

March 2021

OSTERLEY PLACE

TESCO OSTERLEY, SYON LANE, TW7 5NZ

SUSTAINABILITY STATEMENT

Consultant: Hodkinson Consultancy





HODKINSON



**Sustainability
Statement**

St Edward Homes Limited

Tesco Osterley

Final

Alicia Ramos
MSc

March 2021

DOCUMENT CONTROL RECORD

REPORT STATUS: FINAL

Version	Date	Reason for issue	Author	Checked by	Approved for Issue by Project Manager
v.1	01.07.2020	Draft	AR	CS	CS
v.2	09.07.2020	Final Draft	AR	ZW	CFR pp CS
v.3	24.07.2020	Final Draft	AR	CS	CS
v.4	30.07.2020	Final	AR	CS	CS
v.5	04.09.2020	Updated Final	AR	ZW	DS
v.6	16.12.2020	Updated Final – revised energy strategy	AR	ZW	DS
v.7	18.12.2020	Updated Final	AR	ZW	DS
v.8	05.03.21	Updated Final	AR	ZW	DS

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

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Executive Summary

The purpose of this Sustainability Statement is to assess the outline planning application by St Edward Homes Limited for the proposed development at Tesco Osterley in the London Borough of Hounslow against relevant local, regional, and national planning policies on sustainability. This is an updated strategy that incorporates changes to the energy strategy in response to comments from the council on the Sustainability Statement and Energy Statement submitted in September 2020 (planning application reference: 01106/B/P137).

The proposed development comprises up to 1,677 residential units, between 3,000 sqm and 5,000 sqm of flexible non-residential floorspace comprising commercial, business and service space, and/ or learning and non-residential institution space, and/or local community space, and/or a public house/ drinking establishment, and/or mobility hub along with open space and residential car parking spaces.

This is an outline planning application with all matters reserved except access and the detailed design will be subject of future reserved matters applications. As such, this statement assesses the parameters set by the outline planning application and demonstrates how it intends to achieve the sustainability commitments.

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

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

- > **BREEAM:** The commercial units will be designed and built to achieve a BREEAM 'Excellent' rating for shell only units under the New Construction 2018 scheme.
- > **Energy strategy:** The development will target a 60% reduction in regulated CO₂ emissions over the Part L 2013 baseline through energy-efficiency measures, a heat network, and renewable energy measures.
- > **Overheating:** An Overheating Mitigation Strategy Report has been undertaken, which sets out the required measures and the commitment to achieve compliance with overheating planning requirements to minimise the risk of overheating in homes.
- > **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. Rainwater harvesting tanks will be installed to reduce the demand on potable water and promote effective use of water supplies.
- > **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.

- > **Circular Economy:** Key circular economy principles have been considered in the design to minimise embodied carbon and operate with a circular economy, maximising the value extracted from materials and prioritising reuse and recycling.
- > **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 swales, detention ponds, attenuation tanks, permeable paving, and green roofs.
- > **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.
- > **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 London Plan compliant cycle parking spaces and electric vehicle charging points.
- > **Biodiversity and ecology:** Enhancements will be implemented through the provision of landscaped areas, play space and additional tree and shrub planting across the site. A minimum of 4,500 m² biodiverse roofs, in addition to extensive green roof will be included.
- > **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 St Edward Homes Limited.
- 1.2** This Statement sets out the sustainable design and construction measures included in the outline planning application for the residential-led mixed-use development at Tesco Osterley in the London Borough of Hounslow. It presents the updated heating strategy in response to comments from the council on the previous version of the report issued in September 2020 (Tesco Osterley - Sustainability Statement - FINAL - HC - 08.09.20) as well as more recent comments from the Council's Sustainability Officer.

Sustainability Statement Structure and Methodology

- 1.3** The formulation of the Sustainability Strategy for the proposed development has considered several important objectives, including:
- > To conform to the agreed level of sustainability set out within the illustrative masterplan for the development;
 - > To address all national, regional, and local planning policies and requirements;
 - > To achieve a viable reduction in CO₂ emissions with an affordable, deliverable, and technically appropriate strategy;
 - > 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** introduces 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 16** outline the sustainability strategy of the proposed development in relation to the policy documents listed in Chapter 3.
- 1.8 Chapter 17** provides a summary of the key sustainability features associated with the proposed development.

Berkeley Group ‘Our Vision’

1.9 As part of the Berkeley Group, St Edward Homes Limited will ensure that the Proposed Development achieves the goals and targets set out in the ‘Our Vision’ document, which comprises the following commitments:

- > **Customers:** Provide exceptional service to all of our customers and put them at the heart of our decisions.
- > **Homes:** Deliver high quality homes with low environmental impact where people aspire to live.
- > **Places:** Create strong communities where residents can live an enjoyable, sustainable life.
- > **Operations:** Make the right long-term decisions, run the business efficiently and work collaboratively with our supply chain.
- > **Our People:** Develop highly skilled teams that work together in a safe, healthy, and supportive environment and contribute to wider society.



2. DEVELOPMENT OVERVIEW

Site Location

- 2.1 The proposed development site at Tesco Osterley in the London Borough of Hounslow is located at Syon Lane, Isleworth, TW7 5NZ, as shown in Figure 1 below.

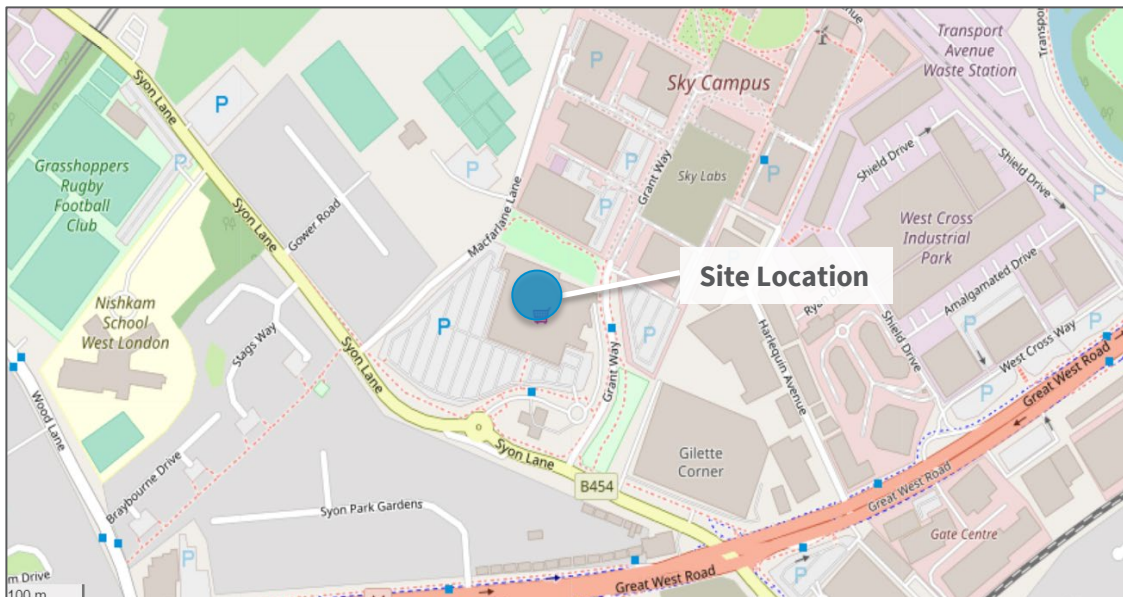


Figure 1: Site Location – OpenStreetMap© 2020

- 2.2 St Edward Homes Limited is bringing forward the redevelopment of both the Tesco Osterley and Homebase Brentford sites. The existing Tesco store would be re-provided on the Homebase site as part of a mixed-use development with residential above, which releases the opportunity to deliver a comprehensive residential-led mixed-use development on the Tesco site.
- 2.3 The 5.45-ha site encompasses the existing two storey Tesco Extra store at Osterley Park, Syon Lane, TW7 5NZ. It comprises a total of circa 11,582 sqm GIA of retail floorspace, associated car parking (625 spaces), a petrol filling station and a rectangular shaped open space, located in the north of the site, known as the “Water Gardens”.
- 2.4 The site lies to the north of Syon Lane, with MacFarlane Way and Grant Way providing the western and eastern boundaries, respectively. The Sky Campus is adjacent to the site to the north and Osterley Park partially borders the site to the west.

Proposed Development

2.5 The proposed development is described as follows:

“Outline planning application with all matters reserved except access for the demolition of existing building and car park and erection of buildings to provide residential homes, plus flexible non-residential space comprising commercial, business and service space, and/or learning and non-residential institution space, and/or local community space, and/or public house/drinking establishment, and/or a mobility hub, along with associated access, bus turning, car and cycle parking, and landscaping arrangements.”

2.6 Figure 2 below illustrates the proposed site layout.



Figure 2: Predominant Ground Floor Uses (JTP, 29.06.20)

3. RELEVANT PLANNING POLICY

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

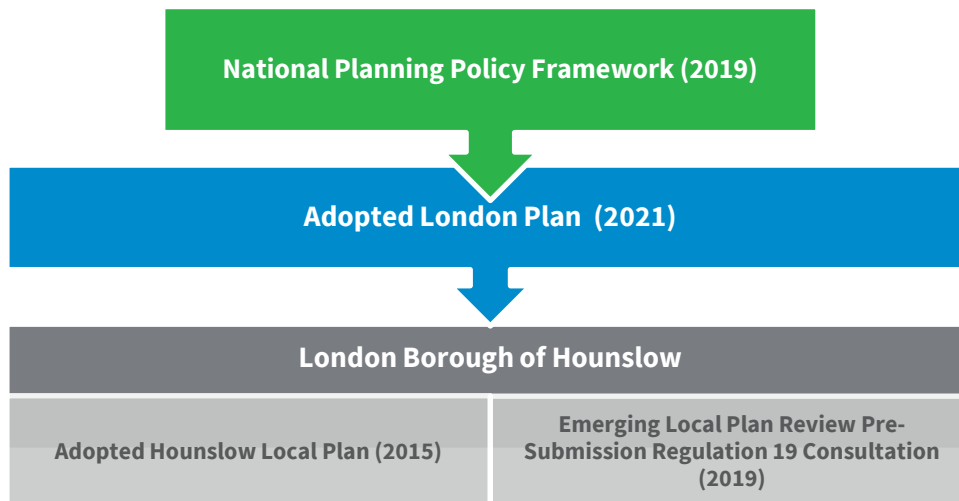


Figure 3: Relevant Planning Policy Documents

National Policy: NPPF

- 3.2 The revised National Planning Policy Framework (NPPF) was published on the 19th June 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

Adopted London Plan (2021)

- 3.5 The 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:
- 3.6 **Policy G5 Urban Greening** states that urban greening should be included as a fundamental element of site and building design by incorporating measures such as landscaping, green roofs, green walls and nature-based sustainable drainage. Boroughs should develop an Urban Greening Factor and in the interim, the Mayor recommends a target score of 0.4 for residential development 0.3 for commercial development.
- 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. In addition, the whole life-cycle carbon emissions of a development should be calculated through a nationally recognised Whole Life-Cycle Carbon Assessment and actions taken to reduce life-cycle carbon emissions should be demonstrated.
- 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 SI13 Sustainable Drainage** states that development proposals 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 defined drainage hierarchy. Drainage should be designed in ways that address issues of water use efficiency, river water quality, biodiversity, amenity, and recreation.

- 3.12 **Policy SI7 Reducing Waste and supporting the Circular Economy** states that measures to achieve waste reduction, increases in material re-use and recycling, and reductions in waste for disposal should be achieved by promoting a circular economy and other waste minimisation approaches.
- 3.13 **Policy T5 Cycling** states that development Plans and development proposals should help remove barriers to cycling and create a healthy environment for cycling by providing appropriate levels of cycle parking and supporting the delivery of a London-wide cycling network.

Local Policy: London Borough of Hounslow

Adopted Hounslow Local Plan (2015)

- 3.14 The London Borough of Hounslow's Local Plan was adopted in 2015. The following policies are considered relevant to this Statement:
- 3.15 **Policy ED1 - Promoting employment growth and development** encourages development proposals to provide flexible space within residential units, particularly in town centres, for home working.
- 3.16 **Policy SC4 - Scale and density of new housing development** expects proposals to meet design standards in Building Regulations and the Local Plan, including demonstrating compliance with prevailing daylighting standards (BRE Guidance 2011) and habitable room window separation guidance.
- 3.17 **Policy SC5 - Ensuring suitable internal and external space** requires development proposals to ensure a minimum of 10% of new dwellings provide enhanced accessibility or adaptability where the local authority is responsible for allocating or nominating a person to live in that dwelling. Private external space that is usable and affords privacy and security must also be provided.
- 3.18 **Policy CC2 – Urban design and architecture** requires development to promote low carbon design and incorporate energy efficiency measures, mitigate noise and air quality issues, ensure sufficient sunlight and daylight to proposed and adjoining/adjacent dwellings, provide adequate levels of privacy, make well-designed provision for bicycles, and provide acceptable storage of refuse, materials for recycling, and composting and with convenient access.
- 3.19 **Policy GB4 - The green infrastructure network** aims to ensure that development proposals to incorporate elements of green infrastructure on site. This may include provision of green roofs, sustainable drainage systems, trees, squares, plazas, and pedestrian access routes.

- 3.20 Policy GB7 – Biodiversity** aims to protect and enhance the natural environment and increase the quantity and quality of the borough’s biodiversity. This could include incorporating green roofs and walls, landscaping, tree planting and installing bat and bird boxes resulting in gains in biodiversity.
- 3.21 Policy EQ1 - Energy and carbon reduction** requires all development to meet the carbon emission reduction requirements set out in the London Plan.
- 3.22 Policy EQ2 - Sustainable design and construction** expects development proposals to:
- > Incorporate established principles for sustainable design and construction as set out in the London Plan, including passive solar design, water efficiency standards, sustainable drainage, the reuse and recycling of construction materials, green roofs, and urban greening.
 - > Be assessed against the standards for sustainable design and construction and submit relevant documentation to demonstrate that minimum specified levels are met or meet any national standards that subsequently supersede these.
 - > All developments over 500 sqm should be assessed against BREEAM standards and meet a rating of ‘Excellent’ as a minimum.
 - > All residential developments should meet the standards for sustainable design and construction set out in the London Plan, including any ‘optional’ Building Regulations requirements it adopts.
 - > Prepare a sustainability statement, where major developments are proposed.
- 3.23 Policy EQ3 - Flood risk and surface water management** requires development proposals to prepare flood risk assessments. Flood resistance, resilience measures, and sustainable drainage systems should be incorporated while avoiding non-permeable hard standings.
- 3.24 Policy EQ4 - Air quality** requires proposals to include air quality assessments and incorporate mitigation measures where air quality assessments show that developments could cause or exacerbate air pollution or where end users could be exposed to air pollution.
- 3.25 Policy EQ5 – Noise** requires proposals to minimise noise disturbance from adjoining uses by incorporating sound insulation or alternative noise barriers. Ensure that noise mitigation measures are implemented, to demonstrate compliance with BS8233: 2014 – Guidance on sound insulation and noise reduction for buildings.
- 3.26 Policy EQ6 – Lighting** requires proposals to minimise light pollution, incorporate energy efficiency measures, provide protection from glare and light spill to sensitive receptors, demonstrate no adverse impacts on biodiversity and environments, submit a light assessment report where necessary and mitigate the illumination level, glare and spillage of light.

- 3.27 Policy EQ7 - Sustainable waste management** requires suitable arrangements for waste management, including the location, size and design of waste and recycling facilities, and transport access.

Emerging Local Plan Review Pre-Submission Regulation 19 Consultation (2019)

- 3.28** Hounslow is currently in the process of preparing its GWC Local Plan Review and Site Allocations Documents, setting out a vision for the borough for the next 15 years. The Plans have undergone extensive consultation but not yet been taken to Examination, so has to be considered in this context and given proportionate weight compared to adopted policy. However, it is noted that it comprises more recent policy that responds to other key emerging and adopted policies. Relevant policies include:
- 3.29 Policy GWC2: Housing Growth** requires 90% of all dwellings to be accessible and adaptable dwellings meeting Housing Technical Standard M4(2) and the remaining 10% to be wheelchair user dwellings meeting Housing Technical Standard M4(3).
- 3.30 Policy GWC3: Health and Wellbeing** requires developments to promote active lifestyle choices by providing an enhanced walking and cycling networks, minimise air pollution making new developments 'air quality positive', improve existing and/or creating new high quality safe and accessible public spaces.
- 3.31 Policy GWC4: Open Space and Green Infrastructure** requires development to improve the overall green coverage and biodiversity of the area.
- 3.32 Policy GWC5: Design and Heritage** requires the following:
- > Sustainable design and construction measures, including minimising energy use and the risk of overheating through passive design measures, and the design allows for adaptation of the space in order to meet or exceed the on-site carbon emissions targets set out in the London Plan energy hierarchy.
 - > Full regard to circular economy principles in the design and implementation of energy (including heating and cooling), water and waste infrastructure as set out in the London Plan.
 - > Incorporate the principles Inclusive Design and Secured by Design.
 - > Use high-quality durable, adaptable and sustainable materials, finishes and details.
 - > Deliver a high standard of design of signs and advertisements by ensuring sensitive designed in terms of degree of illumination.

- 3.33 Policy GWC6: Connecting People and Places** requires development to improve walking and cycling infrastructure provision and network. Also, development should limit the provision of car parking where appropriate for the PTAL levels, in accordance with London Plan policy.
-

4. BREEAM SUMMARY

- 4.1** The proposed commercial units will be assessed under the BREEAM New Construction 2018 assessment for shell only units with a target of achieving an ‘Excellent’ rating, in line with Policy EQ2 of the adopted Hounslow Local Plan.
- 4.2** A full BREEAM Pre-Assessment has been presented in **Appendix A**, which provides an illustrative route to achieving the ‘Excellent’ rating. The predicted score at this stage is 73.1%, where a ‘Very Good’ score is $\geq 55\%$ and an ‘Excellent’ score is $\geq 70\%$. 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 CO₂ 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 is 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.
- 4.4** 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 CO₂ REDUCTION

Energy Strategy

- 5.1 An Energy Statement has been prepared by Hodkinson Consultancy and is submitted as part 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 CO₂ emissions through the application of this Hierarchy with a cost-effective, viable and technically appropriate approach.
- 5.3 In line with the GLA Energy Assessment Guidance (2020) the estimated CO₂ emissions for the development have been calculated using SAP 10 emission factors. All figures presented in the Energy Statement are assuming the SAP 10 emission factors, with tables presenting CO₂ emissions with current SAP 2012 carbon emission factors presented in the appendix (see Energy Statement) for comparison.
- 5.4 A range of advance **Be Lean** energy efficiency measures are proposed. They allow the development to achieve a site wide **12%** reduction in Regulated CO₂ emissions. This is split as an **12%** reduction in Regulated carbon emissions for residential areas and **18%** reduction for non-residential areas, which exceeds London Plan requirements. This significantly exceeds minimum Part L 2013 requirements and shows a high level of fabric energy efficiency performance.
- 5.5 In line with the London Plan, the feasibility of decentralised energy production has been considered at the **Be Clean** stage. It is proposed that a site wide heat network is installed, sourced by high temperature air source heat pumps. All residential units will be connected to the heat network, with connection points provided to all non-residential units. This delivers a further site wide CO₂ reduction of **45%**.
- 5.6 A range of **Be Green** renewable energy generating technologies has been considered. Available roof space will be utilised to provide approximately 246.5 kWp of solar PV.
- 5.7 In line with the GLA guidance, the development will commit to offset the remaining CO₂ emissions through a payment to the London Borough of Hounslow. The remaining CO₂ emissions to be offset are estimated as **636 Tonnes CO₂ per annum**. The corresponding offset payments will be made.
- 5.8 The combination of **Be Lean, Be Clean** and **Be Green** measures as outlined above results in an overall **60%** reduction in regulated CO₂ emissions over the Part L 2013 baseline.
- 5.9 It is expected that the CO₂ emissions from the development will continue to reduce in the future with the ongoing decarbonisation of the electricity grid. In reality, the CO₂ emissions will already be lower

than presented in this report, as SAP 10 carbon emission factors have been used, not the more up to date "SAP 10.1" emission factors.

Ventilation

- 5.10** All dwellings will be fitted with an efficient Mechanical Ventilation with Heat Recovery (MVHR) system. This system provides a whole dwelling ventilation system that supplies and extracts air, reusing heat that would have been lost. The dwelling MVHR unit should target a specific fan power (SFP) of 0.42-0.44 W/l/s and have an efficiency of 91%.
- 5.11** All dwellings will be air tested on completion and have a target design air permeability rate of 3 m³/hr.m².
- 5.12** It is assumed that the non-residential units are supplied with an MVHR system, with summer bypass and demand control ventilation. The specification of this system will be the responsibility of the tenant fitting out the units, but the target performance includes an SFP of 1.5 W/l/s and >85% heat recovery. Extract fans are proposed to any WCs and shower rooms, with an SFP of 0.5 W/l/s.
- 5.13** A suggested target air permeability rate for these units is 5 m³/h.m².
- 5.14** Additionally, subject to overheating requirements, all dwellings should have openable windows and be able to naturally ventilate if required. This will facilitate convective ventilation and night purging of heat.
- 5.15** Please refer to the Energy Statement prepared by Hodkinson Consultancy for more details on the ventilation strategy.

Lighting

- 5.16** All external lighting, and any security lighting, will be energy efficient and adequately controlled using PIR sensors, daylight cut-off sensors or time switches where possible. This will ensure the conservation of energy when the lighting is not in use.
- 5.17** All fixed internal lights within the homes and communal areas will be LED.

Appliances

- 5.18** 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+++ ratings. A+ to A+++ ratings 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.

5.19 The choice of energy-efficient appliances and the effective use of them will not only reduce unregulated CO₂ emissions but will save occupants money. Where provided, white goods will aim to be energy efficient with at least a B rating.

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

Energy Monitoring

5.21 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.

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 CO₂ per household per year. This is equivalent to the CO₂ 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 London Plan Policy SI5 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 building and between the building and the utilities water meter.

Water Metering

- 6.6 It is expected that a water meter with a pulsed output will also be installed on the mains supply for the commercial units. This will allow the water consumption of the development to be monitored and managed and therefore encourage reductions.

External Water Efficiency

- 6.7 Rainwater harvesting tanks will be installed to reduce the demand on potable water and promote effective use of water supplies. These will be appropriately sized and capable of harvesting rainwater for external irrigation across the development.

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 SI7). The waste hierarchy, illustrated in Figure 4, prioritises those waste management options which are best for the environment.
- 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).

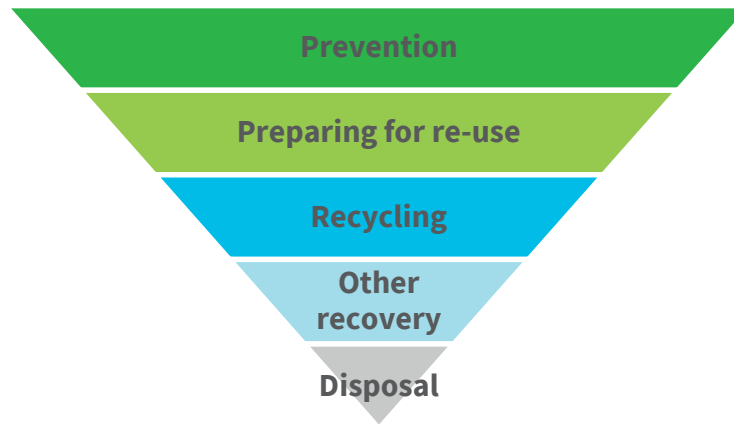


Figure 4: Waste Hierarchy

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 infrastructure requirements and management required to collect and process it.
- 7.4** Prior to demolition, St Edward Homes Limited 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, St Edward Homes Limited 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:
- > Consider 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;
 - > Consider 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, St Edward Homes Limited 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 St Edward Homes Limited 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, where both recyclable and non-recyclable waste can be stored in accordance with Hounslow'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.



Organic Waste

- 7.10 All of the homes will be provided with individual compost bins for food waste with a minimum capacity of 5 litres.
- 7.11 Bins with a minimum capacity of 30 litres for homes with 1-2 bedrooms and 40 litres for homes with 3 + bedrooms will be provided.
- 7.12 Adequate food waste storage will be provided in accordance with the London Borough of Hounslow's collection service.

Commercial Waste

- 7.13 Adequate space for the segregation and storage of commercial waste and recycling will be provided in designated communal stores. This space will meet the following BREEM 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. 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.
- 8.2** 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.
- 8.3** 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);
 - > Manage waste sustainably and at the highest value;
- 8.4** 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.

Local and Responsible Sourcing

- 9.3** In accordance with London Plan Policy SI7, 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** As part of the Berkeley Group, St Edward Homes Limited 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.
- 9.5** 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.
- 9.6** All 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) in line with Berkeley Group Sustainability Procurement Standards.



Recycled Materials

- 9.7** Where feasible, St Edward Homes Limited 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.
- 9.8** This incorporates the principles of the circular economy by promoting resource conservation.

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 commercial 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, 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 St Edward Homes Limited 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 was undertaken by Ramboll UK Limited. Please refer to the full report for more details.

Reduction of Night Time Light Pollution

10.3 The external lighting strategy will be designed across the site 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. In addition, lighting elements will include anti-glare shields as appropriate to reduce light pollution and spill.

10.4 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 PM₁₀ particulate matter reduced by 55% (DEFRA, 2018). This must continue to fall in future years. St Edward Homes Limited are committed to reducing the proposed development's negative impact on air quality during construction and operation.
- 10.7** An Air Quality Assessment was produced by Ramboll UK Limited. A summary is provided below, but please refer to the full report for more details.
- 10.8** Measures concentration of pollutants indicate that current NO₂ concentrations at the site are all well below air quality objectives.
- 10.9** No significant effects on air quality are anticipated as a result of the proposed development. The cumulative effect is 'Negligible Adverse' and 'Not Significant.'

Air Tightness and Ventilation

- 10.10** Air leakage is to be minimised and an air permeability of 3 m³/hr/m² will be targeted for the dwelling while 5 m³/hr/m² will be targeted for the non-residential units.
- 10.11** It is proposed to install Mechanical Ventilation with Heat Recovery (MVHR). This system will remove stale air and odours whilst retaining the heat within the spaces it serves.

11. FLOOD RISK & SURFACE WATER RUN-OFF

Flood Risk

- 11.1** Developments in low flood risk areas are promoted to, not only protect homes, commercial spaces, and local communities and reduce the cost implications if flooding occurs, but also 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 5, the proposed development lies in a low risk flood zone (Flood Zone 1), indicating that the land has a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). There are limited areas of low to high risk of surface water flooding located around the perimeter of the existing Tesco Store.

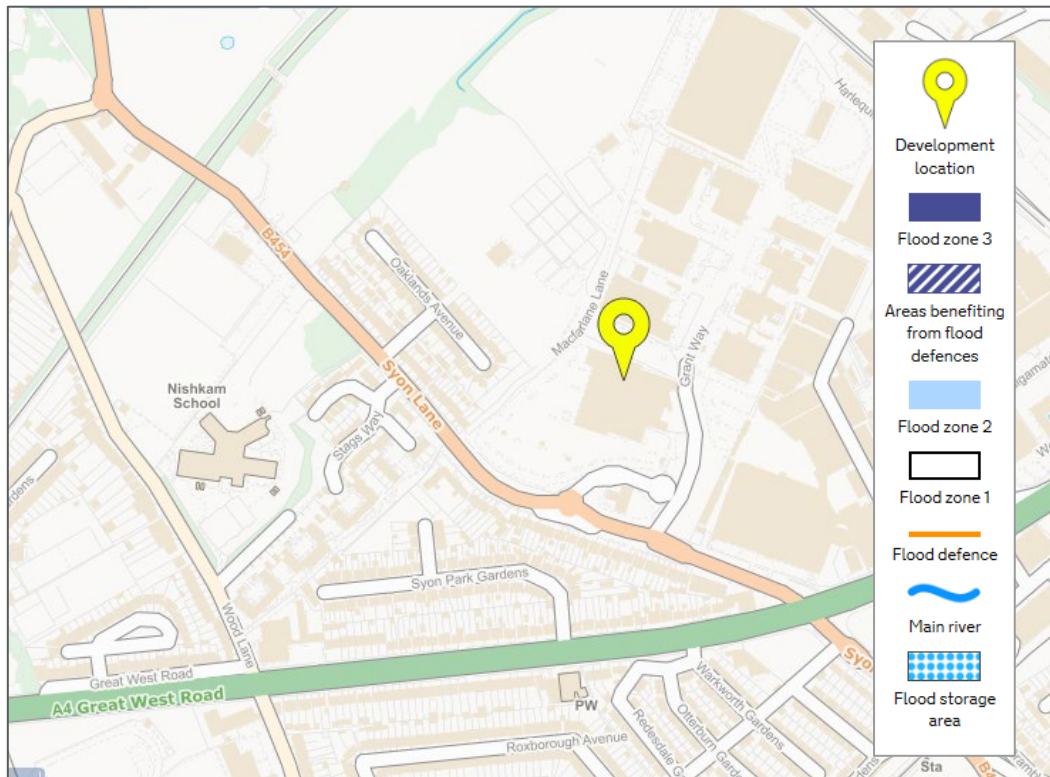


Figure 5: Environment Agency Flood Map – <https://flood-map-for-planning.service.gov.uk>

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 Figure 6. 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.

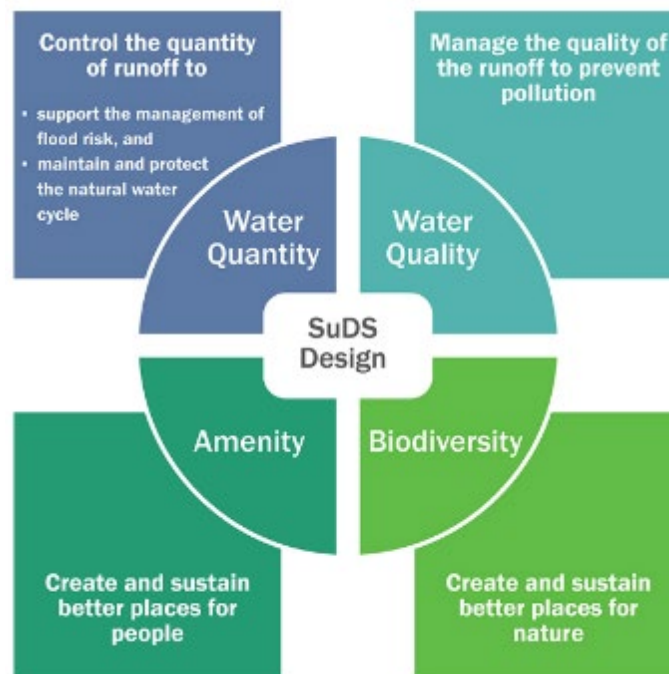


Figure 6: The four 'pillars' of SuDS – CIRIA SuDS Manual (2015)

11.5 Waterman group have developed the drainage strategy for the proposed development. The following listed SuDS are proposed as part of this strategy. These will not only help to attenuate surface water but will provide the necessary water treatment.

- > **Green roofs** will help to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.
- > **Detention ponds** will treat the water by trapping the silt, which contain a high proportion of the pollutants.
- > **Swales** will allow surface water to be stored or conveyed and will allow much of the suspended particulate loads to settle, providing effective pollutant removal.
- > **Attenuation tanks** will be used to store and control discharge from the tank.
- > **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.
- > **Filter drains** will help filter runoff and trap sediment and residues, effectively reducing runoff and providing storage.
- > **Rainwater harvesting systems** will store runoff from roofs and hard surfaces in a holding tank which can then be used for external irrigation and car washing.

12. BUILDING QUALITY

Security

- 12.1** St Edward Homes Limited 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 will involve consultation with a Security Consultant during the detailed design stage.



Safe Access

- 12.3** St Edward Homes Limited is committed to ensuring that the development is safe and secure for its users. All paths will consider dedicated pedestrian crossings and will be appropriately lit and signposted.
- 12.4** As per the Transport Assessment by Royal HaskoningDHV, the site's vehicular access to the car parking areas would be taken from Syon Lane. All car parking would be located in close proximity to the site vehicular spine road, which connects directly to Syon Lane. It is proposed that servicing and delivery vehicles would enter/exit the site from main vehicular access from Syon Lane.

Sound Insulation

- 12.5** 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.
- 12.6** The commercial units of the building will meet the appropriate acoustic performance standards and testing requirements for indoor ambient noise levels in order to achieve the Hea 05 credit of the BREEAM assessment.

Inclusive Design

- 12.7** St Edward Homes Limited's commitment to inclusivity will ensure that the proposed development is scaled appropriately so as to respond to the needs of all its users. St Edward Homes Limited 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.

- 12.8** 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. 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

- 12.9** 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.
- 12.10** A daylight and sunlight assessment has been undertaken by Point 2 Surveyors Ltd. A summary is provided below, but please refer to the full report for more information.



- 12.11** The results of the assessment show that the majority of rooms tested achieve the recommended average daylight factor (ADF) targets for their relevant room use within the proposed blocks.
- 12.12** The overshadowing assessments demonstrate that the development has been designed to maximise sunlight permeability to allow for greater sunlight penetration. Residents will also access to well sunlit outdoor spaces throughout the year, via public open spaces, private residential courtyards, and accessible rooftop amenity areas.

Visual Comfort

- 12.13** The commercial units will be designed to provide an adequate view out through either a window or permanent opening, where possible.
- 12.14** All external lighting will be designed in accordance with BS5489-1:2013 'Code of practice for the design of road lighting' and will provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately.

Overheating

- 12.15** 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. St Edward Homes Limited 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.
- 12.16** There is a commitment to undertake detailed dynamic thermal modelling in line with the CIBSE TM59 from representative dwellings for each future Reserved Matters Application of the proposed scheme.
- 12.17** Effective mitigation measures will be incorporated at the detailed design stage to reduce the risk of overheating.
- 12.18** An Overheating Mitigation Strategy report was done by Hodkinson Consultancy. Please refer to the full report for more details.
-

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 for the site was undertaken by Royal HaskoningDHV. Please refer to the full report for further detail.

Local Amenities

- 13.4** The Transport Assessment by Royal HaskoningDHV confirms that 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., cash points);
- > Health services (e.g., GP practices 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:

- > **Syon Lane Station** is situated approximately 600m to the south of the site. Syon Lane station is in Zone 4. Platform 1 trains go towards Brentford and London Waterloo, whilst Platform 2 trains are directed towards Feltham and Twickenham;
- > **Clapham Junction** is a major railway station on the South Western Railway network and is accessible via a train journey of approximately 20 minutes from Syon Lane. Clapham Junction is served by London Overground, Southern and Gatwick Express services;
- > **Osterley Station** provides access to the Piccadilly Line service and is within 2km of the site. Bus service H91 provides a connection from the site to the station;
- > There are a number of bus routes located around the site, including Route H28 which provides a local service towards Hounslow East and Bulls Bridge roundabout in Hayes, and Route H91, which provides an east-west connection along the A4 Great West Road between West Hounslow and Hammersmith. A bus stop providing Route H28 is available within the site.
- > In addition, there are several proposed improvements to the public transport services within the area. These include the Southall Rail Link, Southern Rail Access to Heathrow Airport, West London Orbital (WLO) Railway (Overground line expansion), and improvements to the Piccadilly Line. In addition, there will be extensions to both the E1 and H28 bus services for the benefit of existing residents and workers as well as new residents.

13.6 The Transport for London Public Transport Accessibility Level (PTAL) map for the site is presented in Figure 7. The site currently has a PTAL rating of 2; however, this is expected to increase to 3 with the proposed improvement to the public transport services.

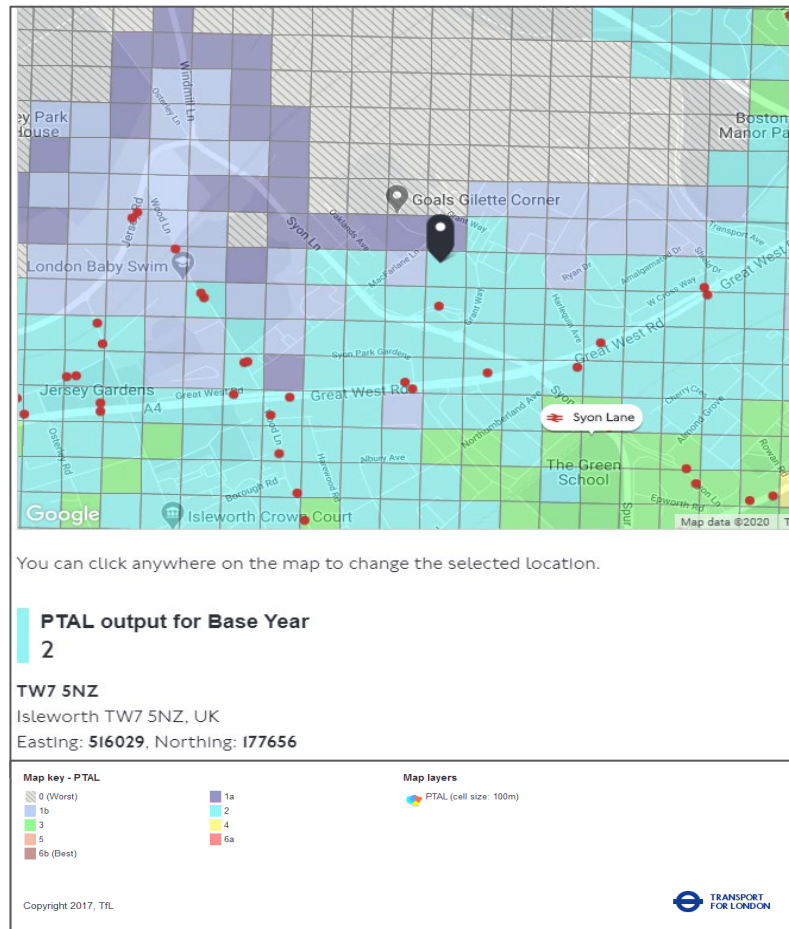


Figure 7: PTAL Map – www.tfl.gov.uk

Cycle Parking

- 13.7 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 T5 of the London Plan.
- 13.8 All of the dwellings will have access to London Plan compliant cycle parking.
- 13.9 For the commercial units, cyclist facilities such as showers, lockers and changing facilities will be provided where possible to encourage commutes via cycling.
- 13.10 Cyclist accessibility to the site will be enhanced, with cyclists permitted to access the development from Syon Lane, Grant Way and MacFarlane Lane.
- 13.11 The development will also incorporate the provision of a shared 3-m wide pedestrian/footway on the site's Syon Lane boundary.

Car Parking

- 13.12** Up to 400 car parking spaces are to be provided across the development. This is significantly lower than the level permissible by the London Plan maximum parking standards, underlining the commitment of the development to encourage the use of active travel and public transport modes. 47 spaces are to be allocated for disabled users for the residential units.
- 13.13** Up to 10 spaces are proposed for use by Zipcar, a Car Club scheme.
- 13.14** Car Club schemes contribute to the sustainability of the scheme as they reduce the need for car ownership and discourage unnecessary car travel. In addition, car club vehicles are usually energy efficient and cleaner than the average car which helps to further reduce emissions.

Electric Car Charging

- 13.15** 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.



- 13.16** Therefore, in accordance with Policy T6 of the London Plan, the proposed development will allow for the provision of 20% active and 80% passive electric vehicle charging points.

Travel Plan

- 13.17** Transport for London define a Travel Plan as a *'long term management strategy for an organisation or site that seeks to deliver sustainable transport objectives through action and is articulated in a document that is regularly reviewed'*.
- 13.18** This will begin with an assessment of the existing travel patterns, current local environment for walkers and cyclists, disabled access arrangements and local public transport links. Then a package of measures will be proposed to promote sustainable modes of transport, such as walking and cycling. These measures are used to meet the specific targets of the Travel Plan, often relating to a specific increase in cycling rates or to minimise the need to travel to and from the site, especially by private car, taken from a baseline situation. It also includes a monitoring regime, whereby surveys will be done to assess progress towards these targets.
- 13.19** A site-wide Residential Travel Plan and Framework Commercial Travel Plan have been developed by Royal HaskoningDHV to promote sustainable transport and are submitted with this application. These travel plans will be updated during the feasibility and design stage.

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 An Ecological Impact Assessment was produced by Ramboll UK Limited. A summary is provided below but please refer to the full report for more details.

14.3 The site contains habitats that vary in nature conservation importance from Negligible to Site level. Additionally, there is potential habitat for breeding birds, commuting bats, foraging, commuting and hibernating hedgehogs, and common assemblages of invertebrates.

14.4 Ecological mitigation and enhancement measures will be undertaken to ensure the development conforms to relevant policies. There is unlikely to be any significant negative residual effects beyond the Site-level as a result of the proposed development. In addition, with the mitigation and enhancement measures including biodiverse roofs, there is potential for significant positive effects.

14.5 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

14.6 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.

14.7 The proposed landscaping strategy includes new planting as well as statement inclusions such as play boulders for decorative purposes and hardscape piazzas. A minimum of 300 new trees will be planted.

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

- > Promote local ecology through the use of native and ornamental 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.

Biodiverse and Green Roofs

14.9 Biodiverse and green roof is to be provided in order to meet Policy G5 of the London Plan.

14.10 A minimum of 4,500 m² biodiverse roofs, in addition to extensive green roof will be included in the development. These 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.

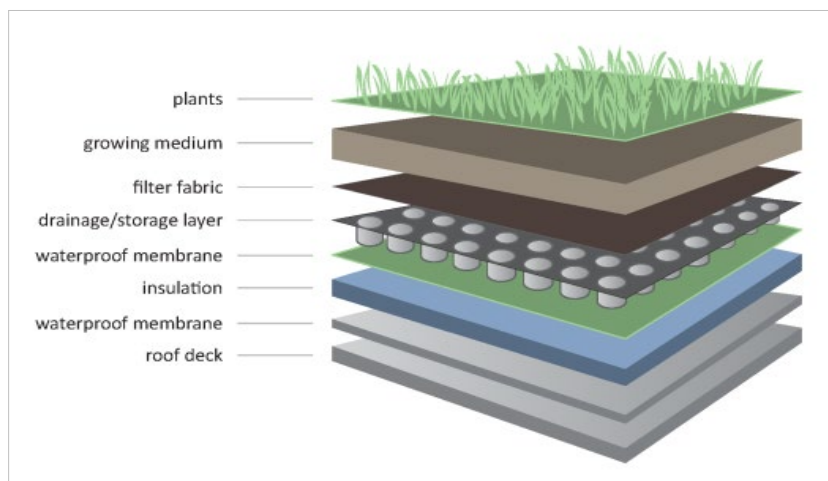


Figure 8: Indicative Build-up of Biodiverse/Green Roof

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.HOME INFORMATION

Home Information

16.1 All dwellings will be provided with a Home Information Manual, providing advice and information on how to best operate the services within their home. This method can be one of the most effective means to reduce energy and water use, both in the short and long term.

Smart Energy Monitors

16.2 As previously mentioned, energy display devices, which monitor consumption data for electricity and primary heating fuel, will be provided to all dwellings.

17. CONCLUSION

- 17.1** Sustainable development has been considered throughout the design of the proposed development at Tesco Osterley by St Edward Homes Limited in the London Borough of Hounslow. 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.
- 17.2** This is an outline planning application with all matters reserved except access and the detailed design will be subject of future reserved matters applications. As such, this statement assesses the parameters set by the outline planning application and demonstrates how it intends to achieve the sustainability commitments.
- 17.3** The key sustainability features outlined in this Sustainability Statement are listed below:
- > **BREEAM:** The commercial units will be designed and built to achieve a BREEAM 'Excellent' rating for shell only units under the New Construction 2018 scheme.
 - > **Energy strategy:** The development will target a 60% reduction in regulated CO₂ emissions over the Part L 2013 baseline through energy-efficiency measures, a heat network, and renewable energy measures.
 - > **Overheating:** An Overheating Mitigation Strategy Report has been undertaken, which sets out the required measures and the commitment to achieve compliance with overheating planning requirements to minimise the risk of overheating in homes.
 - > **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. Rainwater harvesting tanks will be installed to reduce the demand on potable water and promote effective use of water supplies.
 - > **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.
 - > **Circular Economy:** Key circular economy principles have been considered in the design to minimise embodied carbon and operate with a circular economy, maximising the value extracted from materials and prioritising reuse and recycling.
 - > **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 swales, detention ponds, attenuation tanks, permeable paving, and green roofs.
- > **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.
- > **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 London Plan compliant cycle parking spaces and electric vehicle charging points.
- > **Biodiversity and ecology:** Enhancements will be implemented through the provision of landscaped areas, play space and additional tree and shrub planting across the site. A minimum of 4,500 m² biodiverse roofs, in addition to extensive green roof will be included.
- > **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.

18. REFERENCES

- > Greater London Authority (2016) *The London Plan: The Spatial Development Strategy for London Consolidated with Alterations Since 2011*. GLA: London
- > 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 'Excellent' Pre-Assessment

Appendix B

Water Efficiency Calculator

Appendix C

Circular Economy Statement

Appendix A

**BREEAM New Construction 2018
'Excellent' Pre-Assessment**



BREEAM 2018 TRACKER

Tesco Osterley

Project name & number	Tesco Osterley	BREEAM assessor	
Client	St Edward Homes Limited	Project manager	Christopher Scobie
Local authority & postcode	London Borough of Hounslow, TW7 5NZ	Rating required	Excellent
Reason for BREEAM	Planning requirement	Building type	
Status of project	Pre Assessment	Assessment scope	Shell only
Development description	Redevelopment of the current Tesco site in Hounslow. Redevelopment to include residential units and commercial space		

BREEAM assessment details	
Reference number	TBC
Scheme	New Construction 2018
Version	3.0
GIFA (m ²)	
Part L	2013

Target score
73.10%
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	11	12.00%	73.33%	8.80%
Health & Wellbeing	8	7	7.00%	87.50%	6.12%
Energy	13	7	9.50%	53.85%	5.11%
Transport	12	10	14.50%	83.33%	12.08%
Water	3	3	2.00%	100.00%	2.00%
Materials	14	7	22.00%	50.00%	11.00%
Waste	10	8	8.00%	80.00%	6.40%
Land Use & Ecology	13	10	19.00%	76.92%	14.61%
Pollution	6	6	6.00%	100.00%	6.00%
Innovation	10	1	10.00%	10.00%	1.00%
Rating	Excellent				

Revision	Date	Revision details	Author	QA	PM sign off
v1	30.06.2020	Draft for planning	AR	ZW	CS
v2	24.07.2020	Updated draft for planning	AR	ZW	CS
v3	29.07.2020	Updated draft for planning	AR	ZW	CS

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.

For best results please print this document in A3 format.

		Issue		Credits			Minimum standards	
		Issue	Issue sub-title	RIBA Stage	Credit description	Available		Targeted
Management	Man 01	Project brief and design	Project delivery planning	RIBA 2	<p>The project delivery stakeholders will meet to identify and define roles, responsibilities and contributions for each key phase of project delivery. The following will be considered:</p> <ul style="list-style-type: none"> - End user requirements; - Aims of the design and design strategy; - Particular installation and construction requirements or limitations; - Occupiers' budget and technical expertise in maintaining any systems; - Maintainability and adaptability of the proposals; - Operational energy; - Requirements for the production of project and end user documentation; - Requirements for commissioning, training and aftercare support. <p>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.</p>	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	
			Pre-requisite - 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	1	
	Man 02	Life cycle cost and service life planning	Elemental Life Cycle Cost (LCC)	RIBA 2	<p>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.</p> <p>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.</p>	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	Pre-requisite - 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		<p>The principal contractor will operate an Environmental Management System covering their main operations (e.g. ISO 14001).</p> <p>All parties who manage the construction site will also implement best practice pollution prevention policies and procedures on site.</p>	1	1	
			Pre-requisite - 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	1	
			Responsible construction management		<p>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.</p> <p>Compliance with Considerate Constructors is required whilst also undertaking additional responsible construction practices.</p>	1	1	1 credit - Excellent 2 credits - Outstanding
			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	11	

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
Health and wellbeing	Hea 01	Visual comfort	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	1	
			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	1	
			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 be 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	7	
Energy	Ene 01	Reduction of energy and carbon	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	No external lighting will be installed (which includes lighting on the building, at entrances and signs) OR 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	1	
			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 the free cooling strategies as follows: - Night time cooling; - Ground coupled air cooling; - Displacement ventilation; - Ground water or surface water cooling; - Evaporative cooling, direct or indirect; - Desiccant dehumidification and evaporative cooling, using waste heat; - Absorption cooling, using waste heat.	1	0	
			Low and zero carbon technologies	RIBA 2 An energy specialist will complete 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	7	

	Issue			Credits			Minimum standards	
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted		
Transport	Tra 01	Transport assessment and travel plan	RIBA 1	A travel plan is developed based on a site-specific travel assessment or statement. This statement should include: - Existing travel patterns and opinions of existing building or site users towards cycling and walking; - Travel patterns and transport impact of future building users; - Current local environment for walkers and cyclists; - Reporting of the number and type of existing accessible amenities within 500m of the site; - Disabled access; - Calculation of the existing public transport Accessibility Index (AI); - Current facilities for cyclists.	2	2		
	Tra 02	Sustainable transport		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		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. 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 02	Leak detection		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		
	Wat 04	Water efficiency		Identify all water demands from uses that could be realistically mitigated or reduced and establish a demonstrable reduction in the total water demand of the building.	1	1		
Total for water					3	3		
Materials	Mat 01	Environmental impacts - 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	2		
	Mat 02	Environmental impacts - 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	Pre-requisite		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.			
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.	1	1		
Mat 06	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	0		
Total for materials					14	7		

		Issue		Credits				
		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	2	
			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. The assessment will include the following: - Hazard identification - Hazard assessment - Risk estimation - Risk evaluation - Risk management 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	8	

		Issue		Credits			Minimum standards	
		Issue	Issue sub-title	RIBA Stage	Credit description	Available		Targeted
Land Use and Ecology	Le 01	Site selection	Previously occupied land		At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.	1	1	
			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	
	Le 02	Risks and opportunities	Pre-requisite - 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	
	Le 03	Managing negative impacts on ecology	Pre-requisite - 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	1	
	Le 04	Change and enhancement of ecological value	Pre-requisite - 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	1	
	Le 05	Long term ecology management and maintenance	Pre-requisite - 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, the 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	10	

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
Pollution	Pol 03	Flood and surface water management	Pre-requisite	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	
			Pre-requisite - 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	1	
	Pol 04	Reduction of night time light pollution	Reduction of night time light pollution	External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users OR 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.	1	1	
Total for pollution					6	6	

			Issue		Credits		
Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards
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 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	
	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.	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, including as a minimum: - Landscape; - Health and wellbeing; - Resilience; - Infrastructure; - Community and end user involvement. 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	

Appendix B

Water Efficiency Calculator

Water Efficiency Calculator Tesco Osterley				
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 <i>internal</i> 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 <i>total</i> 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.

Appendix C

Circular Economy Statement



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**Circular Economy
Statement**

St Edward Homes Limited

Tesco Osterley

Final

Maihul Varsani
BSc (Hons), MSc

September 2020

DOCUMENT CONTROL RECORD

REPORT STATUS: FINAL

Version	Date	Reason for issue	Author	Checked by	Approved for Issue by Project Manager
v.1	30/06/20	Draft	MV	ZW	CS
v.2	06/07/20	Final Draft	MV	ZW	CS
v.3	24/07/20	Final	MV	ZW	CS
v.4	04/09/20	Final (minor updates)	MV	ZW	DS

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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.

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Executive Summary

The purpose of this Circular Economy statement is to demonstrate that the proposed development at Tesco Osterley by St Edward Homes Limited in the London Borough of Hounslow 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.

The statement takes into consideration the following, with reference to the Intend to Publish London Plan Policy SI7:

- > How demand for materials will be minimised and how new materials are being specified to enable their reuse.
- > How secondary materials can be used.
- > How construction waste will be minimised and how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy.
- > 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.
- > Opportunities for managing as much waste as possible on site.
- > Adequate and easily accessible storage space to support recycling and re-use; and,
- > How much waste the proposal is expected to generate, and how and where the waste will be handled.

Key Commitments

- > Broad objectives for Circular Economy aspirations have been set. Moving forward, workshops will be held to develop and investigate Circular Economy objectives with specific metrics (design team, contractor, suppliers, and facility managers).
- > Site analysis, in the form of detailed pre-demolition / pre-refurbishment audits, will be undertaken.
- > Circular Economy opportunities will be monitored throughout the design and construction process.
- > On completion, success against objectives will be reviewed and an analysis will be undertaken on lessons learnt (whole design team, contractor and relevant supply chains).

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, appointed by St Edward Homes Limited.
- 1.2 The purpose of this statement is to demonstrate that the proposed development at Tesco Osterley, has considered circular economy principles to:
- > Minimise embodied carbon;
 - > Operate with a circular economy;
 - > Maximising the value extracted from materials; and,
 - > Prioritising the reuse and recycling of materials.
- 1.3 The aim of circular economy 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.

2. POLICY AND REGULATIONS

- 2.1 This chapter highlights the policies and regulations which are relevant to the proposed development at Tesco Osterley.

Regional Policy: The London Plan

- 2.2 While not yet adopted, the draft London Plan now carries increasing weight as a material consideration. The Mayor has set out his Intend to Publish (ItP) version. The ItP version of the London Plan has been reviewed by the Secretary of State. Directions have been issued in respect of some policies but none that relate to the sustainability matters.
- 2.3 Policy SI7, listed below, is considered relevant to the proposed development and this Statement, and should therefore be given substantial weight:
- > **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.

Local Policy: London Borough of Hounslow

Adopted Hounslow Local Plan (2015)

- 2.4 The London Borough of Hounslow's Local Plan was adopted in 2015. The following policies are considered relevant to this Statement:

> **Policy EQ2 - Sustainable design and construction** expects development proposals to incorporate established principles for sustainable design and construction as set out in the London Plan, including passive solar design, water efficiency standards, sustainable drainage, the reuse and recycling of construction materials, green roofs and urban greening.



> **Policy EQ7 – Sustainable Waste Management** expects development proposals to incorporate suitable arrangements for waste management, including the location, size and design of waste and recycling facilities, and transport access.

Emerging Local Plan Review Pre-Submission Regulation 19 Consultation (2019)

2.5 Hounslow is currently in the process of preparing its GWC Local Plan Review and Site Allocations Documents, setting out a vision for the borough for the next 15 years. The Plans have undergone extensive consultation but not yet been taken to Examination, so has to be considered in this context and given proportionate weight compared to adopted policy. However, it is noted that it comprises more recent policy that responds to other key emerging and adopted policies. Relevant policies include:

> **Policy GWC5: Design and Heritage** requires full regard to circular economy principles in the design and implementation of energy (including heating and cooling), water and waste infrastructure as set out in new draft London Plan. The policy also requires use high-quality durable, adaptable, and sustainable materials, finishes and details.

Guidance Documents

2.6 Preliminary guidance has been released by the Greater London Authority; it outlines guidance on Circular Economy statements that should accompany all referable planning applications in line with London Plan Policy SI 7.

2.7 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

2.8 The commercial units at the proposed development will be designed and built to achieve a BREEAM ‘Excellent’ rating for shell only units under the New Construction 2018 scheme. A full BREEAM Pre-Assessment has been presented in Appendix A of the Sustainability Statement produced by Hodkinson Consultancy. Implementing a circular economy approach will assist towards achieving the following credits:

- > Management 03 Responsible Construction Practices – Encourage sites to be managed in an environmentally and socially considerate, responsible and accountable manner, resulting in the increased likelihood that construction materials and waste will be managed in an efficient manner to reduce, recycle and reuse where possible.
- > 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.
- > Mat 02 Environmental Impacts of construction products (EPD) – encourages specification of construction products with Environmental Product Declarations (EPD) and therefore increases the likelihood of using reused/recycled/reclaimed and reusable / recyclable / durable / adaptable products within the building reducing life cycle impacts.
- > Materials 03 Responsible Sourcing of Construction Products – Aims to facilitate the selection of products that involve lower levels of negative environmental, economic, and social impact across their supply chain including extraction, processing, and manufacture. Encourages the use of reused/recycled materials and products in the construction of the building.
- > 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.
- > 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 in place for sorting construction waste into waste groups. Encourages circular routes for construction waste.
- > Waste 03 Operational Waste – To encourage the recycling of operational waste through the provision of dedicated storage facilities and space. The building users will be provided with space for recyclable and compostable waste storage, where relevant. It is therefore important 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. This makes it as clear and convenient as possible for the building users to separate waste at source and encourage the reduction of waste to landfill
- > Waste 05 Adaption 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. Credit requires to conduct a study into potential designs for disassembly and functional adaptability of building, with recommendations. Recommendations implemented and an adaptability and disassembly guide produced to communicate.

3. DEVELOPMENT OVERVIEW

Site Location

- 3.1 The proposed development site at Tesco Osterley in the London Borough of Hounslow is located at Syon Lane, Isleworth, TW7 5NZ, as shown in Figure 1 below.

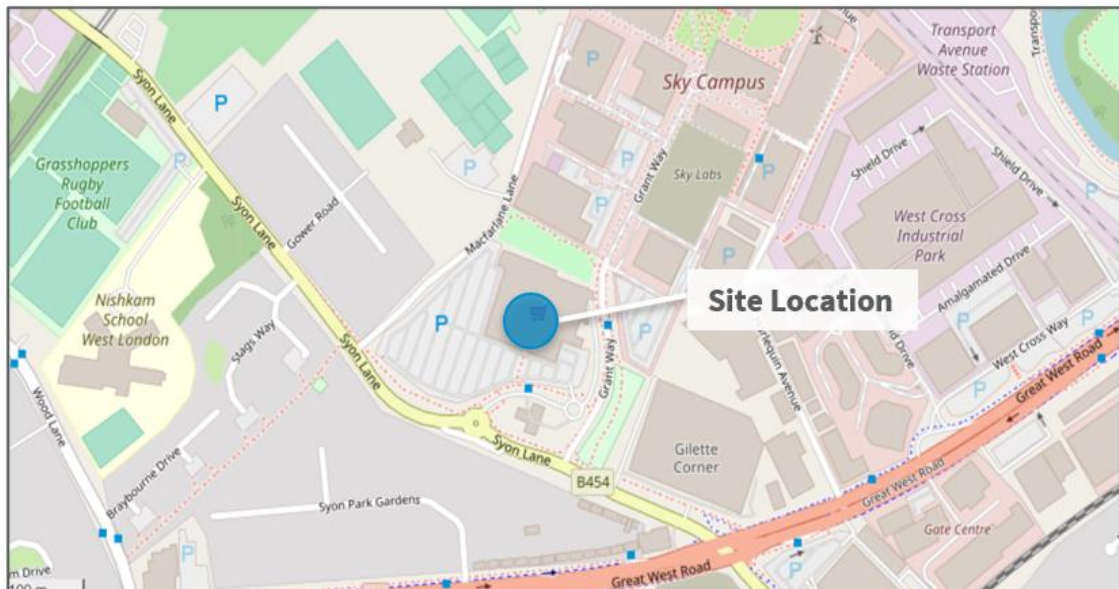


Figure 1: Site Location – OpenStreetMap© 2020

Proposed Development

3.2 The proposed development is described as follows:

“Outline planning application with all matters reserved except access for the demolition of existing building and car park and erection of buildings to provide residential homes, plus flexible non-residential space comprising commercial, business and service space, and/or learning and non-residential institution space, and/or local community space, and/or public house/drinking establishment, and/or a mobility hub, along with associated access, bus turning, car and cycle parking, and landscaping arrangements”

3.3 Summary of scheme:

- > Up to 1,677 new homes;
- > Between 3,000 sqm and 5,000 sqm of flexible non-residential floorspace comprising commercial, business and service space, and/ or learning and non-residential institution space, and/or local community space, and/or a public house/ drinking establishment, and/or mobility hub;
- > Buildings heights ranging from two to 17 storeys;
- > A minimum of 20,000 sqm of publicly accessible open space, which includes three new public open spaces;
- > A minimum of 8,000 sqm of communal amenity space at podium and roof level;
- > A minimum of 5,000 sqm play space split between public ground floor area and communal podium/roof levels;
- > Planting of a minimum of 300 new trees;
- > Up to 400 car parking spaces, including a minimum of 10 car club bays;
- > 20% of car parking spaces to be electric vehicle charging points, with remaining spaces to be passive;
- > London Plan compliant cycle parking;
- > A new public route through the retained and enhanced Water Gardens;
- > A mobility hub and bus welfare facilities; and
- > A new bus turning facility for Route E1 and H28 buses.



Figure 2: Predominant Ground Floor Uses (JTP, 29.06.20)

- 3.4 It is anticipated that the demolition and construction programme of the proposed development would sequence over an approximate six-year period. At this stage, first occupation of units is anticipated in 2026 with full completion potentially in 2030.

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;

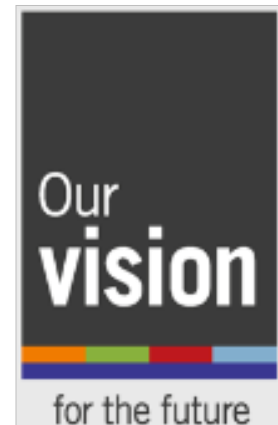
- > Manage demolition waste
- > Manage excavation waste
- > Manage construction waste
- > Manage municipal waste

- 4.5 Adoption of these three core principles on developments would significantly reduce the amount of raw and new materials required for the development at Tesco Osterley. Alongside this, a reduction in vehicle movements, air pollution, noise and greenhouse gas emissions would also be beneficial. St Edward Homes Limited can also benefit from cost savings through the reduction in materials required.

5. BERKELEY GROUP ‘OUR VISION’

- 5.1 As part of the Berkeley Group, St Edward Homes Limited will ensure that the development at Tesco Osterley, achieves the goals and targets set out in the ‘Our Vision’ document.
- 5.2 Although not directly related to circular economy, the company’s vision set by Berkeley encompass the general principals surrounding circular economy, these are as follows:

- > **Climate change and adaptation** – Design homes to consider future climate change to ensure continued thermal comfort
- > **Smart homes** – understand the evolution of smart technology and connectivity in homes and on developments
- > **Net zero carbon** – develop a transition plan for each new development which enables the homes to operate at net zero carbon by 2030.
- > **Carbon positive** – reduce operational carbon emissions intensity by 10% and introduce a programme to become carbon positive.
- > **Off-site manufacture** – through the Berkeley Modular facility, ensure that 30% of construction value is delivered through off-site assembly by 2020.
- > **Waste reduction and recovery** – work with supply chains to develop a zero-waste strategy, focusing on key waste streams including plastics. Reduce construction waste by 10% and reuse or recycle at least 90% of total waste produced.



6. KEY COMMITMENTS

- 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 Appendix C1 has been provided as both a procedural tool to help guide workshops and discussions and as a practical tool to highlight key Circular Economy commitments.
- > Section A guides designers to focus on conserving materials and resources, and to source materials responsibly;
 - > Section B encourages designers to design out waste through measures such as 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;
 - > Section C is where designers should consider measures that can be taken to manage any waste that is generated, by increase reuse and recycling rates.
- 6.3 Opportunities, commitments, and metrics/targets suggested in Appendix C1 will be discussed during workshops and monitored throughout the development process.
- 6.4 In line with recently issued guidance on Circular Economy, on completion of each phase of the development, a review of the successes against objectives and a lessons learnt exercise will be carried out. Where feasible, any improvements will be applied across the latter phased stages.

7. APPROACH TO CIRCULAR ECONOMY

Strategic Design Making

- 7.1 St Edward Homes Limited should look to make changes at a strategic level in order to ensure that the core principles of Circular Economy are adopted. Identifying and applying these approaches during concept design will enable them to be incorporated as part of the development brief.
- 7.2 Some of the different strategic approaches that can be adopted and how they could be incorporated are listed below:

Whole Life Carbon and Material Resource Efficiency

- 7.3 Engagement with the design team has been undertaken to address the end of life strategy for the material. Initial building material formation has been made available to understand future life. This information has been used to initiate a Whole Life Cycle Carbon Emissions Assessment (WLCCE).
- 7.4 An 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 recommendations have been included in a report. The assessment will, once the detailed design has been undertaken, enable BREEAM certification credits (MAT01) to be achieved.
- 7.5 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.
- 7.6 St Edward Homes Limited will follow The Berkeley Group's 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.
- 7.7 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) will be specified where possible.
- 7.8 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/or FSC) where possible, as standard practice.

Refurbishment and Material Conservation

- 7.9 This is the process of redevelopment for similar needs and uses whilst meeting current regulations and standards through restoring, refinishing and future proofing while minimising changes and avoiding replacement of any parts.
- 7.10 A pre-demolition audit should be carried out to determine opportunities for reusing existing materials and / or components. Any existing materials on site will be reviewed to determine if they meet the required functionality of the new building design. Where no such opportunities exist, good practice measures will 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 will be sent to organisations for onward use where feasible.
- 7.11 Investigations will be carried out to establish where possible the extent of reuse, including reuse of materials and components from other projects (whether of major assemblies – e.g. structural steel frame – components, materials, etc.), and its practicality as early as possible. Throughout this process, carbon impacts will also be considered to ensure they are not compromised in material selection.

Minimised Material Use

- 7.12 Adopting 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. For waste reduction, minimisation of excavation, simplification and standardisation of materials and components of choice, and dimensional coordination have been considered.
- 7.13 The development will aim to ‘design out’ waste through the consideration of material specification, such as maximising use of existing materials, and construction techniques in order to prevent and minimise waste generation.
- 7.14 When selecting and designing components the following will be applied where feasible:
- > Design out the need for the component or material.
 - > Use reclaimed material over new and remanufactured components over new, where possible.
 - > Use products with labels such as Cradle to Cradle (C2C) and Natureplus.
 - > Select products that can be remanufactured or reused at end of first life.
 - > Use materials with recycled content.
 - > Select products that are designed for disassembly.

- > Select materials that can be recycled or composted at end of life; and,
- > Consider leasing short lived components.

7.15 When applying the above, complete transparency and visibility throughout the supply chain will be encouraged. Early engagement with the contractor and partnering within the supply chain will be required.

Designing for Longevity

7.16 Liaison with the Local Planning Authority (LPA) to determine population trends and future projections will be considered to ensure the development is capable of meeting them.

7.17 Appropriate and simple maintenance strategies will be planned at design stage, including using condition-based monitoring for equipment.

7.18 Tailored to well-defined, long term needs while being durable and resilient the proposed development will seek to design with longevity in mind. Examples include protecting materials from degradation due to environmental conditions, adopting passive design strategies to provide resilience, and sizing systems to cope with future climate scenarios.

7.19 Suitable durability and protection measures will be incorporated in vulnerable parts of the internal and external building elements (e.g. high pedestrian traffic circulation areas, external walls, glazing, doors, hard landscaping and where exposed to the external environment, cladding, staircases and ramps) so as to minimise the frequency of replacing materials and therefore optimising material use.

7.20 Measures are likely to 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);
- > Roof coverings and/or green roofs;
- > Kick plates or impact protections on doors.

7.21 In accordance with BREEAM guidelines, a climate change adaptation strategy (Waste 05) will be carried out and will comprise of a systematic risk assessment to identify and evaluate the impacts arising from climate change on the buildings at Tesco Osterley, over their projected life-cycle. 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.

- 7.22 Increased flood risk associated with climate change has been addressed in the Flood Risk Assessment, as well as best practice mitigation measures that have been embedded as part of the proposed development. Other climatic predictions, such as increased temperatures, and their likely environmental effects, such as overheating within residential units, will be addressed in separate stand-alone reports that will accompany the outline planning application.
- 7.23 Strong winds associated with storm events will be factored into the design of the proposed development in respect of structural integrity and appropriateness of landscaping features.

Design for offsite construction

- 7.24 Offsite construction and manufacturing should 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.
- 7.25 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, including:
- > Reduced construction related transport movements;
 - > Improved workmanship quality and reducing on site errors and re-work, which themselves cause considerable on-site waste, delay and disruption; and,
 - > Reduced construction timescales and improved programmes.
- 7.26 St Edward Homes Limited will maximise the opportunities for off-site manufacturing using the following:
- > Prefabricated service modules, plant skids for the basement plantrooms
 - > Cladding panels delivered on purpose designed stillage's optimising recycle of temporary equipment

Standardisation or Modularisation

- 7.27 The proposed development will consider designing and construction methods by applying, where feasible, standardised elements or modular designs for materials and products that enable a reduction in construction waste and easier reuse in next life.
- 7.28 Modular elements such as suspended ceiling systems, bathroom pods, utility pods and balconies will be considered where feasible. The use of off-site construction reduces disruption to neighbours,

improves health and safety, and increases efficiency, with minimised material management and waste on site.

- 7.29 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.
- 7.30 Work towards <5% 'special' components across standardised and/or modular designs.

Designing for Assembly, Disassembly and Recoverability

- 7.31 A materials inventory should be created 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.
- 7.32 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.
- 7.33 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.
- 7.34 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.
- 7.35 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.
- 7.36 All assets will seek to be designed to allow for easy assembly and reconfiguration where feasible, for alternative future uses, for example, the design of interior systems for disassembly. Materials will have the option to be taken apart through mechanical and reversible 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.

Designing for Adaptability or Flexibility

- 7.37 The BREEAM Waste 06 'functional adaptability' credit is being 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.

- 7.38 Designing for adaptability and flexibility has been considered in the design to ensure the built asset can cope with a diversity of scenarios, e.g. flexible planning, location of cores and generous floor to ceiling heights. The proposed development has been designed to promote openness and ease of access.
- 7.39 The development will seek to ensuring that the mechanical and electrical design is zoned to allow for future changes in layout.
- 7.40 Considerations have also been given to designing for future adaptability and flexibility, for example, building heights to account for future mezzanine installations.

Site Waste Management

- 7.41 During demolition and construction works, the greatest potential for waste arisings would be from the demolition of existing buildings. Suitable mitigation measures will be employed in order to maximise on-site re-use and recycling and thereby reduce landfill waste from the demolition and construction works.
- 7.42 A detailed Waste Management Strategy will be prepared to confirm the hierarchy of waste management will be adopted in accordance with national policy requirements. 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. For example, if appropriate, areas for temporary stockpiling of materials will be assigned.
- 7.43 A strategy will be put in place to minimise the space taken by storage of new materials. 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.
- 7.44 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.
- 7.45 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.
- 7.46 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.

- 7.47 As part of their commitment to divert construction waste from landfill, St Edward Homes Limited 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.

Operational Waste

- 7.48 Waste reduction during the operational phase is also being considered. New residents and commercial property occupants will be encouraged to reduce and prevent waste through good practice measures such as providing building user guides and 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 London Borough of Hounslow area.
- 7.49 For commercial spaces, the BREEAM Waste 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. The storage will be of a capacity that is appropriate to the building's type, size and predicted volumes of waste
- 7.50 Community initiatives can also provide a good foundation for influencing a more circular economic behaviour. The development should look at possibilities for supporting and implementing community initiative on site. Such initiatives lean towards a focus on household waste reductions.
- 7.51 St Edward Homes Limited is committed to following the waste hierarchy and reducing waste sent to landfill. As such, for the residential units, adequate storage is to be provided in communal stores, where both recyclable and non-recyclable waste can be stored in accordance with Hounslow Council's waste collection service. High profile signage will be provided, where feasible, to encourage correct use of the recycling service.
- 7.52 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.

8. CONCLUSION

8.1 The purpose of this Circular Economy statement is to demonstrate that the proposed development at Tesco Osterley by St Edward Homes Limited in the London Borough of Hounslow 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. The statement takes into consideration the following, with reference to the Intend to Publish London Plan Policy SI7:

- > How demand for materials will be minimised and how new materials are being specified to enable their reuse.
- > How secondary materials can be used.
- > How construction waste will be minimised and how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy.
- > 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.
- > Opportunities for managing as much waste as possible on site.
- > Adequate and easily accessible storage space to support recycling and re-use; and,
- > How much waste the proposal is expected to generate, and how and where the waste will be handled.

Key Commitments

- > Broad objectives for Circular Economy aspirations have been set. Moving forward, workshops will be held to develop and investigate Circular Economy objectives with specific metrics (design team, contractor, suppliers, and facility managers).
- > Site analysis, in the form of detailed pre-demolition / pre-refurbishment audits, will be undertaken.
- > Circular Economy opportunities will be monitored throughout the design and construction process.
- > On completion, success against objectives will be reviewed and an analysis will be undertaken on lessons learnt (whole design team, contractor, and relevant supply chains).

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	The use of RAP (recycled asphalt planning) 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.	Assess existing foundations, floor slabs, pavements, structures, and drainage for possible reuse, where possible.	3D printing of building units on- or off-site can minimise waste generation and resource consumption. This is because 3D printing eliminates off-cuts and can create shapes that use less material and that cannot be made using conventional techniques.	
Minimising the quantities of other resources used (energy, water, land)	N/A	N/A	N/A	In line with BREEAM guidelines (Man 03), energy and water consumption to be monitored on a weekly basis. Targets to be set and progress reported on a monthly basis.
	N/A	N/A	N/A	In line with BREEAM guidelines (Man 03), transport movements from the delivery of construction materials and construction waste from site will be monitored and recorded. Targets are to be set for transportation movements and progress is to be reported on a monthly basis.
Specifying and sourcing materials responsibly and sustainably	Specification of construction products with Environmental Product Declarations (EPD) will be prioritised where feasible/relevant			
	All major building elements to be sourced in accordance with BES6001.			
	St Edward Homes 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.			

	Site / phase / building	Sub-structure	Super-structure	Construction
	Incorporation of a greywater recycling system will be considered			
	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.			
	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. More information can be found in the standalone drainage report, developed by Watermans.	Considerations will be given to the feasibility of oversizing foundations to accommodate future vertical extensions	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.	
		Considerations will be given to the structural grid and floor loading design criteria to allow 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.	
	A pre-demolition audit of any existing buildings, structures or hard surfaces will be carried out and completed	Considerations will be given to the structural cores and typical floor to ceiling heights to allow for future change of use	Unnecessary toxic treatments and finishes will be avoided. Finishes that can contaminate the substrate in a way that they are no longer reusable	

Site / phase / building	Sub-structure	Super-structure	Construction
			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.
			Considerations will be given to designing for services to be easily upgradable for future change of use / changing performance requirements.
			Demountable partitions incorporated where possible to enable flexibility of use.
			Consideration will be given for horizontal and vertical risers, where feasible, to allow for ease of mechanical service upgrades, capacity expansions, and adaptation for change of use.
			Environmental design strategies to allow for future change of use
			Glazing ratios and sound insulation ratings to be considered for different uses.

Site / phase / building	Sub-structure	Super-structure	Construction	
		Connections and components to have high durability.		
Designing out construction, demolition, excavation, industrial and municipal waste arising	Materials, components, and products to be sourced as part of a leasing / buy back scheme, where feasible			
		Access to connections / fittings (internal, façade and structural) provided should allow for ease of dismantling and ensure high percentage recovery of material.	Just in time delivery system to be implemented to ensure that a surplus of materials is not kept on site.	
		Number of different types of connections (to façades, structural, and to internal spaces) are minimised		
	Make information available via a material passport (material circular information database e.g. BAMB) and apply Building Information Modelling (BIM) to understand future life			
	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	Prior to construction, St Edward Homes 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	N/A	N/A	Engagement with community recycling schemes will be considered where appropriate. These include: Community Wood Recycling (CWR) - a network of wood recycling social enterprises providing an efficient and cost-

	Site / phase / building	Sub-structure	Super-structure	Construction
	<p>to all relevant personnel on and off-site.</p> <p>Predicted and actual calculations of total non-hazardous waste arising will be estimated, monitored and recorded.</p>			<p>effective collection service for all types of waste wood.</p> <p>The London Community Resource Network (LCRN) – generate pioneered community-based solutions for waste prevention, recycling and re-use across London</p> <p>Freecycle - a non-profit online group through which people in Barnet can give away items they no longer need, preventing them from going for disposal.</p>
<p>Excavation waste</p>		<p>N/A</p>	<p>N/A</p>	<p>Predicted and actual calculations of total non-hazardous excavation waste arising will be estimated, monitored and recorded.</p>
<p>Construction waste</p>	<p>Contractors should explore reusable packaging solutions with key product manufacturers at the earliest opportunity. Solutions may include:</p> <p>Flat pallets: Wood pallets have the greatest potential for cutting emissions and reusable plastic pallets are better for waste reduction.</p> <p>Box pallets: High quality plastic folding box pallets reduces the need for disposable packaging.</p>			<p>As part of their commitment to divert construction waste from landfill, St Edward Homes 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.</p>

Site / phase / building	Sub-structure	Super-structure	Construction
	<p>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 for other products such as dense cladding, heavy panels and frames.</p>		
<p>Municipal and industrial waste (operational waste management)</p>	<p>The Hounslow Council Website advises on recycling and aims to make recycling easier for residents. Details on accessing this information should be provided in any welcome packs.</p>	N/A	
	<p>Adequate 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 Hounslow's waste collection service.</p>	N/A	
	<p>Space will be provided for segregated recycling waste bins within the kitchen areas of all homes.</p>	N/A	

■	Implemented in design
■	To be considered
■	Future considerations