Patel Taylor

Cambridge Road Estate
Hybrid Planning Application

November 2020

Sustainable Design and Construction Statement
(Including Circular Economy Statement)

CRE
CAMBRIDGE ROAD ESTATE

COUNTRYSIDE
Places People Love

THE ROYAL BOROUGH OF
KINGSTON
UPON THAMES

The Applicant

Cambridge Road (Kingston) Ltd

c/o Countryside Properties
Aurora House
71-75 Uxbridge Road
Ealing
London W5 5SL

The project site

Cambridge Road Estate
Project hub

2 Tadlow
Washington Road
Kingston Upon Thames
Surrey
KT1 3JL

Application forms

Covering letter

Application Form and Notices

CIL Additional Information Form

Design proposals

Planning Statement

Design and Access Statement
- Vol.1 - The Masterplan
- Vol.2 - The Detailed Component

The Masterplan
- Parameter Plans
- Illustrative Plans
- Design Guidelines

Phase 1 Architecture and Landscape
- GA Plans, Sections and Elevations

Supporting information

Statement of Community Involvement

Rehousing Strategy

Financial Viability Appraisal

Draft Estate Management Strategy

Transport Assessment
Phase 1 Travel Plan
Car Parking Management Plan
Servicing and Delivery Management Plan

Construction Logistics Plan
Construction Method Statement and Construction Management Plan
Sustainable Design and Construction Statement (Including Circular Economy Statement)

Environmental Statement
- Non Technical Summary
- Vol.1 – Technical Reports
- Vol.2 – Technical Appendices
- Vol.3 - Townscape and Visual Impact Assessment

Energy Statement (Including Overheating Assessment and Whole Life Cycle Assessment)

Daylight and Sunlight
Internal Assessment of the Detailed Component
External Assessment of the Illustrative Masterplan

Extraction and Ventilation Strategy
Noise Impact Assessment

Arboricultural Report and Tree Conditions Survey
Arboricultural Impact Assessment & Method Statement
Preliminary Ecological and Bat Survey Report
Biodiversity Net Gain Assessment

Archaeology and Heritage Assessment
Ground Conditions Assessment

Utilities Report

Flood Risk Assessment
Phase 1 Drainage Statement

Fire Strategy Report

Accessibility Audit
Health Impact Assessment
Equalities Impact Assessment

HODKINSON

Sustainability Statement (Including Circular Economy Statement)

Cambridge Road (RBK) LLP

Cambridge Road Estate

Final

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November 2020

HODKINSON

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ABOUT HODKINSON CONSULTANCY

Our team of technical specialists offer advanced levels of expertise and experience to our clients. We have a wide experience of the construction and development industry and tailor teams to suit each individual project.

We are able to advise at all stages of projects from planning applications to handover.

Our emphasis is to provide innovative and cost-effective solutions that respond to increasing demands for quality and construction efficiency.

Executive Summary

The purpose of this Sustainability Statement is to demonstrate that the proposed Cambridge Road Estate development by Cambridge Road (RBK) LLP in the Royal Borough of Kingston upon Thames is considered sustainable, as measured against relevant local, regional and national planning policies. The hybrid planning application comprises Plots B, C and E (Detailed) and Plots A, D, F-H, J-N and Q (Outline).

Through the incorporation of sustainable design and construction methods, energy and water saving measures, waste reduction techniques as well as measures to enhance the ecological value of the site, a good quality and sustainable development is proposed.

The key sustainability features outlined in this Sustainability Statement are listed below:

- **BREEAM:** All commercial units will be designed and built to achieve a BREEAM 'Excellent' rating under the New Construction 2018 scheme.
- **Energy efficiency:** The development will target a 35% reduction in Regulated CO_2 emissions through connection to an existing district heat network, energy efficiency measures and PV panels.
- **Overheating:** The scheme has been designed to ensure overheating risk was reduced to acceptable levels in accordance with CIBSE TM59:2017 requirements.
- **Water efficiency:** Flow control devices and water efficient fixtures and fittings will be installed in all dwellings to target a maximum internal daily water consumption of 105 litres/person/day.
- **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.
- **Circular Economy:** The principles of a circular economy shall be incorporated into the development, where possible.
- **Materials:** Where practical, new building materials will be sourced locally to reduce transportation pollution and support the local economy. New materials will be selected based on their environmental impact and responsible suppliers will be used where possible.
- **Flood Risk and SUDs:** The proposed development site lies in a low flood risk zone and will benefit from SUDs such as living roofs, permeable paving and geo-cellular storage.
- **Security:** Consultation with a Security Specialist will take place to ensure the development is safe and secure for its residents.
- **Sound insulation:** The dwellings are to target an improvement on Building Regulations Part E through party walls and floors.

- **Inclusive access:** 90% of the new dwellings will be designed to meet Building Regulations Approved Document M4(2) and 10% will meet Part M4(3).

- **Sustainable transport:** The site will benefit from a good existing public transport network and sustainable modes will be encouraged through the provision of 887 cycle storage spaces for the detailed component of the planning application.

- **Biodiversity and ecology:** Enhancements will be implemented through the provision of landscaped areas, play space and additional tree and shrub planting across the site.

- **Sustainable construction:** The site will aim to achieve a 'Beyond Best Practice' score with the Considerate Constructors Scheme and will closely monitor construction site impacts.

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1. INTRODUCTION

1.1 This Sustainability Statement has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Cambridge Road (RBK) LLP.

1.2 This Statement sets out the sustainable design and construction measures included in the planning application for the proposed development at Cambridge Road Estate in the Royal Borough of Kingston upon Thames.

Sustainability Statement Structure and Methodology

1.3 The formulation of the Sustainability Strategy for the proposed development has taken into account several important objectives, including:

> To achieve a viable reduction in CO_2 emissions with an affordable, deliverable and technically appropriate strategy;

> To address all national, regional and local planning policies and requirements;

> To provide a high quality development that is adaptable to future changes in climate;

> To minimise the negative impact of the proposed development on both the local and wider climate and environment;

> To achieve the highest viable levels of sustainable design and construction;

> To minimise emissions of pollutants such as oxides of nitrogen and particulate matter; and

> To create a pleasant, safe and friendly working and living environment that will be flexible to its occupants' needs.

1.4 This Sustainability Statement does not duplicate the work of the technical reports prepared in support of the application, but presents the findings in the overall context of sustainability.

1.5 **Chapter 2** provides an introduction to the site and the proposed development.

1.6 **Chapter 3** sets out the relevant national, regional and local policy documents which have been used to guide and inform the sustainability strategy for the proposed development.

1.7 **Chapters 4 to 15** outline the sustainability strategy of the proposed development in relation to the policy documents listed in Chapter 3. **Chapter 16** provides a summary of the key sustainability features associated with the proposed development.

2. DEVELOPMENT OVERVIEW

Site Location

2.1 The proposed development site at Cambridge Road Estate in the Royal Borough of Kingston upon Thames is approximately 9 hectares and is located to the immediate south of the A2043 Cambridge Road and Hawks Road, as shown in Figure 1 below.

Figure 1: Site Location – Map data © 2020 Google

2.2 The land use in the immediate vicinity of the site is predominantly residential and of a domestic suburban character and scale. Cambridge Road Estates was built in the late 1960s and early 1970s and currently comprises 832 residential homes; Hawks Road Clinic within the northwest of the site; The Bull and Bush Hotel within the west of the site; and Piper Community Hall within the south of the site. The site also includes small formal and informal play spaces and ground level car parking areas.

Proposed Development

2.3 The proposed development is described as follows:

"Hybrid Outline Planning Application for a mixed use development, including demolition of existing buildings and erection of up to 2,170 residential units (Use Class C3), 290sqm of flexible office floorspace (Use Class E), 1,395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), 1,250sqm community floorspace (Use Class F2), new publicly accessible open space and associated access, servicing, landscaping and works.

Detailed permission is sought for access, layout, scale, appearance and landscaping of Phase 1 for erection of 452 residential units (Use Class C3), 1,250sqm community floorspace (Use Class F2), 290sqm of flexible office floorspace (Use Class E), 395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), new publicly accessible open space and associated access, servicing, parking, landscaping works including tree removal, refuse/recycling and bicycle storage, energy centre and works ("the Proposed Development")."

2.4 Figure 2 below illustrates the proposed masterplan layout.

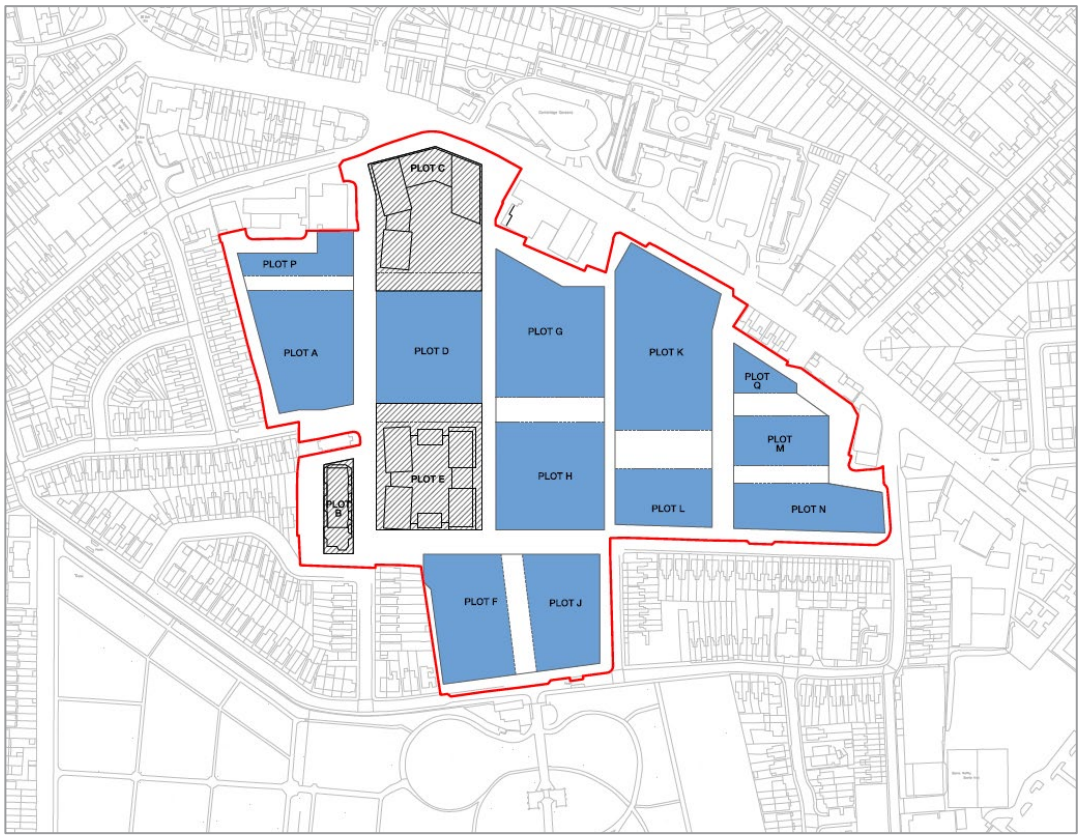


Figure 2: Proposed Masterplan Layout – Patel Taylor (October 2020)

3. RELEVANT PLANNING POLICY

3.1 The following planning policies and requirements have informed the sustainable design of the proposed development.

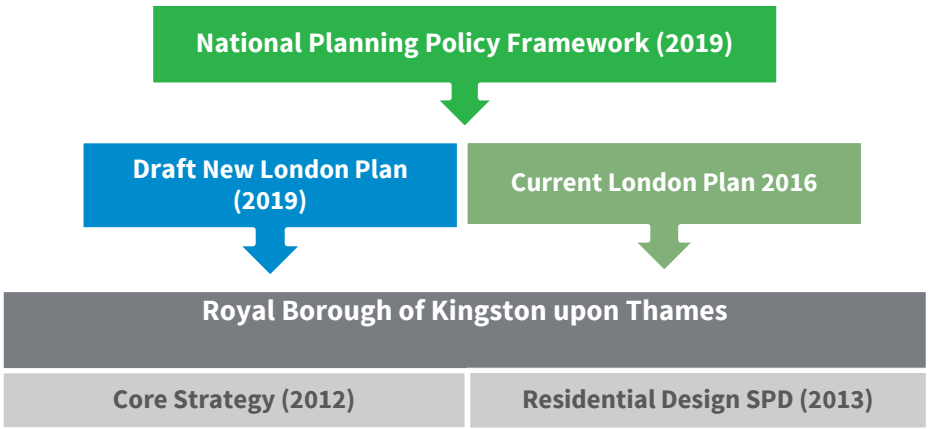


Figure 3: Relevant Planning Policy Documents

National Policy: NPPF

3.2 The revised National Planning Policy Framework (NPPF) was published on the 19th February 2019 and sets out the Government's planning policies for England.

3.3 The NPPF provides a framework for achieving sustainable development, which has been summarised as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*" (Resolution 42/187 of the United National General Assembly). At the heart of the framework is a **presumption in favour of sustainable development**.

3.4 The document states that the planning system has three overarching objectives which are interdependent and need to be pursued in mutually supportive ways:

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

b) **A social objective** – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with

accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

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

Regional Policy: The London Plan

Intend to Publish London Plan (2019)

3.5 The Panel of Inspectors report into the draft London Plan was published in October 2019. The Mayor considered the Inspectors' recommendations and, in December 2019, issued to the Secretary of State the Intend to Publish London Plan. The Secretary of State responded to this in March 2020 and the Mayor is now considering the Secretary of State's response and taking the steps to finalise the plan.

3.6 The following policies in the Intend to Publish London Plan are considered relevant to the proposed development and this Statement:

3.7 **Policy SI2 Minimising Greenhouse Gas Emissions** states that major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand.

3.8 **Policy SI3 Energy Infrastructure** states that energy masterplans should be developed for large-scale development locations which establish the most effective energy supply options.

3.9 **Policy SI4 Managing Heat Risk** states that major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the cooling hierarchy.

3.10 **Policy SI5 Water Infrastructure** states that in order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner. Development proposals should minimise the use of mains water in line with the Optional Requirement of the Building Regulations (residential development) achieving mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption).

3.11 **Policy SI7 Reducing Waste and Supporting the Circular Economy** states that a circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible should be promoted. Development plans that apply circular economy principals and set local lower thresholds for the application of Circular Economy Statements for development proposals are supported.

Current London Plan (2016)

3.12 The existing London Plan sets out an integrated economic, environmental, transport and social framework for the development of London. The following policies are considered relevant to the proposed development and this Statement:

3.13 **Policy 5.3 – Sustainable Design and Construction** states that the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime.

3.14 Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.

3.15 Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in the London Plan and the following sustainable design principles:

a) Minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems)

b) Avoiding internal overheating and contributing to the urban heat island effect

c) Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings

d) Minimising pollution (including noise, air and urban runoff)

e) Minimising the generation of waste and maximising reuse or recycling

f) Avoiding impacts from natural hazards (including flooding)

g) Ensuring developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions

h) Securing sustainable procurement of materials, using local supplies where feasible, and

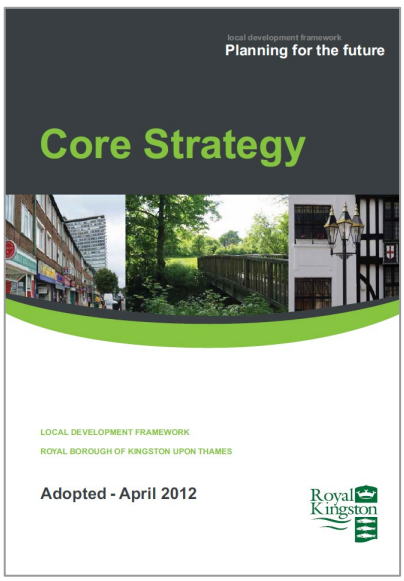
i) Promoting and protecting biodiversity and green infrastructure.

3.16 **Policy 5.11 – Green Roofs and Development Site Environs** requires major development proposals to include roof, wall and site planting, especially green roofs and walls where feasible.

3.17 **Policy 5.13 – Sustainable Drainage** requires that development should use sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy.

3.18 **Policy 5.15 – Water Use and Supplies** requires that development should minimise the use of mains water by incorporating water saving measures and equipment and that residential development is designed so that mains water consumption meets a target of 105 litres/person/day or less.

Local Policy: Royal Borough of Kingston Upon Thames



3.19 The Royal Borough of Kingston Upon Thames' Core Strategy document was adopted in April 2012. The following policies are considered relevant to this Statement:

3.20 **Policy CS1 – Climate Change Mitigation**: All development must be designed and built to make the most efficient use of resources, reduce its lifecycle impact on the environment and contribute to climate change mitigation and adaptation by:

> Reducing CO_2 emissions during construction and throughout the lifetime of the development;

> Building to the highest sustainable design and construction standards;

> Minimising water consumption;

> Using sustainable materials;

> Reducing levels of pollution, air, water noise and light; and

> Planning for increased flood risk.

3.21 **Policy CS2 – Climate Change Adaptation**: The Council will ensure that future development takes into consideration the following:

> Hotter summers and therefore increased cooling demands;

> Warmer, wetter winters and increased flood risk;

> Water shortages and drought;

> Urban heat island effect; and

> Subsidence.

3.22 **Policy DM1 – Sustainable Design and Construction Standards**: The Council will require all new residential developments to achieve successively higher levels of the Code for Sustainable Homes Level category for energy/CO_2.

New development should minimise air, noise and contaminated land impacts in line with industry best practice. Development proposals for contaminated land should include remediation measures.

The Council will promote good carbon management by monitoring CO_2 emissions to ensure the development is operated within the CO_2 emissions standards of the as-built specification and those outlined within the Council's Sustainable Design and Construction SPD. Measures to ensure these standards are maintained will be monitored by the Council.

Where appropriate, other new build developments over 500m^2 are encouraged to achieve higher levels of the appropriate BREEAM standard.

3.23 Since the publication of the Royal Borough of Kingston Upon Thames' Core Strategy Document in April 2012, the Code for Sustainable Homes was formally wound down following a technical housing standard review. This was announced by the Ministerial Statement by Rt. Honourable Eric Pickles on 25th March 2015 and the Government withdrew the Code for Sustainable Homes on 22nd April 2015.

3.24 **Policy DM3 – Designing for Changing Climate**: Design proposals should incorporate climate change adaptation measures based on the type and extent of the main changes expected in the local climate throughout the lifetime of the development, this is likely to require a flexible design that can be adapted to accommodate the changing climate e.g. provision of additional shading and cooling.

Where relevant, development proposals will need to take into consideration the requirements for climate change adaptation in the following ways:

> Design of streets and siting of buildings;

> Incorporation of green and blue infrastructure;

> Building density; and

> Reduction of potable water consumption.

All developments should provide communal or private space for residents and community that:

> Ameliorate the urban heat island effect;

> Providing flood attenuation if required; and

> Increase biodiversity.

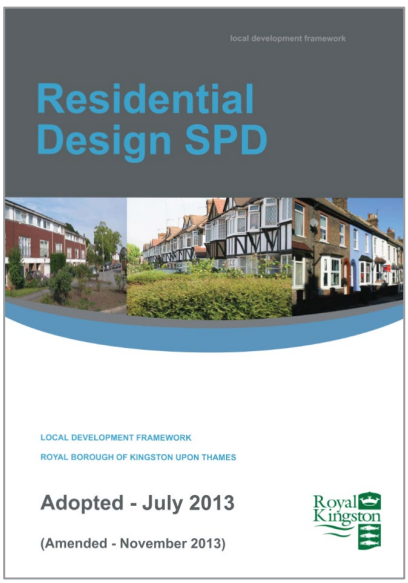
3.25 **Policy DM4 – Water Management and Flood Risk**: The Council will require development to be designed to take account of the impacts of climate change including: water conservation, the need for summer cooling and increase flood risk from fluvial and surface water flooding. Development proposals should include Sustainable Urban Drainage Systems (SUDs) to manage and reduce surface water run-off, unless it can be demonstrated that such measures are not feasible.

3.26 **Policy DM6 – Biodiversity**: The Council will ensure new development protects and promotes biodiversity as part of sustainable design. An ecological assessment is required on major development proposals and new development should not result in a net loss of biodiversity.

3.27 **Policy DM8 – Sustainable Transport for New Development**: All significant new development must develop and implement a robust and effective Travel Plan. New development must provide facilities on-site for cyclists as appropriate.

Residential Design Supplementary Planning Document (SPD)

3.28 The Royal Borough of Kingston Upon Thames' Residential Design SPD document was adopted in July 2013. The following policies are considered relevant to this Statement:



3.29 **Policy Guidance 3 – Sustainable Design**: Developers are encouraged to exceed statutory requirements as set out in London Plan policy 5.3, the Mayor's Housing SPG, and in Core Strategy Policies DM1 and DM3 with particular attention given to:

> Minimising energy and CO_2 emissions;

> Efficient use of natural resources (including water);

> Design of streets and siting of buildings;

> Optimising building density;

> Incorporation of green/blue infrastructure;

> Flood attenuation by sustainable drainage methods;

> Enhancing biodiversity; and

> Promoting local flood growing opportunities.

3.30 **Policy Guidance 9 – Biodiversity**: Developers should seek to minimise opportunities to enhance biodiversity locally.

3.31 **Policy Guidance 20 – Location and Design of Cycle Parking**: Cycle storage should wherever possible be integral to the design of the dwelling and be provided in accordance with the relevant standards.

3.32 **Policy Guidance 22 – Waste Storage**: Storage of waste facilities should be integral to the design of dwellings and located so that they can be accessed conveniently for residents. Development of six or more residential units will require communal waste corridors to be accommodation on site (at ground level); no more than 15m from the public highway; and if more than four communal wheeled bins for landfill waste are to be emptied, then the collection vehicle should be able to enter the development to avoid the risk of obstructing traffic.

3.33 **Policy Guidance 30 – Inclusive Design**: Developer should demonstrate through a Design and Access Statement how inclusive and accessible design has been achieved consistent with:

> A desire to achieve usable, attractive development that promoted high levels of pedestrian permeability through a site (where appropriate); and

> Lifetime Homes and Wheelchair Accessible Standards as set out in Policy DM13 of the Core Strategy.

3.34 In addition, developers must be aware of the need to comply with current building regulations with respect of accessibility. Building regulations approved document Part M(2010) provides accessibility standards that must be met for new residential accommodation.

4. BREEAM SUMMARY

4.1 In accordance with Policy DM1 of Kingston's Core Strategy the commercial units will be assessed under the BREEAM New Construction 2018 assessment with a target of achieving the required 'Excellent' rating.

4.2 A full BREEAM Pre-Assessment has been presented in **Appendix A** and provides an illustrative route to achieving the 'Excellent' rating. The predicted score at this stage is 72.52%, where a 'Very Good' score is ≥55% and an 'Excellent' score is ≥70%. This represents a high level of sustainable design and construction.

4.3 The principles and requirements of many of the individual credits feature throughout this Sustainability Statement, where appropriate, however the mandatory credits for BREEAM 'Excellent' are listed as follows:

> **Man 03: Responsible Construction Practices** – A minimum of one credit is to be achieved, requiring a Considerate Constructors Scheme score of between 25 and 34.

> **Ene 01: Reduction in CO_2 emissions** – An Energy Performance Ratio (EPR) is to be compared against benchmark figures to minimise operational energy demand and carbon emissions in buildings. A minimum of four credits are to be achieved.

> **Wat 02: Water Monitoring** – A water meter is to be provided on the mains water supply which should have a pulsed output connected to a Building Management System (BMS).

> **Mat 03: Responsible Sourcing** – All timber used on the project must be sourced in accordance with the UK Government's Timber Procurement Policy.

> **Wst 03: Operational Waste** – A dedicated space(s) for the segregation and storage of operational recyclable waste is to be provided. This is to be clearly labelled, easily accessible (to building users and for waste collection) and of an adequate size.

> **Le03: Mitigation Ecological Impact** – A suitably qualified ecologist is to carry out species calculations and at least one credit is to be achieved.

4.4 A number of credits are time dependent and must be looked at be carried out by the end of RIBA Stage 2. Whilst this has been determined as the most appropriate route to certification, the actual route to certification may vary as the detailed design progresses.

5. ENERGY AND CO_2 REDUCTION

Energy Strategy

5.1 An Energy Statement has been prepared by Hodkinson Consultancy and is submitted in support of this planning application. A summary of this statement has been outlined as follows however this document should be referred to for greater detail.

5.2 The energy strategy has been formulated following the current London Plan Energy Hierarchy: ***Be Lean, Be Clean*** and ***Be Green***. The overriding objective in the formulation of the strategy is to maximise the reductions in Regulated CO_2 emissions through the application of this Hierarchy with a cost-effective, viable and technically appropriate approach.

5.3 Following an examination of both local and national policy requirements, it has been determined that the proposed development is to target a reduction in CO_2 emissions of 35% beyond a determined Part L 2013 baseline case on site. For the purposes of this Energy Statement the SAP 10 carbon factors are to be utilised.

5.4 A range of ***Be Lean*** energy efficiency measures are proposed for the dwellings and non-residential areas. This is in line with the London Plan Energy Hierarchy. They enable the proposed elements to meet or exceed the baseline cases through energy efficiency alone. They further achieve the proposed requirements of the Draft London Plan by meeting the targeted energy efficiency requirements for this stage.

5.5 In accordance with the Energy Hierarchy, the feasibility of heating infrastructure as a ***Be Clean*** measure has also been carefully examined. Following a site analysis, a site wide heating network with a plant room located at the base of Block E will be present. This is to enable the connection to the wider heat network that is being developed by the Royal Borough of Kingston Upon Thames and is led by heat pumps. This development will be the anchor site and is expected to be connected to this wider network. This achieves the onsite carbon reductions (35%) required by Policy 5.2 of the London Plan.

5.6 In accordance with the Energy Hierarchy, the relevant ***Be Green*** renewable energy generating technologies have been evaluated. In line with Policy 5.9 renewables have been maximised through the application of low carbon heating and where safely and practicably feasible, application of photovoltaics.

5.7 The proposed design for the development will enable it to reduce its CO_2 emissions and go beyond the requirements of the London Plan representing a high level of sustainable design.

Lighting

5.8 Where possible, external lighting and any security lighting will be energy efficient and adequately controlled using PIR sensors, daylight cut-off sensors or time switches. This will ensure the conservation of energy when the lighting is not in use.

Appliances

5.9 The EU Labelling Scheme shows how appliances are rated according to their energy consumption. Due to improved energy efficiency in many new products, more appliances achieve A+, A++ and A+++. In January 2019, it was announced that A+ to A+++ will be phased-out over the coming years and the new grading system will revert back to A to G ratings. This should make it easier for consumers to understand how appliances compare against each other.

5.10 The choice of energy efficient appliances and the effective use of them will not only reduce unregulated CO_2 emissions but will save occupants money. Where provided, white goods will aim to be energy efficient with at least a B rating.

5.11 The purchasing of energy efficient white goods may also be promoted through the provision of information on the EU Labelling Scheme contained within the Home Information Manual.

Energy Monitoring

5.12 Where possible, energy display devices which can monitor electricity and primary heating fuel consumption will be provided to each of the dwellings. This can empower the occupants to be more aware of their usage and therefore make energy and cost savings, where possible.

5.13 For the non-residential units, an appropriate energy monitoring and management system (BMS) or separate accessible sub-metering strategy may be put in place to facilitate the monitoring of energy consumption from the major energy-consuming systems and plant. If installed, this will cover the supply for all relevant function areas within the buildings.

6. WATER REDUCTION

Internal Water Efficiency

6.1 Increased frequency of drought across Europe lines up with climate change projections and water companies in the UK capture much less rain for our use than people assume. As of February 2019, 12 out of the 23 water companies operating in areas of England were classified as being under 'serious' stress (Energy Saving Trust, 2019).

6.2 Each individual in the UK currently uses on average 140 litres/person/day and total UK demand for water in the 2080s is projected to increase by between 4-18% (CCRA2, 2015).

6.3 Reducing water consumption will not only help to preserve our water sources but will also save energy. Approximately 15% of a typical gas-heated household's heating bill is from heating water for showers, baths and taps and the energy used to heat water for devices and appliances emits an average of 875 kg of CO_2 per household per year. This is equivalent to the CO_2 emissions from driving more than 1,700 miles in an average family car (Energy Saving Trust, 2013). As such, internal water consumption will be significantly reduced through the use of practical and hygienic water saving measures.

Residential Water Use

6.4 All new dwellings will target a minimum water efficiency standard of **105 litres/person/day** in accordance with Policy SI5 of the Intend to Publish London Plan and the optional tighter Building Regulations Approved Document G requirement (110 litres/person/day). An evaluation of the proposed fixtures and fittings will be undertaken during the detailed design however an illustrative strategy to achieve this water target is set out in the Water Efficiency Calculator in **Appendix B.**

Leak Detection and Prevention

6.5 Another method of reducing water consumption is to ensure that water leaks do not go undetected. As such a leak detection system may be installed which will be capable of detecting a major water leak on the mains water supply within the commercial units and between the building and the utilities water meter.

Water Metering

6.6 A water meter with a pulsed output will also be installed on the mains supply. This will allow the water consumption of the development to be monitored and managed and therefore encourage reductions.

7. WASTE MANAGEMENT

7.1 Waste reduction and recycling is another key challenge of sustainable development and something which is strongly encouraged in the London Plan (Policy 5.17). The waste hierarchy, illustrated in Figure 4 below, prioritises those waste management options which are best for the environment.

Figure 4: Waste Hierarchy

7.2 The waste hierarchy establishes waste management options according to what is best for the environment. It places great importance on preventing waste in the first place. When waste is created it prioritises preparing if for re-use, then recycling, recovery and lastly disposal (e.g. landfill).

Construction Waste

7.3 The reduction of construction waste not only minimises environmental impacts through ensuring the responsible use of resources and waste disposal but can also significantly reduce construction costs for the developer.

7.4 Prior to demolition, Cambridge Road (RBK) LLP will undertake a pre-demolition audit as part of the BREEAM assessment to determine if refurbishment or reuse is feasible and, if not, to maximise the recovery of material from demolition.

7.5 Prior to construction, Cambridge Road (RBK) LLP will develop a Site Waste Management Plan which will establish ways of minimising waste at source, assess the use, reuse and recycling of materials on and off-site and prevent illegal waste activities. This plan will then be disseminated to all relevant personnel on and off-site.

7.6 The following waste minimisation actions will be considered, where possible:

> Opportunities for zero cut and fill to avoid waste from excavation or groundworks;

> Design for standardisation of components and the use of fewer materials;

> Design for off-site or modular build;

> Return packaging for reuse;

> Community reuse of surplus materials or offcuts; and

> Engage with supply chains and include waste minimisation initiatives and targets in tenders and contracts.

7.7 As part of their commitment to divert construction waste from landfill, Cambridge Road (RBK) LLP will regularly monitor and record the site's waste reduction performance. This will be compared against a target benchmark where at least 95% (by volume) of non-hazardous waste is to be diverted from landfill.

Household Waste

7.8 Cambridge Road (RBK) LLP is committed to following the above waste hierarchy and reducing waste sent to landfill. As such, adequate storage is to be provided in communal stores located at ground floor level, where both recyclable and non-recyclable waste can be stored in accordance with Kingston's waste collection service.

7.9 In addition, space will be provided for segregated recycling waste bins within the kitchen areas. This will involve the installation of recycling bins, where waste can be segregated into paper, glass, cans, plastic and cardboard, if necessary.

Commercial Waste

7.10 Adequate space for the segregation and storage of commercial waste and recycling will be provided in designated communal stores at ground floor level. This space will meet the following BREEAM requirements:

> Bins will be clearly labelled to assist with waste segregation, storage and collection;

> The stores will be accessible to building occupants and facilities operators; and

> The storage will be of a capacity that is appropriate to the building's type, size and predicted volumes of waste.

8. CIRCULAR ECONOMY

8.1 Current and future trends point toward the need for a fundamental shift in the way resources are consumed. A shift to a circular economy will provide considerable economic opportunities as a result.

8.2 In contrast to a linear economy (take, make, dispose), a circular economy keeps products and materials circulating through the system at their highest value for as long as possible, through re-use, recycling, refurbishment and remanufacturing. As 60% of total UK waste is generated from construction, demolition and excavation (Defra and Government Statistical Service, 2019) this transition from linear to circular is essential.

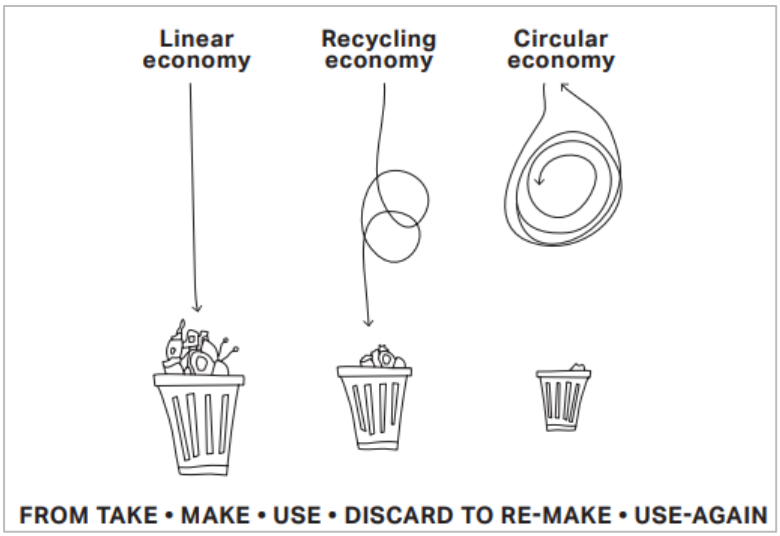


Figure 5: Linear, Recycling and Circular Economies (GLA, 2019)

8.3 A circular economy is defined in draft London Plan Policy SI7 'Reducing Waste and Supporting the Circular Economy' as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste.

8.4 The end goal is to retain the value of materials and resources indefinitely, with no residual waste at all. This is possible but will require a fundamental change in the way that buildings are designed, built, operated, and deconstructed.

8.5 Applying circular economy thinking to the built environment is complex, with many overlapping issues and trade-offs to consider. However, there are some core guiding principles that promote a regenerative and restorative whole systems approach that should be applied on every project. These are as follows:

> Conserve resources and source ethically;

> Design to eliminate waste (and for ease of maintenance); and

> Manage waste sustainably and at the highest value.

8.6 Please refer to the full Circular Economy Statement in **Appendix C** of this report for more detail.

9. MATERIALS

Environmental Impact

9.1 New building materials will be selected, where possible, to ensure that they minimise environmental impact and have low embodied energy – from manufacture, transportation and operational stages, through to eventual demolition and disposal.

9.2 All insulation materials will have an Ozone Depleting Potential (ODP) of zero and a Global Warming Potential (GWP) of less than 5. In addition, all decorative paints and varnishes will meet the relevant standards in order to reduce the emission levels of volatile organic compounds (VOCs).

Local and Responsible Sourcing

9.3 In accordance with London Plan Policy 5.3, preference will be given to the use of locally sourced materials and local suppliers, where viable. This will benefit the local economy as well as having environmental benefits through reduced transportation.

9.4 The main building materials will be responsibly and legally sourced from manufacturers with environmental management systems and/or responsible sourcing credentials, such as BES 6001.

9.5 Timber used on site, including timber used in the construction phase, such as hoarding, fencing and scaffolding, will be sourced from sustainable forestry sources (e.g. PEFC and FSC) where possible.

Suppliers

9.6 Cambridge Road (RBK) LLP will preferentially select suppliers, manufacturers and contractors who have sustainability policies and practices in place, or Environmental Management Systems.

9.7 Improvement in products will be promoted, such as the reduction of packaging, through ongoing liaison with suppliers and manufacturers.

Recycled Materials

9.8 Where feasible, Cambridge Road (RBK) LLP will commit to using materials that have been recycled. The use of recycled materials (e.g. crushed concrete from waste, used for hard-standing) has less embodied energy impact, other than that expended in their processing or transport.

Life Cycle Impacts

9.9 As part of the BREEAM Assessment, it is expected that a full life cycle assessment will be used to assess the main building elements for the areas associated with the commercial units. This involves options appraisals of two to four different super/substructure designs to identify options to reduce overall environmental impact.

9.10 For the full Whole Life Cycle Carbon assessment for the entire site, please refer to Energy Statement by Hodkinson Consultancy prepared in support of the planning application.

Designing for Durability and Resilience

9.11 Appropriate durability and protection measures will be incorporated in vulnerable parts of the internal and external building so as to minimise the frequency of replacing materials and therefore optimising material use. These measures are likely to include:

> Bollards and barriers to delivery areas;

> Hard-wearing floor finishes;

> Protection rails to corridor walls; and

> Kick plates on doors.

10.POLLUTION

Noise Pollution

10.1 Cambridge Road (RBK) LLP are committed to reducing noise disturbance to internal and external areas of dwellings to improve the health and wellbeing of the occupants and to help protect community cohesion.

10.2 A Noise Assessment has been undertaken by WYG. Noise surveys were undertaken, and the results used to determine the noise exposure of future residential dwellings and to characterise the existing baseline at surrounding sensitive receptor locations.

10.3 A glazing and ventilation strategy has been provided which achieves both ventilation and internal ambient noise level requirements in all habitable areas of the development. It is considered that the mitigation measures outlined in the report are suitable to reduce any noticeable and intrusive noise from the surrounding environment within proposed dwellings. Please refer to the report by WYG for further detail.

Reduction of Night Time Light Pollution

10.4 The external lighting strategy will be designed in accordance with the ILP Guidance notes for the reduction of obtrusive light (2011). All external lighting, except from security lighting, will be automatically switched off between the hours of 23:00 and 07:00. This will aim to ensure that lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

Air Quality

10.5 Poor air quality is the greatest environmental risk to public health in the UK and is known to exacerbate the impact of pre-existing health conditions. It is not only a major risk to human health, but it also has significant damaging impacts on both plants and animals.

10.6 Between 1990 and 2017, the UK's estimated emissions of nitrogen oxides reduced by 70%, and the estimated emissions of PM_{10} particulate matter reduced by 55% (DEFRA, 2018). This must continue to fall in future years. Cambridge Road (RBK) LLP are committed to reducing the proposed development's negative impact on air quality during construction and operation.

10.7 An Air Quality Assessment has been carried out by Ensafe Consultants, which concluded the following:

> **Construction Phase**: Potential construction phase air quality effects from fugitive dust emissions were assessed as a result of earthworks, construction and track out activities. It is

considered that the use of good practice control measures would provide suitable mitigation and reduce potential impacts to an acceptable level.

> **Operational Phase**: Dispersion modelling was undertaken in order to quantify existing pollutant concentrations and predict effects of local air quality as a result of road vehicle exhaust emissions associated with traffic generation by the proposed development. The dispersion modelling indicated that pollutant levels at proposed sensitive land uses within the site were below relevant air quality standards and, as such, the site is considered suitable for the proposed end-use. Additionally, the assessment concluded that effects from traffic emissions on pollutant levels were predicted to be not significant.

Air Tightness and Ventilation

10.8 Air leakage is to be minimised and an air permeability of 3 $m^3/hr/m^2$ will be targeted.

10.9 It is proposed to install Mechanical Ventilation with Heat Recovery (MVHR). MVHR provides a constant supply of fresh air to dwellings which has been filtered to remove external pollutants. It operates regardless of external conditions and provides the additional benefit of incorporating boost modes for use during hot weather or when internal humidity levels increase beyond acceptable levels.

11. FLOOD RISK & SURFACE WATER RUN-OFF

Flood Risk

11.1 Developments in low flood risk areas are promoted to, not only protect homes and local communities and reduce the cost implications if flooding occurs, but to protect the environment from the transfer of pollutants during flooding events.

11.2 According to the Environment Agency's Flood Map shown in Figure 6 below, the proposed development lies in a low risk flood zone (Flood Zone 1), indicating that the probability of flooding is 0.1% (1 in 1000 years).

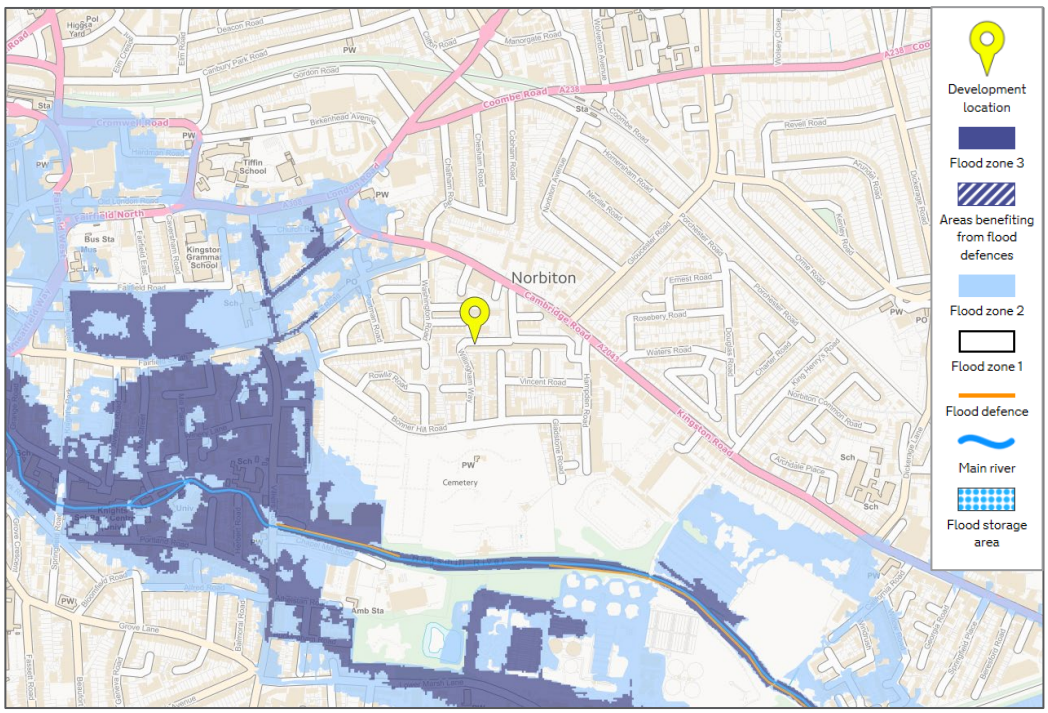


Figure 6: Environment Agency Flood Map – https://flood-map-for-planning.service.gov.uk

Sustainable Drainage Systems

11.3 Sustainable drainage systems (SuDS) can deliver multiple benefits which broadly fit into four categories: water quantity, water quality, amenity and biodiversity, shown in Figure7 overleaf. The overarching principle of SuDS design is that surface water runoff should be managed for maximum benefit.

11.4 Long term environmental and social factors must be included in decisions regarding sustainable drainage. Sustainable drainage takes account of the quantity and quality of runoff, and the amenity and aesthetic value of surface water in the urban environment.

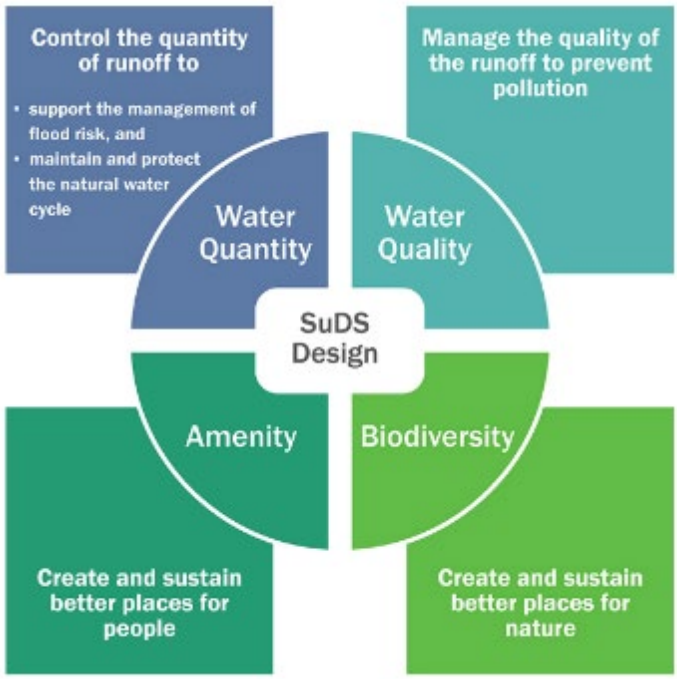


Figure 7: The four 'pillars' of SuDS – CIRIA SuDS Manual (2015)

11.5 The following listed SuDS are proposed. These will not only help to attenuate surface water but will provide the necessary water treatment.

> **Living roofs** will help to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.

> **Permeable paving** will allow rainwater to infiltrate downwards and be temporarily stored before infiltration to the ground, reused or directed towards the cellular attenuation tanks.

> **Geo-cellular storage** will be used to control and retain excess surface water run-off until it can infiltrate into the ground naturally.

12. BUILDING QUALITY

Security

12.1 Cambridge Road (RBK) LLP are committed to ensuring the development is safe and secure for the occupants; reduce the risks and costs associated with crime; and improve occupiers' quality of life by reducing the fear of crime.

12.2 As such, the proposed development will be aiming to incorporate the principles of Secured by Design where appropriate. This may involve consultation with a Security Consultant during the detailed design stage.

Sound Insulation

12.3 In order to reduce the likelihood of noise complaints and to ensure a high quality development is created, the development will be aiming to achieve airborne sound insulation values that will improve upon the performance standards outlined within the Building Regulations for England and Wales, Approved Document E.

12.4 The commercial element of the building will meet the appropriate acoustic performance standards and testing requirements for sound insulation, indoor ambient noise level and reverberation times in order to achieve the Hea 05 credit of the BREEAM assessment.

Inclusive Design

12.5 Cambridge Road (RBK) LLP's commitment to inclusivity will ensure that the proposed development is scaled appropriately so as to respond to the needs of all its users. Cambridge Road (RBK) LLP will endeavour to incorporate the requirements of the Equality Act (2010) into their design, making reasonable adjustments to enable disabled access, regularly reviewing whether the buildings are accessible and effective, and providing necessary design adjustments where it is practical to do so.

12.6 In addition, 90% of the new dwellings will be designed and built to Building Regulations Approved Document M4(2) standards, with 10% to Part M4(3) in accordance with London Plan Policy 3.8. These standards will ensure accessible and adaptable accommodation for everyone; young families, older people, individuals with a temporary or permanent physical impairment, and allow residents to stay in their home despite developing disabilities. They also enable flexibility, visitability (facilitating ease of visiting access to the homes by everyone, regardless of mobility or disability) and future-proofing i.e. the accommodation will be adaptable and able to respond to changing technological and environmental conditions.

Daylight and Sunlight

12.7 The promotion of good daylighting levels contributes to sustainability through improving the occupant's quality of life and reducing the building's energy consumption by minimising the need for artificial lighting.

12.8 Maximising exposure to natural daylight and providing an external view out provides users with a connection to nature, which can support mental wellbeing. Increasing the level of daylight within the building also reduces the need for artificial lighting, which can reduce operational costs and environmental impacts of the building. Further to this, naturally lit environments increase occupant productivity and support the regulation of circadian rhythms.

12.9 A Daylight and Sunlight Assessment has been undertaken by GIA. Please refer to GIA's report for the results of the assessment.

Overheating

12.10 Minimising the risk of summer overheating and high uncontrollable temperatures is important so as to ensure that homes are comfortable for their occupants and remain comfortable in the future. Cambridge Road (RBK) LLP commits to ensuring that all dwellings will not have a high risk of summer overheating and will adopt appropriate measures to ensure this is delivered.

12.11 A Dynamic Overheating Assessment of representative units across Blocks B, C and E of Phase 1 (the detailed component of the application) has been undertaken by Hodkinson Consultancy. The analysis has been undertaken in line with the Greater London Authority's guidance on preparing energy assessments and the Cooling Hierarchy in Policy SI4 of the London Plan.

12.12 The representative units tested demonstrate an acceptable level of overheating based on the London Plan Cooling Hierarchy and CIBSE TM59:2017 criteria. The results were based on some key design features; please refer to the report for further detail.

13. TRANSPORT AND LOCAL AMENITIES

Sustainable Transport

13.1 Sustainable transport links are central to the sustainability debate. They provide a positive contribution to environmental, societal and economic sustainability of the places they serve.

13.2 The provision of alternative sustainable transport options and associated facilities reduces dependency on traditionally fuelled cars and has the following benefits:

> Encourages active travel and helps improve people's health and wellbeing;

> Reduces congestion and encourages clean travel which helps to improve the air quality of the local area; and

> Provides cost savings compared with maintaining and running traditionally fuelled cars.

13.3 A Transport Assessment has been undertaken by Markides Associates. It is forecast that the proposed development trips will be distributed across all of the public transport modes within the vicinity of the site without reliance on any single station, line or service. The proposals are forecast to result in increases to the number of trips, however given the high PTAL of the site and the wide range of services and destinations which can be accessed from within a short walk from the site, once these trips have been distributed across those services and destinations the overall impact of the development is not considered to be significant. Please refer to the Transport Assessment for further detail.

Local Amenities

13.4 The proposed development has access to the following key amenities in the local area which will help to reduce dependency on private transport:

> Administrative services (e.g. post office, banks and cash points);

> Health services (e.g. GP practices, health centres and pharmacies);

> Small/large scale retail services (e.g. shops and restaurants);

> Recreation and leisure facilities (e.g. sports centres and cinemas); and

> Education and community facilities (e.g. nurseries, schools and community centres).

Public Transport

13.5 The site is well located within close proximity to a number of transport links, such as:

> **Norbiton Rail Station** is located approximately 400m to the north of the site and provides train services into Wimbledon, Clapham Junction and London Waterloo.

> **Local bus services** within the immediate vicinity of the site, providing frequent trips in all directions.

Cycle Parking

13.6 Encouraging cycling not only makes a positive contribution to health and well-being, but also reduces pressure on existing transport systems in accordance with Policy 6.9 of the London Plan.

13.7 All of the dwellings will have access to secure cycle stores, located on the ground floor of each block. A total of 829 long-stay and 58 short-stay spaces will be provided for Phase 1. The proposed cycle storage spaces for the remaining masterplan will be in line with the requirements of the Intend to Publish London Plan Policy T5.

Car Parking and Electric Car Charging

13.8 A total of 848 car parking spaces are to be provided across the development. A total of 3% of all spaces are to be for disabled use and an initial two spaces are proposed for use by a Car Club scheme in Phase 1.

13.9 Electric vehicles have the benefit of eliminating emissions, including carbon dioxide, oxides of nitrogen, carbon monoxide and particulates that normal cars emit. With road transport accounting for 66% of particulate emissions and 42% of NO_x emissions in London, measures such as electric vehicle charging points are strongly encouraged.

13.10 Therefore, in accordance with Policy 6.13 of the London Plan, the proposed development will allow for the provision of 20% active and 80% passive electric vehicle charging points.

Working from Home

13.11 The concept of working from home will be promoted by the provision of internal services and infrastructure, enabling a home office to be established in each dwelling. This will contribute to the vibrancy of the scheme, whilst offering additional environmental benefits in terms of potentially reducing the demand for transportation.

13.12 The home office space will likely comprise the provision of two double electric sockets, a broadband connection, good ventilation and adequate internal daylight levels.

14. BIODIVERSITY AND ECOLOGY

Brownfield Site

14.1 The site has been previously used for development which is predominantly covered in hard standing and is therefore considered 'brownfield'. Redeveloping and revitalising vacant and under-used sites is supported by the NPPF.

Protection of Ecological Value

14.2 A Preliminary Ecological Appraisal of the site has been carried out by Greengage Environmental Ltd. The survey aimed to establish the ecological value of the site and the presence/likely absence of notable and/or legally protected species in order to inform appropriate mitigation, compensation and enhancement actions.

14.3 Habitats recorded on site were common and widespread, however the potential to support a number of protected species was recorded. The site is considered to have low potential to support foraging bats; moderate potential to support roosting bats; confirmed presence of nesting birds; and low potential to support west European hedgehog.

14.4 To protect existing biodiversity, a series of measures will be implemented to reduce any impact on local wildlife. These include the following:

> All site operatives to be made aware of current legislation, including the protection of certain species;

> Site clearance works to be timed to avoid the main bird nesting season. If this is not possible, a check should be carried out prior to the works to determine the presence of any active nests;

> Suitable fencing should be erected to reduce the possibility of any damage to established vegetation; and

> Native species, or species of known wildlife value, should be used for the proposed new planting.

Enhancement of Ecological Value

14.5 Enhancing a site's ecological value not only helps to reduce a development's environmental impact but improves the health and wellbeing of the occupants through their interaction with the natural environment.

14.6 The strategy for the new planting will include the following where possible:

> Promote local ecology through the use of native seed and fruit bearing species;

> Attract pollinators such as bees and butterflies through the use of flowering, nectar rich species;

> Combine natural and ornamental species to enrich the planting mix and promote local biodiversity;

> Create new habitats to attract local fauna; and

> Interconnect existing and proposed habitats of the site and its surroundings where possible.

14.7 Ecological enhancement recommendations made by Greengage Environmental Ltd include:

> Provision of extensive, substrate biodiverse roofs on suitable flat roof areas;

> Biodiverse roof enhancements to provide additional invertebrate habitat features;

> Wildflower turf incorporated on any 'amenity grassland' areas;

> Wildlife friendly soft landscaping in public realm; and

> Diverse tree planting.

14.8 As detailed in Countryside Properties sustainable procurement plan, they will avoid the use of flora and fauna species listed on the Convention on International Trade in Endangered Species (CITES) List.

Biodiverse Roofs

14.9 Biodiverse roofs are to be provided in order to meet Policy 5.11 of the London Plan. Green/brown/living roofs have demonstrable sustainability benefits, including:

> Reduction in urban heat island effect (localised cooling through increased evaporation);

> Provision of ecological habitats for fauna and flora, particularly where these roofs can replicate pre-existing ecological conditions; and

> Reduction in surface water run-off.

15. SUSTAINABLE CONSTRUCTION

15.1 Sustainable construction involves the prudent use of existing and new resources and the efficient management of the construction process. This includes the following measures:

> Reducing waste during construction and demolition and sorting waste on site where practical;

> Reducing the risk of statutory nuisance to neighbouring properties as much as possible through effective site management;

> Controlling dust and emissions from demolition and construction; and

> Complying with protected species legislation.

Considerate Constructors Scheme

15.2 The development site will be registered with the Considerate Constructors Scheme. This is designed to encourage environmentally and socially considerate ways of working, to reduce any adverse impacts arising from the construction process. As commonly known, the Considerate Constructors Scheme aims are as follows:

> Enhancing the appearance;

> Respecting the community;

> Protecting the environment;

> Securing everyone's safety;

> Caring for the workforce.

15.3 The site will target *'Beyond Best Practice'* certification, achieving a score of at least 35 out of 50, with all of the five sections scoring at least seven points.

Monitoring Construction Site Impacts

15.4 During the construction processes, control procedures will be put in place to minimise noise and dust pollution and roads will be kept clean. The management systems will generally comprise procedures and working methods that are approved by the development team together with commercial arrangements to ensure compliance.

15.5 Further to the above, additional measures will be adopted to minimise the impact on the local area during construction. This will include the limiting of air and water pollution in accordance with best practice principles, as well as the recording, monitoring and displaying of energy and water use from site activities during construction.

15.6 In terms of construction traffic, this will be minimised by restricting deliveries and arrival times in order to manage potential impacts on existing and future occupants. Work will be limited to appropriate hours to be agreed with the Council, and suppressors will be used to reduce noise from machinery.

16.CONCLUSION

16.1 The issue of sustainable development has been considered throughout the design of the proposed Cambridge Road Estate development by Cambridge Road (RBK) LLP in the Royal Borough of Kingston upon Thames. In particular, the incorporation of sustainable design and construction methods, energy and water saving measures, waste reduction techniques as well as measures to enhance the ecological value of the site, a good quality and sustainable development is proposed.

16.2 The key sustainability features outlined in this Sustainability Statement are listed below:

> **BREEAM:** All commercial units will be designed and built to achieve a BREEAM 'Excellent' rating under the New Construction 2018 scheme.

> **Energy efficiency:** The development will target a 35% reduction in Regulated CO_2 emissions through connection to an existing district heat network, energy efficiency measures and PV panels.

> **Overheating:** The scheme has been designed to ensure overheating risk was reduced to acceptable levels in accordance with CIBSE TM59:2017 requirements.

> **Water efficiency:** Flow control devices and water efficient fixtures and fittings will be installed in all dwellings to target a maximum internal daily water consumption of 105 litres/person/day.

> **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.

> **Circular Economy:** The principles of a circular economy shall be incorporated into the development, where possible.

> **Materials:** Where practical, new building materials will be sourced locally to reduce transportation pollution and support the local economy. New materials will be selected based on their environmental impact and responsible suppliers will be used where possible.

> **Flood Risk and SUDs:** The proposed development site lies in a low flood risk zone and will benefit from SUDs such as living roofs, permeable paving and geo-cellular storage.

> **Security:** Consultation with a Security Specialist will take place to ensure the development is safe and secure for its residents.

> **Sound insulation:** The dwellings are to target an improvement on Building Regulations Part E through party walls and floors.

- **Inclusive access:** 90% of the new dwellings will be designed to meet Building Regulations Approved Document M4(2) and 10% will meet Part M4(3).
- **Sustainable transport:** The site will benefit from a good existing public transport network and sustainable modes will be encouraged through the provision of 887 cycle storage spaces for the detailed component of the planning application.
- **Biodiversity and ecology:** Enhancements will be implemented through the provision of landscaped areas, play space and additional tree and shrub planting across the site.
- **Sustainable construction:** The site will aim to achieve a 'Beyond Best Practice' score with the Considerate Constructors Scheme and will closely monitor construction site impacts.

17.REFERENCES

- Greater London Authority (2016) The London Plan: The Spatial Development Strategy for London Consolidated with Alterations Since 2011. GLA: London
- Greater London Authority (2019) The Intend to Publish London Plan
- Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework. MHCLG: London
- HM Government (2016) The Building Regulations Approved Document L1A: Conservation of Fuel and Power. NBS: London
- Energy Saving Trust (2019) *Why we should all be saving water*
- HR Wallingford (2015) *CCRA2: Updated projections for water availability for the UK*
- Energy Saving Trust (2013) *At home with water*
- Department for Environmental Food and Rural Affairs (2018) *Air Pollution in the UK 2017*

APPENDICES

Appendix A
BREEAM New Construction 2018 Commercial 'Excellent' Pre-Assessment

Appendix B
Water Efficiency Calculator

Appendix C
Circular Economy Statement

HODKINSON

Appendix A

BREEAM New Construction 2018 Commercial
'Excellent' Pre-Assessment

BREEAM 2018 TRACKER

Cambridge Road Estates

Project name & number	Cambridge Road Estates, 03358	**BREEAM assessor**	Zoe Lowther
Client	Countryside Properties	**Project manager**	Nikhil Doshi
Local authority & postcode	Royal Borough of Kingston upon Thames	**Rating required**	Excellent
Reason for BREEAM	Planning requirement	**Building type**	Retail
Status of project	Pre Assessment	**Assessment scope**	Shell Only
Development description	Mixed use development at Cambridge Road Estates.		

BREEAM assessment details	
Reference number	N/A
Scheme	New Construction 2018
Version	v.2
GIFA	

Target score
72.52%
Excellent

Awarded score
0.00%

BREEAM rating benchmarks	
Pass	≥ 30
Good	≥ 45
Very Good	≥ 55
Excellent	≥ 70
Outstanding	≥ 85

Meeting log

Date	Location	Key actions from DTM

BREEAM credits

Section	Available credits	Target credits	Section weighting	% credits targeted	Category score
Management	15	8	12.00%	53.33%	6.40%
Health & Wellbeing	8	5	7.00%	62.50%	4.37%
Energy	13	6	9.50%	46.15%	4.38%
Transport	12	10	14.50%	83.33%	12.08%
Water	2	2	2.00%	100.00%	2.00%
Materials	14	9	22.00%	64.29%	14.14%
Waste	10	7	8.00%	70.00%	5.60%
Land Use & Ecology	13	12	19.00%	92.31%	17.53%
Pollution	6	5	6.00%	83.33%	5.00%
Innovation	10	1	10.00%	10.00%	1.00%
Rating	**Excellent**				

Revision	Date	Revision details	Author	QA
v1	18.09.20	Planning Pre-Assessment	ZL	ZW

Producing BREEAM Evidence:
- All pieces of information need to have a clear source for the audit trail i.e. company branding, name of author and date;
- The BRE require calculator tools to be completed for specific issues. These will be completed by the assessor once all information required for the calculation is provided;
- Drawings produced for BREEAM should be annotated to show how each criterion is met. Notes can be added directly to the drawing, or annotated by hand.

Hodkinson Consultancy can provide you with a wide range of templates to help demonstrate compliance. Your assessor will discuss these with you.

BREEAM New Construction 2018 Tracker

	Issue				Credits				
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	Notes
Management	Man 01	Project brief and design	Project delivery planning	RIBA 2	The project delivery stakeholders will meet to identify and define roles, responsibilities and contributions for each key phase of project delivery. The project team will demonstrate how the project delivery stakeholders' contributions and the consultation process outcomes influence the Initial Project Brief, Project Execution Plan, Communication Strategy and Concept Design.	1	1		
			Stakeholder consultation	RIBA 2	All interested parties will be consulted and the design team will demonstrate how the consultation exercise influences the Project Brief and Concept Design. Prior to completion of the detailed design all interested parties give and receive consultation feedback.	1	1		
			Prerequisite - BREEAM Advisory Professional	RIBA 1	The project team, including the client, formally agree strategic performance targets early in the design process.	-	-		
			BREEAM Advisory Professional - Concept Design	RIBA 2	A BREEAM AP will work with the project team to maximise the project's overall performance against BREEAM. They will monitor progress against the performance targets and identify risks and opportunities related to the achievement of the rating.	1	1		
			BREEAM Advisory Professional (AP) - Detailed Design	RIBA 3	A BREEAM AP will continue to work with the project team to maximise the project's overall performance against BREEAM. Feedback will be provided to support them in taking corrective actions and achieving their agreed rating.	1	0		
	Man 02	Life cycle cost and service life planning	Elemental Life Cycle Cost (LCC)	RIBA 2	An entire asset LCC Plan will be produced with design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865: 2008. This will include an indication of future replacement costs over a period of analysis and will include service life, maintenance and operation cost estimates. Details of how the LCC Plan has been used to influence building and systems design and specifications to minimise life cycle costs and maximise critical value will be demonstrated by the team.	2	0		
			Component level life options appraisal	RIBA 4	A component level LCC options appraisal will be produced in line with PD 156865: 2008 and will include details on the building envelope, building services, finishes and external spaces. Appropriate examples provided by the design team will be used to demonstrate how this appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.	1	0		
			Capital cost reporting		Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/ m^2).	1	1		
	Man 03	Responsible construction	**Prerequisite -** Legally harvested and traded timber		All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber'.	-	-		
			Environmental management		The principal contractor will operate an Environmental Management System covering their main operations (e.g. ISO 14001). All parties who manage the construction site will also implement best practice pollution prevention policies and procedures on site.	1	0		
			Prerequisite - BREEAM Advisory Professional		The client and the contractor formally agree performance targets.	-	-		
			BREEAM Advisory Professional - Site		The BREEAM AP will also monitor construction progress throughout all stages where decisions critically impact BREEAM performance and will proactively identify risks and opportunities related to the procurement and construction process.	1	0		
			Responsible construction management		The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks. Compliance with Considerate Constructors is required for 1 credit.	1	1	1 credit - Excellent 2 credits - Outstanding	
					Compliance with Considerate Constructors is required whilst also undertaking additional responsible construction practices.	1	1		
			Monitoring of construction site impacts - Utility		Assign responsibility to an individual for monitoring, recording and reporting energy use and water consumption from all on-site construction processes throughout the build programme.	1	1		
			Monitoring of construction site impacts - Transport		Assign responsibility to an individual for monitoring, recording and reporting transportation data resulting from all on-site construction processes throughout the build programme.	1	1		
	Man 04	Commissioning and handover	Testing and inspecting building fabric		Post-construction testing and inspection will be undertaken by a suitably qualified professional who will undertake the survey and testing in accordance with the appropriate standard. Any defects identified during post-construction testing and inspection will be rectified prior to building handover and close out.	1	0		
					Total for management	**15**	**8**		

BREEAM New Construction 2018 Tracker

	Issue				Credits				Notes
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	
Health and wellbeing	Hea 01	Visual comfort	View Out		95% of the floor area in 95% of spaces for each relevant building area will be within 8m of an external wall. The external wall must have a window or permanent opening that provides an adequate view out. The window or opening must be ≥ 20% of the surrounding wall area.	1	0		
			Daylighting		At least 80% of floor area in occupied spaces (or 35% in retail sale areas) is adequately day lit with an average daylight factor of 2% or more.	2	0		
			External lighting		All external lighting located within the construction zone will be specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:20145 Light and lighting - Lighting of work places - Part 2: Outdoor work places.	1	1		
	Hea 05	Acoustic performance	Acoustic performance		Demonstrate that all spaces in the building achieve, and for the relevant areas exceed, the performance standards required by BS for sound insulation, indoor ambient noise levels and reverberation times.	1	1		
	Hea 06	Security	Security of site and building	RIBA 2	A Suitably Qualified Security Specialist (SQSS) will conduct an evidence-based Security Needs Assessment (SNA). This SNA will be used to identify attributes of the site and surroundings which may influence the approach to security for the development. The SQSS will develop a set of security controls and recommendations and these will be incorporated in the design.	1	1		
	Hea 07	Safe and healthy surroundings	Safe access		Dedicated and safe cycle paths will be provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. Also, dedicated and safe footpaths are provided on and around the site providing suitable links. Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths and it will ensured that any delivery areas are not accessed through general parking areas and do not cross or share pedestrian and cyclist paths. There will be dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. Also, parking and turning areas will be designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.	1	1		
			Outdoor space		There will be outside space providing building users with an external amenity area.	1	1		
					Total for health and wellbeing	8	5		
Energy	Ene 01	Reduction of energy use and carbon emissions	Energy performance		An Energy Performance Ratio for New Construction (EPR_{NC}) will be calculated. The EPR_{NC} achieved will be compared with the benchmarks below in order to award the corresponding number of BREEAM credits.	9	4	4 credits - Excellent 6 credits - Outstanding	
	Ene 03	External lighting	External lighting		External light fittings within the construction zone will have an average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt, automatic control to prevent operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	1	1		
	Ene 04	Low carbon design	Passive design analysis	RIBA 2	Note - To achieve this the first credit under Hea 04 Thermal Modelling must be achieved. The project team will analyse the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures. Passive design measures will be implemented to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings and the reduced total energy demand and carbon dioxide (CO_2) emissions resulting from the passive design measures will be calculated.	1	0		
			Free cooling		Note - To achieve this credit the passive design analysis credit must be awarded. A free cooling analysis will be included in the passive design analysis and it will identify opportunities for the implementation of free cooling solutions. The building will be naturally ventilated or will use a combination of free cooling strategies.	1	0		
			Low and zero carbon technologies	RIBA 2	An energy specialist will completes a feasibility study by the end of Concept Design, this will establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development. The LZC technologies for the building will be specified in line with the feasibility study recommendations. The reduced regulated carbon dioxide (CO_2) emissions resulting from the feasibility study will be quantified.	1	1		
					Total for energy	13	6		

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	Issue				Credits				
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	Notes
Transport	Tra 01	Transport assessment	Travel plan	RIBA 1	A travel plan is developed based on a site-specific travel assessment or statement.	2	2		
	Tra 02	Sustainable transport	Transport options implementation		Note - At least one credit must be achieved for Tra 01 for any credits to be awarded in this issue. Credits will be awarded based on the Accessible Index (AI) of the project, and the number of transport measures implemented.	10	8		
					Total for transport	12	10		
Water	Wat 02	Water meter	Water meter		A pulsed water meter is installed on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source. For water-consuming plant or building areas consuming 10% or more of the building's total water demand sub meters should be used or water monitoring equipment should be used. The water meter should connect to a BMS or utility monitoring system or should be capable of connecting to one.	1	1	Good Very Good Excellent Outstanding	
	Wat 03	Leak detection	Leak detection system		A leak detection system capable of detecting a major water leak on the utilities water supply within the building will be installed AND A leak detection will be installed between the buildings and the utilities water supply. This leak detection will be a permanent automated water leak detection system that alerts the building occupants to the leak and is activated when the flow of water passing through the water meter. Also, it will be able to identify different flow and therefore leakage rates and also programmable to suit the owner's or occupier's water consumption criteria.	1	1		
					Total for water	2	2		
Materials	Mat 01	Environmental impacts - LCA	Environmental impacts from construction products - Building life cycle assessment (LCA)		During the Concept Design and Technical Design, demonstrate the environmental performance of the building as follows: - Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications).	7	3		
	Mat 02	Environmental impacts – EPD	Specification of products with a recognised environmental product declaration (EPD)		Construction products with an EPD that achieve a total EPD points score of at least 20 will be undertaken. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The Mat 01/02 Results Submission Tool will verify the EPD points score and credit award.	1	1		
	Mat 03	Responsible sourcing of construction products	**Prerequisite**		All timber and timber-based products used on the project will be legally harvested and traded as per the UK Government's Timber Procurement Policy (TPP)	-	-	All ratings	
			Enabling sustainable procurement	RIBA 2	A sustainable procurement plan will be used to guide the specification towards sustainable construction products. This plan will include sustainability aims, objectives and strategic targets to guide procurement activities and will also include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. Details of the checking and verifying the effectiveness of the procurement plan will also be included. In addition, if the plan is applied to several sites or adopted at an organisational level it will identify the risks and opportunities of procurement against the process set out in BS ISO 20400:2017.	1	1		
			Measuring responsible sourcing		Superstructure, internal finishes, substructure and hard landscaping are responsibly sourced in accordance with the below targets: 3 credits > 30% of points achieved 2 credits > 20% of points achieved 1 credit > 10% of points achieved	3	2		
	Mat 05	Designing for durability and resilience	Protecting vulnerable parts of the building from damage		Protection measures will be incorporated into the building's design and construction to reduce damage to the building's fabric or materials.	1	1		
			Protecting exposed parts of the building from material degradation		Provide a detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors and provide convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design will be implemented and the design the roof and façade to prevent water damage, ingress and detrimental ponding will also be undertaken.				
	Mat 06	Material efficiency	Material efficiency	RIBA 1	Targets will be set and opportunities and methods to optimise the use of materials will be reported for all RIBA stages. The implementation of material efficiency will be reported on during developed design through to construction.	1	1		
					Total for materials	14	9		

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	Issue				Credits				Notes
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	
Waste	Wst 01	Construction waste management	Pre demolition audit	RIBA 2	A pre-demolition audit of any existing buildings, structures or hard surfaces will be carried out This will be used to determine whether refurbishment or reuse is feasible and to maximise the recovery of material for subsequent high grade or value applications.	1	1	1 credit - Outstanding	
			Construction resource efficiency		A compliant Resource Management Plan (RMP) covering non-hazardous waste materials, demolition and excavation waste will be produced. The site will meet or improve on the benchmarks as shown below: - One credit - <11.1 tonnes per 100m^2 - Two credits - <6.5 tonnes per 100m^2 - Three credits - <3.2 tonnes per 100m^2	3	1		
			Diversion of resources from landfill		Waste materials will be sorted into separate key waste groups either on-site or through a licensed contractor for recovery. The diversion from landfill benchmarks for non-hazardous construction waste and demolition and excavation waste generated will meet the following: - Non Demolition - 80% (tonnage) - Demolition - 90% (tonnage)	1	1		
	Wst 02	Recycled aggregates	**Pre-requisite**	RIBA 2	To encourage the reuse of site material, a pre demolition audit of any existing buildings, structures or hard surfaces will be undertaken.	-	-		
			Project Sustainable Aggregate Points		Aggregate uses, types and quantities will be identified for each identified use and aggregate type. The region in which the aggregates are sourced will be calculated (km).	1	0		
	Wst 03	Operational waste	Operational waste		Provide a dedicated space for the segregation and storage of operational recyclable waste generated. This will be appropriately labelled, accessible to building users and waste management contractors and be of a sufficient size. If large amounts of waste are expected, waste compactors or balers will be provided and if appropriate, organic waste facilities (with a water outlet).	1	1	Excellent Outstanding	
	Wst 05	Adaptation to climate change	Resilience of structure, fabric, building services and renewables installation	RIBA 2	A climate change adaptation strategy appraisal will be undertaken using a systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. Following this study develop recommendations or solutions based on the climate change adaptation strategy appraisal that aim to mitigate the identified impact.	1	1		
				RIBA 4	An update will be provided during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective.				
	Wst 06	Design for disassembly and adaptability	Design for disassembly and functional adaptability - recommendations	RIBA 2	A study to explore the ease of disassembly and the functional adaptation potential of different design scenarios will be carried out. Following this recommendations or solutions will be developed, based on the study that aim to enable and facilitate disassembly and functional adaptation.	1	1		
			Disassembly and functional adaptability – implementation	RIBA 4	The team will provide an update on how the recommendations or solutions have been implemented where practical and cost effective. Omissions will also justified in writing to the assessor. Any changes to the recommendations and solutions during the development of the Technical Design should also be recorded. A building adaptability and disassembly guide will be produced to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	1	1		
					Total for waste	10	7		

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	Issue				Credits				Notes
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	
Land Use and Ecology	Lue 01	Site selection	Previously occupied land		At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.	1	1		
			Contaminated land		A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified the degree of contamination, contaminant sources or types and the options for remediating sources of contamination. The remediation of the site will be carried out in accordance with the remediation strategy.	1	1		
	Lue 02	Risks and opportunities	**Prerequisite -** Assessment route selection		An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist.	-	-		
			Survey and evaluation	RIBA 1	Route 2 only: An appropriate individual is appointed at an early stage for the involvement of site configuration and to ensure that they can influence strategic planning decisions. An appropriate level of survey and evaluation will be carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish: - Current and potential ecological value and condition of the site, and related areas within the zone of influence; - Direct and indirect risks to current ecological value; - Capacity and feasibility for enhancement of the ecological value of the site and areas within the zone of influence.	1	1		
			Determining the ecological outcomes for the site	RIBA 2	To achieve this credit the survey and evaluation criteria must have been achieved. The project team will liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites for the project. When determining the ecological impact of the site this will involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. The optimal ecological outcome for the site will be selected after liaising with representative stakeholders and the project team.	1	1		
	Lue 03	Managing negative impacts on ecology	**Prerequisite –** Identification and understanding the risks and opportunities		To achieve this credit the credits under LE 02 must be achieved.	-	-		
			Planning, liaison, implementation and data	RIBA 2	Roles and responsibilities will be clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief. Site preparation and construction works will be planned and implemented at an early project stage to optimise benefits and outputs. The project team will implement the solutions, and measures that have been selected (see LE 02) during site preparation and construction works.	1	1		
			Managing negative impacts of the project		Route two only: Negative impacts from site preparation and construction works will be managed according to the hierarchy and either: - No overall loss of ecological value has occurred (2 credits) OR - The loss of ecological value has been limited as far as possible (1 credit)	2	2		
	Lue 04	Change and enhancement of ecological value	**Prerequisite -** Identifying and understanding the risks and opportunities		To achieve this credit the credits under LE 03 must be achieved.	-	-		
			Liaison, implementation and data collation		Route two only: The project team will implement the solutions and measures selected in a way that enhances ecological value in the following order: - On site, and where this is not feasible; - Off site within the zone of influence.	1	1		
			Enhancement of ecology		Route two only: Credits will be awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project.	3	2		
	Lue 05	Long term ecology management and maintenance	**Prerequisite -** Roles and responsibilities, implementation, statutory obligations		The client or contractor will confirm that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.	-	-		
			Planning, liaison, data, monitoring and review management and maintenance		The project team will liaise and collaborate with representative stakeholders to: - Monitor and review implementation and the effectiveness; - Develop and review management and maintenance solutions, actions or measures. The monitoring and reporting of on the ecological outcomes/successes for site implemented at the design and construction stage and the arrangements of ongoing management of the new landscape and habitats will be reviewed. Also, he ecological value of the site and its relationship to its zone of influence and any linked sustainable activities will be maintained. As part of the tenant or building owner information supplied a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features will be included.	1	1		
			Landscape and ecology management plan		A landscape and ecology management plan will be developed in accordance with BS 42020:20131 covering the first five years. The landscape and management plan will be updated as appropriate to support maintenance of the ecological value of the site.	1	1		
					Total for land use and ecology	**13**	**12**		

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	Issue				Credits				Notes
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	
Pollution	Pol 03	Flood and surface water management	**Prerequisite**		An appropriate consultant is appointed to carry out the following requirements; an appropriate consultant is one who has qualifications and experience relevant to designing SuDS and flood prevention measures and completing peak rate of run-off calculations.	-	-		
			Flood resilience		A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration.	2	2		
			Prerequisite - Surface water run-off		Surface water run-off design solutions must be bespoke.	-	-		
			Surface water run-off - volume		Drainage measures will be specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events. Relevant maintenance agreements for the ownership, long term operation and will also be in place and all calculations will include an allowance for climate change.	1	1		
			Surface water run-off - volume		Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND Drainage design measures will be specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change. Any additional predicted volume of run-off for this event will be prevented from leaving the site by using infiltration or other SuDS techniques.	1	1		
			Minimising watercourse pollution		Drainage strategy confirms that there is no discharge from the developed site for rainfall up to 5 mm and that areas with a low risk source of watercourse pollution will have an appropriate level of pollution prevention treatment provided. Areas with a high risk of contamination or spillage of substances have separators installed in surface water drainage systems. All water pollution prevention systems will be designed and installed in accordance with the recommendations of documents such as the SuDS manual and other relevant industry best practice. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS will also be in place.	1	0		
	Pol 04	Reduction of night time light pollution	Reduction of night time light pollution		The external lighting strategy has been designed in compliance with Table 2 (ILP) Guidance notes for the reduction of obtrusive light, 2011. Also All external lighting will have the capabilities to be automatically switched off between 23:00 and 07:00. If safety or security lighting is provided and will be used between 23:00 and 07:00, this will comply with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. Illuminated advertisements will be designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.	1	1		
					Total for pollution	6	5		

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	Issue				Credits				
	Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	Notes
Innovation	Man 03	Responsible construction	Responsible construction management		The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks, covering the items included in the Responsible Construction Management Template. All criteria must be met to achieve this credit.	1	1		
	Hea 01	Visual comfort	Daylighting		At least 80% of floor area in occupied spaces (or 50% in retail sale areas) is adequately day lit with an average daylight factor of 3% or more.	1	0		
	Hea 02	Indoor air quality	Emissions from construction products		Three of the product types noted below will meet the emission limits, testing requirements and any additional requirements as listed in the HEA02 table: - Paints and varnishes; - Wood based products; - Flooring materials; - Ceiling, wall, acoustic, thermal insulation materials; - Interior adhesives and sealants.	1	0		
	Hea 06	Security	Security of site and building		A compliant risk based security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	1	0		
	Ene 01	Reduction of energy use	Beyond zero net regulated carbon		The building will achieve an EPR NC ≥ 0.9 and zero net regulated CO_2 emissions. Energy generation from on-site and near-site LZC sources will be sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use. The exemplary credits will be awarded as follows: 1 credit - 10% 2 credits - 50% 3 credits - 100% (carbon negative)	3	0		
	Wat 01	Water consumption	Water consumption		The standard Wat 01 methodology will be used to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Exemplary credits will be awarded where a 65% improvement on the baseline has been achieved.	1	0		
	Mat 01	Environmental impacts	Third party verification		A suitably qualified third party will carry out the building LCAs OR produces a report verifying the building LCAs accurately represent the designs under consideration during Concept Design and Technical Design. For each LCA option, the findings of the verification checks made by the suitably qualified third party will be itemised in the report including. The suitably qualified third party's relevant skills and experience will be provided and a declaration of their third party independence from the project client and design team will be included in their report.	1	0		
	Mat 03	Responsible Sourcing	Measuring responsible sourcing		Superstructure, internal finishes, substructure and hard landscaping and core services are responsibly sourced in accordance with the below targets: 3 credits plus 1 exemplary credit > 50% of points achieved.	1	0		
	Wst 01	Construction waste management	Construction waste management		Prepare a compliant Resource Management Plan (RMP) covering non-hazardous waste materials, demolition and excavation waste and less than <1.9 tonnes of waste per 100m^2 will be generated. Sort waste materials into separate key waste groups either on-site or through a licensed contractor for recovery. Meet the diversion from landfill benchmarks for non-hazardous construction waste and demolition and excavation waste generated: Non Demolition - 95% (tonnage) Demolition - 85% (tonnage)	1	0		
	Wst 02	Recycled aggregates	Project sustainable aggregate points		Identify all aggregate uses and types on the project and determine the quantity in tonnes for each identified use and aggregate type. Identify the region in which the aggregate source is located and calculate the distance in kilometres travelled by all aggregates by transport type.	1	0		
	Wst 05	Adaptation to climate change	Responding to climate change		In addition to the Wst 05 criteria the following credits will also need to be achieved: - Hea 04 thermal comfort; - Ene 01 reduction of energy use and carbon emissions; - Ene 04 low carbon design; - Wat 01 water consumption; - Mat 05 designing for durability and resilience; - Pol 03 Flood and surface water management.	1	0		
	Le 02	Risks and opportunities	Determine the ecological outcomes for the site		When determining the optimal ecological outcome for the site the wider site sustainability-related activities and the potential for ecosystem service related benefits will be considered. This will include opportunities for integrating ecology with wider site sustainability-related activities and ecosystem service related benefits. The following must also be achieved: - Hea 07 Safe and healthy surroundings; - Pol 03 Flood and surface water management - Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution'; - Pol 05 Reduction of noise pollution.	1	0		
					Total for Innovation	**10**	**1**		

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Appendix B

Water Efficiency Calculator

Water Efficiency Calculator
Cambridge Road Estates

	Internal Water Consumption			
Installation Type	**Unit of Measure**	**Capacity / Flow Rate**	**Litres/person/day**	**Notes**
WC	Full Flush Volume (Litres)	**6**	8.76	Low flush WCs will be installed to reduce the volume of water consumed during flushing. All WCs will have dual flush cisterns which will provide both part (4L) and full (6L) flushes.
	Part Flush Volume (Litres)	**4**	11.84	
Basin Tap	Flow Rate (Litres/minute)	**4**	7.90	All taps (excluding kitchen taps) will be reduced to 4 litres/minute using flow restrictors. Where multiple taps are to be provided the average flow rate will be used.
Bath	Capacity (Litres to overflow)	**160**	17.60	All baths will have reduced capacities of 160 litres (excluding displacement). The bath taps are not included in this calculation as they are already incorporated into the use factor for the baths.
Shower	Flow Rate (Litres/minute)	**8**	34.96	Shower flow rates will be reduced to a maximum of 8 litres/minute using flow restrictors fixed to the shower heads. These contain precision-made holes or filters to restrict water flow and reduce the outlet flow and pressure.
Kitchen Tap	Flow Rate (Litres/minute)	**5**	12.56	Kitchen taps will be reduced to 5 litres/minute using flow restrictors which will be fitted within the console of the tap or in the pipework.
Washing Machine	Water Consumption (Litres/kg)	**8.17**	17.16	Water efficient washing machines or washer-dryers will be specified. The make and model numbers of the appliances are unknown at this stage therefore a default figure of 8.17 litres/kg has been assumed.
Dishwasher	Water Consumption (Litres/place setting)	**1.25**	4.50	All dishwashers will be water efficient. The make and models numbers are unknown therefore a default figure of 1.25 litres/place setting has been assumed at this stage.
Net Internal Water Consumption (Litres/person/day)			**115.3**	
Normalisation Factor			**0.91**	
Total Internal Water Consumption (Litres/person/day)			**104.9**	The total *internal* water consumption target of ≤105 litres/person/day will be achieved in accordance with Regulation 36 para (2)b optional requirement Approved Document G.
Allowance for External Water Consumption (Litres/person/day)			**5**	
Total Water Consumption (Litres/person/day)			**109.9**	The *total* water consumption target of ≤110 litres/person/day will be achieved in accordance with Regulation 36 para (2)b optional requirement of Approved Document G.

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Appendix C

Circular Economy Statement

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Circular Economy Statement

Cambridge Road (RBK) LLP

Cambridge Road Estate

Final

Maihul Varsani
BSc (Hons), MSc

October 2020

DOCUMENT CONTROL RECORD
REPORT STATUS: FINAL

Version	Date	Reason for issue	Author	Checked by	Approved for Issue by Project Manager
v.1	02.10.20	Draft	MV	ZW	ND
v.2	27.10.20	Final	MV	ZW	ND

ABOUT HODKINSON CONSULTANCY

Our team of technical specialists offer advanced levels of expertise and experience to our clients. We have a wide experience of the construction and development industry and tailor teams to suit each individual project.

We are able to advise at all stages of projects from planning applications to handover.

Our emphasis is to provide innovative and cost-effective solutions that respond to increasing demands for quality and construction efficiency.

Definitions

The following definitions will assist in reading this Circular Economy Statement:

Adaptability (Design for) – Designed to meet the needs of the present, but with consideration of how those needs might change in the future and designed for change in the form of periodic remodelling including alterations or replacement of non-structural parts.

Circular Economy – "*A circular economy is one that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles*" - Ellen MacArthur Foundation.

Embodied carbon – The carbon that is released in the manufacturing, production, and transportation of our building materials.

Flexibility (Design for) – Designed to balance the needs of the present with how those needs will change in the future and designed for change through frequent reconfiguring including reconfiguration of non-structural parts.

Longevity (Design for) - Tailored to well-defined, long term needs while being durable and resilient or able to cope with change with little modification/no replacement of parts due to its 'loose fit', generous proportions and readiness for alternative technologies, different ways of living or working and a changing climate.

Operational Carbon – The carbon load created using energy to heat and power a building.

RIBA Stages – The Royal Institute of British Architects (RIBA) stages organise the process of briefing, designing, constructing, maintaining, operation and using building projects into a number of key stages.

Recoverability (Design for) – Designed to be deconstructed and reused or recycled on a part by part basis due to neither modules nor a kit of parts being desirable, feasible or viable and/or a limited future market as a result of unusual parts, dimensions or specifications.

Reusability (Design for) – Designed to be redeployed as modules or reused as a kit of parts on one or more different sites while minimising any servicing and maximising the size of the future market by using high-demand, standard dimensions and specifications

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1. INTRODUCTION

1.1 This Circular Economy Statement has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development.

1.2 The development has considered the following circular economy principles:

> Conserve resources and source ethically;

> Design to eliminate waste (and for ease of maintenance);

> Manage waste sustainably and at the highest value;

1.3 The above assessment has been undertaken at RIBA stages 2-3 and will be submitted as part of the hybrid planning application, to the Royal Borough of Kingston upon Thames. The development summarised in this application concerns:

> *"Hybrid Outline Planning Application for a mixed use development, including demolition of existing buildings and erection of up to 2,170 residential units (Use Class C3), 290sqm of flexible office floorspace (Use Class E), 1,395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), 1,250sqm community floorspace (Use Class F2), new publicly accessible open space and associated access, servicing, landscaping and works.*

> *Detailed permission is sought for access, layout, scale, appearance and landscaping of Phase 1 for erection of 452 residential units (Use Class C3), 1,250sqm community floorspace (Use Class F2), 290sqm of flexible office floorspace (Use Class E), 395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), new publicly accessible open space and associated access, servicing, parking, landscaping works including tree removal, refuse/recycling and bicycle storage, energy centre and works ("the Proposed Development")."*

1.4 The aim of circular economy is to retain the value of materials and resources indefinitely, with no residual waste at all.

1.5 The following consultant reports have been referred to while developing this statement:

> Design and Access Statement, Patel Taylor

> Energy Strategy, Hodkinson Consultancy

> Sustainability Statement, Hodkinson Consultancy

> Environmental Impact Assessment, Barton Wilmore

2. POLICY AND REGULATIONS

2.1 This chapter highlights the policies and regulations which are relevant to the proposed Cambridge Road Estate development.

Regional Policy: The Intend to Publish London Plan

2.2 Whilst not yet adopted, the Intend to Publish London Plan now carries increasing weight as a material consideration. The Intend to Publish version of the London Plan has been reviewed by the Secretary of State. However, it should be noted, directions have been issued in respect of some policies but none that relate to the sustainability and circular economy matters.

2.3 Policy SI7, listed below, is considered relevant to the proposed development and this Statement. It explains that referable schemes submitted, following the adoption of the new London Plan, will be required to provide a Circular Economy Statement to demonstrate how circular economy principles have been accommodated throughout the proposed project phases.

> **Policy SI7 Reducing Waste and supporting the Circular Economy**.

A. Waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by:

1. Promoting a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible

2. Encouraging waste minimisation and waste avoidance through the reuse of materials and using fewer resources in the production and distribution of products

3. Designing developments with adequate and easily accessible storage space that supports the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass and food).

B. Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted, to demonstrate:

1. How all materials arising from demolition and remediation works will be re-used and/or recycled

2. How the proposal's design and construction will enable building materials, components and products to be disassembled and re-used at the end of their useful life

3. Opportunities for managing as much waste as possible on site

4. Adequate and easily accessible storage space to support recycling and re-use

5. How much waste the proposal is expected to generate, and how and where the waste will be handled.

6. How performance will be monitored and reported.

Local Policy: Royal Borough of Kingston Upon Thames

2.4 The Royal Borough of Kingston Upon Thames' Core Strategy document was adopted in April 2012. The following policies are considered relevant to this Statement:

2.5 **Policy CS1 – Climate Change Mitigation**: All development must be designed and built to make the most efficient use of resources, reduce its lifecycle impact on the environment and contribute to climate change mitigation and adaptation by:

> Reducing CO_2 emissions during construction and throughout the lifetime of the development;

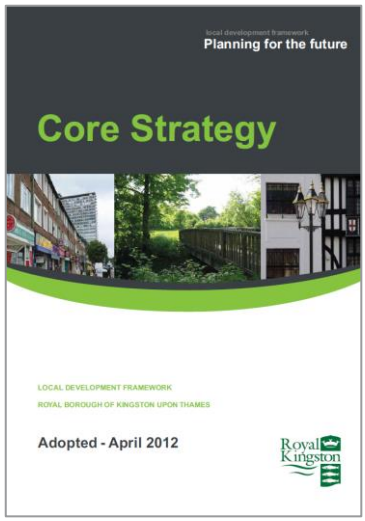
> Building to the highest sustainable design and construction standards;

> Minimising water consumption;

> Using sustainable materials;

> Reducing levels of pollution, air, water noise and light; and

> Planning for increased flood risk.



Guidance Documents

2.6 Preliminary guidance has been released by the GLA; it outlines guidance on Circular Economy statements that should accompany all referable planning applications in line with the ItP Policy SI7. This document will be consulted upon following adoption of the new London Plan.

2.7 The guidance notes that Circular Economy Statements should be submitted at three stages:

> **Outline/pre-application (RIBA Stage 1/2)** - Draft Circular Economy Statement with a focus on the strategic approach;

> **Full application (RIBA Stage 2/3)** - Detailed Circular Economy Statement outlining how the principles will be addressed through detailed design.

> **Post-completion stages (RIBA Stage 5/6)** - Post-Planning Updates should outline the progress in meeting the targets and commitment can be provided during the construction process.

2.8 As the proposed Cambridge Road Estate development is at RIBA 2/3 with a hybrid application being submitted, a detailed Circular Economy Statement will be produced. However, as this guidance has not been fully adopted the actions within are not compulsory.

2.9 In addition, the following guidance is available to apply circular economy principles to projects:

> 'BS 8001:2017 – Framework for Implementing the Principles of the Circular Economy' by British Standards Institution, May 2017.

> 'Designing for a Circularity - Primer' by GLA, October 2019.

> 'Circular Economy Guidance for Construction Clients' by UK Green Building Council (UKGBC), April 2019.

BREEAM

2.10 The commercial areas of the proposed Cambridge Road Estate development, will be assessed to target a minimum of BREEAM 'Excellent' rating under the New Construction 2018 scheme, thus representing a high level of sustainable design and construction. A full BREEAM Pre-Assessment has been presented in Appendix A of the Sustainability Statement.

2.11 Implementing a circular economy approach can support achieving the following credits:

> **Waste 01 Construction Waste Management –** Aims to reduce construction waste by encouraging reuse, recovery, and best practice waste management practices to minimise waste going to landfill. The pre-demolition audit of existing buildings takes place, to identify where existing buildings, structures or hard surfaces may be reused as part of the planned project. It ensures procedures are in place for sorting construction waste into waste groups. Encourages circular routes for construction waste;

> **Waste 03 Operational Waste** (mandatory credit for BREEAM 'Excellent') **–** Encourages the recycling of operational waste through the provision of dedicated storage facilities and space. Highlights the importance to provide sufficient storage areas within the building to reflect the recyclable waste streams that are generated and then collected by the local waste authority;

> **Waste 05 Adaptation to Climate Change –** Encourages to take measures to mitigate the impact of extreme weather conditions arising from climate change over the lifespan of the building. Requires an assessment of structural and fabric resilience to extreme weather conditions arising from projected climate change, with mitigation where feasible. Reduces likelihood of needing to replace products and materials due to damage or poor functionality resulting from changing climate conditions;

- **Waste 06 Design for Disassembly and Adaptability –** Aims to avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy;

- **Materials 01 Environmental Impacts from Construction Products –** Building and Life Cycle Assessment (LCA) – This encourages the use of reused / recycled / reclaimed and reusable / recyclable / durable / adaptable materials, products and systems in the building services and superstructure reduces life cycle impacts;

- **Materials 05 Designing for Durability and Resilience** – Aims to reduce the need to repair and replace materials resulting from damage to exposed elements of the building and landscape. It requires protecting vulnerable and exposed parts of the building from damage and material degradation, thus increasing longevity and resilience of building components, resulting in fewer resources required for repairs and refurbishment; and,

- **Materials 06 Material Efficiency -** Aims to avoid unnecessary material use arising from over specification without compromising structural stability, durability, or the service life of the building. Targets and reporting on opportunities and methods to optimise the use of materials, at various stages of design and construction will be required. It will be necessary to develop and record the implementation of material efficiency at various stages of design construction. Targets and actual material efficiencies achieved will need to be reported. Less over-specification means that there is less wastage of materials and reduced overall demand.

3. DEVELOPMENT OVERVIEW

Site Location

3.1 The proposed development site at Cambridge Road Estate in the Royal Borough of Kingston upon Thames is approximately 9 hectares and is located to the immediate south of the A2043 Cambridge Road and Hawks Road, as shown in Figure 1 below.

Figure 1: Site Location – © Map data Google

3.2 The land use in the immediate vicinity of the site is predominantly residential and of a domestic suburban character and scale. Cambridge Road Estates was built in the 1970s and currently comprises 832 residential homes; Hawks Road Clinic within the northwest of the site; The Bull and Bush Hotel within the west of the site; and Piper Community Hall within the south of the site. The site also includes small formal and informal play spaces and ground level car parking areas.

Proposed Development

3.3 The proposed development is described as follows:

"Hybrid Outline Planning Application for a mixed use development, including demolition of existing buildings and erection of up to 2,170 residential units (Use Class C3), 290sqm of flexible office floorspace (Use Class E), 1,395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), 1,250sqm community floorspace (Use Class F2), new publicly accessible open space and associated access, servicing, landscaping and works.

Detailed permission is sought for access, layout, scale, appearance and landscaping of Phase 1 for erection of 452 residential units (Use Class C3), 1,250sqm community floorspace (Use Class F2), 290sqm of flexible office floorspace (Use Class E), 395sqm of flexible retail/commercial floorspace (Use Class E/Sui Generis), new publicly accessible open space and associated access, servicing, parking, landscaping works including tree removal, refuse/recycling and bicycle storage, energy centre and works ("the Proposed Development").

3.4 At this stage of the design, it is intended that the proposed structure will be a concrete frame. Figure 2 below illustrates the proposed development layout.

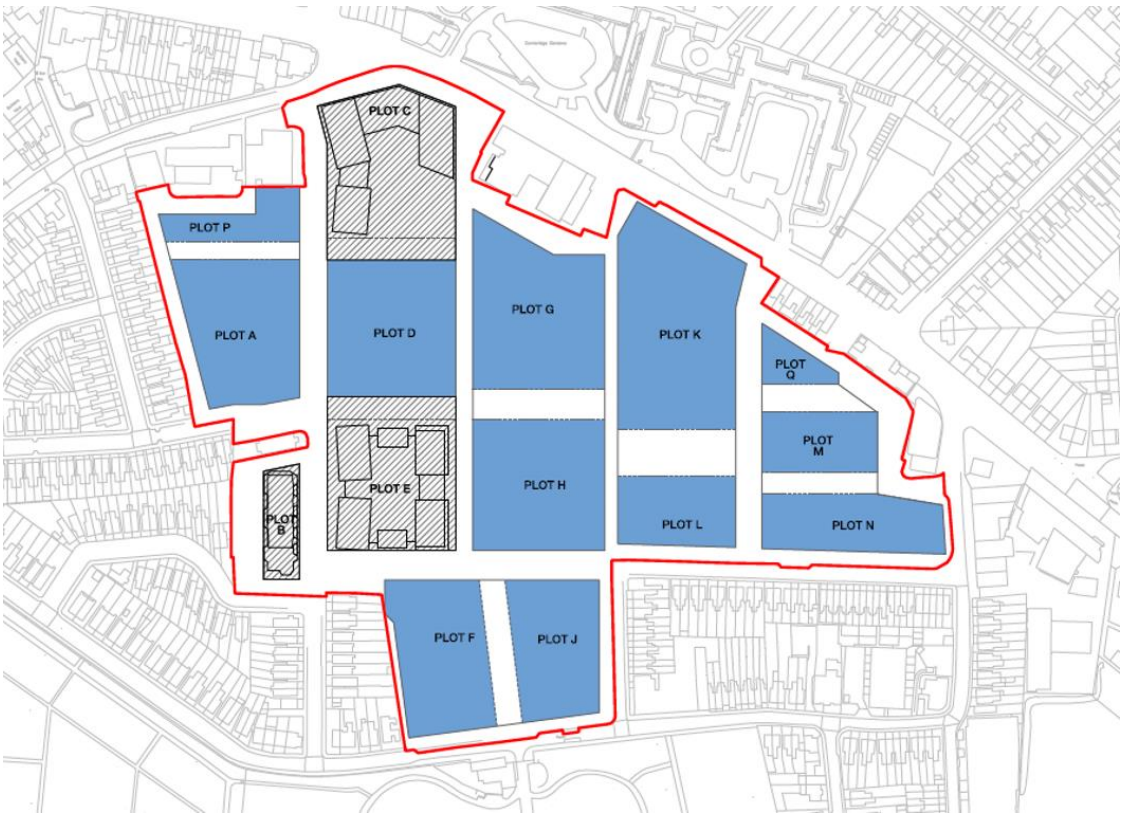


Figure 2: Proposed Masterplan Layout (Patel Taylor, October 2020)

4. CIRCULAR ECONOMY PRINCIPLES

4.1 A circular economy is defined in the Intend to Publish London Plan Policy SI7 'Reducing Waste and Supporting the Circular Economy' as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste.

4.2 In contrast to a linear economy (take, make, dispose), a circular economy keeps products and materials circulating through the system at their highest value for as long as possible, through re-use, recycling, refurbishment, and remanufacturing.

4.3 The end goal is to retain the value of materials and resources indefinitely, with no residual waste at all. This is possible but will require a fundamental change in the way that buildings are designed, built, operated, and deconstructed.

4.4 Applying circular economy thinking to the built environment is complex, with many overlapping issues and trade-offs to consider. However, there are some core guiding principles that promote a regenerative and restorative whole systems approach that should be applied on every project. These are as follows:

1. **Conserve resources and source ethically;**
    - > Minimise the quantities of materials used
    - > Minimise the quantities of other resources used
    - > Specify and source materials and other resources responsibly and sustainably
2. **Design to eliminate waste (and for ease of maintenance);**
    - > Design for longevity, adaptability or flexibility and reusability or recoverability
    - > Design out construction, demolition, excavation, and municipal waste arising
3. **Manage waste sustainably and at the highest value;**
    - > Manage demolition waste
    - > Manage excavation waste
    - > Manage construction waste
    - > Manage municipal waste

4.5 Adoption of these three core principles on developments would significantly reduce the amount of raw and new materials required for the proposed Cambridge Road Estate development. Alongside this, a reduction in vehicle movements, air pollution, noise and greenhouse gas emissions would also be beneficial. The developer could benefit from cost savings through the reduction in materials required, if this was undertaken.

5. CIRCULAR ECONOMY ASPIRATIONS

5.1 Circular economy considerations have formed a key part of the Sustainability Strategy for the Cambridge Road Estate development, given the scale of the development, and the client's wider sustainability aspirations.

5.2 Considerations around resource efficiency and responsible procurement have been considered within the sustainability strategy from the early stages.

5.3 It is proposed that the developer will engage Countryside Properties as its Construction Manager. Countryside will ensure that the development at Cambridge Road Estate, achieves the goals and targets set out in the company's sustainability strategy and policies to ensure that development is delivered in an environmentally responsible, ethical, safe and sustainable manner.

5.4 Although not directly related to circular economy, the vision set by Countryside encompass the general principals surrounding circular economy, these are as follows:

- **Waste** – In 2019 Countryside improved their waste management monitoring and reporting using the Building Research Establishment (BRE) SmartWaste reporting tool. Countryside produced 6.9 tonnes per 100m^2 of developed area in 2019 compared to 7.7 tonnes per 100m^2 in 2018, a reduction of 10% on the previous year, of which 97.5% and 99.4%, respectively, was diverted from landfill.

- **Resource use** – Countryside will continue to work more closely with supply chains and contractors to improve waste management and reduction. Engaging with supply chain is essential in working towards a more circular economy and will enable them to:

  - Minimise resource use;

  - Identify technologies that enable us to source more sustainable materials, reduce resource use and any resulting waste;

  - Reduce vehicle movements to and from site; and,

- Reduce our production of waste and increase the reuse and recycling of materials.

- **Modular** – In 2019, Countryside opened a modular timber panel factory in Warrington to service our northern and West Midlands regions with a total capacity of 1,500 units per annum. A second factory in 2020 may be opened to assist with demand for their products.

- **Water** – Countryside monitor site water consumptions. Site water consumptions decreased for the third year in a row to 22,816m^3 for 2019, compared to 33,414m^3 in 2018. This is also a reduction in the normalised water consumption to 0.04m^3 per m^2 (2018: 0.08m3 per m^2). Low-flow fittings within new properties are installed, and show homes have details of water-saving actions that customers can take when they occupy our properties.

6. APPROACH TO CIRCULAR ECONOMY

Strategic Design Making

6.1 For circular principles to be successful, it requires a whole building approach. These principles need to be proactively considered throughout specification, design, procurement, construction, and operation. This includes collaborating with supply chains to explore and develop solutions which implement these principles and realise the benefits.

6.2 Post planning, the developer will consider at a strategic level further opportunities to adopt, where feasible, a circular economy approach. Such opportunities have been suggested in Appendix C1 and will be discussed during workshops with the design team throughout the design development process.

6.3 Whilst not exhaustive, the targets set in Table 1 provide an example of circular economy measures that could be implemented, and the suggested targets associated with them.

Table 1: Strategic Approach

	Steering Approach	Target	Supporting Analysis
Circular economy approach for the new development at Cambridge Road Estate	Minimise construction waste	Work towards <5% 'special' components across standardised and/or modular designs. Design to standard dimensions where possible to enable pre-fabrication	

	Steering Approach	Target	Supporting Analysis
		No more than 6.5 tonnes per 100m^2 of non-hazardous waste (excluding demolition and excavation waste) to be achieved At least 85% of non-hazardous waste is to be diverted from landfill.	Site Waste Management Plan BREEAM Waste 01 – *Construction Waste Management*
		Monitor water, energy and waste during construction.	BREEAM Management 03 – C*onstruction Site Impacts*
	Design with adaptability and longevity in mind	Commercial spaces will be designed with an open plan layout to enable easy future adaptability for different use types. Residential units will be designed to meet long-term needs, be robust, durable and resilient to climate change. The design will use a 'building in layers' approach to allow different elements to be disassembled from the main structure.	BREEAM Waste 05 – *Adaptation to Climate Change* BREEAM Waste 06 - *Disassembly and Adaptability*
	Source materials sustainably	Prioritise use of materials with low embodied carbon and materials with recycled content, where feasible. 100% of timber used on site, including timber used in the construction phase will be sourced from sustainable forestry sources (e.g. PEFC and FSC). Steel with at least 20% recycled content to be procured	BREEAM Materials 03 – *Responsible Sourcing of Construction Products* Whole Life Cycle Assessment
		Endeavour to specify at least 20 products with Environmental Product Declarations.	BREEAM Materials 02 – *Environmental Product Declarations*

	Steering Approach	Target	Supporting Analysis
Circular economy approach for the existing site	Demolish and maximise re-use/recycling of existing building components on site.	Demolition of the existing buildings on the site will occur as they have been deemed not suitable for refurbishment or repurposing. 85% of non-hazardous demolition waste to be diverted from landfill through reuse, recycling, and recovery will be targeted, where possible.	Pre-demolition Audits Site Waste Management Plan
Circular economy approach for municipal waste during operation	Occupant municipal waste (Commercial and residential)	Provide infrastructure for sharing of resources between members of the building community. All commercial units are to be provided with access to refuse stores at ground level. Dedicated residential waste and recycling facilities will be provided in line with Royal Borough of Kingston Council guidelines	BREEAM Waste 03 – *Operational Waste*
		Provide meter and submeter water and energy use (incl. smart meters) during operation to allow for monitoring of usage	BREEAM Water 02 – *Water Monitoring* BREEAM Energy 02 – *Energy Monitoring*

6.5 Further approaches that can be adopted and how they could be incorporated are listed overleaf.

Conserve Resources

Sustainable Procurement

6.6 In accordance to BREEAM Mat 03 requirements, Countryside are expected to follow their Sustainable Procurement Policy which ensures that new building materials are selected to ensure that they minimise environmental impact and have low embodied energy – from manufacture, transportation and operational stages, through to eventual demolition and disposal.

6.7 Where feasible, the main building materials will be responsibly and legally sourced from manufacturers with environmental management systems and/or responsible sourcing credentials, such as BES 6001. In addition, products with a recognised environmental product declaration (EPD) should be specified where possible.

6.8 Approximately 20% of the total value of materials used, where feasible, can be derived from recycled and reused content in the products and materials selected, in accordance with published GLA Circular Economy Guidance Pre-Consultation Draft and WRAP recommendations.

6.9 Where appropriate, timber used on site, including timber used in the construction phase, such as hoarding, fencing and scaffolding, will be sourced from sustainable forestry sources (e.g. PEFC and FSC).

Material Recovery

6.10 The existing site comprises 832 residential homes built in the 1960's and 1970's. Post planning, a detailed pre-demolition audit could be undertaken to determine opportunities for reusing existing materials and / or components. Any existing materials on site would then be reviewed to determine if they meet the required functionality of the new buildings and landscape design. Where no such opportunities exist, good practice measures can be taken in the demolition to ensure maximum recovery of materials through recycling. All elements from the deconstruction phase that cannot be reused on site can be sent to organisations for onward use wherever feasible.

6.11 Products that have recycled content, low embodied energy and can be re-used/ recycled/ refilled/ recharged or reconditioned will be considered by Countryside where possible.

Whole Life Carbon

6.12 A Whole Life Cycle Carbon Emissions (WLCCE) assessment on the proposed design has been undertaken, by Hodkinson Consultancy, with the aim to improve the overall environmental impact. The initial findings and early stage recommendations have been included in a report, appended to the Energy Statement submitted. These are presented from the perspective of embodied carbon and life cycle only and must be considered alongside other design considerations by other members of the design team.

6.13 The above assessment will enable BREEAM certification credits (MAT01) to be achieved for the non-residential elements of the proposed masterplan, and will consider, for RIBA stage 2-4, the design for superstructure, substructure, and core services.

6.14 Life Carbon Assessment (LCA) is a tool to measure how effective different design strategies are at improving wider environmental (or cost) performance. It is then used to prioritise which strategies will provide the best value. If a building can be adapted for a new purpose it is less likely to be demolished in the future.

Minimised Material Use

6.15 Where appropriate, the proposed development will seek to adopt a design approach that focuses on material resource efficiency so that less material is used in the design (i.e. lean design), and / or less waste is produced in the construction process, without compromising the design concept. These can include, but are not limited to, the following:

> Considerations to the sizing and number of piles within the foundations to optimise and reduce material usage.

> Where feasible, different piling solutions will also be explored e.g. driven piles are a sustainable solution as no spoil is produced so no waste is sent to landfill;

> General arrangements and services layout options to be reviewed to allow minimal amount of mechanical and electrical pipework required where possible.

> Use materials with recycled content and reclaimed material over new and remanufactured components over new, where feasible.

> Considerations to leasing short lived components and procure Products as a Service (PAAS).

6.16 When applying the above, early engagement, complete transparency and visibility throughout the supply chain is encouraged.

Design to Eliminate Waste

Designing for Longevity

6.17 Protecting materials from degradation due to environmental conditions, adopting passive design strategies to provide resilience, and sizing systems to cope with future climate scenarios should be considered from the offset.

6.18 The proposed development will seek to design with longevity in mind. Suitable durability and protection measures will be incorporated in vulnerable parts of the internal and external building so as to minimise the frequency of replacing materials and therefore optimising material use. Potential measures may include:

> Column protection, bollards and barriers to delivery and service areas to protect buildings and boundary walls from potential vehicular damage;

> Hard-wearing floor and wall finishes (e.g. protection rails to walls of corridors);

> Non-porous, durable surfaces constructed of corrosion resistant materials, where relevant;

> Roof coverings and/or green roofs;

> Kick plates or impact protections on doors, in addition to door stoppers to prevent door handles damaging walls.

6.19 Considerations will be given to producing a climate change adaptation strategy, in accordance with BREEAM guidelines, which would comprise of a systematic risk assessment to identify and evaluate the impacts arising from climate change on the buildings at Cambridge Road Estate, over their projected life-cycle.

6.20 Measures will be undertaken to minimise the main hazards considered significant to the proposed development e.g. solar radiation/heatwaves, precipitation/surface water flooding and drought.

6.21 Designing a robust frame to enable changes in building use, for example design loads could be considered.

Design for offsite construction

6.22 Offsite construction and manufacturing will also be considered. The benefits of offsite factory production in the construction industry are well documented and include the potential to considerably reduce waste especially when factory manufactured elements and components are used extensively.

6.23 Its application also has the potential to significantly change the operations onsite, reducing the amount of trades and site activities and changing the construction process into one of a rapid assembly of parts that can provide many environmental, commercial and social benefits.

Standardisation or Modularisation

6.24 Considerations for standardised elements or modular designs for materials and products that enable a reduction in construction waste and easier reuse in next life, will be prioritised, where feasible.

6.25 Examples of such items that can be modular and/or fabricated offsite include suspended ceiling systems, bathroom pods, utility pods and balconies. It should be noted current limitations in incorporating larger modular construction elements include the lack of availability to source high quality, aesthetically pleasing design in modules, in addition to difficulties in transporting and handling modules.

6.26 Elements should use standardised design formats to enable future reuse, e.g. no bespoke cutting of materials as this can make replacements difficult to obtain.

Designing for Assembly, Disassembly and Recoverability

6.27 Creation of a materials inventory could be considered for the entire building that includes a detailed breakdown of all building elements that sets out the constituents of each product and material, the structural loadings, and the ability for each material to be reused and/or recycled.

6.28 Consideration to designing the building systems and components in layers to enable the ability to remove, adjust or replace of some elements is feasible, particularly for areas where different components have different life spans and maintenance needs.

6.29 A disassembly guide could be developed to address techniques for prolonging the life of the building and reducing operational construction, demolition and excavation wate.

6.30 Materials could have the option to be taken apart through mechanical and reversable fixings to allow for future reuse. Permanent fixing of products, such as by glue and cement mortar, will be avoided where feasible, to enable end of life deconstruction and salvage of building elements. Fixings will be easily accessible, where possible, for disassembly.

6.31 The lifespan of internal fixtures is often over-estimated which leads to significant waste. Components that are likely to have a shorter lifespan could either be made of biological materials which can be returned to the biosphere (for example breather board) or designed to be returned to the manufacture.

6.32 Materials such as plasterboards, furniture, lighting, floor finishes (e.g. carpets, etc.) with a planned short life span will be prioritised to be selected with manufacturers with take back schemes or that are procured through a service agreement.

6.33 Unnecessary toxic treatments and finishes will be avoided where possible. In addition, finishes that can contaminate the substrate in a way that they are no longer reusable will be avoided unless they serve a specific purpose.

Designing for Adaptability or Flexibility

6.34 The BREEAM Wst 06 ‘functional adaptability’ credit is likely to be targeted to avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works. These changes

could be required as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a Circular Economy.

6.35 Designing for adaptability and flexibility could be considered in the design to ensure the built asset can cope with a diversity of scenarios, e.g. flexible planning, location of cores and adequate floor to ceiling heights.

6.36 The development will seek to ensuring that the mechanical and electrical design of the commercial areas is zoned to allow for future changes in layout.

Managing Waste

Estimated Waste from Construction

6.37 At this stage, no detailed bill of quantities for building material has been confirmed for the proposed revised development. The appointed demolition and enabling works contractors should segregate all materials prior to off-site removal to a designated transfer facility. Wherever possible, re-use and recycling of arisings and materials will be required and monitored.

6.38 In line with Countryside's company sustainability vision and objectives, waste arising from the construction of buildings at the proposed development will be calculated in line with BRE guidelines (BRE SmartWaste) and approximately 6.5 tonnes per 100m^2 of non-hazardous waste will be targeted, where appropriate.

6.39 As part of their commitment to divert construction waste from landfill, Countryside Properties will endeavour to regularly monitor and record the site's waste reduction performance. This will be compared against a target benchmark where at least 85% (by volume) of non-hazardous waste is to be diverted from landfill.

Site Waste Management

6.40 The reduction of construction waste not only minimises environmental impacts through ensuring the responsible use of resources and waste disposal but can also significantly reduce construction costs for the developer.

6.41 Post planning, a detailed Site Waste Management Strategy can be prepared, in accordance with BREEAM guidelines, to confirm the hierarchy of waste management and will be adopted in accordance with national policy requirements.

6.42 The waste management methods will include preparation for reuse and material recovery. The scale of the site lends itself to store materials and manage construction so that vehicle movements off-site can be minimised.

6.43 Space taken by storage of new materials will be avoided, wherever feasible. Frequently used items will be placed in easy to access areas. This will increase efficiency and minimise wastage due to damage. Prolonged storage of materials on site will be avoided, where possible, and implementation of 'just in time' deliveries will be encouraged.

6.44 Options also include using waste materials found on site and recycling / recovering them into an alternative form that can be used for any construction purposes (for example crushing concrete for road construction material). By recycling onsite, carbon emissions associated with the proposed development are also reduced, rather than materials being taken away from the application site.

6.45 During the construction phase, materials recovered from any on-site works may works may be suitable for reuse on-site, reducing costs of transportation and procurement of virgin materials. This combined with considerate design practice, such as balancing any cut and fill of materials, will help to minimise construction waste in line with the waste hierarchy which seeks to eliminate, reduce, reuse, and recycle.

6.46 Reusable packing solutions with key product manufacturers will be explored at the earliest opportunity. Solutions may include flat pallets, bulk bags, steel stillages and returnable cable drums.

6.47 Minimise packaging through re-usable packaging options and mobile storage solutions that allow transferring materials to the work interface without packaging.

Operational Waste

6.48 Waste reduction during the operational phase is also being considered. The proposed development will provide easily accessible waste and recycling facilities in accordance with Policy 5.17 of the London Plan to minimise and manage waste.

6.49 Waste storage provisions have been calculated using British Standard 5906:2005 for both residential and non-domestic uses.

6.50 Adequate storage is to be provided in communal stores, where both recyclable and non-recyclable waste can be stored in accordance with Royal Borough of Kingston upon Thames Council's waste collection service. High profile signage will be provided, where feasible, to encourage correct use of the recycling service.

6.51 Through good practice measures, Kingston Council will encourage occupants to reduce and prevent waste by providing information packs to residents about how the waste segregation and recycling scheme operates. The information will also include details on waste prevention schemes within the Royal Borough of Kingston upon Thames area.

6.52 Each residential unit will be provided with a segregated waste bin, to enable the separation of mixed dry recycling from refuse. Residents may also have the option to pay for a subscription garden waste collection service from Kingston Council.

6.53 For commercial spaces specifically, the BREEAM Wst 03 'Operational Waste' criteria will be followed to ensure adequate provision of dedicated storage facilities for a building's operational-related recyclable waste streams is provided, so that this waste is diverted from landfill or incineration. This space will meet the following BREEAM requirements:

> Bins will be clearly labelled to assist with waste segregation, storage and collection;

> The stores will be accessible to building occupants and facilities operators; and,

> The storage will be of a capacity that is appropriate to the building's type, size and predicted volumes of waste.

7. CONCLUSION

7.1 The purpose of this Circular Economy statement is to demonstrate that the proposed Cambridge Road Estate development by Cambridge Road (RBK) LLP in the Royal Borough of Kingston Upon Thames has considered the circular economy principles to minimise embodied carbon and operate with a circular economy, maximising the value extracted from materials and prioritising the reuse and recycling of materials.

7.2 The statement takes into consideration the following, with reference to the draft new London Plan Policy SI7:

> Conserve resources, increase efficiency and source sustainability

> Design to eliminate waste (and for ease of maintenance)

> Manage waste (demolition, excavation, construction, and municipal) sustainably and at the highest value.

7.3 The Statement sets broad objectives for Circular Economy aspirations that could be implemented.

7.4 Post planning, subsequent meetings and workshops may be held as the design progresses to determine how the circular economy aspirations could be further developed, including taking into consideration the requirements under BREEAM Mat 06 criteria, if targeted.

Appendix C1

Matrix

	Site / phase / building	Sub-structure	Super-structure	Construction
Section A: Conserve resources - *Focus on conserving materials and resources, and to source materials responsibly*				
Minimising the quantities of materials used	A whole-life cycle carbon assessment is being undertaken to ensure a lean, low embodied carbon design is adopted, where feasible.			
	Post planning, a pre-demolition audit to be produced to maximise material recovery and reuse, where feasible.			
	The use of RAP (recycled asphalt planings) as a significant proportion of the aggregate input in landscaping could be considered. As well as avoiding the use of virgin aggregate this utilises the bitumen on the reused stone.	Where feasible, piled foundations should be prioritised over pad foundations for material optimization.		
Minimising the quantities of other resources used (energy, water, land)	In line with BREEAM Land Use and Ecology 01 – Site Selection, the proposed development will be entirely on previously developed land, avoiding land which has not been previously disturbed.	N/A	N/A	In accordance with the BREEAM guidelines set in Management 03, energy and water consumption will be monitored on a weekly basis. Targets to be set and progress reported on a monthly basis.
	An Energy Statement has been produced and demonstrates how the building fabric (shell and skin) has been optimised to reduce energy demand.	N/A	N/A	In accordance with the BREEAM guidelines set in Management 03, the monitoring and recording of data for the transport movements from the delivery of construction materials and construction waste from site will be undertaken. Targets

	Site / phase / building	Sub-structure	Super-structure	Construction
				for transportation movements and progress will be reported on a monthly basis.
Specifying and sourcing materials responsibly and sustainably	Countryside Properties Plc will follow their defined Sustainable Procurement Policy which ensures that new building materials are selected to ensure that they minimise environmental impact and have low embodied energy – from manufacture, transportation and operational stages, through to eventual demolition and disposal.			
	Specification of construction products with an Environmental Product Declaration (EPD) will be prioritised where feasible/relevant			
	Major building elements to be sourced in accordance with BES6001			
	Products to be specified using performance criteria, rather than by brand or specification. For example, tensile and yield for steel and lux levels for lighting.	Considerations for opportunities to use secondary/recycled aggregates in accordance with BREEAM Waste 02 will be assessed at detailed design.		
	Specify materials with increased levels of recycled content where there is no impact on cost or performance			
Section B: Design to eliminate waste – ***Includes designing to facilitate maintenance (therefore retaining materials and products in service for as long as possible), and through careful selection of construction techniques or procurement strategies***				
Designing for reusability / recoverability / longevity / adaptability / flexibility	Drainage systems capacity and allowances for climate change have been accounted for in the drainage strategy. See the standalone Flood Risk and Drainage Strategy Report for more details.	For the commercial units, considerations will be given to the typical floor to ceiling heights to allow for future change of use	Vulnerable elements will be protected from damage. Protection measures will be incorporated to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring.	

	Site / phase / building	Sub-structure	Super-structure	Construction
	Circulation capacity, fire strategy and means of escape are appropriate for different uses	Considerations will be Structural grid and floor loading design criteria allows for flexibility and future change of use where feasible.	No fixtures or fittings will be glued down wherever feasible to ease future disassembly and recovery.	
		Considerations will be given to the feasibility of oversizing foundations to accommodate future vertical extensions	Unnecessary toxic treatments and finishes will be avoided. Finishes that can contaminate the substrate in a way that they are no longer reusable will be avoided unless they serve a specific purpose.	
			Adopt passive design strategies to provide resilience, size systems to cope with future climate scenarios.	
			Consider panelised construction, particularly for roofs and facades to permit final deconstruction on the ground.	
			Demountable partitions incorporated where possible to enable flexibility of use.	
			Connections and components to have high durability.	
			For commercial areas, glazing ratios and sound insulation ratings are to be considered for different uses.	

	Site / phase / building	Sub-structure	Super-structure	Construction
Designing out construction, demolition, excavation, industrial and municipal waste arising				Just in time delivery system to be implemented to ensure that a surplus of materials is not kept on site.
	Materials, components, and products to be sourced as part of a leasing / buy back scheme, where feasible			
	Design coordinated to avoid excess cutting and jointing of materials / components that generate waste			
		Where relevant, producing a site deconstruction strategy plan should be considered.	Façade replacement or upgrade strategy should be developed	The subcontractor will be responsible for organising the take back of packaging waste, including pallets, where they can be re-used as a material as opposed to disposing as waste.
Section C: Manage waste - *Consider measures that can be taken to manage any waste that is generated, by increase reuse and recycling rates*				
Demolition waste	A pre-demolition audit to be produced to maximise material recovery and reuse, where feasible. Prior to construction, Countryside Properties Plc will develop a Site Waste Management Plan which will establish ways of minimising waste at source, assess the use, re-use, and recycling of materials on and off-site and prevent illegal waste activities. This will be disseminated to all relevant personnel on and off-site. Predicted and actual calculations of total non-hazardous waste arising	N/A	N/A	Community Wood Recycling (CWR) is a network of wood recycling social enterprises providing an efficient and cost-effective collection service for all types of waste wood.

	Site / phase / building	Sub-structure	Super-structure	Construction
	will be estimated, monitored and recorded			
Excavation waste	N/A	N/A	N/A	Predicted and actual calculations of total non-hazardous excavation waste arising will be estimated, monitored and recorded and opportunities for use on site should be reviewed.
Construction waste	Contractors should explore reusable packaging solutions with key product manufacturers at the earliest opportunity. Solutions may include: **Flat pallets:** Wood pallets have the greatest potential for cutting emissions and reusable plastic pallets are better for waste reduction. **Box pallets:** High quality plastic folding box pallets reduces the need for disposable packaging. **Steel stillages:** Specialist steel A-frame stillages (carrying plate glass) can replace single trip pallets of non-standard sizes and associated protective disposable packaging. This could be extended to be used			As part of their commitment to divert construction waste from landfill, Countryside Properties will regularly monitor and record the site's waste reduction performance. This will be compared against a target benchmark where at least 85% (by volume) of non-hazardous waste is to be diverted from landfill. Waste will be segregated on site and materials only to be delivered to site when needed, to prevent damage

	Site / phase / building	Sub-structure	Super-structure	Construction
	for other products such as dense cladding, heavy panels and frames.			
Municipal and industrial waste (operational waste management)	The Royal Borough of Kingston Upon Thames website advises on recycling and aims to make recycling easier for residents. Details on accessing this information should be provided in any welcome packs.	N/A		
	Waste and recycling storage will be provided for residential units.	N/A		
	Adequate and easily accessible storage is to be provided in communal stores located at ground floor level of each block, where both recyclable and non-recyclable waste can be stored in accordance with the Royal Borough of Kingston Upon Thames waste collection service.	N/A		

	Implemented in design
	To be considered
	Future considerations

The Design Team

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Arboricultural consultant

Architecture in Perspective
Visualisation artist

AWA Consulting
MEP engineer

Base Models
Physical modelmaker

Barton Willmore
Planning consultant
Environmental Impact Assessment
Townscape Impact Assessment

Countryside Properties
Developer

CTP Consulting
Structural & Civil engineer

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Greengage Environmental
Ecology and biodiversity consultant

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Pipers
Physical modelmaker

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