 7.b: The loss of ecological value has been limited as far as possible (1 credit)	2	2.31%	2	-	Based on initial assessment by WSP Ecologist this credit should be targeted. **2 credits targeted.**			Suitably Qualified Ecologist Contractor
LE 04	Change and enhancement of ecological value	Pre-requisite	**Identifying and understanding the risks and opportunities for the project** - LE 03 has been achieved. Including the following, specific to the aims of this issue: 1.a: Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes 1.b: Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs. - The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site. - **Project team member route (Route 1)** = 1 credit available - **Ecologist route (Route 2)** = up to 4 credit available	Yes	No	Yes	-	Based on initial assessment by WSP Ecologist this credit should be targeted. **Pre-requisite targeted.**	Route 1 1) A submission of the BREEAM Guidance Note **GN34 BREEAM Ecological Risk Evaluation Checklist** Route 2 1) **Ecologist qualifications and appointment letter** 2) **Site survey and evaluation report** carried out at RIBA Stage 1 3) Correspondence with stakeholders	RIBA Stage 1	Suitably Qualified Ecologist / Landscape Consultant
		Enhancement of ecology	**Route 1 (One credit)** - The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions and measures based on recommendations from recognised 'local' ecological expertise, specialist input and guidance to inform the adoption of locally relevant ecological solutions and measures which enhance the site. - Data collated is provided to the local environmental records centres nearest to, or relevant for, the site.	4	4.62%	4	-	Based on initial assessment by WSP Ecologist this credit should be targeted. **4 credits targeted.**			
		Liaison, implementation and data collation	**Route 2 (One credit)** - The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented the solutions and measures selected in a way that enhances ecological value in the following order: 5.a: On site, and where this is not feasible, 5.b: Off site within the zone of influence								

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		Enhancement of ecology	**Route 2 (up to 3 credit)** - Credits are awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in either GN 35 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues – Route 1 or GN 36 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues – Route 2 (whichever is applicable to the project).								Suitably Qualified Ecologist / Landscape Consultant
LE 05	Long term ecology management and maintenance	Pre-requisite	**Roles and responsibilities, implementation, statutory obligations** - The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site. - Where pursued, LE 04 has been achieved, including the following specific aims of this issue: 2.a: Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes. 2.b: Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs. - **Project team member route (Route 1)** = 1 credit available - **Ecologist route (Route 2)** = 2 credit available	**Yes**	**No**	**Yes**	**-**	Based on initial assessment by WSP Ecologist this credit should be targeted. **Pre-requisite targeted.**	Route 1 1) A submission of the BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist Route 2 1) Ecologist qualifications and appointment letter 2) Site survey and evaluation report carried out at RIBA Stage 1 3) Correspondence with stakeholders	**RIBA Stage 2**	Suitably Qualified Ecologist / Landscape Architect / Contractor
		Planning, liaison, data, monitoring and review management and maintenance	- The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to: 3.a: monitor and review implementation and the effectiveness 3.b: develop and review management and maintenance solutions, actions or measures. - In support of the above and to help ensure their continued relevance over the period of the project the following should be considered: 4.a: Monitoring and reporting of on the ecological outcomes for site implemented at the design and construction stage 4.b: Monitoring and reporting of outcomes and successes from the project 4.c: Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site) 4.d: Maintaining the ecological value of the site and its relationship or connection to its zone of influence 4.e: Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02). 4.f: Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04. 5 As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site.	**2**	**2.31%**	**2**	**-**	Based on initial assessment by WSP Ecologist this credit should be targeted. **2 credits targeted.**			
		Landscape and ecology management plan (or similar) development	- Landscape and ecology management plan, or similar, is developed in accordance with BS 42020:20131 covering as a minimum the first five years after project completion and includes: 6.a: Actions and responsibilities, prior to handover, to give to relevant individuals 6.b: The ecological value and condition of the site over the development life. 6.c: Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework 6.d: Identification and guidance s to trigger appropriate remedial actions to address previously unforeseen impacts 6.e: Clearly defined and allocated roles and responsibilities. - The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site.								

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Revision 01
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Pollution											
Pol 01	**Impact of refrigerants**	**No refrigerant use**	**3 Credits if no refrigerant is use within the installed plant or systems** OR alternatively, where the building does use refrigerants, **the three credits can be awarded as follows:**	**0**	**0.00%**	-	-	Refrigerant will be used within the installed plant or systems	1) **Written confirmation** and **manufacturer datasheet** of the relevant refrigeration type confirming refrigerant charge (kg) and system information, if applicable: a. Refrigerant Recovery Efficiency factor (%) b. Annual Leakage Rate (units: % refrigerant charge) c. Annual Purge Release factor (% Refrigerant charge) d. Annual Service Release (% Refrigerant charge) e. Probability factor for catastrophic failure (% refrigerant charge loss/year) f. Global Warming Potential of refrigerant g. Cooling capacity (kW)	RIBA Stage 2	Mechanical Engineer
		Pre-requisite	All systems with electric compressors comply with the requirements of BS EN 378:2016 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice	**Yes**	**No**	**Yes**	-	WSP MEP confirmed that all systems with electric compressor will comply with the requirements of BS EN 378:2016 and all refrigeration systems containing ammonia will comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice.			
		Impact of refrigerant	Two credits where The direct effect life cycle CO_2 equivalent emissions (DELC) of ≤ 100 CO_2-eq/kW. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. OR All refrigerants used have a global warming potential (GWP) ≤ 10	**1**	**0.75%**	-	-	Based on experience with a similar project (Air Source Heat Pump system) WSP AP assume that at this stage of the design one credit could targeted.			
			Systems using refrigerants have a DELC of ≤ 1000 kgCO_2-eq/kW cooling and heating capacity	**1**	**0.75%**	**1**	-	**1 credit targeted.**			
		Leak detection	- All systems are hermetically sealed or only use environmentally benign refrigerants (see Leak detection and Hermetically sealed systems). **OR** - Where the systems are not hermetically sealed: 7.a: Systems have: 7.a.i A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR 7.a.ii An inbuilt automated diagnostic procedure for detecting leakage is enabled. 7.b: In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant	**1**	**0.75%**	-	-	Credit not targeted, believed to be very difficult to achieve, awaiting confirmation WSP MEP as Design progresses.	2) **Specification** confirming inclusion of refrigerant leak detection and containment system as per the BREEAM Criteria column.	RIBA Stage 2	Mechanical Engineer
Pol 02	**Local air quality**		**Up to two credits** All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity. **OR** '- Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set below: NOx ~ Gas Boiler 27mg/kWh = 1 credit or 24 mg/kWh = 2 credits ~ Oil/fossil fuel Boiler 56/130 mg/kWh = 1 credit or 55/70 mg/kWh = 2 credits ~ CHP/Heat Pumps Gas 34 mg/kWh = 1 credit or 30 mg/kWh = 2 credits ~ CHP (internal combustion) 119 mg/kWh = 1 credit or 50 mg/kWh = 2 credits ~ Local space heaters (Gas and Oil) 76 mg/kWh = 1 credits or 50 mg/kWh = 2 credits PM10 & VOC ~ Boiler 6/7 = 1 credit or 4/5 = 2 credits ~ Local Space heater 20/20 = 1 credit or 10/10 = 2 credits No credits can be awarded for Pol 02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5. - Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set above.	**2**	**1.50%**	**2**	-	WSP Energy specialist expects that 2 credits can be targeted based on the proposed air source heat pump servicing (fully electric) strategy for the building **2 credits targeted.**	1) **Specification** confirming heating, cooling and hot water systems. 2) Calculations from the project team confirming average NOx emission rate and PM10 & VOC emissions if applicable. 3) Manufacturer's datasheet confirming dry NOx emission rate (at 0% excess O2) of cooling and hot water systems.	RIBA Stage 2	Mechanical Engineer

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Pol 03	Flood and surface water management	Flood resilience	**- Pre-requisite - an appropriate consultant is appointed to carry out and demonstrate the criteria.** **Two credits** where the development is situated in a low flood risk zone, as confirmed by a site specific Flood Risk Assessment (FRA). **One Credit** where the development is situated in a medium/high flood risk zone, as confirmed by a site specific FRA	2	1.50%	2	-	WSP Flood Risk Consultant has been appointed to carry out an FRA. The site is located on a low flood risk zone. **2 credits are targeted.**	1) A site specific **FRA** confirming flood risk from all sources of flooding.	RIBA Stage 1	Flood Risk Consultant
		Surface water run off	**- Pre-requisite - Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site** One credit where drainage measures ensure the peak rate of run-off from the site to the watercourses is no greater post development than the pre-development site, in accordance with the 1 year and 100 year return period events. Calculations should include an allowance for climate change.	1	0.75%	-	-	Credit not targeted as confirmed by the Flood Specialist.	1) Drainage consultant's **report/calculations** confirming: a.Type and storage volume (l) of the drainage measures b. Total area of hard surfaces (m2) c. Peak/Volume flow rates (l/s) pre and post development for the return period events d. Additional allowance for climate change designed in to the system e. Impact on the building of flooding from local drainage system failure	RIBA Stage 1	Drainage Consultant
			One credit where flooding of property will not occur in the event of local drainage system failure AND the post run-off volume over the development lifetime is no greater than the pre-development rate. Where there is any additional predicted flow for the 100yr 6 hr. event, this is prevented from leaving the site by infiltration or other SUDS techniques. OR where this is not possible (this must be justified), the post peak rate of run-off must be reduced to a limiting discharge.	1	0.75%	-	-	Credit not targeted as confirmed by the Flood Specialist.			
		Minimising water course pollution	One credit where there is no discharge from the site for rainfall up to 5mm and SUDS **AND** source control systems are specified in low risk areas. Oil / petrol separators should be specified in high risk areas.	1	0.75%	-	-	Credit not targeted as confirmed by the Flood Specialist.	1) **Drainage consultant's** report/calculations to support the 5mm rainfall discharge criteria.	RIBA Stage 1	Drainage Consultant
Pol 04	Reduction of Night Time Light Pollution		One credit where evidence provided demonstrates that the external lighting design is in compliance with the guidance in the ILP Guidance notes for the reduction of obtrusive light, 2011. All external lighting (except safety and security) should be automatically switched off between 23:00 and 7:00 hours. Safety and security lighting levels should be lowered between these hours to meet the criteria in table 2 of the ILP notes. illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements.	1	0.75%	1	-	It is understood that the architect and specialist lighting designer will ensure at Stage 3 that the requirements meet the BREEAM requirements. **1 Credit targeted.**	1) **Specification** confirming compliance with the ILP Guidance notes for the reduction of obtrusive light, 2011 and inclusion of controls to automatically switch off lighting between 23:00 and 07:00 hours.	RIBA Stage 2	Architect
									2) **Design plan** confirming external lighting layout and control strategy.	RIBA Stage 4	Lighting designer
Pol 05	Reduction of noise pollution		- There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR - Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 4142:20141 is commissioned. Noise levels must be measured or determined for: a. Existing background noise levels b. Noise rating level from the assessed building - The noise impact assessment must be carried out by a suitably qualified acoustic consultant. - The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least **5dB** lower than the background noise throughout the day and night.	1	0.75%	1	-	A Noise Assessment has been carried out. WSP Suitable Qualified Acoustician (SQA) to confirm that new sources of noise from the development is **5dB** lower than background noise throughout the day and night and will not give rise to the likelihood of complaints from existing noise-sensitive premises (e.g. residential areas) and amenity. **1 credit targeted.**	1) **Acoustician's report** confirming: a. Distance to noise sensitive buildings from the proposed sources of noise in the new development. b. Baseline noise investigations (compliant with BS 7445:1991) and plant noise values that the background noise levels will not be exceeded and the proximity of any noise sensitive receptors in the vicinity. c. Recommendations for noise attenuation measures. 2) **Written confirmation** that any recommendations made by the Acoustician will be implemented into the design to ensure the final building is compliant with the relevant standards	RIBA Stage 4	Acoustician
										RIBA Stage 5	Contractor

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Innovation											
Man 03	**Responsible Construction Practices**		Achieve all items in Table 4.1 'Responsible Construction management items' found in the BREEAM Manual	**1**	**1.00%**	-	-	Credit could be required of the contractor.	Please see Man 03 above.	RIBA Stage 4/5	Contractor
Hea 01	**Visual Comfort - Daylighting**		- Occupied areas have an average daylight factor of 3% in 80% of the space - A minimum point daylight factor of 1.2% OR 2.1% for spaces with glazed roofs, such as atria or At least 300 lux for 2650 hours per year or more for 80% occupied areas	**1**	**1.00%**	-	-	During the Pre-assessment, Architect confirmed credit can be achieved based on the layout and location of the development, awaiting confirmation of study.	Please see Hea 1 above.	RIBA Stage 3/4	Architect
Hea 06	**Security**		- A compliant risk based security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	**1**	**0.00%**	-	-	Credit will be considered as design progresses.	See actions for HEA 06 in the main assessment section	RIBA Stage 2	
Ene 01	**Reduction of energy use and carbon emissions**		**Up to two credits - Beyond zero net regulated carbon** - The building achieves an EPRNC≥ 0.9 and zero net regulated CO2 emissions. - Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use. - Award the exemplary credits based on the percentage of additional emissions from unregulated energy that are offset by LZC sources **Three credits - Carbon negative** - The building is deemed carbon negative where > 100% of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources **Two credits - Post - occupancy stage** - Achieve maximum available credits in Ene 02 Energy monitoring - The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4 - The energy model (criterion 3) is: 12.a: Submitted to BRE and 12.b: Retained by the building owner.	**7**	**5.00%**	-	-	Credit not targeted.		RIBA Stage 2	Accredited 'Energy Specialist
Wat 01	**Water Consumption**		As per Wat 1, one exemplary credit can be achieved where there is a 65% reduction in water consumption over the notional building.	**1**	**1.00%**	-	-	Credit not targeted.	See actions for Wat 1 in the main assessment section.	RIBA Stage 3/4	Public Health Engineer
			Core building services options appraisal during Concept Design - Option appraisal during Concept Design are achieved - During Concept Design identify opportunities for reducing environmental impacts as follows: .a Carry out building LCA options appraisal of at least 3 significantly different core building services design options.	**1**	**1.00%**	-	-	This credit will not be targeted as confirmed by the Client on the 7th of August 2018.	1) The Mat 01/02 Results Submission Tool 2) The options appraisal summary document 3) Evidence that the LCA options appraisal summary document has been received by the design team and client (meeting minutes, letter of acknowledgement) 4) Evidence of how the LCA design options have informed the design decision-making process (e.g. meeting minutes, documented design development showing how the LCA options have affected the design). 5) The LCA options appraisal summary	RIBA Stage 2	LCA Consultant

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Mat 01	**Environmental impacts from construction products - Building life cycle assessment (LCA)**		**LCA and LCC alignment** **-** Achieve Option appraisal during Concept Design and Technical Design Stage - Achieve Elemental LCC plan and Component Level LCC options appraisal credits - Include the design options appraised during Concept Design in the 'Component level LCC option appraisal' - Integrate the aligned LCA and LCC options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document including the relevant cost information from the 'elemental LCC plan' and 'Component level LCC option appraisal'.	**1**	**1.00%**	**-**	**-**	This credit will not be targeted as confirmed by the Client on the 7th of August 2018.	1) The Mat 01/02 Results Submission Tool 2) The options appraisal summary document 3) Evidence that the LCA options appraisal summary document has been received by the design team and client (meeting minutes, letter of acknowledgement) 4) Evidence of how the LCA design options have informed the design decision-making process (e.g. meeting minutes, documented design development showing how the LCA options have affected the design). 5) •The 'elemental LCC plan' and 'Component level LCC option appraisal; in issue Man 02 Life cycle cost and service life planning'.	RIBA Stage 2	LCA Consultant / Cost Consultant
			Third party verification - Mat 01 are achieved	**1**	**1.00%**	**-**	**-**	This credit will not be targeted as confirmed by the Client on the 7th of August 2018.	The third party's report: •Verifying that building LCAs accurately represent the designs under consideration. •Itemising the findings of their verification checks. •Evidence that the requirements of a Suitably qualified third party are fulfilled.	RIBA Stage 2	LCA Consultant
Mat 03	**Measuring responsible sourcing**		Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved: ≥ 50% - Superstructure, Internal Finishes, Substructure, Hard Landscaping and core building services	**1**	**1.00%**	**-**	**-**	Not targeted.	Please see Mat 3 above	RIBA Stage 4	Client / Contractor
Wst 01	**Construction Site Waste Management**		Non-hazardous construction waste generated, excluding demolition and excavation waste, is less than or equal to 1.6m3 or 1.9 tonnes per 100m2 GIFA. - The percentage of non-hazardous construction, demolition and excavation waste (if relevant) diverted from landfill meets or exceeds 85% volume or 95% tonnage and 95% volume or 95% tonnage respectively - All key waste groups in Table 10.3 for diversion from landfill are covered in the RMP. - Waste data obtained from licensed external waste contractors is reliable and verifiable, by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms or from a PAS 402:2013 compliant company.	**1**	**1.00%**	**-**	**-**	Not targeted.	Please see Wst 1 above.	RIBA Stage 4	-

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Wst 02	**Use of recycled and sustainably sourced aggregates**		**One credit - Project Sustainable aggregate points** BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points	**1**	**1.00%**	**-**	**-**		Please see Wst 2 above.	RIBA Stage 4	-
Wst 05	**Adaptation to climate change**	**Responding to Climate Change**	Achievement of the Structural and fabric resilience criterion in this issue and the following criteria points or credits: Hea 04 Thermal comfort (Link to Wst 05 issue:- to preventing increasing risks of overheating) Criterion 6 in the second credit of the Hea 04 issue has been achieved. Ene 01 Reduction of energy use and carbon emissions (Link to Wst 05 issue: to maximise energy efficiency contributing to low carbon emissions resulting from increasing energy demands) At least six credits in this issue needs to be achieved. Ene 04 Low carbon design (Link to Wst 05 issue: to maximise opportunities to avoid unnecessary carbon emissions) The Passive design analysis credit in this issue has been achieved. Wat 01 Water consumption (Link to Wst 05: to minimise water demands in periods of drought) A minimum of three credits in this issue needs to be achieved. Mat 05 Designing for durability and resilience (Link to Wst 05 issue: to avoid increased risks of deterioration and higher maintenance demands) Criterion 2 relating to material degradation in this issue needs to be achieved. Pol 03 Surface water run-off (Link to Wst 05: to minimise the risks of increased flood risk and surface water run-off affecting the site or others) Flood risk – a minimum of one credit needs to be achieved. Surface water run-off – two credits needs to be achieved.	**1**	**1.00%**	**-**	**-**	Credit is believed not to be achievable due to the Ene 01 (6 credits) requirements and not targeted normal requirements.	Please see Wst 05 above.	RIBA Stage 4	-
LE 02	**'Identifying and understanding the risks and opportunities for the project**	**Determine the ecological outcomes for the site (sustainability-related activities)**	Achieve LE 02 - Determining the ecological outcomes for the site criteria - When determining the optimal ecological outcome for the site consider, in addition to those outlined in criteria 8 to 10, the wider site sustainability-related activities and the potential for ecosystem service related benefits. - Achieve the credits of the assessment issues outlined below: a: Hea 07 Safe and healthy surroundings - Both credits b: Pol 03 Flood and surface water management - Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution' c: Pol 05 Reduction of noise pollution	**1**	**1.00%**	**-**	**-**		Please see LE 02 above	RIBA Stage 2	-
			Additional Innovation credit - requiring application to BRE.	**1**	**1.00%**	**-**	**-**	An application can be made to BRE for the achievement of an innovation credit relating to a site/ design feature of sustainable benefit which is not recognised within the BREEAM framework. The assessor will advise on the application process during the course of formal assessment.		RIBA Stage 4	-

		Target	Target
0 Unclassified	Sub-total (from above)	70.38%	3.75%
30% Pass	Innovation	0.00%	0.00%
45% Good	Total	70.38%	3.75%
55% Very Good		**70.38%**	**74.13%**
70% Excellent		**Excellent**	**Excellent**
85% Outstanding			

10 ONLINE PRE-ASSESSMENT SUMMARY SCORE

Pre-assessment : All: Template (7000xxxxx)

Issue scores

Please Note: X means the exemplary credit for the relevant issue

Management

Man01 Project Brief and design	Man02 Life cycle cost and service life planning	Man03 Responsible construction practices	Man04 Commissioning and handover	Man05 Aftercare
0 / 4	0 / 4	0 / 6 X: 0 / 1	0 / 4	N/A

Health and Wellbeing

Hea01 Visual comfort	Hea02 Indoor air quality	Hea04 Thermal comfort	Hea05 Acoustic performance	Hea06 Security	Hea07 Safe and Healthy Surroundings
0 / 4 X: 0 / 1	0 / 1	0 / 2	0 / 1	0 / 1 X: 0 / 1	0 / 2

Energy

Ene01 Reduction of energy use and carbon emissions	Ene02 Energy monitoring	Ene03 External lighting	Ene04 Low carbon design	Ene05 Energy efficient cold storage	Ene06 Energy efficient transportation systems	Ene07 Energy efficient laboratory systems	Ene08 Energy efficient equipment
0 / 13 X: 0 / 5	0 / 2	0 / 1	0 / 3	N/A	0 / 2	N/A	N/A

Transport

Tra01 Transport assessment and travel plan	Tra02 Sustainable transport measures
0 / 2	0 / 10

Water

Wat01 Water consumption	Wat02 Water monitoring	Wat03 Water leak detection	Wat04 Water efficient equipment
0 / 5 X: 0 / 1	0 / 1	0 / 2	0 / 1

Materials

Mat01 Life cycle impacts	Mat02 Environmental impacts from construction products	Mat03 Responsible sourcing	Mat05 Designing for durability and resilience	Mat06 Material efficiency
0 / 7 X: 0 / 3	0 / 1	0 / 4 X: 0 / 1	0 / 1	0 / 1

Waste

Wst01 Construction waste management	Wst02 Use of recycled and sustainably sourced aggregates	Wst03 Operational waste	Wst04 Speculative finishes (Offices only)	Wst05 Adaptation to climate change	Wst06 Design for disassembly and adaptability
0 / 5 X: 0 / 1	0 / 1 X: 0 / 1	0 / 1	0 / 1	0 / 1 X: 0 / 1	0 / 2

Land use and ecology

LE01 Site selection	LE02 Identifying and understanding the risks and opportunities for the site	LE03 Managing negative impacts on ecology	LE04 Change and enhancement of ecological value	LE05 Long term impact on biodiversity
0 / 2	0 / 2 X: 0 / 1	0 / 3	0 / 4 X: 0 / 1	0 / 2

Pollution

Pol01 Impact of refrigerants	Pol02 Local air quality	Pol03 Flood risk management and reducing surface water run-off	Pol04 Reduction of Night Time Light Pollution	Pol05 Noise attenuation
0 / 3	0 / 2	0 / 5	0 / 1	0 / 1

Innovation

Inn01 Innovation
0 / 0 X: 0 / 10

Pre-assessment : All: Template (7000xxxxx)

BREEAM Rating

	Credits available	Credits achieved	Credits targeted	% Credits achieved	Weighting	Category score	Target score
Man	18.0	0.0	13.0	0.00%	11.00%	0.00%	7.94%
Hea	11.0	0.0	9.0	0.00%	8.00%	0.00%	6.54%
Ene	21.0	0.0	14.0	0.00%	14.00%	0.00%	9.33%
Tra	12.0	0.0	12.0	0.00%	11.50%	0.00%	11.50%
Wat	9.0	0.0	6.0	0.00%	7.00%	0.00%	4.66%
Mat	14.0	0.0	7.0	0.00%	17.50%	0.00%	8.75%
Wst	11.0	0.0	4.0	0.00%	7.00%	0.00%	2.54%
LE	13.0	0.0	12.0	0.00%	15.00%	0.00%	13.84%
Pol	12.0	0.0	7.0	0.00%	9.00%	0.00%	5.25%
Inn	10.0	0.0	0.0	0.00%	10.00%	0.00%	0.00%
Total	131.0	0.0	84.0	0.00%	-	0.00%	70.38%
Rating	-	-	-	-	-	Unclassified	Excellent

WSP
70 Chancery Lane
London
WC2A 1AF

wsp.com