

metropolis Sustainability and **Energy Statement**

Car Showroom and Workshop, 45 - 49 Station Road London Borough of Richmond-upon-Thames

On Behalf of **G** Kingsbury and Son Ltd.

28/10/2015 Job Ref: 5366

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Planning Masterplanning Architecture Renewable Energy Sustainable Development



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1.0 INTRODUCTION

- 1.1 This Sustainability and Energy Statement has been prepared by Metropolis Green on behalf of G Kingsbury and Son Ltd. It accompanies the planning application submitted to the London Borough of Richmond-upon-Thames' Council for the proposed development at 45-49 Station Road, Hampton, Richmond-upon-Thames, TW12 2BU.
- 1.2 The proposed development consists of the demolition of the existing buildings at the 45-49 Station Road site to provide a car showroom and workshop/garage, 8 No. residential units, soft landscaping, car parking and cycle storage spaces. This report will only be focussing on the commercial areas of the development: the car showroom and workshop.
- 1.3 The proposed development has met or exceeded all relevant sustainable development policies stipulated at national and local levels. Following these policies has meant that sustainability has been targeted throughout the lifetime of the building; in particular, energy efficiency measures, sustainable material selection, low water consumption, pollution and waste management and incorporating areas of green space will be integral to the site's design and specification.
- 1.4 The London Borough of Richmond-upon-Thames (LBRUT) Policy CP1 and Policy DMSD1 require all new non-residential buildings over 100m² to achieve a BREEAM 'Excellent' rating and to submit an LBRUT Sustainable Construction Checklist for their planning applications. As the proposed development has a gross internal area of 372m², a BREEAM 2014 Pre-Assessment, achieving an Excellent rating (and a score of 73.40%), and an LBRUT Sustainable Construction Checklist have been prepared for the development, and are included in Appendices B and C, respectively. This report assumes a basic understanding of the BREEAM assessment methodology; however, for further information please refer to the BREEAM 2014 New Construction Non-Domestic Buildings Technical Manual¹
- 1.5 The London Borough of Richmond-upon-Thames Policy CP2 requires all new developments to achieve a reduction in carbon dioxide emissions of 20% from on-site renewable energy generation.
- 1.6 The proposed commercial development is considered to be a minor development in term of the London Plan, as it consists of less than 1000m² of non-residential floor space. The scheme is therefore not required to comply with London Plan Sustainability and Energy policies, but does comply with the London Borough of Richmond's Core Strategy Policy CP2, by utilising both an Air Source Heat Pump (ASHP) and PV

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¹ http://www.breeam.com/BREEAMUK2014SchemeDocument/

- panels to achieve a reduction in CO₂ emissions solely from renewables of 21.15%.
- 1.7 This Sustainability and Energy Statement should be read alongside other supplementary planning documents prepared by the design team for the planning application.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 Proposed Development

2.1.1 The proposed development consists of the demolition of the existing buildings at the 45-49 Station Road site to provide a car showroom and workshop/garage, 8 No. residential units, soft landscaping, car parking and cycle storage spaces. This Sustainability and Energy Statement will only be focussing on the commercial areas of the development, however it will make reference to the other areas- these will be referred to as the 'residential spaces'; the site as a whole will be referred to as the 'entire development'. Figure 1 shows the Architect's designs of the entire development.



Figure 1: Architect's Impression of the Entire Development.

2.1.2 The commercial areas of the proposed development consists of the car showroom (ground floor of a two-storey building; dwelllings on the first floor) and a one-storey car workshop to the rear with a green roof; also included are 14 No. car parking spaces, cycle storage spaces and landscaping. The total gross internal area of commercial development is 372m². Figure 2 shows the Architect's elevations of the car show room and the garage.





Figure 2: Architect's Elevations of Car Show Room (North Façade) and Garage (South Façade), respectively.

2.1.3 For further details of the proposed development works, please refer to design drawings and the design and access statement produced by Clive Chapman Architects.

2.2 Site and Surrounding Area

2.2.1 The site of the proposed development is located on the south side of Station Road in Hampton, and is currently a car showroom and workshop owned by G Kingsbury and Son Ltd. It consists of 2 No. large single-storey buildings (a car show room and a warehouse) and a two-storey office building. Figure 3 shows the west-facing façade of the existing buildings on the 45-49 Station Road site.



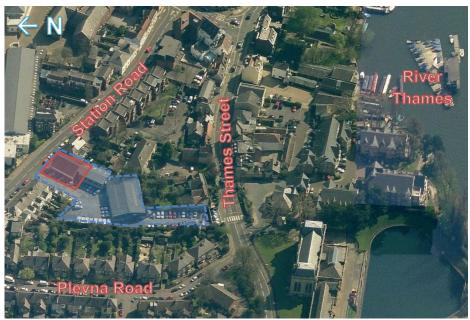


Figure 3: Existing Site and Surrounding Area (entire development site defined by blue outline; commercial area denoted by red line). Image from Bing Maps.

2.2.2 The area surrounding the site consists of a mixture of residential and commercial use buildings. The area in general contains a lot of green space and water- due south of the site is the River Thames, to the west is the Thames Water Hampton Water Treatment Works, Bushy Park resides to the east and to the North is Hampton and Richmond Borough Football Club.



3.0 POLICY CONTEXT

3.1 Policy Compliance

- 3.1.1. Sustainable development is the core principle underpinning planning, and has a key role to play in the creation of sustainable communities. In order to ensure the implementation of sustainable development and determine the targets and standards to be met by the proposed development, it is necessary to review the relevant national, regional and local planning policies and standards that are applicable to the development with respect to sustainability and the site's location.
- 3.1.2. The proposed development is considered to be a minor development in terms of the London Plan, as it consists of less than 1000 m² of new non-residential floor space. As such, it is therefore not required to comply with London Plan sustainability and energy policies, however it will still need to adhere to relevant London Borough of Richmond-upon-Thames policies.
- 3.1.3. The national and local sustainability and energy policies applicable to the proposed development are discussed in more detailed in the subsequent sections of this chapter and are as follows:
 - The National Planning Policy Framework, March 2012
 - The Building Regulations, Approved Document Part L2A and L2B, 2013 Editions
 - London Borough of Richmond-upon-Thames' Core Strategy, Adopted April 2009
 - London Borough of Richmond-upon-Thames' Development Management Plan, Adopted November 2011
 - London Borough of Richmond-upon-Thames' Refuse and Recycling Requirements Supplementary Planning Document, April 2015
 - London Borough of Richmond-upon-Thames' Sustainable Construction Checklist, September 2015
 - BREEAM 2014 New Construction Non-Domestic Buildings
- 3.1.1. The subsequent chapters of this report summarise how the design team have addressed the three dimensions of sustainable development noted in the NPPF and how they have met the sustainable design principles found within the London Borough of Richmond-upon-Thames Core Strategy, Development Management Plan and Supplementary Planning Documents. The sustainability principles for the proposed development are addressed in chapter 4.0 and the energy strategy is addressed in chapter 5.0.



3.1.2. Overall, the proposed development demonstrates that sustainable design standards have been integral to the proposal, and can be applied to both its construction and operation.

3.2 National Policy

National Planning Policy Framework, March 2012

- 3.2.1 The National Planning Policy Framework (NPPF) was published in March 2012 and sets out the Government's planning policies for England, and how these policies are expected to be applied. The policies in the document, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system.
- 3.2.2 Fundamentally for the proposed development, paragraph 7 of the NPPF states that:

There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

- an economic role contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;
- a social role supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and
- an environmental role contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

3.2.3 Paragraph 14 of the NPPF states that:

At the heart of the National Planning Policy Framework is a **presumption in favour of sustainable development**, which should be seen as a golden thread running through both plan-making and decision-taking.

For **decision-taking** this means:



- approving development proposals that accord with the development plan without delay
- 3.2.4 The NPPF outlines a set of core land-use planning principles that should underpin both plan-making and decision-taking, three of which are particularly relevant to this Sustainability Statement. Under paragraph 17, these principles are that planning should:
 - support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy);
 - contribute to conserving and enhancing the natural environment and reducing pollution. Allocations of land for development should prefer land of lesser environmental value, where consistent with other policies in this Framework; and
 - encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value.
- 3.2.5 Design is addressed in section 7 of the NPPF, and paragraph 56 states:

The Government attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people.

- 3.2.6 Meeting the challenge of climate change is addressed in section 10 of the NPPF, and paragraph 93 notes that planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development.
- 3.2.7 Further to the above, paragraphs 95 and 96 state:

To support the move to a low carbon future, local planning authorities should:

- plan for new development in locations and ways which reduce greenhouse gas emissions;
- actively support energy efficiency improvements to existing buildings; and



 when setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards.

In determining planning applications, local planning authorities should expect new development to:

- comply with adopted Local Plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
- take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.
- 3.2.8 Conserving and enhancing the natural environment is addressed in section 11 of the NPPF, and excerpts from paragraph 109 state that the planning system should contribute to and enhance the natural and local environment by:
 - minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; and
 - preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.
- 3.2.9 Paragraph 118 notes that when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by encouraging opportunities to incorporate biodiversity in and around developments.
- 3.2.10 Noise is addressed under paragraph 123 which notes that Planning policies and decisions should aim to:
 - avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development; and
 - mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.
- 3.2.11 Additionally, paragraph 125 notes that by encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity.



3.3 Local Policy

3.3.1. Policies in the London Borough of Richmond-Upon-Thames' Local Plan relating to sustainability and the proposed development are contained within the following documents: the Core Strategy (April 2009), Development Management Plan (November 2011) and various Supplementary Planning Documents. The London Borough of

London Borough of Richmond-Upon-Thames' Core Strategy, Adopted April 2009

Core Strategy Policy CP1: Sustainable Development

A. The policy seeks to maximise the effective use of resources including land, water and energy, and assist in reducing any long term adverse environmental impacts of development. Development will be required to conform to the Sustainable Construction checklist, including the requirement to meet the Code for Sustainable Homes level 3 (for new homes), Ecohomes "excellent" (for conversions) or BREEAM "excellent" (for other types of development). This requirement will be adjusted in future years through subsequent DPDs, to take into account the then prevailing standards in the Code for Sustainable Homes and any other National Guidance, and ensure that these standards are met or exceeded.

The following principles will be promoted:

- B. <u>Appropriate location of land uses</u>: Facilities and services should be provided at the appropriate level locally, taking account of the network of town centres identified in policy CP8. Higher density residential and mixed use developments to be in town centres, near to public transport to reduce the need to travel by car.
- C. <u>Making best use of land</u>: The use of existing and proposed new facilities should be maximised through management initiatives, such as co-location or dual use. Redevelopment of sites should normally only take place where there can be an increase in the number of housing units and/or quantity of commercial floorspace.
- D. Reducing environmental impact: The environmental benefits of retaining and, where appropriate, refurbishing existing buildings, should be compared against redevelopment. Development should seek to minimise the use of open land for development and seek to maintain the natural vegetation, especially trees, where possible. Local environmental impacts of development with respect to factors such as noise, air quality and contamination should be minimised.
- E. Environmental gain to compensate for any environmental cost of development will be sought.



Core Strategy Policy CP2: Reducing Carbon Emissions

- A. The Borough will reduce its carbon dioxide emissions by requiring measures that minimise energy consumption in new development and promoting these measures in existing development, particularly in its own buildings.
- B. The Council will require the evaluation, development and use of decentralised energy in appropriate development.
- C. The Council will increase the use of renewable energy by requiring all new development to achieve a reduction in carbon dioxide emissions of 20% from on-site renewable energy generation unless it can be demonstrated that such provision is not feasible, and by promoting its use in existing development.

Core Strategy Policy CP3: Climate Change – Adapting to the Effects

- A. Development will need to be designed to take account of the impacts of climate change over its lifetime, including:
 - Water conservation and drainage
 - The need for Summer cooling
 - Risk of subsidence
 - Flood risk from the River Thames and its tributaries.
- B. Development in areas of high flood risk will be restricted, in accordance with PPS25, and using the Environment Agency's Catchment Flood Management Plan, Borough's Strategic Flood Risk Assessment and site level assessments to determine risk.

Core Strategy Policy CP4: Biodiversity

- A. The Borough's biodiversity including the SSSIs and Other Sites of Nature Importance will be safeguarded and enhanced. Biodiversity enhancements will be encouraged particularly in areas of deficiency (parts of Whitton, Hampton, Teddington, Twickenham and South Kew), in areas of new development and along wildlife corridors and green chains such as the River Thames and River Crane corridors.
- B. Weighted priority in terms of their importance will be afforded to protected species and priority species and habitats in the UK, Regional and Richmond upon Thames Biodiversity Action Plans.



Core Strategy Policy CP5: Sustainable Travel

- A. The need for travel will be reduced by the provision of employment, shops and services at the most appropriate level locally, within the network of town centres identified in CP 8. To implement this policy the Council will:
 - Protect and enhance local facilities and employment to reduce the need to travel.
 - Require developments which would generate significant amounts of travel to be located on sites well served by public transport.

In promoting safe, sustainable and accessible transport modes such as walking, cycling and public transport, in association with its partners the Council will seek to:

B. Land for transport:

- Safeguard land for existing and proposed transport functions.
- Reflect the above priorities in the allocation of road spaces as part of the Parallel Initiatives Programme

C. Cycling and Walking:

- Give priority to pedestrians, including those with disabilities, particularly in Richmond town centre and the district and local shopping centres.
- Provide and promote a well-designed bicycle and walking network across the Borough (the Strategic Walks network, Richmond Borough Cycle Network and London Cycle Network Plus), and improve conditions for cyclists and pedestrians elsewhere.
- Prioritise the needs of pedestrians and cyclists in the design of new developments including links to existing networks and requiring the provision of adequate cycle parking.
- Investigate the possibility of a footbridge across the Thames between Ham and Twickenham for pedestrians and cyclists.

D. Public Transport:

- Improve provision for buses particularly in Richmond and Twickenham town centres, and seek to improve bus services within River Crane Corridor through the implementation of development proposals.
- Achieve integration and convenient interchange facilities at all the borough's stations.
- Seek improvements to orbital public transport including rail access to Heathrow.
- Improve walking, cycling and public transport in areas less well served by public transport, including some of the areas of relative deprivation.



E. Congestion and Pollution:

 Undertake traffic management measures to reduce the impact of traffic particularly in Richmond town centre, the district and local centres, residential areas and streets unsuitable for through traffic.

F. Car parking and Travel:

- Require new car free housing in Richmond and Twickenham town centres and in other areas where there is good public transport and elsewhere have regard to maximum parking standards.
- Require car share facilities and car clubs in appropriate new developments and encourage the use of low emission motor vehicles in order to reduce congestion and pollution.
- Discourage commuter parking particularly by giving priority to residents' needs. Limit any further expansion of parking in town and local centres and manage parking controls to help maintain the vitality and viability of the centres, including the evening economy.

G. Sustainable Travel:

- Encourage major employers and schools to develop Green Travel Plans and require these where appropriate with planning applications.
- Require all major developments to submit a Transport Assessment based on TfL's Best Practice Guidance.
- Encourage efficient, safe and sustainable freight transport.
- Encourage river transport through the retention and support for new transport infrastructure.
- H. The Council will support measures to minimise the impacts of Heathrow, particularly on traffic and noise on the Borough and will oppose changes that increase local impacts. Specifically it will seek the support of BAA, the Government and relevant statutory authorities for the following measures:
 - i. maintenance of the 480,000 limit on total air transport movements;
 - ii. maintenance of the current system of segregated mode;
 - iii. maintenance of the current noise preferential routes;
 - iv. the discontinuation of night flights;
 - v. restrictions of the use of private cars and improvements to public transport including a southern rail link.



Core Strategy Policy CP6: Waste

This Borough supports the objectives of sustainable waste management and will:

- A. Maximise self-sufficiency in waste management capacity (in line with London Plan target of 85% self-sufficiency within London by 2020).
- B. Seek to minimise waste creation, increase household recycling and composting rates to at least 40% by 2010, 50% by 2020, address waste as a resource and look to disposal as the last option, in line with the waste hierarchy.
- C. Work with its partners in the West London Waste Authority to prepare a Joint Waste Plan, which will identify locations suitable for waste management facilities to meet The London Plan consolidated with Alterations since 2004 apportionment and other requirements.
- D. Safeguard and improve existing waste sites at Craneford Way, Twickenham and Townmead Road, Kew unless compensatory provision is made.
- E. Monitor changes in the stock of waste management facilities, waste arisings, and the amount of waste recycled, recovered and going for disposal.

London Borough of Richmond-Upon-Thames' Development Management Plan, Adopted November 2011

Policy DM SD 1: Sustainable Construction

All development in terms of materials, design, landscaping, standard of construction and operation should include measures capable of mitigating and adapting to climate change to meet future needs.

New buildings should be flexible to respond to future social, technological and economic needs by conforming to the Borough's Sustainable Construction Checklist SPD.

New homes will be required to meet or exceed requirements of the Code for Sustainable Homes Level 3.

They also must achieve a minimum 25 per cent reduction in carbon dioxide emissions over Building Regulations (2010) in line with best practice from 2010 to 2013, 40 per cent improvement from 2013 to 2016, and 'zero carbon' standards (as designed in future legislation) from 2016. It is expected that efficiency measures will be prioritised as a means towards meeting these targets. These requirements may be adjusted in future years to take into account the then prevailing standards and any other national guidance to ensure the standards are met or exceeded.

New non-residential buildings over 100sqm will be required to meet the relevant BREEAM 'excellent' standards.



Policy DM SD 2: Renewable Energy and Decentralised Energy Networks

New development will be required to conform with the Sustainable Construction Checklist SPD and:

- A. Maximise opportunities for the micro-generation of renewable energy. Some form of low carbon renewable and/or decentralised energy will be expected in all new development, and
- B. Developments of 1 dwelling unit or more, or 100sqm of non-residential floor space or more will be required to reduce their total carbon dioxide emissions by following a hierarchy that first requires an efficient design to minimise the amount of energy used, secondly, by using low carbon technologies and finally, where feasible and viable, including a contribution from renewable sources.
- C. Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged where there is no over-riding adverse local impact.
- D. All new development will be required to connect to existing or planned decentralised energy networks where one exists. In all major developments and large Proposals Sites identified in the (forthcoming) Site Allocations DPD, provision should be made for future connection to a local energy network should one become available.

Policy DM SD 4: Adapting to Higher Temperatures and Need for Cooling

All new developments, in their layout, design, construction, materials, landscaping and operation, are required to take into account and adapt to higher temperatures, avoid and mitigate overheating and excessive heat generation to counteract the urban heat island effect, and meet the need for cooling.

All new development proposals should reduce reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy:

- 1. minimise internal heat generation through energy efficient design
- 2. reduce the amount of heat entering a building in summer through shading, reducing solar reflectance, fenestration, insulation and green roofs and walls
- 3. manage the heat within the building through exposed internal thermal mass and high ceilings
- 4. passive ventilation
- 5. mechanical ventilation



6. active cooling systems (ensuring they are the lowest carbon options).

Opportunities to adapt existing buildings, places and spaces to manage higher temperatures should be maximised and will be supported.

Policy DM SD 5: Living Roofs

Living roofs should be incorporated into new developments where technically feasible and subject to considerations of visual impact. The onus is on the applicant/developer for proposals with roof plate areas of 100sqm or more to provide evidence and justification if a living roof cannot be incorporated. The aim should be to use at least 70% of any potential roof plate area as a living roof.

The use of living roofs in smaller developments, renovations, conversions and extensions is encouraged and supported.

3.3.2. Policy DM SD 6: Flood Risk has been considered within this report, however as the proposed development will be located in an area within Flood Zone 1, many of the requirements within this policy are not applicable to the site, i.e. a Flood Risk Assessment does not need to be produced for the development.

Policy DM SD 7: Sustainable Drainage

All development proposals are required to follow the drainage hierarchy when disposing of surface water and must utilise Sustainable Drainage Systems (SuDS) wherever practical. Any discharge should be reduced to greenfield run-off rates wherever feasible.

When discharging surface water to a public sewer, developers will be required to provide evidence that capacity exists in the public sewerage network to serve their development.

Policy DM SD 9: Protecting Water Resources and Infrastructure

The borough's water resources and supplies will be protected by resisting development proposals that would pose an unacceptable threat to surface water and groundwater quantity and quality. This includes pollution caused by water run-off from developments into nearby waterways.

New developments must achieve a high standard of water efficiency by:

- 1. meeting the minimum mandatory target for water consumption as set out in the Code for Sustainable Homes, or
- 2. meeting a minimum of 2 credits on water consumption for other types of developments (BREEAM "excellent"), or



- 3. meeting a minimum of 3 credits on water consumption for conversions (EcoHomes "excellent"), and
- 4. utilising rainwater harvesting for all external water uses to reduce the consumption of potable water wherever possible.

The above requirements may be adjusted in future years to take into account the then prevailing standards and any other national guidance to ensure that these standards are met or exceeded.

New developments should also consider the following:

- utilising rainwater harvesting and greywater recycling for all non-potable uses to reduce the consumption of potable water wherever possible, and
- 2. designing of landscaping to minimise water demand.

Proposals that seek to increase water availability or protect and improve the quality of rivers or groundwater will be encouraged.

The development or expansion of water supply or waste water facilities will normally be permitted, either where needed to serve existing or proposed new development, or in the interests of long term water supply and waste water management, provided that the need for such facilities outweighs any adverse land use or environmental impact.

The Council will support in principle the implementation of the Thames Tunnel project.

Where rivers have been classified by the Environment Agency as having 'poor' status (currently the River Crane, the Beverley Brook and the River Thames, upstream of Teddington), any development affecting such rivers is encouraged to improve the water quality in these areas.

Policy DM OS 5: Biodiversity and New Development

All new development will be expected to preserve and where possible enhance existing habitats including river corridors and biodiversity features, including trees.

All developments will be required to enhance existing and incorporate new biodiversity features and habitats into the design of buildings themselves as well as in appropriate design and landscaping schemes of new developments with the aim to attract wildlife and promote biodiversity, where possible.

When designing new habitats and biodiversity features, consideration should be given to the use of native species as well as the adaptability to the likely effects of climate change.

New habitats and biodiversity features should make a positive contribution to and should be integrated and linked to the wider green and blue infrastructure network, including de-culverting rivers, where possible.



London Borough of Richmond-upon-Thames Refuse and Recycling Requirements SPD, Adopted April 2015

3.3.3. Clause 2.1 of the LBRUT Refuse and Recycling SPD states that:

When considering the amount of storage space needed for any particular development, the following requirements will help to calculate the volume of waste generated. They should only be taken as a guide since individual developments may need specific storage requirements:

2.6m² waste storage should be provided for every 1,000m² gross floorspace. Note: 50% of this capacity should be retained for the storage of separated waste for recycling.

London Borough of Richmond-upon-Thames Sustainable Construction Checklist SPD, September 2015

3.3.4. The London Borough of Richmond-upon-Thames requires a Sustainable Construction Checklist (SCC) to be completed for all new non-residential developments providing a floor area greater than or equal to 100m². An SCC for the proposed development is included in Appendix C.

3.4 BREEAM 2014 New Construction

- 3.4.1 The Building Research Establishment's Environmental Assessment Method (BREEAM) is the world's leading and most widely used environmental assessment method for buildings. It sets out the standard for best practice in sustainable design and is used to describe a building's designed environmental performance.
- 3.4.2 BREEAM UK New Construction (NC) is a performance based assessment method and certification scheme for new non-residential buildings. The primary aim of BREEAM NC is to mitigate the life cycle impacts of new non-residential buildings on the environment, in a robust and cost effective manner.
- 3.4.3 The London Borough of Richmond-upon-Thames (LBRUT) requires all new non-residential buildings over 100m² to undertake a BREEAM assessment and expects developments to achieve an 'Excellent' rating.
- 3.4.4 To achieve a score of Excellent, a score of 70% or more must be achieved overall and a number of mandatory minimum BREEAM standards must also be met; these are as follows:
 - Man 03: Responsible Construction Practices at least 1 'Considerate Constructors' credit must be achieved.



- Man 04: Commissioning and Handover a Building User Guide must be produced, in line with BREEAM requirements.
- Man 5: Aftercare the 'Seasonal Commissioning' credit must be achieved.
- Ene 01: Reduction of Energy Use and Carbon Emissions at least 5 credits must be achieved.
- Ene 02: Energy Monitoring the 'Sub-metering of Major Energy Consuming Systems' credit must be achieved.
- Wat 01: Water consumption at least 1 credit must be achieved.
- Wat 02: Water Monitoring a water meter must be specified on site, in line with BREEAM requirements.
- Mat 03: Responsible Sourcing of Materials all timber and timber-based products used on site must be legally harvested and traded timber, in line with BREEAM requirements.
- Wst 03: Operational Waste at least 1 credit must be achieved.
- LE 03: Minimising Impact on Existing Site Ecology at least
 1 credit must be achieved
- 3.4.5 The proposed development has a gross internal area of 372m², therefore a BREEAM 2014 assessment is required. A pre-assessment targeting a score of 73.40% and achieving all relevant mandatory minimum requirements, equating to an Excellent rating has been prepared for the development, and is included in Appendix B. For further information on the assessment methodology, please refer to the BREEAM 2014 New Construction Non-Domestic Buildings Technical Manual².



² http://www.breeam.com/BREEAMUK2014SchemeDocument/

4.0 SUSTAINABILITY PRINCIPLES SUMMARY

4.1 Three Dimensions of Sustainable Development

- 4.1.1 This section of the report describes how the design team intends to address the three dimensions of sustainable development noted in the NPPF: social, economic and environmental benefits the proposed development can provide.
- 4.1.2 The site currently consists of 3 buildings and a large expanse of hard landscaping, which acts as car parking. The proposed development will better utilise the space by redesigning and relocating the car showroom, workshop/garage and commercial car parking area so it is more compact and close to the entrance of the site; it will also incorporate cycle storage for the employees of the car showroom and garage. Eight residential units will then be constructed in the remaining site space, as well as soft landscaping, and resident parking and cycle storage.
- 4.1.3 The Kingsbury and Son Ltd. car showroom and garage is already boosting the economy of the local area by providing vehicle sales and services; by better utilising the space, the proposed development can provide improved services, and further increase the economic value of the area by creating new homes. Other local service providers will also benefit financially from the more densely populated development.
- 4.1.4 The influx of new customers and residents will likely also improve the social interactions in the area and can provide the potential for diversification. Creating high quality housing has been identified as a high priority societal requirement at both the local and national levels.
- 4.1.5 The construction stage of the proposed development has significant employment and economic potential: with any future development, there is a requirement for skilled and unskilled labour, as well as the procurement of materials for the construction of buildings and associated infrastructure.
- 4.1.6 The environmental role of the proposed development is acknowledged and has been addressed through the design and master-planning prepared for the site to date, for the purposes of the planning application. It is therefore imperative that the proposed development meets or exceeds high standards of sustainable design and construction, to ensure that environmental stability is maintained and will not be compromised by the development.
- 4.1.7 The following sections of this report demonstrate that sustainable design standards stemming from national and local policies have been integral to the proposal, and will be applied to both its construction and operation. These standards and policies have ensured that the proposed development will contribute to a reduction in carbon



emissions, improve biodiversity, use natural resources prudently, minimise waste and pollution, encourage the use of sustainable transport and mitigate and adapt to climate change, including moving to a low carbon economy.

4.2 Use of Land

4.2.1 The proposed development works at the Kingsbury and Son Ltd. site will better utilise the previously developed land and increase the density of the site, whilst also incorporating green space. Car parking facilities for the development will be reduced and cycle storage spaces will be incorporated, which will help to reduce the need to travel to the site by car.

4.3 Water Consumption, Surface Water Run-Off and Flood Risk

- 4.3.1 Policy DM SD 9 of the London Borough of Richmond-upon-Thames' Development Management Plan document states that developments should target a minimum of 2 BREEAM credits on water consumption (Wat 01). 3 BREEAM Wat 01 credits have been targeted for the development, equating to a 40% improvement over baseline building water consumption. This exceeds the mandatory minimum number of Wat 01 credits required to achieve Excellent.
- 4.3.2 A water meter will be installed for the commercial areas of the development in line with BREEAM Wat 02, as this is also a mandatory minimum requirement to achieve Excellent.
- 4.3.3 Rainwater harvesting will be utilised for all external water uses where possible, in order to reduce the consumption of potable water. Soft landscaping will be designed to rely solely on precipitation or manual watering, and not on an irrigation system. Greywater recycling is not deemed appropriate for the commercial space, as no shower facilities will be provided.
- 4.3.4 Policy DM SD 7 of LBRUT's Development Management Plan states that: "all development proposals are requires to follow the drainage hierarchy when disposing of surface water and must utilise Sustainable Drainage Systems (SuDS) wherever practical; any discharge should be reduced to greenfield run-off rates wherever feasible. When discharging surface water to a public sewer, developers will be required to provide evidence that capacity exists in the public sewerage network to serve their development." The proposed development incorporates soft landscaping and a green roof which will greatly reduce the surface water run off of the site, compared to the existing hardstanding impermeable surface.



- 4.3.5 According to the Environment Agency interactive flood map, the proposed development is located within Flood Zone 1, meaning that there is a low risk of flooding. London Borough of Richmond-upon-Thames' Development Management Plan Policy DM SD 6: Flood Risk states that for developments within Flood Zone 1, there will be no land use restrictions and no requirement for a Flood Risk Assessment (FRA), or sequential and exception tests, for sites less than 1 hectare; therefore an FRA is not required for the proposed development.
- 4.3.6 The completed building is anticipated to connect to the public drainage network in the main road. The contractor will be required to ensure proper connections with checks made prior to practical completion and handover.
- 4.3.7 Water pollution policies will be implemented during the construction phase of the proposed development works to mitigate water pollution and ensure water quality is maintained.

4.4 Ecology and Biodiversity

- 4.4.1 The proposed development will greatly improve the ecology and biodiversity of the existing site, which contains no green space or trees. The commercial area of the development will incorporate a green roof above the garage and the entire development site includes soft landscaping and trees around the car parking areas, with additional garden space for the majority of the residential units.
- 4.4.2 As a requirement of BREEAM, a suitably qualified ecologist will be appointed to determine the ecological value of the existing site (in line with BREEAM LE 01 and LE 03), provide specific advice on the ecological enhancement of the site (in line with BREEAM LE 04) and to determine the increase in the ecological value of the site (in line with BREEAM LE 03 and 04). A landscape and habitat management plan covering at least the first 5 years after project completion will also be produced for the site (in line with BREEAM LE 05). At least 1 BREEAM LE 03 credit will be targeted, as this is a mandatory minimum requirement to achieve Excellent.
- 4.4.3 All planting specified on site will rely solely on precipitation or manual watering from rainwater collection (if this is found to be feasible), to ensure that potable water use is minimised. Planting will also be hardy and drought resistant to ensure that it will acclimatise to climate change effects.



4.5 Transport

- 4.5.1 Transport has a significant impact on the social and economic characteristics of a community, as well as on the environment. In order for the UK economy to grow sustainably, communities need efficient and integrated transport systems linking employment areas, services, shops and leisure facilities.
- 4.5.2 The proposed development has a PTAL rating of 2 (poor), but it is located a 7-minute walk from Hampton Train Station and is in close proximity to a number of bus routes. The proposed development provides 14 No. parking spaces for the commercial space (2 No. of which are disability spaces), which is a reduction on the previous site, and it will also provide cycle storage spaces to encourage users of the car showroom and garage to travel to site using low-carbon, more sustainable methods. Car share and car club facilities will be encouraged when the proposed development is in operation, as well as the development of a Green Travel Plan. The changes to the site will not affect the provision of street-side pedestrian facilities.
- 4.5.3 The layout of the development has been designed to restrict vehicle speeds and incorporate homezone principles to provide shared surfaces for pedestrians, cyclists and vehicles and enables access to public transport provision. The proposed development makes efficient and maximum use of a previously developed site, achieving an appropriate density in an accessible location.

4.6 Materials and Waste

- 4.6.1 The environmental impact of materials used on site will be minimised by specifying locally supplied, sustainably-sourced, low-impact and recycled material, where feasible. It is anticipated that 100% of the timber used for the proposed development will be from FSC or PEFC sources. At least 1 BREEAM Mat 03 Responsible Sourcing of Materials credit will be targeted, as this is a mandatory minimum requirement to achieve Excellent.
- 4.6.2 The detailed characteristics of the materials to be specified will be determined at the detailed design stage, however the specified materials will achieve a rating of A+ to D in the BRE's Green Guide to Specification, as these have a low embodied impact on the environment. Materials will also be durable to cater for their level of use and exposure, and will not release toxins into the internal and external environment, including those that deplete stratospheric ozone. Prefabricated building elements will be used where feasible.



- 4.6.3 Construction and demolition waste will be minimised on site by utilising the principles of the 'waste hierarchy', thereby limiting the amount of resources used and waste generated. The preferred approach to specifying materials will therefore be:
 - i. The use of reclaimed materials;
 - ii. The use of materials with higher levels of recycled content; and
 - iii. The use of new materials
- 4.6.4 At the detailed design stage it is anticipated that construction materials will be responsibly sourced, taking into account the social, environmental and economic impacts of building and finishing materials from their raw state, through manufacture and production, to use and eventually their disposal. Locally produced building materials can be utilised wherever possible. All timber used within the development will be legally and responsibly harvested. Material taken from the demolition of the car park will be reused within the construction of the development where feasible.
- 4.6.5 We encourage the production of a Site Waste/Resource Management Plan (SW/RMP) (in line with BREEAM Wst 01) for the construction stage of the proposed development, which records construction waste, set targets, and outlines measures and procedures to divert waste from landfill.
- 4.6.6 The LBRUT Refuse and Recycling SPD states that "2.6m² waste storage space should be provided for every 1000m² of gross floor space, with 50% of this capacity retained for the storage of separated waste for recycling". At least 1 BREEAM Wst 03 credit must be targeted, as it is a mandatory minimum requirement to achieve Excellent. BREEAM states that developments with a net floor area than 5000m² should provide at least 2m² of waste storage space.
- 4.6.7 The commercial area of the proposed development has a floor space of 372m², therefore 2m² of waste storage space (in line with BREEAM Wst 03) will be provided to ensure that sufficient and well-designed storage for recyclable and general waste is provided. The development does not include a canteen or cafeteria, so it is not considered necessary to incorporate composting facilities into the waste strategy. The waste storage area will be located in an area which can be easily accessed internally by the occupants and externally for the removal of waste.

4.7 Health and Wellbeing and Pollution Minimisation

4.7.1 The health and wellbeing of the occupants of the proposed development can be ensured by designing good levels of daylighting within the proposed development. The development will optimise window height and size to enable an adequate view out of the building for staff, whilst



- allowing adequate solar gains. The provision of more green space and the encouragement of walking and cycling to work will also help to improve the health and wellbeing of occupants
- 4.7.2 The design of the proposals has been considered with the wider environment in mind, and as such there will be minimal disruption in terms of water, noise and light pollution upon completion of the development. Best practice construction mitigation measures will be implemented during construction to reduce air and surface water pollution.
- 4.7.3 The commercial areas of the development do not have any positive found features that require protection, however the M&E services plant will be within an acoustically treated enclosure to reduce any potential noise impact to the residential dwellings.
- 4.7.4 The energy strategy for the development comprises Air Source Heat Pumps. The Air Source Heat Pumps use grid electricity, so have a global impact on air quality, however there are no local air quality issues associated with their use. The ventilation system contains no refrigerants, therefore has negligible impact on air quality.



5.0 ENERGY STRATEGY

- 5.0.1 This section of the report has been prepared to ensure that the relevant national and local energy policies are achieved by the proposed 45-49 Station Road development.
- 5.0.2 As the commercial area of the proposed development is less than 1000m² of non-residential space, it is not required to comply with the London Plan Policy 5.2 for a 35% reduction in carbon emissions against 2013 Building Regulations.
- 5.0.3 However the proposed development is required to comply with the London Borough of Richmond-upon-Thames' Core Strategy Policy CP2, which requires all new developments to achieve a reduction in carbon dioxide emissions of 20% from on-site renewable energy generation, unless it can be demonstrated that such provision is not feasible. A BREEAM Excellent rating must also be achieved, which in relation to energy requires at least 5 Ene 01 credits to be attained, based on the BRUKL outputs of the proposed development.
- 5.0.4 The proposed development has met both of these requirements, achieving a carbon reduction due to renewables of 21.15% and 6 Ene 01 credits.
- 5.0.5 The energy strategy for the proposed development has been prepared by following the energy hierarchy: minimise energy demand (Be Lean), supply energy efficiently (Be Clean), and encourage the use of renewables (Be Green); this means assessing the energy efficiency measures of the proposed development and the low carbon options for supplying energy, before examining the potential for renewable energy technologies to reduce carbon emissions.
- 5.0.6 Measures incorporated in the proposed development include the combination of high levels of fabric performance and insulation to achieve low U-values, optimising solar gains and natural daylight, low air permeability, efficient use of shading, the use of an Air Source Heat Pump to provide heating and cooling, and the use of PV panels for renewable electricity.
- 5.0.7 All energy and carbon figures have been calculated using approved Simplified Building Energy Model (SBEM) software to demonstrate compliance with Approved Document Part L2A.
- 5.0.8 Further detailed results, and BRUKL reports can be found in Appendix A.



5.1 Site Energy and Notional Baseline

- 5.1.1 Metropolis Green has assessed the energy demands of the commercial areas of the proposed 45-49 Station Road development against current 2013 Building Regulations.
- 5.1.2 The energy hierarchy promotes a 'regulated' energy approach to calculating the energy demand and carbon baseline of the development. The baseline therefore includes the energy consumed in the operation of the space heating/cooling, hot water systems, ventilation and all internal lighting.
- 5.1.3 Reported separately are the carbon savings from all electrical appliances and other occupant small power demands, which are not covered by Building Regulations, this is called 'unregulated' energy.
- 5.1.4 Table 1 provides a summary of the Notional Baseline results for the proposed development, against regulated and unregulated carbon emissions.

Table 1 Notional Baseline

Notional Baseline	Total
Un-Regulated Carbon Emissions (t/CO2/yr)	4.26
Regulated Carbon Emissions (t/CO2/yr)	14.02

5.2 Energy Efficiency Measures

- 5.2.1 Metropolis Green have worked with the project architects, Clive Chapman Architects, to determine the most efficient and feasible way to reduce the carbon emissions through passive and active design measures.
- 5.2.2 Improving the fabric and services efficiency is the most effective way of reducing carbon emissions as these measures will last the lifetime of the building. Reducing the CO₂ emissions in turn reduces the amount of low carbon and renewable energy technologies required to comply with regulations and policies, as well as lowering costs.
- 5.2.3 The thermal performance of the building fabric proposed is significantly better than the limiting parameters of Building Regulations Part L, improving overall fabric efficiency and reducing carbon emissions for the lifetime of the development. Table 2 details the fabric performance of car workshop and garage.



Table 2 Building fabric performance

Specification	Notional baseline	Efficient Baseline
External Wall U-value	0.26	0.16
Internal no heat loss wall U-Value	1.78	0
Internal heat loss wall U-Value	0.16	0.16
Ground Floor/Exposed Floor U-Value	0.22	0.13
Roof U-value	0.18	0.13
Windows U-values	1.4	

5.2.4 Passive and active design measures such as fabric performance and air tightness will be utilised in the proposed development to prevent overheating and subsequent carbon emissions. Tables 3 and 4 outline the design measures which will be utilised by the proposed development.

Table 3 Passive Design measures

Passive Design Measures	Specific Project Measures	
Description on types of glazing/windows	Double glazing windows. Windows full height, which also suit the showroom use of the building. Glazing g-value of 0.4.	
Optimise natural daylight	Internal spaces receive natural daylight through windows; Ceiling heights are optimum height according to building use.	
Optimise solar gain	Solar gains are maximised during winter months through optimal percentage of glazing at the south elevation.	
Limit overshadowing	The development will benefit from a high percentage of glazing optimising natural daylight and beneficial solar gains.	
Optimise insulation	Insulation will be designed to achieve the specified U-values.	
Minimise cold bridging	Accredited construction details.	
Optimise air tightness	Air Permeability of 5 m3/(h.m2) at 50 Pa has been specified.	
Use light coloured materials	Interior spaces will be light colours.	
Internal or external shading elements	The canopy located above the double height windows on the south elevation will prevent glare and prevent excessive solar gains.	



Table 4 Active design measures

Active Design Measures	Specific Project Measures
Air Permeability	5 m3/(h.m2) at 50 Pa
Domestic Hot Water System	By Electric Point Of Use
Space Heating System	By ASHP with SCoP of 4.5 or higher
Space Cooling System	By ASHP with SEER of 4.5 or higher
Ventilation System	Natural with intermittent mechanical extracts for the toilet areas; Optional – by the main HVAC system (Heat pump)
Lighting (office)	Luminaire efficacy 90 lm/W, metering with 'out of range' alarm, photoelectric dimming

- 5.2.5 As a result of the above energy efficiency measures and improvements, the first stage of the energy hierarchy, to be lean and use energy efficiently, is complete. The new baseline has been calculated and is referred to as the Efficient Baseline. Energy efficiency measures relating to BREEAM include the use of energy display devices (in line with BREEAM Ene 02 requirements), energy efficient lighting (in line with Ene 03 requirements), and the passive design measures mentioned in table 3 above (in line with Ene 03 requirements).
- 5.2.6 Table 5 shows that an improvement of 8.20% can be made through the energy efficiency measures, lowering the total regulated carbon emissions by 3.1t/CO₂/yr from the Notional Baseline.

Table 5 Efficient Baseline

Efficient Baseline	Total
Un-Regulated Carbon Emissions (t/CO2/yr)	4.26
Regulated Carbon Emissions (t/CO2/yr)	12.87

5.3 Overheating and Cooling

- 5.3.1 Through the application of energy efficient design, the design team have worked to ensure that the risk of summer overheating is minimised in line with the 'cooling hierarchy'.
- 5.3.2 Good natural daylighting within the proposed development will create significant benefits in terms of reduced electrical use for lighting, and maximise solar gains in the winter months to reduce space heating consumption and create a healthier, more pleasant environment.



- 5.3.3 A combination of high levels of fabric performance and insulation has been implemented, resulting in low U-values.
- 5.3.4 A green roof has also been specified for the roof of the garage to encourage biodiversity and contribute to natural cooling by reducing the surface temperature of the building, and surrounding air temperature through evaporation and transpiration.
- 5.3.5 Initial analysis using SBEM software shows that the solar gain limits in Summer have not been exceeded for the commercial spaces, therefore satisfying Criterion 3 requirements of Building Regulations Part L.
- 5.3.6 To meet space heating and cooling requirements for the car showroom space, an Air Source Heat Pump (ASHP), with SEER and SCoP of 4.5 has been specified.

5.4 Communal Heating and Combined Heat and Power (CHP)

- 5.4.1 The energy hierarchy and the London Borough of Richmond-upon-Thames' Core Strategy Policy CP2 requires the evaluation, development and use of decentralised energy in appropriate developments; using the London Plan as a guide, these are selected in accordance with the following hierarchy:
 - 1. Connection to existing or planned area wide, low carbon heat distribution networks;
 - 2. Site wide heat networks;
 - Combined Heat and Power (CHP).
- 5.4.2 Due to the small size of the commercial space and the low heat demand, a CHP would not be appropriate for the proposed development.

5.5 Renewable Energy

- 5.5.1 The third stage of the energy hierarchy refers to the production of renewable energy, which relates to London Plan Policy 5.7.
- 5.5.2 Each of the approved renewable energy technologies have been appraised, examining the suitability to the site and potential for delivering CO₂ reductions.
- 5.5.3 London Plan's approved renewable energy technologies include:
 - Photovoltaics
 - Solar Water Systems



- Biomass Heating
- Air and Ground Sourced Heating/Cooling
- Wind
- 5.5.4 The choice of technology will be dependent upon a range of factors including: orientation, height, window size, surrounding buildings and environment, site size and layout, geology, conservation and biodiversity.
- 5.5.5 Site analysis and calculations have determined that high efficiency ASHPs providing both heating and cooling, to be the most suitable renewable energy technology for the development. The following section sets out the strategy for implementing the ASHP and the carbon reductions predicted for the solution.

Air Source Heat Pump

- 5.5.6 An ASHP is a system which transfers heat from outside to inside a building, or vice versa. Under the principles of vapour compression refrigeration, an ASHP uses a refrigerant system involving a compressor and a condenser to absorb heat at one place and release it at another.
- 5.5.7 Heat produced in this way can be used to heat radiators, underfloor heating systems, or warm air convectors and hot water in buildings. A single system can be designed to transfer heat in either direction, to heat or cool the interior of the building in winter and summer respectively.
- 5.5.8 Heat pumps have some impact on the environment as they need electricity to run, but the heat they extract from the ground, air, or water is constantly being renewed naturally. In addition, they produce more units of energy than the electricity they consume which is defined as the Seasonal Coefficient of Performance (SCoP) and therefore deliver higher carbon savings than traditional heating technologies.
- 5.5.9 The installed ASHP is required to comply with the minimum performance standards as set out in the Enhanced Capital Allowances³ (ECA). Selection of particular ASHP product. In addition, the final selected ASHP will comply with all other relevant issues as outlined in the Microgeneration Certification Scheme Heat Pump Product Certification Requirements⁴.
- 5.5.10 The ASHPs will be used to provide space heating and cooling for the proposed commercial space. The ASHP selected for this analysis is a



³ http://etl.decc.gov.uk

⁴ http://www.microgenerationcertification.org

highly efficient heat pump with a Seasonal Coefficient of Performance (SCoP) and SEER of minimum 4.5.

Photovoltaics

- 5.5.11 Photovoltaic systems convert solar energy from both direct light and diffuse light, into electricity through semiconductor cells. PV systems require an inverter to convert the low voltage, direct current (DC) electricity produced by the array of panels into 230V 50/60Hz alternating current (AC).
- 5.5.12 Through investigation it has been found that there is sufficient roof space for 21 No. PV panels. This area is calculated to ensure that there is sufficient space for access to the panels required for maintenance, and to avoid any potential shading from surrounding obstructions such as lift overruns and neighbouring buildings or other taller structures.
- 5.5.13 For the purposes of the analysis, the Sunpower E20/333 model has been used, however there are a number of products available which may be selected and as such the PV array is subject to change. It is therefore the overall output of the system that is important, which is the kilowatt peak (kWp) of the system; the proposed panel array will provide a total system size of 6.99kWp.
- 5.5.14 The PV panels have been positioned for optimal performance in terms of exposure to light, orientation, and angle and to reduce their visual impact. The panels are therefore be south facing at angle of 30°. At less than 10°, the modules will not self-clean, invalidating their warranty. An indicative layout of the PV array is illustrated in Figure 5 below.
- 5.5.15 Table 6 shows that a carbon reduction of 21.15% (7.3t/CO₂/yr) over the Efficient Baseline can be achieved by introducing the high efficiency ASHP and 21 No. PV panels.

Table 6 Renewable Baseline

Renewable Baseline	Total
Un-Regulated Carbon Emissions (t/CO2/yr)	4.26
Regulated Carbon Emissions (t/CO2/yr)	10.14



5.6 Energy Strategy Summary

- 5.6.1 As highlighted in Section 5.0 of this report, the proposed development can achieve a 21.15% carbon reduction from renewable energy technologies. In addition, the strategy also achieves a 27.35% improvement over 2013 Building Regulations.
- 5.6.2 London Borough of Richmond Policy CP1 requires a BREEAM Excellent rating to be achieved, which in relation to energy requires at least 5 Ene 01 credits to be attained. The BRUKL documents generated for the energy strategy for the proposed development have been inputted in the BREEAM Pre-Assessment scoring and reporting tool, and the results show that 6 Ene 01 credits have been achieved; the development therefore meets the Ene 01 mandatory minimum requirements to reach Excellent.

Table 7: Regulated Carbon Emissions Reduction.

Notional Baseline	Un-Regulated Carbon Emissions (tCO2/yr)	4.26
	Regulated Carbon Emissions (tCO2/yr)	14.02
Efficient Baseline	Regulated Carbon Emissions (tCO2/yr)	12.87
	% Improvement over Notional Baseline	8.20%
Renewable Baseline	Regulated Carbon Emissions (tCO2/yr)	10.14
	% Improvement over Efficienct Baseline	21.15%
Total Regulated Carbon Emission Improvement (over 2013 BRs)		27.65%
BREEAM Ene 01 Credits Achieved (calculated from BRUKL results)		6 credits (Excellent)



6.0 CONCLUSIONS

- 6.0.1 This Sustainability and Energy Statement demonstrates that the proposed development of the car showroom and workshop at 45-49 Station Road meets the sustainability standards and policies set out in the London Borough of Richmond-upon-Thames' Core Strategy, Development Management Document and Supplementary Planning Documents.
- 6.0.2 The sustainability strategy focuses on the implementation of sustainable systems for energy, water, waste management, pollution, and construction management; sustainable transport methods, occupant health and wellbeing and ecology have also been considered. Much attention has been given to reducing the environmental impact throughout the lifetime of the building, during construction, refurbishment and occupation of the building.
- 6.0.3 In conclusion, the design team has considered the site's potential environmental impacts and this report details how those impacts will be managed and mitigated. The approach to designing and constructing a sustainable development will result in a building that complies with the London Borough of Richmond-upon-Thames' policies on sustainability and exceeds the requirements for energy.



APPENDIX A: BRUKL DOCUMENTS

Energy Efficient Baseline BRUKL Document



Compliance with England Building Regulations Part L 2013

Project name

Car showroom

As designed

Date: Mon Oct 26 17:35:25 2015

Administrative information

Building Details

Address: 45-49 Station road, Hampton, City, TW12 2BU

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.2.d.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.2 BRUKL compliance check version: v5.2.d.2

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	37.6
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	37.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	34.5
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

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

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red. **Building fabric**

Element	Ua-Limit	Ua-Calc	U _{I-Calc}	Surface where the maximum value occurs*
Wall**	0.35	0.16	0.16	RM000000_W11
Floor	0.25	0.13	0.13	RM000000_F1
Roof	0.25	0.13	0.13	RM000000_C1
Windows***, roof windows, and rooflights	2.2	1.4	1.4	RM000000_W1-W0
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

Us-umt = Limiting area-weighted average U-values [W/(m²K)]

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

U_{FCalc} = Calculated maximum individual element U-values [W/(m²K)]

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

Air Permeability	Worst acceptable standard	This building
m³/(h.m²) at 50 Pa	10	5

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

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

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

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

1- Tolet extracts

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency			
This system	3.5	-	-	-	-			
Standard value	2.5*	N/A	N/A	N/A	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								

^{*} Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

2- Heating and cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency		
This system	4.5	4.5	-	-	-		
Standard value	2.5*	2.6	N/A	N/A	N/A		
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO							

^{*} Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- SYST0002-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
Α	Local supply or extract ventilation units serving a single area
В	Zonal supply system where the fan is remote from the zone
С	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
Е	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
Н	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name		SFP [W/(I/s)]						HR efficiency			
ID of system type	Α	В	С	D	E	F	G	Н	I	TR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
Toilets	-	-	0.3	-	-	-	-	-	-	-	N/A
Toilets	-	-	0.3	-	-	-	-	-	-	-	N/A
Showroom and garage	-	-	-	-	-	-	-	-	-	-	N/A
Staff kitchen	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Lumino	us effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
Toilets	-	90	-	45

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General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
Toilets	-	90	-	77
Showroom and garage	-	90	22	3369
Staff kitchen	-	90	-	112

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Showroom and garage	NO (-51.7%)	NO

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

Separate submission

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

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

Building Use

	Actual	Notional
Area [m²]	373.1	373.1
External area [m²]	847.6	847.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	7
Average conductance [W/K]	204.46	265.68
Average U-value [W/m²K]	0.24	0.31
Alpha value* [%]	22.87	49.19

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

A1/A2 Retail/Financial and Professional services
--

A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways

B1 Offices and Workshop businesses

B2 to B7 General Industrial and Special Industrial Groups

B8 Storage or Distribution

C1 Hotels

% Area Building Type

C2 Residential Inst.: Hospitals and Care Homes

C2 Residential Inst.: Residential schools

C2 Residential Inst.: Universities and colleges

C2A Secure Residential Inst.

Residential spaces

D1 Non-residential Inst.: Community/Day Centre

D1 Non-residential Inst.: Libraries, Museums, and Galleries

D1 Non-residential Inst.: Education

D1 Non-residential Inst.: Primary Health Care Building

D1 Non-residential Inst.: Crown and County Courts

D2 General Assembly and Leisure, Night Clubs and Theatres

Others: Passenger terminals Others: Emergency services Others: Miscellaneous 24hr activities

Others: Miscellaneous 24nr activities

Others: Car Parks 24 hrs Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	13.87	12.43
Cooling	16.32	12.93
Auxiliary	0.64	1.02
Lighting	35.6	46.67
Hot water	1.68	1.94
Equipment*	22.04	22.04
TOTAL**	68.11	74.99

^{*} Energy used by equipment does not count towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

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

Energy & CO, Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	436.93	286.1
Primary energy* [kWh/m²]	203.87	220.78
Total emissions [kg/m²]	34.5	37.6

^{*} Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

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Н	IVAC Sys	tems Per	formanc	е						
Sys	stem Type	Heat dem MJ/m2	Cool dem MJ/m2		Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central he	eating using	j water: rad	iators, [HS]	Heat pump	(electric):	air source,	[HFT] Elec	tricity, [CFT] Electricity
	Actual	302	75.8	26.9	0	9.7	3.12	0	3.5	0
	Notional	208.8	149.2	23.9	0	15.5	2.43	0		
[ST	[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
	Actual	195.5	245.5	13	17.5	0	4.19	3.91	4.5	5.5
	Notional	101.7	179.4	11.6	13.8	0	2.43	3.6		

Key to terms

HFT CFT = Heating fuel type = Cooling fuel type

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Key Features

 $\label{thm:condition} The \ BCO \ can \ give \ particular \ attention \ to \ items \ with \ specifications \ that \ are \ better \ than \ typically \ expected.$

Building fabric

Element	U І-тур	U _{I-Min}	Surface where the minimum value occurs*
Wall	0.23	0.16	RM000000_W11
Floor	0.2	0.13	RM000000_F1
Roof	0.15	0.13	RM000000_C1
Windows, roof windows, and rooflights	1.5	1.4	RM000000_W1-W0
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{FTyp} = Typical individual element U-values [W/(m²K)]		U _{HMn} = Minimum individual element U-values [W/(m²K)]

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

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

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Renewable Energy Baseline BRUKL Document



Compliance with England Building Regulations Part L 2013

Project name

Car showroom

As designed

Date: Wed Oct 28 15:24:44 2015

Administrative information

Building Details

Address: 45-49 Station road, Hampton, City, TW12 2BU

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.2.d.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.2 BRUKL compliance check version: v5.2.d.2

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

CO₂ emission rate from the notional building, kgCO₂/m².annum	37.6
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	37.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	27.2
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

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

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red. **Building fabric**

Element	Ua-Limit	Ua-Calc	UI-calc	Surface where the maximum value occurs*
Wall**	0.35	0.16	0.16	RM000000_W11
Floor	0.25	0.13	0.13	RM000000_F1
Roof	0.25	0.13	0.13	RM000000_C1
Windows***, roof windows, and rooflights	2.2	1.4	1.4	RM000000_W1-W0
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

Us-Limit = Limiting area-weighted average U-values [W/(m2K)]

Ua-calc = Calculated area-weighted average U-values [W/(m2K)] Urcaic = Calculated maximum individual element U-values [W/(m²K)]

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

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

Air Permeability	Worst acceptable standard	This building
m3/(h.m2) at 50 Pa	10	5

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

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

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

1- Tolet extracts

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR	Refficiency
This system	4.5	-	-	-	-	
Standard value	2.5*	N/A	N/A	N/A	N//	Ą
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO						
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.						

2- Heating and cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency
This system	4.5	4.5	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO					
* Standard shown is for all types >12 kW output, except absorption and gas engine heat numbs. For types <=12 kW output, refer to EN 14825.					

^{*} Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- SYST0002-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
Α	Local supply or extract ventilation units serving a single area
В	Zonal supply system where the fan is remote from the zone
С	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
Е	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
Н	Fan coil units
1	Zonal extract system where the fan is remote from the zone with grease filter

Zone name		SFP [W/(I/s)]						UD officioness			
ID of system type	Α	В	С	D	Е	F	G	Н	I	HR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
Toilets	-	-	0.3	-	-	-	-	-	-	-	N/A
Toilets	-	-	0.3	-	-	-	-	-	-	-	N/A
Showroom and garage	-	-	-	-	-	-	-	-	-	-	N/A
Staff kitchen	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Lumino	us effic	acy [lm/W]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
Toilets	-	90	-	45

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General lighting and display lighting	Lumino	us effic	acy [lm/W]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
Toilets	-	90	-	77
Showroom and garage	-	90	22	3369
Staff kitchen	-	90	-	112

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Showroom and garage	NO (-51.7%)	NO

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

Separate submission

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

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

Building Use

% Area Building Type

	Actual	Notional
Area [m²]	373.1	373.1
External area [m²]	847.6	847.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	7
Average conductance [W/K]	204.46	265.68
Average U-value [W/m²K]	0.24	0.31
Alpha value* [%]	22.87	49.19

Ī	100	A1/A2 Retail/Financial and Professional services
		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeawa

B1 Offices and Workshop businesses B2 to B7 General Industrial and Special Industrial Groups

B8 Storage or Distribution

C2 Residential Inst.: Hospitals and Care Homes

C2 Residential Inst.: Residential schools

C2 Residential Inst.: Universities and colleges

C2A Secure Residential Inst.

Residential spaces

D1 Non-residential Inst.: Community/Day Centre

D1 Non-residential Inst.: Libraries, Museums, and Galleries

D1 Non-residential Inst.: Education

D1 Non-residential Inst.: Primary Health Care Building

D1 Non-residential Inst.: Crown and County Courts

D2 General Assembly and Leisure, Night Clubs and Theatres

Others: Passenger terminals Others: Emergency services Others: Miscellaneous 24hr activities

Others: Car Parks 24 hrs Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	13.48	12.43
Cooling	16.32	12.93
Auxiliary	0.64	1.02
Lighting	35.6	46.67
Hot water	1.68	1.94
Equipment*	22.04	22.04
TOTAL**	67.72	74.99

^{*} Energy used by equipment does not count towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	13.54	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	436.93	286.1
Primary energy* [kWh/m²]	202.69	220.78
Total emissions [kg/m²]	27.2	37.6

^{*} Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

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Н	HVAC Systems Performance									
Sys	stem Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central he	eating using	water: rad	iators, [HS]	Heat pump	(electric):	air source,	[HFT] Elec	tricity, [CFT] Electricity
	Actual	302	75.8	20.9	0	9.7	4.01	0	4.5	0
	Notional	208.8	149.2	23.9	0	15.5	2.43	0		
[ST] Split or m	ulti-split sy	stem, [HS]	Heat pump	(electric): a	ir source, [HFT] Electr	icity, [CFT]	Electricity	
	Actual	195.5	245.5	13	17.5	0	4.19	3.91	4.5	5.5
	Notional	101.7	179.4	11.6	13.8	0	2.43	3.6		

Key to terms

Heat dem [MJ/m2] = Heating energy demand = Cooling energy demand = Cooling energy demand = Heating energy demand = Heating energy consumption = Cooling energy consumption = Auxiliary energy consumption = Auxiliary energy consumption = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) = Cooling system seasonal energy efficiency ratio = Heating generator seasonal energy efficiency ratio = System type = Heat source = Heat source

ST HS = Heat source HFT CFT = Heating fuel type = Cooling fuel type

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Key Features

 $\label{thm:condition} \textbf{The BCO can give particular attention to items with specifications that are better than typically expected.}$

Building fabric

Element	U І-Тур	U _{I-Min}	Surface where the minimum value occurs*
Wall	0.23	0.16	RM000000_W11
Floor	0.2	0.13	RM000000_F1
Roof	0.15	0.13	RM000000_C1
Windows, roof windows, and rooflights	1.5	1.4	RM000000_W1-W0
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{гтур} = Typical individual element U-values [W/(m²K)]	•	U _{HMn} = Minimum individual element U-values [W/(m²K)]

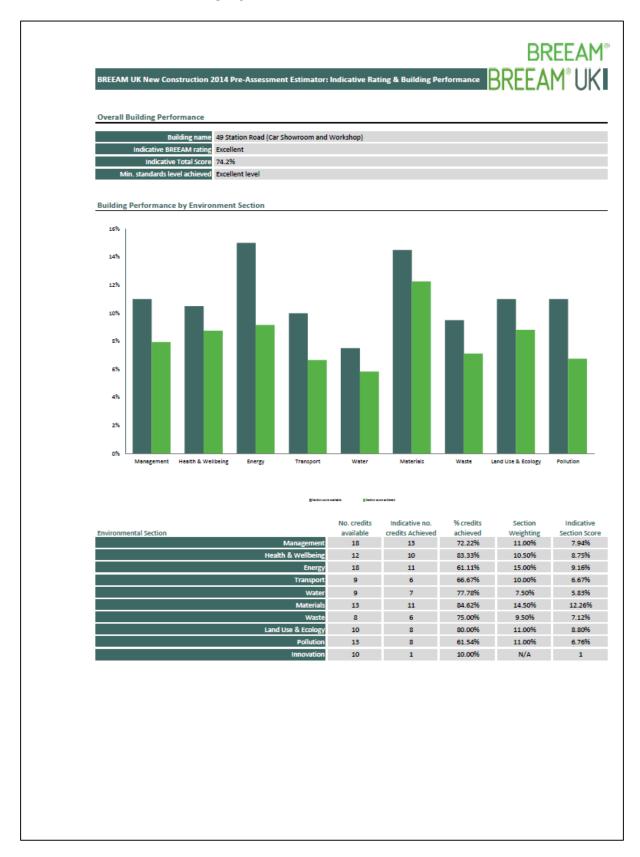
^{*} There might be more than one surface where the minimum U-value occurs.

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

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APPENDIX B: BREEAM NC 2014





BREEAM UK New Construction 2014 Pre-Assessment Estimator: Assessment Issue Scoring



Building name	49 Station Road (Car Showroom and Workshop)
Building score (%)	74.20%
Building rating	Excellent
Minimum standards level achieved	Excellent level

MANAGEMENT

Man 01 Project brief and design

No. of BREEAM credits available	4	Available contribution to overall score	2.44%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will stakeholder consultation (project delivery) take place?	Yes	1	1
Will stakeholder consultation (third party) take place?	No	1	0
Will a sustainability champion (design) be assigned?	Yes	1	1
Will a sustainability champion (monitoring progress) be assigned?	Yes	1	1

Total BREEAM credits achieve	ed 3
Total contribution to overall building sco	re 1.83%
Total BREEAM innovation credits achieve	ed 0
Minimum standard(s) lev	el N/A

Comments/notes

Roles and responsibilties of the design team will be established at the outset of the project.

Man 02 Life cycle cost and service life planning

No. of BREEAM credits available	4	Available contribution to overall score	2.44%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No



Assessment Criteria		_	Compliant?	Credits available	Credits achieved
	Will an elemental life cycle cost (LCC)analyses	s be carried out?	No	2	0
	Will a component level LCC pla	n be developed?	No	1	0
	Will the predicted capital co	ost be reported?	Yes	1	1
	Expected capital cost of the pro	ject (if available)		£/m²	
	Total BREEAM credits achieved	1			
	Total contribution to overall building score	0.61%			
	Total BREEAM innovation credits achieved	N/A			
	Minimum standard(s) level	N/A			

Comments/notes:

omments/notes:			
he project team will report on the capi	tal cost of the project.		
	состана ризјазан		

Man 03 Responsible construction practices

No. of BREEAM credits available	6	Available contribution to overall score	3.67%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Is all site timber used in the project 'legally harvested and traded timber'?	Yes		
Will/does the principal contractor operate a compliant Environmental Management System?	Yes	1	1
Will a construction stage sustainability champion be assigned?	Yes	1	1
Will a considerate construction scheme be used by the principal contractor? (One credit where 'compliance' has been achieved. Two credits where 'compliance' is significantly exceeded.)	2	2	2
Will construction site impacts be metered/monitored?	Yes		
Will site utility consumption be metered/monitored?	Yes	1	1
Will transport of construction materials and waste be metered/monitored?	Yes	1	1
Will exemplary level criteria be met?	No	1	0
ey Performance Indicators: Construction site energy use		_	
Energy consumption (total) - site processes Energy consumption (intensity) - site processes Distance (total) - materials transport to site Distance (total) -waste transport from site Energy consumption (total) - materials transport to site Energy consumption (total) - waste transport from site Energy consumption (intensity) - materials transport to site Energy consumption (intensity) - waste transport from site		Information not available Information not av	ailable at design stag
ey Performance Indicators: Construction site greenhouse gas emissions		-	
Process greenhouse gas emissions (total) - site processes			ailable at design stag
Greenhouse gas emissions (intensity) - site processes			ailable at design stag
Greenhouse gas emissions (total) - materials transport to site Greenhouse gas emissions (total) - waste transport from site			ailable at design stag ailable at design stag
Greenhouse gas emissions (total) - waste transport from site			allable at design stag
Greenhouse gas emissions (intensity) - waste transport from site			
ey Performance Indicators: Construction site use of freshwater resources		_	
Use of freshwater resource (total) - site processes Use of freshwater resource (intensity) - site processes			ailable at design stag ailable at design stag
Total BREEAM credits achieved 6			
Total contribution to overall building score 3.67%			

Total BREEAM innovation credits achieved

Minimum standard(s) level Outstanding level

Comments/notes:

			A	A	R
H	ĸ		Λ		
	1	_			

Consideration will be given to the above when selecting the principal contractor, and the above requirements will be written in to the contract documents.				



Man 04 Commisioning and handover

No. of BREEAM credits available	4	Available contribution to overall score	2.44%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will commissioning schedule and responsibilities be developed & accounted for?	Yes	1	1
Will a commissioning manager be appointed?	Yes	1	1
Will the building fabric be commissioned?	No	1	0
Will a building user guide be developed prior to handover?	Yes	1	1
Will a training schedule be prepared for building occupiers/managers?		1	1

Total BREEAM credits achieved	3
Total contribution to overall building score	1.83%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

t is anticipated that commissioning will be undertaken for the installed services and a building user guide handed to the building occupants at handover.				

Man 05 Aftercare

Assessment issue not applicable

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

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will aftercare support be provided to building occupiers?			
Will seasonal commissioning occur over 12months once substantially occupied?			
Will a post occupancy evaluation be carried out 1 year after occupation?			
Will exemplary level criteria be met?			

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A



Total BREEAM innovation credits achieved 0	
Minimum standard(s) level N/A	
Comments/notes:	



HEALTH & WELLBEING

Hea 01 Visual Comfort

No. of BREEAM credits available	5	Available contribution to overall score	4.38%
No. of BREEAM innovation credits available	1	Minimum standards applicable	No

Assessment Criteria Compliant? Credits available Credits achieved

Will the design provide adequate glare control for building users?	Yes	1	1
How many credits will be targeted for the daylighting criteria?	2	2	2
Will the design provide adequate view out for building users?	Yes	1	1
Will internal/external lighting levels, zoning and controls be specified in accordance with the relevant CIBSE Guides/British Standards?	Yes	1	1
Will exemplary level criteria be met?	No	1	0

Total BREEAM credits achieved	5
Total contribution to overall building score	4.38%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

The car garage/showroom will be fitted with external shading (in the form of a canopy) to design out solar glare. Due to the floor to ceiling windows, the car garage is likely to achieve good daylighting levels, a daylighting analysis will need to be undertaken at the detailed design stage. All relevant areas are anticipated to have an adequate view out, and lighting will be specified in line with the relevant CIBSE guidance.

Hea 02 Indoor Air Quality

No. of BREEAM credits available	2	Available contribution to overall score	1.75%
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	No

Assessment Criteria Compliant? Credits available Credits achieved

Will an air quality plan be produced and building designed to minimise air pollution?			
Will building be designed to minimise the concentration and recirculation of pollutants in the building?	No	1	0



Section 3 - Page 8

Will the relevant products be specified to meet the VOC testing and emission will formaldehyde and total VOC levels be measured power will the building be designed to, or have the potential to provide, national states.	ost construction?	1	0
Will exemplary level VOCs (product	s)criteria be met?		
Key Performance Indicators: Indoor air quality			
Concentration levels Total volatile organic compound (TVC	•		ailable at design stage ailable at design stage
Total BREEAM credits achieved	0		
Total contribution to overall building score	0.00%		
Total BREEAM innovation credits achieved	0		
Minimum standard(s) level	N/A		

Comments/notes:

Due to the nature of the development, it is unclear whether adequate separation will be achieved, and natural ventilation may not be possible, therefore these credits have been excluded at this stage. Further investigation at the detailed design stage may allow these credits to be awarded.

	No. of BREEAM credits available	N/A		Available contribu	ution to overall score	N/A
	No. of BREEAM innovation credits available	N/A			standards applicable	N/A
sessment Criteri	ia		Compliant?	Credits available	Credits achieved	
Will an objec	ctive risk assessment of proposed laboratory facilities' design	n be completed?				
Will the manufa	acture & installation of fume cupboards and containment de pra	evices meet best ctice standards?				
Will cor	ntainment level 2 & 3 labs meet best practice safety & perfo	rmance criteria?				
	Total BREEAM credits achieved	N/A				
	Total contribution to overall building score	N/A				
	Total BREEAM innovation credits achieved	N/A				
	Minimum standard(s) level	N/A				
ea 04 Thermal co	omfort					
	No. of BREEAM credits available	2		Available contribu	ution to overall score	1.75%
	No. of BREEAM innovation credits available	0		Minimum	standards applicable	No
sessment Criteri	ia		Compliant?	Credits available	Credits achieved	
	Will thermal modelling of the design Will the building design be adapted for a projected climate c		Yes	1	1	
			Yes		1	



Predicted Mean Vote (PMV)		INA
Predicted Percentage Dissatisfied (PPD)		INA
Total BREEAM credits achieved	2	
Total contribution to overall building score	1.75%	
Total BREEAM innovation credits achieved	N/A	
Minimum standard(s) level	N/A	

Comments/notes:

illiments/notes.
ermal modelling will be undertaken to ensure a comfortable internal environment is created.



Hea 05 Acoustic Performance

No. of BREEAM credits available	1	Available contribution to overall score	0.88%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Credits	Credits available	Credits achieved
Will the building meet the appropriate acoustic performance standards and testing			
requirements for:			
a. Sound insulation	1	1	1
b. Indoor ambient noise level			
c. Reverberation times?			

Total BREEAM credits achieved	1
Total contribution to overall building score	0.88%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Hea 06 Safety and Security

No. of BREEAM credits available	2	Available contribution to overall score	1.75%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Where external site areas are present, will safe access be designed for pedestrians and cyclists?	Yes	1	1
Will a suitably qualified security consultant be appointed and security considerations accounted for?	Yes	1	1

Total BREEAM credits achieved	2
Total contribution to overall building score	1.75%
Total BREEAM innovation credits achieved	N/A

B	R	F	F	Δ	M	R

Minimum standard(s) level	N/A
---------------------------	-----

Comments/notes:
The site will be designed to provide safe pedestrian and cycle routes, and will be assessed from a security perspective.

ENERGY

Ene 01 Reduction of energy use and carbon emissions

No. of BREEAM credits available	12	Available contribution to overall score	10.00%
No. of BREEAM innovation credits available	5	Minimum standards applicable	Yes
How do you wish to assess the number of BREEAM credits achieve	ed for this issue?	Enter building performance data into the Ene01 calculator	

Ene 01 Calculator

Country of the UK where the building is located	England	Confirm building regulation and version to be used:	Scotland Section 6 2015
New Construction (shell and core)			
Building floor area	373] m2	
National building booting and applies around demand	296.10	1 ми/	
Notional building heating and cooling energy demand		MJ/m2yr	
Actual building heating and cooling energy demand		MJ/m2yr	
Notional building primary energy consumption	220.78	kWh/m2yr	
Actual building primary energy consumption	202.69	kWh/m2yr	
Target emission rate (TER)	37.60	kgCO2/m2yr	
Building emission rate (BER)	27.2	kgCO2/m2yr	
Building emission rate improvement over TER	27.7%		
Heating & cooling demand energy performance ratio (EPR _{ED})	0.000		
Primary consumption energy performance ratio (EPR _{PC})	0.170		
CO ₂ Energy performance ratio (EPR _{CO2})	0.282		
Overall building energy performance ratio (EPR _{NC})	0.451		

Where specified, please confirm the energy production from onsite or near site energy generation technologies

Equivalent % of the building's 'regulated' energy consumption generated by carbon neutral sources and used to meet energy demand from 'unregulated' building systems or processes?

Is the building designed to be 'carbon negative'?

If the building is defined as 'carbon negative' what is the total (modelled) renewable/carbon neutral energy generated and exported?

Total BREEAM credits achieved	6
Total contribution to overall building score	5.00%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Excellent level



mments/notes:	



Ene 02 Energy monitoring

No. of BREEAM credits available	2	Available contribution to overall score	1.67%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment criteria	Compliant?	Credits available	Credits achieved	
Will a BMS or sub-meters be specified to monitor energy use from major building services systems?	Yes	1	1	
Will a BMS or sub-meters be specified to monitor energy use by tenant/building function areas?	Yes	1	1	

	_
Total BREEAM credits achieved	2
Total contribution to overall building score	1.67%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) leve	Outstanding level

Comments/notes:

Electricity submeters will be provided for major energy consuming systems and areas.

Ene 03 External lighting

No. of BREEAM credits available	1	Available contribution to overall score	0.83%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment criteria Compliant? Credits available Credits achieved

Will external light fittings and controls be specified in accordance with the BREEAM criteria? Yes 1 1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.83%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

		A	A A	R
$\langle H \rangle$		Δ		
иν				

ernal lighting to the Car garage/showroom will be fitted in line with the BREEAM criteria.



Ene 04 Low carbon design

No. of BREEAM credits available	3	Available contribution to overall score	2.50%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment criteria	Compliant?	Credits available	Credits achieved
Will passive design measures be used in line with an analysis be carried out during concept design stage (RIBA stage 2 or equivalent)?	Yes	1	1
Will free cooling measures be implemented in the whole building in line with the passive design analysis?	No	1	0
Will a LZC technology be specified in line with a feasibility study carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent)?	Yes	1	1

KPI - Low and/or zero carbon energy generation

Total on-site and/or near-site LZC energy genera	ation INA kWh/y	yr
Total BREEAM credits achieved 2		
Total contribution to overall building score 1.67%		
Total BREEAM innovation credits achieved N/A		
Minimum standard(s) level N/A		

Comments/notes:		

Ene 05 Energy efficient cold storage

Assessment issue not applicable

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



Will the refrigeration system be designed, installed & commissioned in Will the refrigeration system demonstrate a saving in indirect greenhous	BREEAM criteria?	N/A N/A	N/A N/A	
	(
Total BREEAM credits achieved	N/A			
Total contribution to overall building score	N/A			
Total BREEAM innovation credits achieved	N/A			
Minimum standard(s) level	N/A			
Comments/notes:				



ne 06 Energy efficient transportation systems				Assessment issue	not applic
No. of BREEAM credits available	N/A		Available contrib	ution to overall score	N/A
No. of BREEAM innovation credits available	N/A		Minimum	standards applicable	N/A
essment criteria		Compliant?	Credits available	Credits achieved	
Will a transportation system analysis be carried out to determine and specif	•				
number, size and type of lifts that is most er	0,				
Will the relevant energy-efficient features o	criteria be met?				
Total BREEAM credits achieved	N/A				
Total contribution to overall building score	N/A				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
iments/notes:					
ments/notes.					
07 Energy efficient laboratory systems				Assessment issue	not appli
No. of BREEAM credits available	N/A		Available contrib	ution to overall score	N/A
No. of BREEAM innovation credits available	, N/A			standards applicable	, N/A
	,				,
		Commissed	Cradita available	Candita a abias ad	
essment criteria	ratary facilities	Compliant?	Credits available	Credits achieved	
Pre-requisite: Criterion 1 of Hea 03 - risk assessment of labo	•				
ave the occupants' laboratory requirements & performance criteria been co the preparation of the initial project brief to minimise er					
the preparation of the initial project brief to minimise er	neigy demand:				
Best Practice Energy Practices in Laborat	ories (table 27)				
Will the laboratory meet criteria item					
Will the laboratory criteria item c) Fume cupboard volu					
Will the lab meet item d) Grouping / isolation of high filtration/ventila	ation activities?				
Will the laboratory meet criteria item e) Energy re					
Will the laboratory meet criteria item f) Energy reco					



Will the laboratory meet criteria item g) Grouping of c	ooling loads?	
Will the laboratory meet criteria item h) I	Free cooling?	
Will the laboratory meet criteria item i) Load res	ponsiveness?	
Will the laboratory meet criteria item j)		
Will the laboratory meet criteria item		
Will the laboratory meet criteria item l) Room air-c	hange rates?	
T I I DOCEANA IN IN IN	21/2	
Total BREEAM credits achieved	N/A	
Total contribution to overall building score	N/A	
Total BREEAM innovation credits achieved	N/A	
Minimum standard(s) level	N/A	
Comments/notes:		





No. of BREEAM credits available	N/A		Available contribu	ution to overall score	N/A
No. of BREEAM innovation credits available	N/A		Minimum	standards applicable	N/A
Assessment criteria					
Which of the following will be present and likely to be a/the major 'unregulate	contributor to d' energy use?	Present	Major impact		
Ref A Small power and plug					
	vimming pool?				
	nunal laundry? D Data centre?				
Ref E IT-intensive op	_				
	idential areas?				
	G Healthcare?				
Ref H Kitchen and cate	ering facilities?				
		Compliant	Credits available	Credits achieved	
Will the significant majority contributor(s) to 'unregulated' energy use a	bove meet the EEAM criteria?				
DIV.	ELAW CITCHA:				
Total BREEAM credits achieved	N/A				
Total contribution to overall building score	N/A				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
Comments/notes:					
Comments/notes.					

Ene 09 Drying space

Assessment issue not applicable

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



	Will internal/external drying space and fixir	ngs be provided?		
	Total BREEAM credits achieved	N/A		
	Total contribution to overall building score	N/A		
	Total BREEAM innovation credits achieved	N/A		
	Minimum standard(s) level	N/A		
Comments/notes:				

TRANSPORT

Tra 01 Public Transport Accessibility

No. of BREEAM credits available	5	Available contribution to overall score	5.56%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Building type category (for purpose of Tra01 issue assessment) Retail

Assessment Criteria

Indicative public transport accessibility index (AI):

Will the building have a dedicated bus service?

Compliant

Credits available

Credits achieved

8.44

5

N/A

Al	Indicative Accessibility Index for pre-assessment
0	Poor or no public transport provision
1	A single BREEAM compliant public transport node available
2	Some BREEAM compliant public transport nodes/services available
4	A selection of BREEAM compliant public transport nodes/services available
8	Good provision of public transport i.e. small urban centre / suburban area
10	Very Good provision of public transport i.e. small/medium urban centre
12	Excellent provision of public transport, i.e. medium urban centre
18	Excellent provision of public transport, i.e. large urban/metropolitan city centre

Total BREEAM credits achieved	3
Total contribution to overall building score	3.33%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:



No. of BREEAM credits available	1		Available contrib	ution to overall score	1.11%
No. of BREEAM innovation credits available	0		Minimum	standards applicable	No
Assessment Criteria		Compliant?	Credits available	Credits achieved	
Will the building be in close proximity of and accessible to applic	cable amenities?	Yes	1	1	
Total BREEAM credits achieved	1				
Total contribution to overall building score	1.11%				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
Comments/notes:					



	No. of BREEAM credits available	2		Available contrib	ution to overall score	2.22%
	No. of BREEAM innovation credits available	0		Minimum	standards applicable	No
	Building type category (for purpose of Tra03 is	ssuo assassment)	Potail Individua	L rotail unit		
	How many compliant cycle storage spaces v		4	Tretaii uiiit		
	What cyclist facilities v	•		<u>J</u> ilities		
ssessment Criteria			Compliant?	Credits available	Credits achieved	
ssessifient Criteria	Cyc	le storage spaces	Yes	Credits available	Credits acilieved	
	Cycl	Cyclist facilities	No	2	1	
	Total BREEAM credits achieved	1				
	Total contribution to overall building score	1.11%				
	Total BREEAM innovation credits achieved	N/A				
	Minimum standard(s) level	N/A				
omments/notes:						
ra 04 Maximum Car Par	king Capacity				Assessment issue	not appl
	No. of BREEAM credits available	N/A		Available contrib	ution to overall score	N/A
	No. of BREEAM innovation credits available	N/A			standards applicable	N/A
	No. of Breezew Illinovation credits available	N/A		William	standards applicable	IN/ A
	Building type category (for purpos					
	Building type category (for purpos Building's indicative Accessibility Index (sourced f					
Assessment Criteria			Compliant?	Credits available	Credits achieved	
		from issue Tra01)	Compliant?	Credits available	Credits achieved	

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

Comments/notes:		



Tra	05	Trave	D	an
110	\mathbf{u}_{-}	IIave		a

	No. of BREEAM credits available	1		Available contrib	ution to overall score	1.11%
	No. of BREEAM innovation credits available	0			standards applicable	No
sessment Criteria			Compliant?	Credits available	Credits achieved	
	plan based on site specific travel survey/assessme	nt be developed?	Yes	1	1	
a a						
	Total BREEAM credits achieved	1				
	Total contribution to overall building score	1.11%				
	Total BREEAM innovation credits achieved	N/A				
	Minimum standard(s) level	N/A				
mments/notes:						
	el Plan will be produced.					
/ATED						
/ATER						
	on					
	on No. of BREEAM credits available	5		Available contrib	ution to overall score	4.17%
		5 1			ution to overall score standards applicable	4.17% Yes
at 01 Water Consumptio	No. of BREEAM credits available No. of BREEAM innovation credits available	1				
at 01 Water Consumptio	No. of BREEAM credits available	1	Define a target %	Minimum		Yes
at 01 Water Consumptio How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
at 01 Water Consumption How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
at 01 Water Consumptio How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
at 01 Water Consumptio How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
at 01 Water Consumptio How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
at 01 Water Consumption How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
•	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary	1 for this issue?		Minimum	standards applicable baseline sanitary fittings	Yes
How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary Please select the calculation procedure used Water Consumption from building m	for this issue? vuse in the building	3.5	Minimum	standards applicable baseline sanitary fittings	Yes
How do you wish to ass	No. of BREEAM credits available No. of BREEAM innovation credits available ess the number of BREEAM credits to be achieved duction in potable water consumption for sanitary Please select the calculation procedure used Water Consumption from building m Water demand met via greywater/	for this issue? vuse in the building	3.5	Minimum	standards applicable baseline sanitary fittings	Yes



Improvement on bas	eline performance	
Key Performance Indicator - use of freshwater resource		
Total net Wa	ater Consumption	
Default b	building occupancy	
Alternative approach data		
Overall microcomponent performan	nce level achieved	
Total BREEAM credits achieved	3	1
Total contribution to overall building score		
Total BREEAM innovation credits achieved		
Minimum standard(s) level	Outstanding level	
Comments/notes:		
Comments/notes.		



Wat 02 Water Monitoring

No. of BREEAM credits available	1	Available contribution to overall score	0.83%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will there be a water meter on the mains water supply to the building(s)?	Yes	1	1
Will metering/monitoring equipment be specified on the water supply to any relevant plant/building areas?	N/A		
Will all specified water meters have a pulsed output?	Yes		
If the site/building has an existing BMS connection, will all pulsed meters be connected to the BMS?	N/A		

Total BREEAM credits achieve	1
Total contribution to overall building scor	0.83%
Total BREEAM innovation credits achieve	N/A
Minimum standard(s) leve	Outstanding level

Comments/notes:

Wat 03 Water Leak Detection and Prevention

No. of BREEAM credits available	2	Available contribution to overall score	1.67%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a mains water leak detection system be installed on the building's mains water supply?	Yes	1	1
Will flow control devices be installed in each sanitary area/facility?	Yes	1	1

Total BREEAM credits achieved	2
Total contribution to overall building score	1.67%
Total BREEAM innovation credits achieved	N/A



Minimum standard(s) level N/A
Comments/notes:



Wat 04 Water Efficient Equipment

	No. of BREEAM credits available	1			ution to overall score	0.83%
	No. of BREEAM innovation credits available	No		Minimum	standards applicable	No
ssessment Criteria			Compliant?	Credits available	Credits achieved	
	eaningful reduction in unregulated water demand	been achieved?	Yes	1	1	
			. 55	_	_	
	Total BREEAM credits achieved	1				
	Total contribution to overall building score	0.83%				
	Total BREEAM innovation credits achieved	N/A				
	Minimum standard(s) level	N/A				
omments/notes:						
1ATERIALS						
	No. of BREEAM credits available	5		Available contrib	ution to overall score	5.58%
	No. of BREEAM credits available No. of BREEAM innovation credits available	5 3			ution to overall score standards applicable	5.58% No
at 01 Life Cycle Impacts	No. of BREEAM innovation credits available	3		Minimum	standards applicable	
at 01 Life Cycle Impacts How do you wish to asses		3	Define the numbe		standards applicable	
at 01 Life Cycle Impacts How do you wish to asses	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved f	3 For this issue?		Minimum	standards applicable	
at 01 Life Cycle Impacts How do you wish to asses	No. of BREEAM innovation credits available ss the number of BREEAM credits to be achieved for Predicted total Mat01	3 For this issue? credits achieved		Minimum	standards applicable	
lat 01 Life Cycle Impacts How do you wish to asses	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved for a Predicted total Mat01 Predicted total Mat01	3 for this issue? credits achieved points achieved		Minimum	standards applicable	
lat 01 Life Cycle Impacts How do you wish to asses	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved f Predicted total Mat01 Predicted total Mat01 Number of building ele Green Guide exemplary	for this issue? credits achieved points achieved ements assessed level compliant?		Minimum	standards applicable	
MATERIALS Mat 01 Life Cycle Impacts How do you wish to assesssessment Criteria	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved for the predicted total Mat01 Predicted total Mat01 Number of building elements	for this issue? credits achieved points achieved ements assessed level compliant?		Minimum	standards applicable achieved	
Mat 01 Life Cycle Impacts How do you wish to asses	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved f Predicted total Mat01 Predicted total Mat01 Number of building ele Green Guide exemplary	for this issue? credits achieved points achieved ements assessed level compliant?	4	Minimum	achieved Area of element	
How do you wish to assesssessment Criteria	No. of BREEAM innovation credits available as the number of BREEAM credits to be achieved f Predicted total Mat01 Predicted total Mat01 Number of building ele Green Guide exemplary	for this issue? credits achieved points achieved ements assessed level compliant? ware been used?		Minimum	standards applicable achieved	



Windows				
l lana	Roof			
Upper	floor construction Internal wall		1	
Floor	finishes/coverings			
			11	
ey Performance Indicator - embodied green house gas emissions for buildi			1.	
Total embodied green house gas emissions for building (by a		Missing data	kgCO₂ eq.	kgCO ₂ eq./m ²
Proportion of applicable building elements that da	ta reported covers]	
T . 10055444 12 12 12				
Total BREEAM credits achieved				
Total contribution to overall building score				
Total BREEAM innovation credits achieved				
Minimum standard(s) level	N/A			
omments/notes:				
oniments/notes.				



Mat 02 Hard Landscaping and Boundary Protection

No. of BREEAM innovation credits available 0 Minimum standards applicable No	No. of BREEAM credits available	1	Available contribution to overall score	1.12%
	No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will ≥80% of all external hard landscaping and boundary protection achieve a Green Guide A or A+ rating?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	1.12%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

ļ			

Mat 03 Responsible Sourcing

No. of BREEAM credits available	4	Available contribution to overall score	4.46%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

All timber and timber based products are 'Legally harvested and trader timber' Is there a documented sustainable procurement plan? Percentage of available responsible sourcing of materials points achieved 40,00% 40,00% 3 2	Assessment Criteria	Compliant	Credits available	Credits achieved
	All timber and timber based products are 'Legally harvested and trader timber'	Yes		
Percentage of available responsible sourcing of materials points achieved 40,00% 3	Is there a documented sustainable procurement plan?	Yes	1	1
	Percentage of available responsible sourcing of materials points achieved	40.00%	3	2

Percentage of available responsible sourcing of material	s points achieved	40.00%	3	2
		[n] .		
Please confirm the route used	to assess Mat03	Please select		
Total DDEEANA conditional in a de	2			
Total BREEAM credits achieved	3			
Total contribution to overall building score	3.35%			
Total BREEAM innovation credits achieved	0			
Minimum standard(s) level	Outstanding level			

BREEAM®



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IVIC	שונו	/	IIISUI	ıatıvı	

Mat 04 Insulation					
No. of BREEAM credits available	1		Available contribu	ution to overall score	1.12%
No. of BREEAM innovation credits available	0			standards applicable	No
The of Still fill this cation of catio a tallable	· ·				110
Accessor Criteria			Cua dita available	Cup dita a abias a d	
Assessment Criteria	Jatina indov	2.50	Credits available	Credits achieved	Noto: An inculatio
What is the building's targeted insu	ulating index?	2.50	1	1	Note: An insulation
Total BREEAM credits achieved	1				
Total contribution to overall building score	1.12%				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
Comments/notes:					
Mat 05 Designing for durability and resilience					
No. of BREEAM credits available	1		Available contribu	ution to overall score	1.12%
No. of BREEAM innovation credits available	0		Minimum	standards applicable	N/A
Assessment Criteria		Compliant?	Credits available	Credits achieved	
Will suitable durability/protection measures be specified and installed to vulner	rable areas of				
	the building?	Yes			
Will suitable durability/protection measures be specified and installed to expose	_	Vaa	1	1	
	building?	Yes			
Total BREEAM credits achieved	1				
Total contribution to overall building score	1.12%				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				

Comments/notes:



Mat 06 Material efficiency						
iviat oo iviaterial efficiency						
	No. of BREEAM credits available	1		Available contrib	ution to overall score	1.12%
	No. of BREEAM innovation credits available	0		Minimum	standards applicable	No
Assessment Criteria			Compliant?	Credits available	Credits achieved	
	cy measures be identified & implemented durin	ng all RIBA stages?	Yes	1	1	
	,				_	
	Total BREEAM credits achieved	1				
	Total contribution to overall building score	1.12%				
	Total BREEAM innovation credits achieved	N/A				
	Minimum standard(s) level	N/A				
Comments/notes:						
comments/notes.						



No. of BREEAM innovation credits available How do you wish to assess the number of BREEAM credits to be achieved for this issue? Define a target number of BREEAM credits Select the number of BREEAM credits being targeted for issue Wst 01: 3 BREEAM Wst01 Innovations assessment Criteria Compliant?	
Select the number of BREEAM credits being targeted for issue Wst 01: 3 BREEAM Wst01 Innovation	
concernant Critaria	on credits:
Construction resource management plan Compliant Pre-demolition audit	
Does the excavation waste meet the exemplary level requirements?	
ey Performance Indicators - Construction Waste	
Measure/units for the data being reported	
Non-hazardous construction waste (excluding demolition/excavation)	
en de la companya de	the pre-assessment stage th
	this stage this will be a targe
	the pre-assessment stage this
en de la companya de	this stage this will be a targe: this stage this will be a targe:
	the pre-assessment stage thi
	this stage this will be a targe
	this stage this will be a targe
	his stage this will be a targe
Hazardous waste to disposal Note: At t	his stage this will be a targe
Total BREEAM credits achieved 3	
Total contribution to overall building score 3.56%	
Total BREEAM innovation credits achieved 0	
Minimum standard(s) level Outstanding level	
omments/notes:	



Wst 02 Recycled Aggregates

	No. of BREEAM credits available	1		Available contribution to overall score	1.19%
	No. of BREEAM innovation credits available	1		Minimum standards applicable	No
Accessors and Cuitouia			Total		
Assessment Criteria			Total	1	
What is the target total % o	f high-grade aggregate that will be recycled/seco	ondary aggregate?	0%		
% of high-grade aggregate t	that is recycled/secondary aggregate - by applications	tion			
		Structural frame			
	Bitumen/hydraulically bound base, binder ar				
		ilding foundations			
	Conci	rete road surfaces			
		Pipe bedding			
	Granul	lar fill and capping			
	Total BREEAM credits achieved	0			
	Total contribution to overall building score	0.00%			
	Total BREEAM innovation credits achieved	0			
	Minimum standard(s) level	N/A			
	iviiiiiiuuii Stailualu(S) level	N/A			
Comments/notes:					
Wst 03 Operational Waste					
The second of th					

No. of BREEAM credits available	1	Available contribution to overall score	1.19%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will operational recyclable waste volumes be segregated and stored?	Yes	1	1
Will static waste compactor(s) or baler(s) be specified where appropriate?	N/A		
Will vessel(s) for composting suitable organic waste where appropriate?	N/A		



	Total BREEAM credits achieved	1
	Total contribution to overall building score	1.19%
	Total BREEAM innovation credits achieved	N/A
	Minimum standard(s) level	Outstanding level
Comments/notes:		

Assessment issue not applicable

st 04 Speculative Floor a	ind denning i misries					
	No. of BREEAM credits available	N/A		Available contrib	ution to overall score	N/A
	No. of BREEAM innovation credits available	N/A		Minimum	standards applicable	N/A
sessment Criteria			Compliant?	Credits available	Credits achieved	
			·			
	Total BREEAM credits achieved	N/A				
	Total contribution to overall building score	N/A				
	Total BREEAM innovation credits achieved	, N/A				
	Minimum standard(s) level	N/A				
omments/notes:						
at OF Adaption to alimate						
st 05 Adaption to climate	e change					
st 05 Adaption to climate	e change No. of BREEAM credits available	1		Available contrib	ution to overall score	1.19%
st 05 Adaption to climate		1 1			ution to overall score standards applicable	1.19% N/A
st 05 Adaption to climate	No. of BREEAM credits available					
st 05 Adaption to climate	No. of BREEAM credits available		Compliant?			
ssessment Criteria	No. of BREEAM credits available	1		Minimum Credits available	standards applicable Credits achieved	
ssessment Criteria Will a climate change	No. of BREEAM credits available No. of BREEAM innovation credits available	1 oric resilience be	Compliant? Yes	Minimum	standards applicable	
sessment Criteria Will a climate change cor	No. of BREEAM credits available No. of BREEAM innovation credits available adaptation strategy appraisal for structural and fab	1 oric resilience be 2 or equivalent)?		Minimum Credits available	standards applicable Credits achieved	
sessment Criteria Will a climate change cor	No. of BREEAM credits available No. of BREEAM innovation credits available adaptation strategy appraisal for structural and fab aducted by the end of Concept Design (RIBA Stage 2 evel criteria – Responding to adaptation to climate	1 oric resilience be 2 or equivalent)? change be met?	Yes	Minimum Credits available	Credits achieved 1	
sessment Criteria Will a climate change cor	No. of BREEAM credits available No. of BREEAM innovation credits available adaptation strategy appraisal for structural and fab aducted by the end of Concept Design (RIBA Stage 2 evel criteria – Responding to adaptation to climate Total BREEAM credits achieved	1 oric resilience be or equivalent)? change be met?	Yes	Minimum Credits available	Credits achieved 1	
sessment Criteria Will a climate change cor	No. of BREEAM credits available No. of BREEAM innovation credits available adaptation strategy appraisal for structural and fabriducted by the end of Concept Design (RIBA Stage 2 evel criteria – Responding to adaptation to climate Total BREEAM credits achieved Total contribution to overall building score	1 oric resilience be or equivalent)? change be met? 1 1.19%	Yes	Minimum Credits available	Credits achieved 1	
sessment Criteria Will a climate change cor	No. of BREEAM credits available No. of BREEAM innovation credits available adaptation strategy appraisal for structural and fab aducted by the end of Concept Design (RIBA Stage 2 evel criteria – Responding to adaptation to climate Total BREEAM credits achieved	1 oric resilience be or equivalent)? change be met?	Yes	Minimum Credits available	Credits achieved 1	

Comments/notes:



Wst 06 Functional adaptability					
No. of BREEAM credits available	1		Available contribu	ution to overall score	1.19%
No. of BREEAM innovation credits available	0		Minimum	standards applicable	N/A
Assessment Criteria		Compliant?	Credits available	Credits achieved	
Will a building specific functional adaptation strategy appraisal be condu Design (RIBA Stage 2 or equivalent) and will functional adaptation measures b		Yes	1	1	
Total BREEAM credits achieved	1			_	
Total contribution to overall building score	1.19%				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
Comments/notes:					
LAND USE & ECOLOGY					
LE 01 Site Selection					
LE 01 Site Selection					
No. of BREEAM credits available	2		Available contribu	ution to overall score	2.20%

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No. of BREEAM innovation credits available 0		Minimum	standards applicable	No
ssessment Criteria	Compliant?	Credits available	Credits achieved	
Will at least 75% of the proposed development's footprint be located on previously occupied land?	Yes	1	1	
Is the site deemed to be significantly contaminated?	No	1	0	
Total BREEAM credits achieved 1				
Total contribution to overall building score 1.10%				
Total BREEAM innovation credits achieved N/A				
Minimum standard(s) level N/A				
omments/notes:				



LE 02 Ecological Value of Site and Protection of Ecological Features

No. of BREEAM credits available	2		Available contribu	2.20%	
No. of BREEAM innovation credits available	0		Minimum standards applicable		No
Ecological value of the lan	nd defined using	Please select			
	a defined domb	Tease select			
essment Criteria		Compliant?	Credits available	Credits achieved	
Can the land within the construction zone be defined as 'land of low ec	cological value'?	Yes	1	1	
Will all features of ecological value surrounding the construction zone/si	ite boundary be protected?	Yes	1	1	
Total BREEAM credits achieved	2				
Total contribution to overall building score	2.20%				
Total BREEAM innovation credits achieved	N/A				
Minimum standard(s) level	N/A				
amonto (notos)					
nments/notes:					

LE 03 Mitigating Ecological Impact

No. of BREEAM credits available	2	Available contribution to overall score	2.20%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Data sourced for calculating the change in ecological value from Suitably Qualified Ecologist site survey of plant species

Assessment Criteria

Assessment Citeria		
What is the likely change in ecological value as a result of the sites development?	≥0 species (i.e. no negative change)	Plant species richn
Total BREEAM credits achieved 2		
Total contribution to overall building score 2.20%		



Total BREEAM innovation credits achieved N/A	
Minimum standard(s) level Outstanding level	
Comments/notes:	



LE 04 Enhancing Site Ecology

No. of BREEAM credits available	2	Available contribution to overall score	2.20%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Total BREEAM credits achieved	1
Total contribution to overall building score	1.10%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

LE 05 Long Term Impact on Biodiversity

No. of BREEAM credits available	2	Available contribution to overall score	2.20%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a Suitably Qualified Ecologist be appointed to monitor/minimise impacts of site activities on biodiversity?	ν Δς	2	2
Will a landscape and habitat management plan be produced covering at least the first five years after project completion in accordance with British Standards?	ν Δς		
Number of applicable measures to improve biodiversity confirmed by SQE:			
Number of applicable measures implemented:	2		

Total BREEAM credits achieved	2
Total contribution to overall building score	2.20%



	Total BREEAM innovation credits achieved	N/A
	Minimum standard(s) level	N/A
Comments/notes:		



POLLUTION

Pol 01 Impact of Refrigerants

No. of BREEAM credits available	3	Available contribution to overall score	2.54%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria Credits available Credits achieved

Refrigerant containing systems installed in the assessed building?	Yes	2	2
Do all systems (with electric compressors) comply with the requirements of BS EN 378:2008			
(parts 2 $\&$ 3) $\&$ where refrigeration systems containing ammonia are installed, the IoR	Yes		
Ammonia Refrigeration Systems Code of Practice?			
Global Warming Potential of the specified refrigerant(s) 10 or less?	Yes		
What is the target range Direct Effect Life Cycle CO2eq. emissions for the system?		kgCO2eq/kW coolt	h capacity
Cooling/Heating capacity of the system		kW	
Will a refrigerant leak detection and containment system be specified/installed?	Yes	1	1

Total BREEAM credits achieved	3
Total contribution to overall building score	2.54%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Pol 02 NO_x Emissions

No. of BREEAM credits available	3	Available contribution to overall score	2.54%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria

		_
NO _x emission level - space heating	1200.00	mg/kWh
NO _x emission level - cooling	1200.00	mg/kWh



Does this building meet BREEAM's definition of a highly in	insulated building?
Energy consumption: heat	
Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A
Comments/notes:	



Pol 03 Surface Water Run off

No. of BREEAM credits available	5	Available contribution to overall score	4.23%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
What is the actual/likely annual probability of flooding for the assessed site?	Low	2	2
Will a Flood Risk Assessment be undertaken?	Yes	2	2
Will the site meet the BREEAM criteria for peak rate surface water run off?	Yes	1	1
Will the site meet the criteria for surface water run off volume, attenuation and/or limiting discharge?	No	1	0
Will the site be designed to minimise watercourse pollution in accordance with the BREEAM criteria?	No	1	0

Total BREEAM credits achieved	3
Total contribution to overall building score	2.54%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Com	ments/	'notes:
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Pol 04 Reduction of Night Time Light Pollution

No. of BREEAM credits available	1	Available contribution to overall score	0.85%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria		Compliant?	Credits available	Credits achieved	
	Will the external lighting specification be designed to reduce light pollution?	Yes	1	1	

Total BREEAM credits achieved	1
Total contribution to overall building score	0.85%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A



iments/notes:	



Pol 05 Noise Attenuation

No. of BREEAM credits available	1	Available contribution to overall score	0.85%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Complia	ant Credits available	Credits achieved
Will there be noise-sensitive areas/buildings within 800m radius of the develop	ment? Yes	1	1
Will a noise impact assessment be carried out and, if applicable, noise attenuation me	easures ecified?		
Total BREEAM credits achieved 1			

Total BREEAM credits achieved	1
Total contribution to overall building score	0.85%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A
	•

Comments/notes:

INNOVATION

Inn 01 Innovation

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

Assessment Criteria	Compliant?	Credits available	Credits achieved
Man 03 Responsible construction practices	No	1	0
Man 05 Aftercare	N/A	N/A	0
Hea 01 Visual Comfort	No	1	0
Hea 02 Indoor Air Quality	N/A	N/A	0
Ene 01 Reduction of energy use and carbon emissions	No	5	0
Wat 01 Water Consumption	No	1	0
Mat01 Life Cycle Impacts	No	3	0
Mat03 Responsible Sourcing of Materials	No	1	0



	Wet01 Construction West	o Managamant	No	1	0
	Wst01 Construction Wasto			1	0
		cled Aggregates		1	0
	Wst 05 Adaption to	climate change	N/A	N/A	1
		Number of 'ap	proved' innovation	credits achieved?	
	Total BREEAM innovation credits achieved	1			
	Total contribution to overall building score	1.00%			
	Minimum standard(s) level	N/A			
	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
ments/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
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nents/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			
nents/notes:	Minimum standard(s) level	N/A			

APPENDIX C: LONDON BOROUGH OF RICHMOND-UPON-THAMES' SUSTAINABLE CONSTRUCTION CHECKLIST

Completed by: Metropolis Green Ltd Give Chapman Architects For Non-Residential Size of development (m2) 372 1 MINIMUM COMPLIANCE (RESIDENTIAL AND NON-RESIDENTIAL)	LBRUT Sustainable					
This document forms part of the Sustainable Construction Checklist SPD. This document must be filled out as part of the planning application for the following developments: all residential development providing one or more new residential units (including conversions leading to one or more wurth), and all other forms of development providing 1000ppm or more of non-residential floor space. Developments including new non-residential development of less than 1000ppm, and other conversions are strongly encouraged to comply with this checklist. Where further information is requested, please either fill in the relevant section, or refer to the document where this information may be found in the Justification and Guidance section of this SPO. Property Name (if relevant): \$\frac{1}{25-45-55\text{station Road}}\$ Application No. (if known): \$\frac{1}{25-45-55\text{station Road}}\$ Number of dwellings \$\frac{1}{3572}\$ For Residential Number of dwellings \$\frac{1}{3572}\$ Percentage of fold site CO2 emissions saved through renewable energy installation? Please of heck the Guidance Section of this SPO for the poli	LBRUT Sustainable					
residential development providing one or more new residential units (Inobuding conversions leading to one or more new units), and all other forms of development providing 1000spam or more of non-residential floor space. Developments including new non-residential development of including the conversions are strongly encouraged to comply with bits checklist. Where further information is requested, please either fill in the relevant section, or refer to the document where this information may be found in the Justification and Guidance section of this SPO. Property Name (if relevant): \$\frac{45-45 Station Road}{5000}\$ Application No. (if known): \$\frac{45-45 Station Road}{5000}\$ \$\frac{45-45 Station Road}{5000}\$ \$45-45 Station	This document forms and of t				for the following development	
Information may be found in detail, e.g. Flood Risk Assessment or similar. Further guidance on completing the Checklist may be found in the Justification and Guidance section of this SPD. Property Name (if relevant): 4549 Station Road, Hampton, TW12 28U Hetropolis Green Ltd Completed by: Check Chapman Architects	residential development provided 100 sqm or more of non-resident	ding one or more Idential floor spac	new residential units (including conversions leading to one oe. Developments including new non-residential development of	or more new units), and all of less than 100sqm floor space, o	her forms of development pro extensions less than 100sqm,	oviding and other
Property Name (if relevant): #5-95 Station Road Application No. (if known):	information may be found in d					
Completed by: Metropolis Green Ltd Cive Chapman Architects For Non-Residential Size of development (m;) 372 MINIMUM GOMPLANCE (RESIDENTIAL AND NON-RESIDENTIAL) Energy Assessment Has an energy assessment been submitted that demonstrates the expected energy and carbon dioxide emissions saving from energy efficiency and renewable energy measures, including the feasibility of CHPICCHP and community heating systems? If yes, please 8ck. Carbon Dioxide emissions reduction What is the carbon dioxide emissions reduction against a Building Regulations Part L (2013) baseline Pictry DM 5D 1 and London Plan Policy 52 (2016) require a 36% reduction in CO 2 emissions beyond Building Regulations 2013. Percentage of that site CO2 emissions saved through renewable energy installation. A MINIMUM POLICY COMPLIANCE (NON-RESIDENTIAL) AND DOMESTIC REFURBISHMENT) Flease check the Guidance Section of this SPD for the policy requirements Environmental Rating of development: Non-Residential new-build (100cqm or more) REFEARL Level Flease check the Guidance Section of this SPD for the policy requirements Exteriors and conversions for residential develops REFEARL Level Flease Check the Guidance Section of this SPD for the policy requirements Exteriors and conversions for residential develops REFEARL Level Flease Select Have you attached a pre-assessment to support this? REFEARL Level BREEARL Good = 0, Very Good = 4, Excellent = 0, Outstanding = 16 MINIMUM POLICY COMPLIANCE (RESIDENTIAL) Water Usage Internal water usage Imited to 105 litres person per day, (Excluding an allowance 5 litres per person per day for external water consumption), Calculations using the water efficiency calculator for new dwellings have been submitted.		45-49 Station R	load	Application No.	. (If known):	
For Non-Residential Size of development (m2) 372 For Residential Number of dwellings B	Address (Include, postcode) Completed by:	Metropolis Gree	en Ltd			
Energy Assessment Has an energy assessment been submitted that demonstrates the expected energy and carbon dioxide emissions saving from energy efficiency and renewable energy measures, including the feasibility of CHPICCHP and community heating systems? If yes, please tick. Carbon Dioxide emissions reduction against a Building Regulations Part L (2013) baseline Policy DM 50 1 and London Plan Policy 6.2 (2016) require a 36% reduction in CO ₂ emissions beyond Building Regulations 2013. Percentage of total site CO ₂ emissions saved through renewable energy installation? In MINIMUM POLICY COMPLIANCE (NON-RESIDENTIAL AND DOMESTIC REFURBISHMENT) Please check the Guidance Section of this SPD for the policy requirements Entensions and conversions for residential development: Extensions and conversions for residential developes Extensions and conversions for residential developes Entensions and conversions for residential developes Extensions and conversions for non-residential buildings BREEAM Level BREEAM Level Flease Select Have you attached a pre-assessment to support this? BREEAM Level BREEAM Level BREEAM Level Flease Select Have you attached a pre-assessment to support this? BREEAM Level BREEAM	For Non-Residential			For Residential		
Has an energy assessment been authentited that demonstrates the expected energy and carbon clouds emissions saving from energy efficiency and renewable energy measures, including the feasibility of CHPICCHP and community heating systems? If yes, please tick. Carbon Dloxide emissions reduction against a Building Regulations Part L (2013) baseline. What is the carbon cloudse emissions reduction against a Building Regulations Part L (2013) baseline. Policy DM 80 1 and London Plan Policy 6.2 (2016) require a 35% reduction in CO ₂ emissions beyond Building Regulations 2013. Percentage of total site CO ₂ emissions saved through renewable energy installation? Please check the Guildence Section of this SPD for the policy requirements Please check the Guildence Section of this SPD for the policy requirements Environmental Rating of development: Benefand Level Excellent Have you attached a pre-assessment to support this? BREEAM Level Please Select Have you attached a pre-assessment to support this? BREEAM Conversions for non-residential buildings BREEAM Level Please Select Have you attached a pre-assessment to support this? BREEAM Level Returbishment Please Select Have you attached a pre-assessment to support this? BREEAM Level Returbishment Returbishment Brease Select Have you attached a pre-assessment to support this? BREEAM Level Good = 0, Very Good = 4, Excellent = 0, Cutstanding = 16 MINIMUM POLICY COMPLIANCE (ResidentILL) Walter Usage Intensi water caused for Environmental Rating: Brease Select Have you attached a pre-assessment to support this?			•	Number of dischings		
Carbon Dixide emissions reduction What is the carbon dixide emissions reduction against a Building Regulations Part L (2013) baseline What is the carbon dixide emissions reduction against a Building Regulations Part L (2013) baseline Policy DM SD 1 and London Plan Policy 6.2 (2016) require a 35% reduction in CO ₂ emissions beyond Building Regulations 2013. Percentage of total site CO2 emissions saved through renewable energy installation? Please check the Guidance Section of this SPD for the policy requirements Environmental Rating of development: Non-Residential new-build (100sqm or more) BREEAM Level Briefersions and conversions for residential dwellings BREEAM Conversions for residential dwellings BREEAM Level Briefersions and conversions for non-residential buildings Briefersions and conversions for non-residential building	Energy Assessment		illad that demonstrates the expected energy and makes disorde	andreione caules from an array	-Melancu and	Vec
What is the carbon dioxide emissions reduction against a Building Regulations Part L (2013) baseline Policy DM 50 1 and London Plan Policy 6.2 (2016) require a 36% reduction in CO ₂ emissions beyond Building Regulations 2013. Percentage of total site CO ₂ emissions saved through renewable energy installation? Place of the County of the Policy Computation of the County of the Policy requirements	renewable energy me	easures, including	the feasibility of CHP/CCHP and community heating systems? It	fyes, please tick.	eniciency and	
Percentage of total site CO2 emissions saved through renewable energy installation? A MINIMUM POLICY COMPLIANCE (NON-RESIDENTIAL AND DOMESTIC REFURBISHMENT) Please check the Guidance Section of this SPD for the policy requirements Please check the Guidance Section of this SPD for the policy requirements Please check the Guidance Section of this SPD for the policy requirements Please check the Guidance Section of this SPD for the policy requirements Please check the Guidance Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for the policy requirements Please Section of this SPD for th	What is the carbon di	lloxide emissions re	eduction against a Building Regulations Part L (2013) baseline			35%
### MINIMUM POLICY COMPLIANCE (NON-RESIDENTIAL AND DOMESTIC REFURBISHMENT) ### Please check the Guidance Section of this SPD for the policy requirements ### Please check the Guidance Section of this SPD for the policy requirements ### Non-Residential new-build (100strop or more) ### BREEAM Level				ounsing regulations 2013.		20.35%
Environmental Rating of development: Non-Residential new-build (100sgm or more) RREEAN Levie						
Non-Residential rew-build (100sqm or more)	Environmental Rating of de	velopment:	Please check the Guidance Section of this SPO for the	policy requirements		
Extensions and conversions for residential dwellings BREEAM Domestic Returbishment Extensions and conversions for non-residential buildings BREEAM Level BREEAM Level Score awarded for Environmental Rating: BREEAM: Good = 0, Very Good = 4, Excellent = 6, Outstanding = 16 MINIMUM POLICY COMPLIANCE (RESIDENTIAL) Water Usage Internal water usage Imited to 105 litres person per day. (Excluding an allowance 5 litres per person per day for external water consumption). Calculations using the water efficiency calculator for new dwellings have been submitted.	Non-Residential new-build (10 BREEAM Level	00sqm or more)		Have you attached a pre-as	sessment to support this?	•
BREEAM Level Piease Select Have you attached a pre-assessment to support this? Score awarded for Environmental Rating: BREEAM: Good = 0, Very Good = 4, Excellent = 6, Outstanding = 16 MINIMUM POLICY COMPLIANCE (RESIDENTIAL) Water Usage Intensi water usage limited to 105 litres person per day, (Excluding an allowance 5 litres per person per day for external water consumption). Calculations using the water efficiency calculator for new dwellings have been submitted.	BREEAM Domestic F	Refurbishment	Please Select	Have you attached a pre-as	sessment to support this?	
BREEAM: Good = 0, Very Good = 4, Excellent = 0, Cutstanding = 16 ### MINIMUM POLICY COMPLIANCE (RESIDENTIAL) Water Usage Intensi water usage limited to 105 litres person per day. (Excluding an allowance 5 litres per person per day for external water consumption). Calculations using the water efficiency calculator for new dwellings have been submitted.	BREEAM Level		Please Select	Have you attached a pre-as	sessment to support this?	
18 MINIMUM POLICY COMPLIANCE (RESIDENTIAL) Water Usage Internal water usage Imited to 105 litres person per day. (Excluding an allowance. 5 litres per person per day for external water consumption). Calculations using the water efficiency calculator for new dwellings have been submitted.						Subtotal 8
Water Usage Internal water usage limited to 105 litres person per day. (Excluding an allowance 5 litres per person per day for external water consumption). Calculations using the water efficiency calculator for new dwellings have been submitted.						



Below does the development incorporate cooling measures? Tick all that apply: Energy efficient design incorporating specific heat demand to less than or equal to 15 kWhizapm Reduce heat entering a building through providing/improving insulation and living roofs and walls Exposed thermal mass and high cellings Belopsed thermal mass and high cellings Passive vertilation Active cooling systems, i.e., Air Conditioning Unit 2.2 Head Generation b. How have the heating and cooling systems, with preference to the heating system hierarchy, been selected (defined in London Plan policy 6.8)? Tick all heating and cooling systems, i.e., Air Conditioning Unit Connection to existing heating or cooling networks powered by renewable energy Connection to existing heating or cooling networks powered by gas or electricity Site wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by renewable energy Community Bits wide CHP related to powered by gas or electricity Community Bits wide CHP related to powered by gas or electricity Community Bits wide CHP related to powered by gas or electricity Community Bits wide CHP related to powered by gas or electricity Community Bits Bits Bits Bits Bits Bits Bits Bits	How does the development incorporate cooling measure? Tits all that apply.	How does the development incorporate cooling measures** Titd all that apply.		ERGY USE AND POLLUTION seed for Cooling	Score
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	A OOC A NOUT OF		
7.1 8.	ACCESSIBILITY Ensure flexible adapt If the development is	able and long-	term use of structures It meet the requirements of the nationally described space standard for internal space and layout?
•	ii tiio dovolopiiloiit io		is are not met, in the space below, please provide details of the functionality of the internal space and layout
AND	***		It meet Building Regulation Requirement M4 (2) 'accessible and adaptable dwellings'?
ь.	if the development is	If this is not me	It meet Building Regulation Requirement M4 (2) 'accessible and adaptable dwellings'? et, in the space below, please provide details of any accessibility measures included in the development.
			dental developments, are 10% or more of the units in the development to Building Regulation Requirement
OR		M4 (3) Wheeld	cental developments, are 10% or more of the units in the development to Bullating Regulation Requirement.
C.	If the development is	Please provide	al, does it comply with requirements included in Richmond's Design for Maximum Access SPG 2 e debails of the accessibility measures specified in the Maximum Access SPG that will be included in the
		development	See Design and Access Statement for further information
			subtotal 6
See D	give any additional releves	ant comments t ent for further in	to the Design Standards and Accessibility Section below
LBRUT S	ustainable Construction Score		oring Matrix for New Construction (Non-Recidential and domestic returb) TOTAL 63
	80 or more 71-79	A+ A	signimoanoe Project strives to achieve highest standard in energy efficient sustainable development Makes a major contribution towards achieving sustainable development in Richmond
	61-70 36-60	B	Heips to significantly improve the Borough's stock of sustainable developments Minimal effort to increase sustainability beyond general compliance
	36 or less	FAIL	Does not comply with SPD Policy
LBRUT S	ustainable Construction Score		oring Matrix for New Construction Recidential new-build Significance
	81 or more 64-50		Project strives to achieve highest standard in energy efficient sustainable development Project strives to achieve highest standard in energy efficient sustainable development
	66-63 36-64	A B	Makes a major contribution towards achieving sustainable development in Richmond Helps to significantly improve the Borough's stock of sustainable developments
	20-34	C FAIL	Minimal effort to increase sustainability beyond general compliance
	10 oclass		
	19 or less	PAIL	Does not comply with SPD Policy
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