

September 2020

# SYON GARDENS

## HOMEBASE BRENTFORD SITE, TW7 5QE

### SUSTAINABILITY STATEMENT

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Consultant: Hodkinson Consultancy





**HODKINSON**



**Sustainability  
Statement**

**St Edward Homes Limited**

# **Syon Gardens, Homebase Brentford Site**

Final

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BSc (Hons), MSc

September 2020

## DOCUMENT CONTROL RECORD

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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 demonstrate that the proposed development at Syon Gardens by St Edward Homes Limited in the London Borough of Hounslow is considered sustainable, as measured against relevant local, regional, and national planning policies.

The development will comprise up to 473 high-quality homes; a Tesco retail store of circa 10,550 sqm; additional flexible commercial, business and service space; a community space of 200 sqm; and parking facilities.

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

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

- > **BREEAM:** The retail space for the foodstore will be designed and built to achieve a BREEAM 'Very Good' rating under the New Construction 2018 scheme as a Shell Only assessment.
- > **Overheating:** The scheme has been designed to ensure overheating risk is reduced. The proposed strategy includes window openings and other passive mitigation measures.
- > **Energy strategy:** The development will target a 36% reduction in Regulated CO<sub>2</sub> emissions through energy-efficiency measures and a site-wide heat network.
- > **Water efficiency:** Flow control devices and water efficient fixtures and fittings will be installed in all dwellings to target a maximum internal daily water consumption of 105 litres/person/day.
- > **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.
- > **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 development lies in a low risk flood zone. It will benefit from an attenuation and flow control system that collects surface runoff for discharge into a sewer.
- > **Security:** Consultation with a Security Specialist will take place to ensure the development is safe and secure for its residents.
- > **Sound insulation and noise mitigation:** The dwellings are to target an improvement on Building Regulations Part E through party walls and floors. An appropriate design will be considered to provide the necessary noise mitigation from external and plant noise sources.

- > **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 cycle storage spaces for both the residential and commercial uses.
- > **Biodiversity and ecology:** Enhancements will be implemented through the inclusion of ecological valuable habitats within the landscape strategy.
- > **Green/brown roofs:** The development is expected to include 4, 537 m<sup>2</sup> of green/brown roofs.
- > **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.
- > **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.

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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 planning application for the proposed development at Syon Gardens in the London Borough of Hounslow.

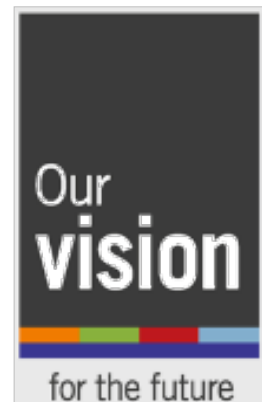
### Sustainability Statement Structure and Methodology

- 1.3** The formulation of the Sustainability Strategy for the development has considered several important objectives, including:
- > To conform to the agreed level of sustainability set out within the masterplan for the development;
  - > To achieve a viable reduction in CO<sub>2</sub> emissions with an affordable, deliverable, and technically appropriate strategy;
  - > To address all national, regional, and local planning policies and requirements;
  - > To provide a high-quality development that is adaptable to future changes in climate;
  - > To minimise the negative impact of the proposed development on both the local and wider climate and environment;
  - > To achieve the highest viable levels of sustainable design and construction;
  - > To minimise emissions of pollutants such as oxides of nitrogen and particulate matter; and
  - > To create a pleasant, safe, and friendly working and living environment that will be flexible to its occupants' needs.
- 1.4** This Sustainability Statement does not duplicate the work of the technical reports prepared in support of the application but presents the findings in the overall context of sustainability.
- 1.5** **Chapter 2** introduces the site and the 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 development.

- 1.7** Chapters 4 to 16 outline the sustainability strategy of the 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 development.

## Berkeley Group ‘Our Vision’

- 1.9** As part of the Berkeley Group, St Edward Homes Limited will ensure that the 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.





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## 2. DEVELOPMENT OVERVIEW

### Site Location

- 2.1 The development site at Homebase Brentford in the London Borough of Hounslow is located at Homebase, Syon Lane, Isleworth TW7 5QE, as shown in Figure 1.



Figure 1: Site Location (Source: St Edward Client Brief, 2019)

- 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 Homebase Site is a rectangular plot of land located on the corner of Syon Lane and the Great West Road at Gillette Corner. It has an area of approximately 1.4 ha.
- 2.4 The site is developed with a large Homebase store (4,180 sqm) and associated surface car parking and under-croft car parking (295 spaces). The Homebase store comprises of a large industrial style shed with metal cladding. The building is effectively two storeys high with a central pylon to the front.

## Development Description

2.5 The development is described as follows:

*“Full planning application for the demolition of existing building and car park and erection of buildings to provide residential units, a replacement retail foodstore, with additional commercial, business and service space, and a flexible community space, and ancillary plant, access, servicing and car parking, landscaping and associated works.”*

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## 3. RELEVANT PLANNING POLICY

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

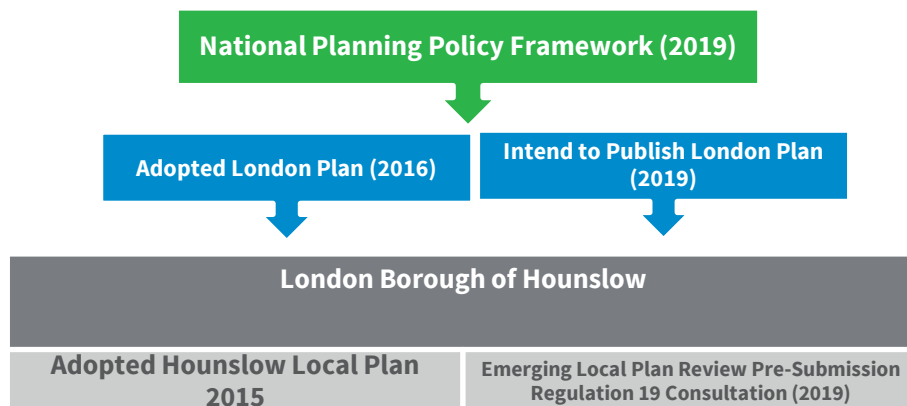


Figure 2: Relevant Planning Policy Documents

### National Policy: National Planning Policy Framework (NPPF)

- 3.2 The revised National Planning Policy Framework (NPPF) was published on 19<sup>th</sup> 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 (2016)

- 3.5** The existing London Plan sets out an integrated economic, environmental, transport and social framework for the development of London. The following policies are considered relevant to the proposed development and this Statement:
- 3.6** **Policy 5.3 – Sustainable Design and Construction** states that the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime.
- 3.7** Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.
- 3.8** Major development proposals should meet the minimum standards outlined in the Mayor’s supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in the London Plan and the following sustainable design principles:



- a) Minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems)
- b) Avoiding internal overheating and contributing to the urban heat island effect
- c) Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings
- d) Minimising pollution (including noise, air and urban runoff)
- e) Minimising the generation of waste and maximising reuse or recycling
- f) Avoiding impacts from natural hazards (including flooding)
- g) Ensuring developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions
- h) Securing sustainable procurement of materials, using local supplies where feasible, and
- i) Promoting and protecting biodiversity and green infrastructure.

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

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

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

## Intend to Publish London Plan (2019)

**3.12** 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.

**3.13** The policies, which are listed below, are considered relevant to the proposed development and this Statement, and should therefore be given substantial weight:

- 3.14 **Policy SI2 Minimising Greenhouse Gas Emissions** states that major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand.
- 3.15 **Policy SI3 Energy Infrastructure** states that energy masterplans should be developed for large-scale development locations which establish the most effective energy supply options.
- 3.16 **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.
- 3.17 **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).
- 3.18 **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.
- 3.19 **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.
- 3.20 **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)

- 3.21 The London Borough of Hounslow's Local Plan was adopted in 2015. The following policies are considered relevant to this Statement:
- 3.22 **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.

- 3.23 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.
- 3.24 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.
- 3.25 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.
- 3.26 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.
- 3.27 Policy EQ1 - Energy and carbon reduction** requires all development to meet the carbon emission reduction requirements set out in the London Plan.
- 3.28 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.
- 3.29 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.

- 3.30 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.
- 3.31 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.
- 3.32 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.
- 3.33 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)

- 3.34** 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:
- 3.35 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).
- 3.36 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.
- 3.37 Policy GWC4: Open Space and Green Infrastructure** requires development to improve the overall green coverage and biodiversity of the area.
- 3.38 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 new draft 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.

**3.39 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 Intend to Publish London Plan policy.

## GLA pre-application feedback

**3.40** The Greater London Authority (GLA) was consulted at the pre-application stage. The pre-application advice with respect to climate change is summarised below.

**3.41** The following targets are in effect for planning applications that are referred to the Mayor:

- > Residential – Net zero carbon with at least an on-site 35% reduction in carbon emissions beyond Part L of 2013 Building Regulations.
- > Non-residential – 35% reduction in carbon emissions beyond Part L of 2013 Building Regulations. The zero-carbon target will apply to non-domestic developments when the new London Plan is adopted.

**3.42** The carbon emission figures should be reported against a Part L 2013 baseline separately for the domestic and non-domestic elements. The use of the SAP 10 emission factors is encouraged. An assessment using SAP 2012 emission factors should be provided for comparison.

**3.43 Be Lean - demand reduction:** The applicant should commit to meeting Part L 2013 by efficiency measures alone as a minimum for domestic and non-domestic elements separately.

**3.44 Cooling and overheating:** Overheating risk should be identified using the domestic overheating checklist and passive responses should be adopted. The demand for cooling and the overheating risk should be minimised in line with the Cooling Hierarchy. Dynamic overheating modelling in line with CIBSE Guidance is recommended.



- 3.45 Be Clean - heating infrastructure:** Connection to nearby existing or planned district heating networks should be considered. The site-wide heat network should be developed in line with the new heating hierarchy in Policy SI3 of the Intend to Publish London Plan and further advice in the GLA's Energy Assessment Guidance (2020).
- 3.46 Be Green - renewable energy:** Major development proposals are expected to maximise on-site renewable energy generation.
- 3.47 Carbon off-setting:** New developments should maximise carbon emission reductions on-site. A financial contribution to the Council's carbon offset fund will be required where the carbon reduction targets are not achievable.
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## 4. BREEAM SUMMARY

- 4.1** The proposed shell only Tesco store will be assessed under the BREEAM New Construction 2018 assessment with a target of achieving a 'Very Good' rating. Although Policy EQ2 of the adopted Hounslow Local Plan, requires an 'Excellent' rating, the mandatory credits to achieve this such as the Ene 01 credits are difficult to achieve for Shell only units. Hence, a 'Very Good' rating with endeavours for 'Excellent' is being targeted for the larger Tesco food store.
- 4.2** The smaller flexible use space is approximately 144 sqm. Hence, as this is less than 500 sqm as indicated in Policy EQ2, BREEAM certification is not being pursued for it. However, it will benefit from BREEAM-related site-wide measures implemented for the larger Tesco food store including:
- > minimised flood risk;
  - > responsible construction practices;
  - > protection and enhancement of ecology;
  - > waste minimisation measures;
  - > sustainable procurement of materials.
- 4.3** A full BREEAM Pre-Assessment has been presented in **Appendix A** and provides an illustrative route to achieving the 'Very Good' rating. The predicted score at this stage is 65.6%, 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.
- 4.4** The principles and requirements of many of the individual credits feature throughout this Sustainability Statement, where appropriate, however the mandatory credits for BREEAM 'Very Good' are listed as follows:

- > **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.
- 4.5 Whilst this has been determined as the most appropriate route to certification, the actual route to certification may vary as the detailed design progresses.
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## 5. ENERGY AND CO<sub>2</sub> 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; however, this document should be referred to for greater detail.
- 5.2 The purpose of this Energy Statement is to outline the proposed energy strategy for the development. The energy strategy has been formulated following the London Plan Energy Hierarchy: Be Lean, Be Clean and Be Green.
- 5.3 A range of advanced Be Lean energy efficiency measures are proposed. They enable the development to achieve a 12% reduction in regulated carbon emissions for the residential areas, and 23% for non-residential areas, which exceeds the Intend to Publish London Plan requirements.
- 5.4 In line with the Intend to Publish London Plan, the feasibility of decentralised energy production as a Be Clean measure has been carefully examined. There are no existing district heat networks in proximity to the site. It is proposed that a site-wide heat network is installed, supplying heat from a network sourced by air source heat pumps and gas boilers. All homes will be connected to the heat network, with connection points provided to all non-residential units (with the exception of the Tesco store, which will have a standalone heating strategy). Provision will be made for future connection to external heat networks. This delivers a site-wide CO<sub>2</sub> reduction of 19% over the Part L 2013 baseline.
- 5.5 The combination of energy efficiency and heat network measures results in an estimated Regulated CO<sub>2</sub> emissions reduction of 36% over the Part L 2013 baseline. This meets the energy requirements of the Intend to Publish London Plan Policy SI 2 and London Borough of Hounslow local plan policy.
- 5.6 The full spectrum of Be Green renewable energy generating technologies has been considered. No further renewable energy technologies are considered necessary to meet the 35% onsite carbon reduction policy target, which has already been achieved through focusing on energy efficiency and heat network measures.

- 5.7** In line with the GLA guidance, the development will commit to offset the remaining domestic CO<sub>2</sub> emissions through a payment to the London Borough of Hounslow.

## Ventilation

- 5.8** 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 otherwise been lost. The dwelling MVHR unit should target a specific fan power (SFP) of 0.42-0.44 W/l/s and efficiency of 91%.
- 5.9** The Tesco food store is anticipated to utilise a fan coil unit with a heat recovery system. The specification of this system will be the responsibility of the tenant fitting out the unit. The target performance should be an SFP of 1.5 W/l/s with ≥ 85% heat recovery.
- 5.10** The other non-residential units (flexible use space, community space, and residential facility) will utilise an efficient MVHR system. An SFP of 1.3 W/l/s and 85% heat recovery have been assumed.

## Lighting

- 5.11** 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.

## Appliances

- 5.12** 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+++. 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.
- 5.13** The choice of energy efficient appliances and the effective use of them will not only reduce unregulated CO<sub>2</sub> emissions but will save occupants money. Where provided, white goods will aim to be energy efficient with at least a B rating.
- 5.14** 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.

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## 6. WATER REDUCTION

### Internal Water Efficiency

- 6.1 Increased frequency of drought across Europe lines up with climate change projections and water companies in the UK capture much less rain for our use than people assume. As of February 2019, 12 out of the 23 water companies operating in areas of England were classified as being under 'serious' stress (Energy Saving Trust, 2019).
- 6.2 Each individual in the UK currently uses on average 140 litres/person/day and total UK demand for water in the 2080s is projected to increase by between 4-18% (CCRA2, 2015).
- 6.3 Reducing water consumption will not only help to preserve our water sources but will also save energy. Approximately 15% of a typical gas-heated household's heating bill is from heating water for showers, baths and taps and the energy used to heat water for devices and appliances emits an average of 875 kg of CO<sub>2</sub> per household per year. This is equivalent to the CO<sub>2</sub> 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 the Draft New London Plan and the optional tighter Building Regulations Approved Document G requirement (110 litres/person/day). An evaluation of the proposed fixtures and fittings will be undertaken during the detailed design however an illustrative strategy to achieve this water target is set out in the Water Efficiency Calculator in Appendix B.

### Leak Detection and Prevention

- 6.5 Another method of reducing water consumption is to ensure that water leaks do not go undetected. As such a leak detection system may be installed which will be capable of detecting a major water leak on the mains water supply within the 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 foodstore. This will allow the water consumption of the development to be monitored and managed and therefore encourage reductions. This will enable the BREEAM 2018 Wat 02 credit to be achieved.

## External Water Efficiency

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

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## 7. WASTE MANAGEMENT

- 7.1 Waste reduction and recycling is another key challenge of sustainable development and something which is strongly encouraged in the Intend to Publish London Plan Policy SI7. The waste hierarchy, illustrated in Figure 4 below, prioritises those waste management options which are best for the environment.

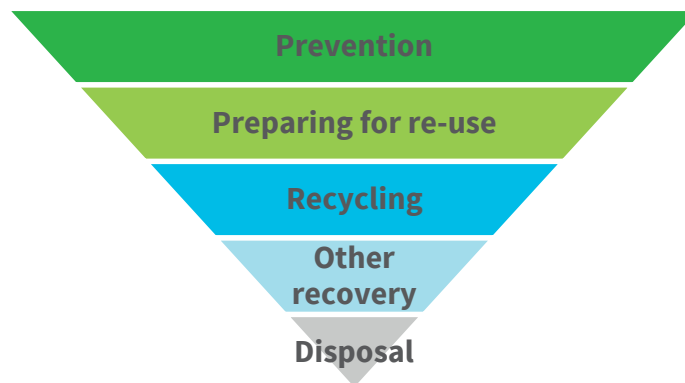


Figure 3: Waste Hierarchy

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

## Construction Waste

- 7.3** The reduction of construction waste not only minimises environmental impacts through ensuring the responsible use of resources and waste disposal but can also significantly reduce 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** As mentioned in paragraph 7.3, a detailed waste management strategy will be prepared to confirm the hierarchy of waste management will be adopted in accordance with national policy requirements. This establishes 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 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 located at ground floor, 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.
- 7.11** Adequate food waste storage will be provided in accordance with the London Borough of Hounslow's collection service.

## **Commercial Waste**

- 7.12** Adequate space for the segregation and storage of commercial waste and recycling will be provided in communal stores located at ground floor. This space will meet the following BREEAM requirements:
- > Bins will be clearly labelled to assist with waste segregation, storage and collection;
  - > The stores will be accessible to building occupants and facilities operators; and
  - > The storage will be of a capacity that is appropriate to the building's type, size and predicted volumes of waste.

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# **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.

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## 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 5.3 and the Intend to Publish 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, like BES 6001.
- 9.6** All timber and timber-based products will be PEFC or FSC certified 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. This involves options appraisals of two to four different super/substructure designs to identify options to reduce overall environmental impact.
- 9.10** Please refer to Energy Statement by Hodkinson Consultancy for the Whole Life Cycle Carbon Assessment submitted in support of the 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.

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# 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** An External Noise Assessment has been undertaken by Buro Happold, which indicates the measures required to address noise pollution, if any. The findings are summarised below, but please refer to this report in full for further detail.

- 10.3** Road traffic noise on the surrounding roads and regular aircraft overflights associated with Heathrow Airport nearby are the dominant sources of noise at the Site. In addition, there are occasional train movements to the south-east of the Site.
- 10.4** The report outlines the acoustic requirements to ensure that the internal ambient noise levels are compliant with the guidance given in BS8233:2014 and the requirements of the London Borough of Hounslow.
- 10.5** Mitigation measures have been designed-in via glazing and façade specification and ventilation. Attenuation measures have also been suggested for plant noise.

## Reduction of Night Time Light Pollution

- 10.6** As per BREEM requirements (credit: Pol 04), 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. 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. As Tesco signage will be illuminated, it will be designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements, to ensure suitable illuminance levels are achieved.

## Air Quality

- 10.7** 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 (DEFRA, 2018). It is not only a major risk to human health, but it also has significant damaging impacts on both plants and animals.
- 10.8** Between 1990 and 2017, the UK's estimated emissions of nitrogen oxides reduced by 70%, and the estimated emissions of PM<sub>10</sub> particulate matter reduced by 55% (DEFRA, 2018). This must continue to fall in future years. St Edward Homes Limited are committed to reducing the development's negative impact on air quality during construction and operation.
- 10.9** An Air Quality Assessment has been undertaken by Buro Happold.
- 10.10** The potential air quality impacts on future Site users were assessed, and pollutant concentrations at the residential unit locations across the Site have been predicted for the opening year and compared against air quality objectives. All residential units meet long and short-term air quality limits in the most realistic operational scenario, and as such openable windows are acceptable for all residential units.
- 10.11** The predicted operational impact is insignificant; hence, no mitigation measures are required. Please refer to the full report for further detail.

## Air Tightness and Ventilation

**10.12** Air leakage is to be minimised. For the dwellings, an air permeability of 3 m<sup>3</sup>/hr/m<sup>2</sup> will be targeted.

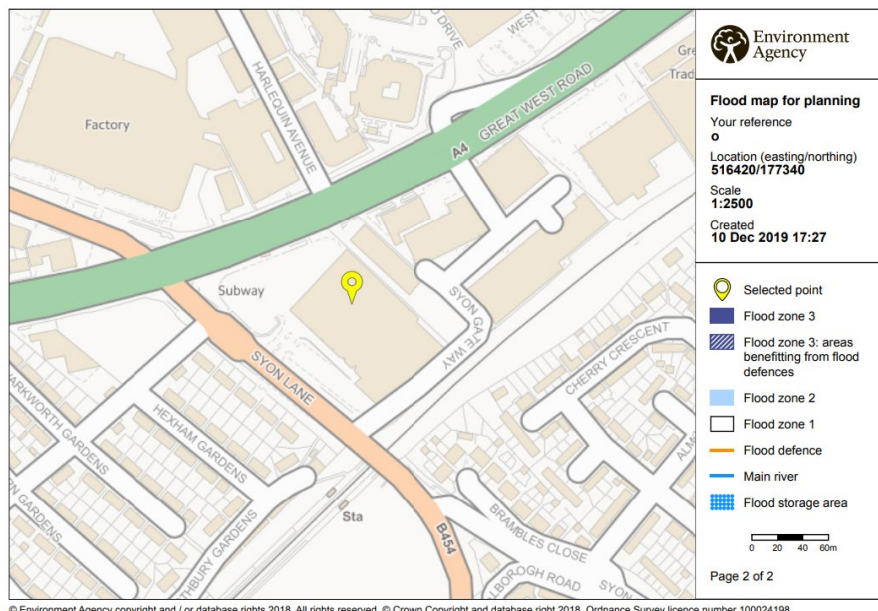
**10.13** For the commercial units, an air permeability of 5 m<sup>3</sup>/hr/m<sup>2</sup> will be targeted.

# 11. FLOOD RISK & SURFACE WATER RUN-OFF

## Flood Risk

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

**11.2** A Flood Risk Assessment (FRA) was undertaken by AECOM Ltd. According to the FRA and the Environment Agency's Flood Map shown in Figure 4, the 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%).



**Figure 4: 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 5 below. 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.

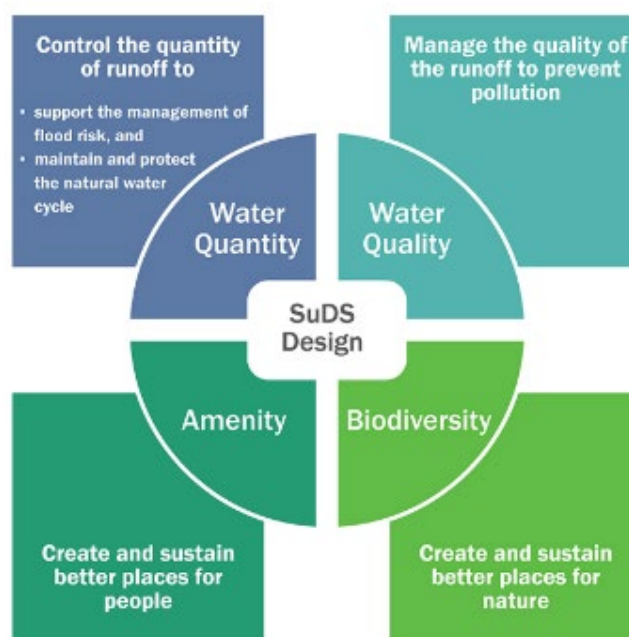


Figure 5: The four 'pillars' of SuDS – CIRIA SuDS Manual (2015)

- 11.5** Waterman group have developed the drainage strategy and AECOM Ltd. have produced the SuDS hierarchy for the proposed development. In line with Policy 5.13 of the Adopted London Plan and Policy SI13 of the Intend to Publish London plan, the following listed SuDS are proposed as part of the drainage strategy. These will not only help to attenuate surface water but will provide the necessary water treatment.
- > **Attenuation via oversized pipes** will be used to store and control discharge from the tank. Attenuated runoff will be gradually discharged into the Thames Water foul water sewer located in Syon Lane.
  - > **Green/brown roofs** will help to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows. These roofs will be incorporated in accordance with Local Plan Policy EQ2 and Adopted London Plan Policy 5.11.

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## 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 development will be aiming to incorporate the principles of Secured by Design where appropriate. An initial consultation with a Security Consultant has been undertaken and recommendations have been incorporated in the design.



### Safe Access

- 12.3** St Edward Homes Limited is committed to ensuring that the development is safe and secure for its users. All footpaths will consider dedicated pedestrian crossings and will be appropriately lit and signposted.

### Sound Insulation

- 12.4** 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.
- 12.5** The commercial element of the building will target the appropriate acoustic performance standards and testing requirements for sound insulation in order to achieve the Hea 05 credit of the BREEAM assessment.

### Inclusive Design

- 12.6** St Edward Homes Limited's commitment to inclusivity will ensure that the 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.
- 12.7** In addition, 90% of the new dwellings will be designed and built to Building Regulations Approved Document M4(2) standards, with 10% to Part M4(3) in accordance with London Plan Policy 3.8. These standards will ensure accessible and adaptable accommodation for everyone; young

families, older people, individuals with a temporary or permanent physical impairment, and allow residents to stay in their home despite developing disabilities. They also enable flexibility, visitability (facilitating ease of visiting access to the homes by everyone, regardless of mobility or disability) and future-proofing i.e. the accommodation will be adaptable and able to respond to changing technological and environmental conditions.

## Daylight and Sunlight

- 12.8** 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.
- 12.9** A Daylight and Sunlight Assessment has been produced by Point 2 Surveyors Ltd. Please refer to the full report for further details.



## Overheating

- 12.10** Minimising the risk of summer overheating and high uncontrollable temperatures is important so as to ensure that homes are comfortable for their occupants and remain so 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.
- 12.11** Given the noise context, an initial overheating dynamic thermal modelling has been carried out to balance thermal and acoustical comfort as well as natural daylight provision. This was done on a sample of dwellings.
- 12.12** The proposed ventilation strategy introduces window openings during unoccupied hours for living rooms exposed to high noise risk and outside sleeping hours for bedrooms. It also employs passive mitigation measures in line with the GLA's cooling hierarchy such as reduced glazing ratio, raised windows sills in bedrooms on noisy facades to reduce solar gain, controlled solar glazing, external shading in the form of balconies arranged to provide shade to both living rooms and bedrooms. In addition, communal corridors will benefit from an environmental ventilation system, which will act as the primary means of ventilation.
- 12.13** All homes and the communal corridor tested demonstrate that the risk of overheating has been minimised as far as practical based on the London Plan Cooling Hierarchy and CIBSE TM59:2017 criteria. The overall strategy effectively accounts for noise limitations and provides occupants with a choice to naturally ventilate their home according to their preferences, tolerance and perception of noise and thermal comfort, while mitigating the need to use comfort cooling.

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## 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.
- > 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.
- 13.2** A Transport Assessment for the site was undertaken by Royal HaskoningDHV.
- 13.3** According to the Transport Assessment, the residential development of 473 dwellings could generate approximately 336 and 269 two-way trips during the weekday AM and PM peak hours, respectively.
- 13.4** In addition, the development is expected to result in reduced retail traffic movements on the local highway network.
- 13.5** Please refer to the full report for further detail.

### Local Amenities

- 13.6** The development has access to the following key amenities in the local area which will help to reduce dependency on private transport:
- > Administrative services (e.g. post office, banks and cash points);
  - > Health services (e.g. Hospitals, GP practices, and pharmacies);
  - > Small/large scale retail services (e.g. shops and restaurants). In particular, the Tesco foodstore is on the ground floor of the development, directly under the dwellings;
  - > Recreation and leisure facilities (e.g. sports centres and cinemas); and

- > Education and community facilities (e.g. nurseries, schools, places of worship and community centres).

## Public Transport

- 13.7** The site is well-positioned to be accessed by public transport, due to its proximity to Syon Lane station, Osterley Station and a number of frequent bus services:
- > **Syon Lane Station** is situated approximately 100m to the south of the site, along Syon Lane. It is in Zone 4. It provides National Rail services direct to London Waterloo, Richmond and Weybridge.
  - > **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.
  - > **Clapham Junction** is a major railway station on the South Western Railway network and is accessible via a train journey of some 20 minutes from Syon Lane. Clapham Junction is served by London Overground, Southern and Gatwick Express services.
  - > There are bus stops directly adjacent to the site on A4 Great West Road and Syon Lane within 50m. Bus stops on London Road, adjacent to Syon Park are also accessible to the site, approximately 600m south of the site. The site is well served by bus routes with seven regular bus services within walking distance of the site. The H28 bus route runs along Syon Lane and stops and turns around at Tesco Osterley. The H91 can be accessed from the A4 at bus stops K/C respectively and serves destinations which include Chiswick, Hammersmith and Hounslow Town Centre.
- 13.8** The Transport for London Public Transport Accessibility Level (PTAL) map for the site is presented in Figure 6 below. The site has a public transport accessibility rating of PTAL 2/3. The southern part of the site falls into a PTAL 3 area, due to its proximity to bus services on London Road.





Figure 6: PTAL Map – [www.tfl.gov.uk](http://www.tfl.gov.uk)

## Cycle Parking

- 13.9 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 Intend to Publish London Plan.
- 13.10 The development includes 204 cycle parking spaces for the retail space. Cyclist facilities such as showers, lockers, and changing facilities will also be provided.
- 13.11 There are also 896 cycle parking spaces available for residents and visitors across multiple floors. All the cycle stores are served by a cycle lift.

## Car Parking

- 13.12 The development will include 400 retail car parking spaces, 100 residential car parking spaces, 3 residential visitor car parking spaces, and 2 car club spaces.
- 13.13 The development’s vehicular access to the car parking area is from the existing site access junction on Syon Lane. A two-way ramp will serve a two-storey car park. It is proposed that the junction of main vehicular access with Syon Lane will take the form of a three-arm signalised junction. The proposed car parking facilities makes provision for car parking spaces that are associated with the

use of the Tesco store and for residents separately. These will be provided in compliance with Policy T6 of the Intend to Publish London Plan.

## Electric Car Charging

- 13.14** 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<sub>x</sub> emissions in London, measures such as electric vehicle charging points are strongly encouraged.
- 13.15** Therefore, in accordance with Policy T6 of the Intend to Publish London Plan, the development will allow for the provision of electric vehicle charging points.
- 13.16** Electric vehicle car charge points will be provided for 10% and 20% of all parking spaces for the commercial and residential units, respectively, on first site occupation, with passive provision made such that all car parking on-site could have access to an electric car charge point in the future if required.

## Travel Plan

- 13.17** The proposed scheme provides public realm improvements in the adjacencies of the site which result in an attractive pedestrian environment for future users of the site as well as pedestrians that traverse the site frontages as part of local access routes.
- 13.18** The proposed improvements include cycle infrastructure improvements provide a continuous link across the northern frontage of the site. Pedestrian access for the residential units will be provided on all four frontages of the site. The scheme improves pedestrian infrastructure on the southern perimeter of the site (Syon Gateway). There is a cycle lift present that can be accessed from the street level along Syon Gate Way.
- 13.19** The Residential and Commercial Travel Plans will be managed by a Travel Plan Coordinator (TPC) and will be funded by St Edward Homes Limited. The modal shift targets will be achieved through a range of measures to encourage active travel modes.

## Working from Home

- 13.20** The concept of working from home will be promoted by the provision of internal services and infrastructure, enabling a home office to be established in each dwelling. This will contribute to the vibrancy of the scheme, whilst offering additional environmental benefits in terms of potentially reducing the demand for transportation.
- 13.21** The home office space will likely comprise the provision of two double electric sockets, a broadband connection, good ventilation, and adequate internal daylight levels.

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## 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. It will also enable the Le 01 credit under the BREEAM assessment to be achieved.

### Protection of Ecological Value

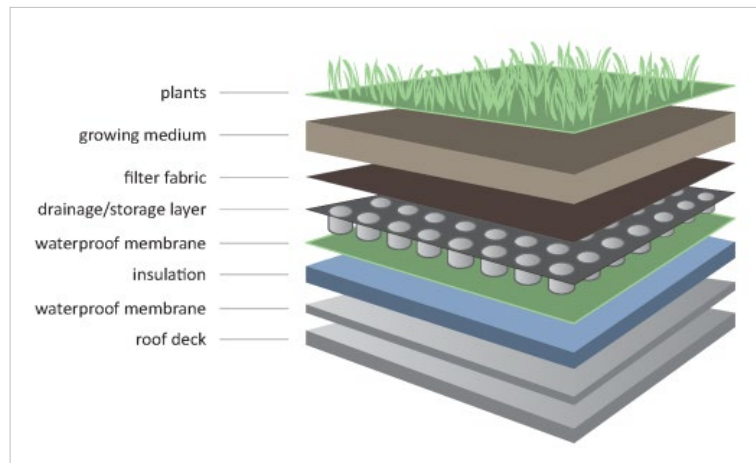
- 14.2** An ecological assessment, comprising an Extended Phase 1 Habitat survey, was undertaken across the site at Homebase Brentford by Derek Finnie Associates. This is in line with the Le 02 credit under the BREEAM assessment. The Site was found to comprise building and hardstanding surrounded by introduced shrub planting.
- 14.3** Overall, the Site is of negligible ecological value with no ecological constraints to re-development being identified.
- 14.4** Biodiversity gains will be achieved through the inclusion of ecological valuable habitats within the landscape strategy.
- 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 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. This is also crucial to achieve the Le 04 credit under the BREEAM assessment.
- 14.7** The landscape will be an integral part of the development, providing valuable open space for the enjoyment of residents and other users. The landscape strategy was created by Murdoch Wickham, which should be referred to for further information. It includes the following:
- > Provision of a circulation network which responds to existing and future movements patterns and facilitates accessibility, connectivity and permeability to the wider context and within the Site;
  - > Enhancement of the existing adjacent context to promote healthy and high-quality public spaces and streets;
  - > A new landscape which captures the beneficial environmental opportunities offered by the Site (sun, fresh air, light, access to green spaces) and protects against the negative (noise, pollution, strong, cold winds);
  - > Provision of high quality and richly layered residential amenity space within the communal podium gardens. Each home at podium level will have an individual private terrace encouraging outdoor living. In addition, a child play space will also be provided;
  - > Promotion of biodiversity and sustainability through the inclusion of wildlife friendly planting and ecological enhancements. In particular, this will include new tree and shrub planting including native species and/ or species of wildlife value; native hedge planting to private residential garden boundaries; wild flower meadow planting to podium nature garden; species-rich amenity grass to podium lawns; and bird & bat nesting boxes and invertebrate 'Bug Hotels'.

## Green/brown Roofs

- 14.8** Green/brown roof is to be provided in order to meet Policy 5.11 of the Adopted London Plan, S113 of the Intend to Publish London Plan, and Policy GB4 and GB7 of the adopted Hounslow Local Plan. Currently, it is expected that 4,537 m<sup>2</sup> of green/brown roof will be provided, but this may vary at detailed design stage. 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 7: Indicative Build-up of Green/Brown Roof**

## Green Walls

- 14.9** A green wall could potentially be incorporated as part of the building. However, this requires further assessment, which will be undertaken at detailed design stage.
- 14.10** Green walls are vertical built structures intentionally covered by vegetation. Green walls include a vertically applied growth medium such as soil, substitute substrate, or hydroculture felt; as well as an integrated hydration and fertigation delivery system. Green walls add to the natural elements present on a site and promote biophilia.

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## 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.
- 15.2** An outline Design and Construction Management Plan (DCM) and Construction Environmental Management Plan (CEMP) has been submitted in support of the full planning Application by St. Edward Homes Limited. The DCM and CEMP aim to ensure that construction industry best practice standards are adopted throughout the construction process and demonstrates the developer's

commitment to undertake construction activities in such a way as to avoid or minimise environmental effects and provides a mechanism for the implementation of recommended mitigation and monitoring measures throughout the construction. Measures 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.

## Considerate Constructors Scheme

**15.3** 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.

**15.4** 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

**15.5** 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.

**15.6** 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.

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## 16. HOME INFORMATION AND AFTERCARE

### 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 Energy display devices, which monitor consumption data for electricity and primary heating fuel, will be provided to all dwellings.

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## 17. CONCLUSION

- 17.1 Sustainable development has been considered throughout the design of the proposed development at Syon Gardens by St Edwards 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 The key sustainability features outlined in this Sustainability Statement are listed below:
- > **BREEAM:** The retail space for the foodstore will be designed and built to achieve a BREEAM 'Very Good' rating under the New Construction 2018 scheme as a Shell Only assessment.
  - > **Overheating:** The scheme has been designed to ensure overheating risk is reduced. The proposed strategy includes window openings and other passive mitigation measures.
  - > **Energy strategy:** The development will target a 36% reduction in Regulated CO<sub>2</sub> emissions through energy-efficiency measures and a site-wide heat network.
  - > **Water efficiency:** Flow control devices and water efficient fixtures and fittings will be installed in all dwellings to target a maximum internal daily water consumption of 105 litres/person/day.
  - > **Waste and recycling:** Adequate facilities will be provided for domestic and construction related waste, including segregated bins for refuse and recycling.
  - > **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 development lies in a low risk flood zone. It will benefit from an attenuation and flow control system that collects surface runoff for discharge into a sewer.
- > **Security:** Consultation with a Security Specialist will take place to ensure the development is safe and secure for its residents.
- > **Sound insulation and noise mitigation:** The dwellings are to target an improvement on Building Regulations Part E through party walls and floors. An appropriate design will be considered to provide the necessary noise mitigation from external and plant noise sources.
- > **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 cycle storage spaces for both the residential and commercial uses.
- > **Biodiversity and ecology:** Enhancements will be implemented through the inclusion of ecological valuable habitats within the landscape strategy.
- > **Green/brown roofs:** The development is expected to include 4, 537 m<sup>2</sup> of green/brown roofs.
- > **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.
- > **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.

**17.3** These measures demonstrate compliance with London Plan and Hounslow Local Plan policies and guidance.



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## 18. REFERENCES

- > 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 Retail 'Very Good'  
Pre-Assessment

### **Appendix B**

Water Efficiency Calculator

### **Appendix C**

Circular Economy Statement

# **Appendix A**

**BREEAM New Construction 2018  
Retail 'Very Good' Pre-  
Assessment**



# BREEAM 2018 TRACKER

## Syon Gardens

<b>Project name &amp; number</b>	Syon Gardens, Homebase Brentford Site	<b>BREEAM assessor</b>	Zeta Watkins
<b>Client</b>	St Edward Homes Limited	<b>Project manager</b>	Christopher Scobie
<b>Local authority &amp; postcode</b>	London Borough of Hounslow, TW7 5QE	<b>Rating required</b>	Very Good
<b>Reason for BREEAM</b>	Planning requirement	<b>Building type</b>	Retail
<b>Status of project</b>	Pre Assessment	<b>Assessment scope</b>	Shell only
<b>Development description</b>	Redevelopment of the current Homebase 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 <sup>2</sup> )	10,500
Part L	2013

Target score
<b>65.60%</b>
<b>Very Good</b>

Awarded score
<b>0.00%</b>

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	10	12.00%	66.67%	8.00%
Health & Wellbeing	8	7	7.00%	87.50%	6.12%
Energy	13	3	9.50%	23.08%	2.19%
Transport	12	7	14.50%	58.33%	8.45%
Water	3	3	2.00%	100.00%	2.00%
Materials	14	6	22.00%	42.86%	9.42%
Waste	10	8	8.00%	80.00%	6.40%
Land Use & Ecology	13	11	19.00%	84.62%	16.07%
Pollution	6	6	6.00%	100.00%	6.00%
Innovation	10	1	10.00%	10.00%	1.00%
<b>Rating</b>	<b>Very Good</b>				

Revision	Date	Revision details	Author	QA	PM sign off
v1	11.09.2019	Draft for comment	ZW	KP	CS
v2	24.07.2020	Updated draft	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
<b>Management</b>	<b>Man 01</b>	<b>Project brief and design</b>	Project delivery planning	<b>RIBA 2</b>	<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"> <li>- End user requirements;</li> <li>- Aims of the design and design strategy;</li> <li>- Particular installation and construction requirements or limitations;</li> <li>- Occupiers' budget and technical expertise in maintaining any systems;</li> <li>- Maintainability and adaptability of the proposals;</li> <li>- Operational energy;</li> <li>- Requirements for the production of project and end user documentation;</li> <li>- Requirements for commissioning, training and aftercare support.</li> </ul> <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>	<b>1</b>	<b>1</b>	
			Stakeholder consultation	<b>RIBA 2</b>	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.	<b>1</b>	<b>1</b>	
			<b>Pre-requisite - BREEAM Advisory Professional</b>	<b>RIBA 1</b>	The project team, including the client, formally agree strategic performance targets early in the design process.	-	-	
			BREEAM Advisory Professional - Concept Design	<b>RIBA 2</b>	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.	<b>1</b>	<b>1</b>	
			BREEAM Advisory Professional (AP) - Detailed Design	<b>RIBA 3</b>	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.	<b>1</b>	<b>1</b>	
	<b>Man 02</b>	<b>Life cycle cost and service life planning</b>	Elemental Life Cycle Cost (LCC)	<b>RIBA 2</b>	<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>	<b>2</b>	<b>0</b>	
			Component level life options appraisal	<b>RIBA 4</b>	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.	<b>1</b>	<b>0</b>	
			Capital cost reporting		Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/ m <sup>2</sup> ).	<b>1</b>	<b>1</b>	
	<b>Man 03</b>	<b>Responsible construction</b>	<b>Pre-requisite - Legally harvested and traded timber</b>		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>	<b>1</b>	<b>1</b>	
			<b>Pre-requisite - BREEAM Advisory Professional</b>		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.	<b>1</b>	<b>0</b>	
			Responsible construction management		The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks. Compliance with Considerate Constructors is required for 1 credit.	<b>1</b>	<b>1</b>	<b>1 credit - Excellent 2 credits - Outstanding</b>
					Compliance with Considerate Constructors is required whilst also undertaking additional responsible construction practices.	<b>1</b>	<b>1</b>	
	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.	<b>1</b>	<b>1</b>			
	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.	<b>1</b>	<b>1</b>			

			Issue		Credits			
Issue		Issue sub-title	RIBA Stage	Credit description	Available	Targeted	Minimum standards	
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		
		<b>Total for management</b>				<b>15</b>	<b>10</b>	
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 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	
<b>Total for health and wellbeing</b>					<b>8</b>	<b>7</b>		
Ene 01	Reduction of energy and carbon	Energy performance		An Energy Performance Ratio for New Construction (EPR <sub>NC</sub> ) will be calculated. The EPR <sub>NC</sub> achieved will be compared with the benchmarks below in order to award the corresponding number of BREEAM credits.	9	1	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

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
Energy	Ene 04	Low carbon design	RIBA 2	<p>Note - To achieve this the first credit under Hea 04 Thermal Modelling must be achieved.</p> <p>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<sub>2</sub>) emissions resulting from the passive design measures will be calculated.</p>	1	0	
				<p>Note - To achieve this credit the passive design analysis credit must be awarded.</p> <p>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:</p> <ul style="list-style-type: none"> <li>- Night time cooling;</li> <li>- Ground coupled air cooling;</li> <li>- Displacement ventilation;</li> <li>- Ground water or surface water cooling;</li> <li>- Evaporative cooling, direct or indirect;</li> <li>- Desiccant dehumidification and evaporative cooling, using waste heat;</li> <li>- Absorption cooling, using waste heat.</li> </ul>	1	0	
			RIBA 2	<p>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.</p> <p>The reduced regulated carbon dioxide (CO<sub>2</sub>) emissions resulting from the feasibility study will be quantified.</p>	1	1	
<b>Total for energy</b>					<b>13</b>	<b>3</b>	
Transport	Tra 01	Transport assessment and travel plan	RIBA 1	<p>A travel plan is developed based on a site-specific travel assessment or statement. This statement should include:</p> <ul style="list-style-type: none"> <li>- Existing travel patterns and opinions of existing building or site users towards cycling and walking;</li> <li>- Travel patterns and transport impact of future building users;</li> <li>- Current local environment for walkers and cyclists;</li> <li>- Reporting of the number and type of existing accessible amenities within 500m of the site;</li> <li>- Disabled access;</li> <li>- Calculation of the existing public transport Accessibility Index (AI);</li> <li>- Current facilities for cyclists.</li> </ul>	2	2	
	Tra 02	Sustainable transport		<p>Note - At least one credit must be achieved for Tra 01 for any credits to be awarded in this issue.</p> <p>Credits will be awarded based on the Accessible Index (AI) of the project, and the number of transport measures implemented.</p>	10	5	
<b>Total for transport</b>					<b>12</b>	<b>7</b>	
Water	Wat 02	Water meter		<p>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.</p> <p>The water meter should connect to a BMS or utility monitoring system or should be capable of connecting to one.</p>	1	1	Good Very Good Excellent Outstanding
	Wat 02	Leak detection		<p>A leak detection system capable of detecting a major water leak on the utilities water supply within the building will be installed AND</p> <p>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.</p>	1	1	
	Wat 04	Water efficiency		<p>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.</p>	1	1	
<b>Total for water</b>					<b>3</b>	<b>3</b>	
	Mat 01	Environmental impacts - LCA		<p>During the Concept Design and Technical Design, demonstrate the environmental performance of the building as follows:</p> <ul style="list-style-type: none"> <li>- 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</li> </ul> <p>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).</p>	7	1	
	Mat 02	Environmental impacts - EPD		<p>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.</p>	1	1	

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
<b>Materials</b>	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.	1	1	
			Protecting exposed parts of the building from material degradation	Provide a detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors and provide convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design will be implemented and the design the roof and façade to prevent water damage, ingress and detrimental ponding will also be undertaken.			
	Mat 06	Material efficiency	Material efficiency	RIBA 1 Targets will be set and opportunities and methods to optimise the use of materials will be reported for all RIBA stages. The implementation of material efficiency will be reported on during developed design through to construction.	1	0	
	<b>Total for materials</b>					<b>14</b>	<b>6</b>
<b>Waste</b>	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 <sup>2</sup> - Two credits - <6.5 tonnes per 100m <sup>2</sup> - Three credits - <3.2 tonnes per 100m <sup>2</sup>	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.							



	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
	Wst 06	Design for disassembly and adaptability	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	
			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	
<b>Total for waste</b>					<b>10</b>	<b>8</b>	
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		<b>Pre-requisite</b> - 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  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		<b>Pre-requisite</b> - 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		<b>Pre-requisite</b> - Identifying and understanding the risks and opportunities  To achieve this credit the credits under LE 03 must be achieved.	-	-	
				Liaison, implementation and data collation  Route two only: The project team will implement the solutions and measures selected in a way that enhances ecological value in the following order: - On site, and where this is not feasible; - Off site within the zone of influence.	1	1	
				Enhancement of ecology  Route two only: Credits will be awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project.	3	2	

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
	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	<p>The project team will liaise and collaborate with representative stakeholders to:</p> <ul style="list-style-type: none"> <li>- Monitor and review implementation and the effectiveness;</li> <li>- Develop and review management and maintenance solutions, actions or measures.</li> </ul> <p>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.</p> <p>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.</p>	1	1	
			Landscape and ecology management plan	<p>A landscape and ecology management plan will be developed in accordance with BS 42020:20131 covering the first five years.</p> <p>The landscape and management plan will be updated as appropriate to support maintenance of the ecological value of the site.</p>	1	1	
<b>Total for land use and ecology</b>					<b>13</b>	<b>11</b>	
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	<p>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.</p> <p>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.</p>	1	1	
			Surface water run-off - volume	<p>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</p> <p>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.</p>	1	1	
			Minimising watercourse pollution	<p>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.</p> <p>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.</p>	1	1	
	Pol 04	Reduction of night time light pollution	Reduction of night time light pollution	<p>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</p> <p>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.</p>	1	1	
<b>Total for pollution</b>					<b>6</b>	<b>6</b>	

	Issue			Credits			Minimum standards
	Issue	Issue sub-title	RIBA Stage	Credit description	Available	Targeted	
<b>Innovation</b>	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 $\geq 0.9$ and zero net regulated CO <sub>2</sub> 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 <sup>2</sup> 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	
				<b>Total for Innovation</b>	<b>10</b>	<b>1</b>	

# **Appendix B**

## **Water Efficiency Calculator**

Water Efficiency Calculator Syon Gardens				
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**



**HODKINSON**



**Circular Economy  
Statement**

**St Edward Homes Limited**

# **Syon Gardens, Homebase Brentford Site**

Final

**Maihul Varsani**  
BSc (Hons), MSc

September 2020

## DOCUMENT CONTROL RECORD

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## ABOUT HODKINSON CONSULTANCY

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

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

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

This report has been prepared by Hodkinson Consultancy using all reasonable skill, care and diligence and using evidence supplied by the design team, client and where relevant through desktop research.

Hodkinson Consultancy can accept no responsibility for misinformation or inaccurate information supplied by any third party as part of this assessment.

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## Executive Summary

The purpose of this Circular Economy statement is to demonstrate that the proposed development at Syon Gardens 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.
- > How secondary materials can be used.
- > How new materials are being specified to enable their reuse.
- > 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 Syon Gardens 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 Syon Gardens.

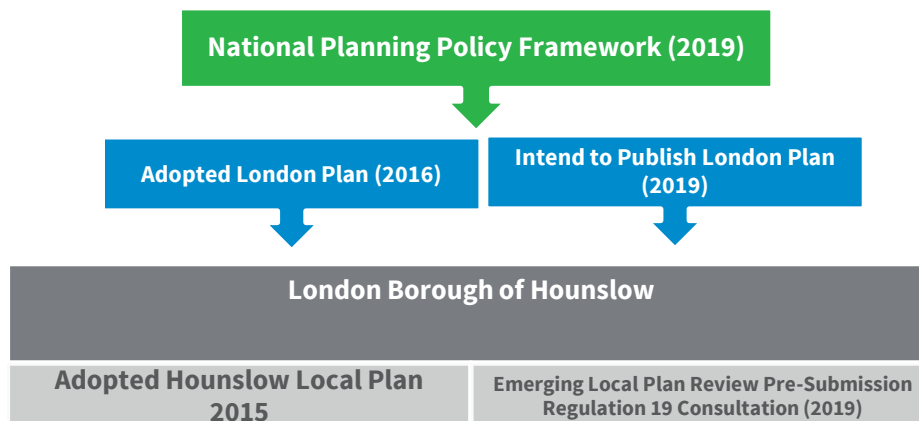


Figure 1: Relevant Planning Policy Documents

## Legislation: Climate Change Act 2008

- 2.2 The UK government amended the **Climate Change Act 2008** in June 2019 to target net zero carbon emissions by 2050. The target requires the UK to bring all greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels.
- 2.3 Any emissions must be balanced by schemes to offset an equivalent amount of greenhouse gases from the atmosphere.

## National Policy: NPPF

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

## Regional Policy: The London Plan

- 2.5 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.
- 2.6 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)

2.7 The London Borough of Hounslow's Local Plan was adopted in 2015 to 2030. 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)

2.8 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

- 2.9 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.
- 2.10 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

- 2.11 The proposed development (food store) will be designed and built to achieve a BREEAM 'Very Good' rating under the New Construction 2018 scheme as a Shell Only unit. Implementing a circular economy approach will assist, where targeted, towards achieving credits under Mat01 (Environmental Impacts from Construction Products – Building and Life Cycle Assessment (LCA)); Mat05 (Designing for Durability and Resilience); and Wst06 (Material Efficiency).

## 3. DEVELOPMENT OVERVIEW

### Site Location

- 3.1 The development site at Homebase Brentford in the London Borough of Hounslow is located at Homebase, Syon Lane, Isleworth TW7 5QE, as shown in Figure 2.



Figure 2: Site Location – St Edward Client Brief, 2019

- 3.2 The Homebase Site is a rectangular plot of land located on the corner of Syon Lane and the Great West Road at Gillette Corner. It has an area of approximately 1.4 ha.
- 3.3 The site is developed with a large Homebase store (4,180sqm) and associated surface car parking and under-croft car parking (295 spaces). The Homebase store comprises of a large industrial style shed with metal cladding. The building is effectively two storeys high with a central pylon to the front.

### Proposed Development

- 3.4 The proposed development is described as follows:

*“Full planning application for the demolition of existing building and car park and erection of buildings to provide residential units, a replacement retail foodstore, with additional commercial, business and service space, and a flexible community space, and ancillary plant, access, servicing and car parking, landscaping and associated works”*



3.5 As a summary, the scheme will provide:

- > Delivery of up to 473 high quality homes;
- > 38% affordable housing (on a habitable room basis);
- > A new and modern Tesco retail store of circa 10,550 sqm (GIA);
- > Community space of 200 sqm;
- > 137 sqm (GIA) of flexible commercial, business and service space;
- > 400 retail car parking spaces;
- > 100 residential car parking spaces;
- > 3 residential visitor car parking spaces and 2 car club spaces;
- > 204 retail cycle parking spaces;
- > 896 residential cycle parking spaces;
- > Building heights include a four-storey podium with blocks ranging up to seventeen storeys;
- > Communal residential amenity space with biodiverse podium gardens including open space and children's play space;
- > New active frontages and improved, safer public realm along Syon Lane and the Great West Road; and,
- > Dedicated new pedestrian and cycle friendly 'clean air' route provided between Syon Lane Station and the Great West Road via Syon Gate Way and new eastern street, Syon Gate Lane.

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## 4. CIRCULAR ECONOMY PRINCIPLES

- 4.1 A circular economy is defined in the Intend to Publish London Plan Policy SI7 'Reducing Waste and Supporting the Circular Economy' as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste.
- 4.2 In contrast to a linear economy (take, make, dispose), a circular economy keeps products and materials circulating through the system at their highest value for as long as possible, through re-use, recycling, refurbishment, and remanufacturing.

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

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

**1. Conserve resources and source ethically;**

- > Minimise the quantities of materials used
- > Minimise the quantities of other resources used
- > Specify and source materials and other resources responsibly and sustainably

**2. Design to eliminate waste (and for ease of maintenance);**

- > Design for longevity, adaptability or flexibility and reusability or recoverability
- > Design out construction, demolition, excavation, and municipal waste arising

**3. Manage waste sustainably and at the highest value;**

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

4.5 Adoption of these three core principles on developments would significantly reduce the amount of raw and new materials required for the proposed development at Syon Gardens. 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.

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## 5. BERKELEY GROUP ‘OUR VISION’

- 5.1 As part of the Berkeley Group, St Edward Homes Limited will ensure that the proposed development at Syon Gardens, 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.



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## 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.
- 6.3 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.

- 6.4 Opportunities, commitments, and metrics/targets suggested in Appendix C1 will be discussed during workshops and monitored throughout the development process.
- 6.5 In line with recently issued guidance on Circular Economy, on completion, a review of the success against objectives and a lessons learnt exercise will be carried out.

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## **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 Assessment (WLCA).
- 7.4 An WLCA 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, attached to a standalone Sustainability Statement appendix. The assessment will enable BREEAM certification credits (MAT01) to be achieved and will consider, for RIBA stage 2-4, design for superstructure, substructure and core services.
- 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.

## Pre-demolition and Material Conservation

- 7.6 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.
- 7.7 A pre-demolition audit will 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.
- 7.8 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

- 7.9 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.
- 7.10 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.
- 7.11 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.

7.12 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**

7.13 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.

7.14 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.

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

### **Design for offsite construction**

7.16 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.

7.17 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.

## Standardisation or Modularisation

- 7.18 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.
- 7.19 Berkeley Modular, a newly formed company, founded to produce a volumetric modular housing solution for the Berkeley Group could cater for this service, 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.
- 7.20 Elements should use standardised design formats to enable future reuse, e.g. no bespoke cutting of materials as this can make replacements difficult to obtain.

## Designing for Assembly, Disassembly and Recoverability

- 7.21 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.
- 7.22 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.
- 7.23 Materials 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.
- 7.24 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.
- 7.25 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.
- 7.26 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

- 7.27 The BREEAM Wst 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.
- 7.28 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.
- 7.29 The development will seek to ensuring that the mechanical and electrical design is zoned to allow for future changes in layout.
- 7.30 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

- 7.31 An outline Design and Construction Management Plan (DCM) and Construction Environmental Management Plan (CEMP) has been submitted in support of the full planning Application by St Edward Homes Limited for the proposed development at Syon Gardens. The DCM and CEMP aims to ensure that construction industry best practice standards are adopted throughout the construction process and demonstrates the commitment of the Developer to undertake construction activities in such a way as to avoid or minimise environmental effects and provides a mechanism for the implementation of recommended mitigation and monitoring measures throughout the construction.
- 7.32 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 strategy will aim to support innovative design features to the proposed development to use materials in their current state and form (for example reuse of soils), this can occur either on or off site. 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.
- 7.33 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.



- 7.34 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.
- 7.35 During the construction phase, materials recovered from any on-site 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.
- 7.36 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.

## Estimated Waste from Construction

- 7.37 At this stage, no detailed bill of quantities for building material has been drawn up for the proposed development. Assumptions on the likely quantity of waste to arise will be made based on the building use schedule, and using typical construction waste composition data (DEFRA, 2009). Therefore, estimations at present, do not account for measures that should be incorporated to reduce waste produced during construction, for example through design and procurement.
- 7.38 Waste arising from the construction of buildings at the proposed development will be calculated using BRE SmartWaste benchmarks. The BREEAM Wst 01 'Construction Waste Management' credit is being sought which aims to limit the volume of waste arising and encourages diversion of resources from landfill. A benchmark of approximately 6.5 tonnes per 100m<sup>2</sup> will be initially targeted with at least 90% of non-hazardous waste to be diverted from landfill.

## Operational Waste

- 7.39 Waste reduction during the operational phase is also being considered. New residents and property occupants will be encouraged to reduce and prevent waste through good practice measures such as providing information packs to residents about how the waste segregation and recycling scheme operates. The information will also include details on waste prevention schemes within the London Borough of Hounslow area.
- 7.40 For commercial spaces, the BREEAM Wst 03 'Operational Waste' criteria will be followed to ensure adequate provision of dedicated storage facilities for a building's operational-related recyclable waste streams is provided, so that this waste is diverted from landfill or incineration.
- 7.41 Community initiatives can 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.

## Household Waste

7.42 St Edward Homes Limited is committed to following the 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 Council's waste collection service. High profile signage will be provided, where feasible, to encourage correct use of the recycling service.

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.

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## 8. CONCLUSION

8.1 The purpose of this Circular Economy statement is to demonstrate that the proposed development at Syon Gardens 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
- > How secondary materials can be used
- > How new materials are being specified to enable their reuse
- > 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
- > 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
<b>Section A: Conserve resources - Focus on conserving materials and resources, and to source materials responsibly</b>				
<b>Minimising the quantities of materials used</b>	The use of RAP (recycled asphalt planings) as a significant proportion of the aggregate input in landscaping could be considered. As well as avoiding the use of virgin aggregate this utilises the bitumen on the reused stone.	Reuse existing foundations, floor slabs, pavements, structures, and drainage 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.	
<b>Minimising the quantities of other resources used (energy, water, land)</b>	N/A	N/A	N/A	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	Monitor and record data for the transport movements from the delivery of construction materials and construction waste from site. Set targets for transportation movements and progress to be reported on a monthly basis.
<b>Specifying and sourcing materials responsibly and sustainably</b>	St Edward Homes Ltd 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.			
	All major building elements to be sourced in accordance with BES6001.			
	Products to be specified using performance criteria, rather than by brand or specification. For example,			

	Site / phase / building	Sub-structure	Super-structure	Construction
	tensile and yield for steel and lux levels for lighting.			
	Incorporation of a greywater recycling system will be considered			
	Specify materials with increased levels of recycled content where there is no impact on cost or performance			
<b>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</b>				
<b>Designing for reusability / recoverability / longevity / adaptability / flexibility</b>	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.	
	Circulation capacity, fire strategy and means of escape could be developed to accommodate for different uses	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		Connections and components to have high durability	

Site / phase / building	Sub-structure	Super-structure	Construction	
			Adopt passive design strategies to provide resilience, size systems to cope with future climate scenarios.	
			Consider panelised construction, particularly for roofs and facades to permit final deconstruction on the ground	
			Demountable partitions incorporated where possible to enable flexibility of use	
			Unnecessary toxic treatments and finishes will be avoided. Finishes that can contaminate the substrate in a way that they are no longer reusable will be avoided unless they serve a specific purpose.	
<b>Designing out construction, demolition, excavation, industrial and municipal waste arising</b>	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 dismount 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			

	Site / phase / building	Sub-structure	Super-structure	Construction
	Design coordinated to avoid excess cutting and jointing of materials / components that generate waste			
		A deconstruction plan will be produced	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.
<b>Section C: Manage waste - Consider measures that can be taken to manage any waste that is generated, by increase reuse and recycling rates</b>				
<b>Demolition waste</b>	<p>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 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>	N/A	N/A	Engagement with community recycling schemes such as Community Wood Recycling (CWR) is a network of wood recycling social enterprises providing an efficient and cost-effective collection service for all types of waste wood.
<b>Excavation waste</b>		N/A	N/A	Predicted and actual calculations of total non-hazardous excavation waste arising will be estimated, monitored and recorded
<b>Construction waste</b>	Contractors should explore reusable packaging solutions with key product manufacturers at the			As part of their commitment to divert construction waste from landfill, St Edward Homes will regularly monitor and record the



Site / phase / building	Sub-structure	Super-structure	Construction
	<p>earliest opportunity. Solutions may include:</p> <p><b>Flat pallets:</b> Wood pallets have the greatest potential for cutting emissions and reusable plastic pallets are better for waste reduction.</p> <p><b>Box pallets:</b> High quality plastic folding box pallets reduces the need for disposable packaging.</p> <p><b>Steel stillages:</b> 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>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>
<p><b>Municipal and industrial waste (operational waste management)</b></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>	<p>N/A</p>	
	<p>Adequate storage is to be provided in communal stores located at ground floor level of each block,</p>	<p>N/A</p>	

Site / phase / building	Sub-structure	Super-structure	Construction
	where both recyclable and non-recyclable waste can be stored in accordance with Hounslow's waste collection service.		
	Space will be provided for segregated recycling waste bins within the kitchen areas of all homes.		N/A

■	Implemented in design
■	To be considered
■	Future considerations