HOARE LEA

Stag Brewery.
London.
Reselton Properties Limited.

SUSTAINABILITY
SUSTAINABILITY STATEMENT

REVISION 01 – 14 JULY 2020

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	14/07/2020	Final issue for planning submission.	R. Harper	E. Jolly	R. Harper

Project number: 23/10513
Document reference: REP-2310513-5A-RH-20190909-Sustainability Statement-Rev01.docx

Contents.

Audit sheet. **2**

Executive summary. **4**

1. Introduction. **6**

2. Sustainability statement. **8**
2.1 Resource management – land. 8
2.2 Resource management - energy and carbon dioxide emissions. 12
2.3 Resource management - water efficiency. 22
2.4 Resource management - materials and waste. 24
2.5 Resource management - nature conservation and biodiversity. 25
2.6 Climate change adaption - tackling increased temperature and drought. 25
2.7 Climate change adaption – increasing green cover. 28
2.8 Climate change adaptation – flooding. 28
2.9 Pollution management - land contamination. 30
2.10 Pollution management - air quality. 31
2.11 Pollution management – noise. 32
2.12 Pollution management - light pollution. 32
2.13 Pollution management - water pollution. 32
2.14 Pollution management - wastewater treatment. 33

3. Conclusion. **35**

4. Appendix A: BREEAM new construction pre-assessment summary. **36**

5. Appendix B: BREEAM domestic refurbishment pre-assessment summary. **38**

6. Appendix C: Policy framework. **39**
6.1 Building regulation Part L2013. 39
6.2 GLA planning policy. 39
6.3 Supplementary planning guidance documents. 40
6.4 London Borough of Richmond upon Thames. 40

7. Appendix D: LBRuT sustainability checklist. **49**

Executive summary.

This Sustainability Statement has been prepared by Hoare Lea as a revised submission document to the Energy Strategy submitted under Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL) ('the Applications'), in respect of the former Stag Brewery Site in Mortlake ('the Site') within the London Borough of Richmond Upon Thames ('LBRuT'). The Applications are for the comprehensive redevelopment of the Site. This document has been prepared on behalf of Reselton Properties Limited ('the Applicant'). A summary of the Applications is set out below:

a. Application A – hybrid planning application for comprehensive mixed use redevelopment of the former Stag Brewery site consisting of:
    i. Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
    ii. Land to the west of Ship Lane (excluding the school) applied for in outline (referred to as 'Development Area 2' throughout).
b. Application B – detailed planning application for the school (on land to the west of Ship Lane).
c. Application C – detailed planning application for highways and landscape works at Chalkers Corner.

This document replaces the Sustainability Statement submitted in support of the original applications.

The Applications were submitted in February 2018 to LBRuT. The Applications are related and were proposed to be linked via a Section 106 Agreement. In May 2019, a package of substitutions was submitted to LBRuT for consideration, which sought to address comments raised by consultees during determination. On 29 January 2020, the Applications were heard at LBRuT's Planning Committee with a recommendation for approval. This scheme is thereafter referred to as "the Original Scheme".

The Committee resolved to grant Applications A and B, and refuse Application C. The granting of Applications A and B was subject to the following:

a. Conditions and informatives as set out in the officer's report, published addendum and agreed verbally at the meeting;
b. Amendments to the Heads of Terms and completion of a Section 106 Legal Agreement which was delegated to the Assistant Director to conclude;
c. No adverse direction from the Greater London Authority ('GLA'); and
d. No call in by the Secretary of State for Housing, Communities and Local Government.

The Applications have been referred to the GLA and the Mayor has given a direction that he will take over the determination of the Applications and act as local planning authority in relation to all three applications.

The Applicant has engaged with the GLA in respect of the proposed amendments to the scheme, referred to throughout this document as the 'Revised Scheme'. As a result of these discussions, a number of changes have been made to the scheme proposals which are summarised as follows:

a. Increase in residential unit provision from up to 813 units (this includes the up to 150 flexible assisted living and / or residential units) to up to 1,250 units;
b. Increase in affordable housing provision from up to 17% to up to 30%;
c. Increase in height for some buildings, of up to three storeys compared to the Original Scheme;
d. Change to the layout of Buildings 18 and 19, conversion of Block 20 from a terrace row of housing to two four storey buildings;
e. Reduction in the size of the western basement, resulting in an overall reduction in car parking spaces of 186 spaces, and introduction of an additional basement storey beneath Building 1 (the cinema);
f. Other amendments to the masterplan including amendments to internal layouts, re-location and change to the quantum and mix of uses across the Site, including the removal of the nursing home and assisted living in Development Area 2;
g. Landscaping amendments, including canopy removal of four trees on the north west corner of the Site; and
h. Associated highways works may be carried out on adopted highways land.

The submission documents have tested an affordable housing provision of 30%. However, it should be noted that the final affordable housing level is subject to further viability testing and discussions with the GLA.

Minor amendments have also been made to the road and pedestrian layouts for the school (Application B). No other amendments are proposed to Application B. No amendments are proposed to the physical works proposed under Application C, although alternative options within the highway boundaries for mitigating the highway impact of the amended proposals have been assessed within the relevant substitution documents for Applications A and B and are the subject of ongoing discussions with the GLA and TfL.

A more detailed summary is included within the Planning Statement Addendum and Design and Access Statement Addendum submitted with the Revised Scheme documents.

These changes are being brought forward as substitutions to Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL), which are related applications (to be linked via a Section 106 Agreement).

It is important to note that no changes are proposed to the physical works proposed under Application C – the only change to this application is that the supporting documents (which include all documents submitted under Applications A and B) have been updated in the context of the proposed changes to the scheme as sought under Applications A and B. Application C was resolved to be refused by LBRuT at Committee on 29 January 2020. As a result, whilst the works proposed in Application C are still an available option, the Applicant has progressed alternative approaches for addressing and mitigating the impacts on surrounding highways, and these have been tested within the relevant substitution documents for Applications A and B. All of these options are subject to ongoing discussions and testing with TfL. They are all within the existing highway boundaries and if agreed would not, in themselves, require planning consent.

Accordingly, Application C remains 'live' within this substitution package.

Environmental Assessment
The office, retail, leisure and school elements of the Proposed Development, will target a BREEAM 'Excellent' rating as a minimum under BREEAM New Construction, and the residential refurbishment at The Maltings will aim to achieve an 'Excellent' rating under BREEAM Domestic Refurbishment. Please refer to Appendix A and B for pre-assessment summaries.

Inclusive Design
The principles of Secured by Design will be adopted for the redevelopment to ensure the safety and security of all users. Flexible use space is being proposed which will provide opportunity for a variety of spaces including retail, community, restaurants, and bars, which can be utilised and enjoyed by all.

Energy & CO_2 Emission Reduction Strategy
The Energy Strategy has demonstrated that through implementation of passive design and energy efficiency measures and the installation of a CHP engine and on-site PV array, that the Proposed Development is anticipated to achieve a **42.1%** reduction in regulated CO_2 emissions beyond the requirements of the Part L gas boiler 'baseline' for the areas in Application A. The application for the School (Application B) achieves an overall **29.9%** reduction in regulated CO_2 emissions.

Table 1: Summary of energy strategy – Application A

Non-Dwellings	Carbon Dioxide Emissions (tonnes CO_2 per annum)	
	(Regulated)	(Unregulated)
Part L Gas Boiler Baseline	2,411	455
Reduction from Be Lean	2,288	455
Reduction from Be Clean	1,428	455
Reduction from Be Green	1,396	455

	Regulated Carbon Dioxide Emission Savings	
	(tonnes/yr)	(%)
Reduction from Be Lean	122	5.1%
Reduction from Be Clean	860	35.7%
Reduction from Be Green	32	1.3%
Total Reduction	1015	42.1%
Dwelling Reduction	864	35.8%
Non-Dwelling Reduction	150	6.2%

Development Area 1 in Application A achieves an overall 41.6% reduction in regulated CO_2 emissions with the connection to the site wide heat network supplied by a single CHP engine.

The Application B (School) achieves an overall 29.9% reduction in regulated CO_2 emissions.

Water
Application B (School) and Application A (Development Area 1) of the Proposed Development will be provided with water efficient fixtures, fittings and appliances. The residential spaces within Development Area 1 of Application A will aim to achieve a water consumption rate of 105 litres per person per day.

For the non-domestic elements in Application A Development Area 1, two credits are currently being targeted under Wat 01 in BREEAM 2014 New Construction. 2.5 credits are also targeted under Wat 01 in BREEAM 2014 Domestic refurbishment for The Maltings. These principles would also be considered for Development Area 2 of Application A.

Materials
Building elements will be selected in accordance with the BRE Green Guide to Specification, with the aim of selecting elements in the range A+ to C to minimise environmental impact.

A Resource Management Plan (RMP) will be produced that will outline how recycling of construction, demolition and excavation material can be maximised and reused on site.

All timber used at the Proposed Development will be FSC certified and where possible and practicable materials will be locally sourced.

The Maltings building (Building 4) is being retained in its entirety, with works proposed to the windows and internal layouts. New floors would be inserted, and the upper floors would be partitioned to create apartments. The proposals for the existing former Bottling and hotel building (building 5) aims to convert this into a hotel and office building. It is proposed that the South and West facades of the building will be retained in their entirety and that the North and East facades will be largely demolished and rebuilt to an extended footprint. Where new materials are introduced, they will be specified, where possible and practicable, to be sustainably sourced, recycled or re-used building materials.

Waste
The contractor will be required to produce and adhere to a RMP which clearly sets out requirements to maximise diversion of demolition and construction waste from landfill.

All spaces at the Proposed Development will be provided with suitable internal and communal waste storage facilities for the segregation of recyclable materials, designed to meet the requirements of BS5096 (Waste Management in Buildings), LBRuT policies and guidance and BREEAM.

Transport
For Application A (Development Area 1) and Application B (School), secure cycle storage, changing and showering facilities will be provided for residents and occupants. The aim of such facilities is to encourage the use of sustainable transport to and from the Proposed Development. Cycle parking will also be provided for visitors. These measures would also be considered for Development Area 2.

Biodiversity
Native species or species of benefit to wildlife will be incorporated throughout the development, and it is expected that the construction of the Proposed Development will lead to ecological enhancements to the site.

The Proposed Development (Application A) will include park/recreation areas which will include the planting of new evergreen and deciduous trees. With Application A and B it is proposed that there will be a net increase in trees on the site.

Pollution
Systems at the Proposed Development (Application A and B) will be selected to minimise emissions of Nitrous Oxide (NOx) and other pollutants which can lead to adverse air quality impacts. The Proposed Development, Application A and B, will be serviced through the provision of CHP engines with NOx abatement technologies and low NOx emission boilers to minimise the generation of air pollution, and cycling will be encouraged through the provision of cyclist facilities in order to reduce the use of cars. Dedicated car parking spaces with electric car charging points will also be provided. These measures are consistent with those identified by LBRuT within their Air Quality Action Plan. Details provided in the Environmental Impact Assessment and associated addendums.

Luminaires will be selected with suitable output to direct lighting appropriately to minimise light pollution and loss of light to the sky.

The main contractor will operate to minimise the risk of pollution from the Proposed Development and will be required to register with the Considerate Constructors Scheme.

1. Introduction.

The Application
This Sustainability Statement has been prepared by Hoare Lea as a revised submission document to the Energy Strategy submitted under Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL) ('the Applications'), in respect of the former Stag Brewery Site in Mortlake ('the Site') within the London Borough of Richmond Upon Thames ('LBRuT'). The Applications are for the comprehensive redevelopment of the Site. This document has been prepared on behalf of Reselton Properties Limited ('the Applicant'). A summary of the Applications is set out below:

i. Application A – hybrid planning application for comprehensive mixed use redevelopment of the former Stag Brewery site consisting of:
    i. Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
    ii. Land to the west of Ship Lane (excluding the school) applied for in outline (referred to as 'Development Area 2' throughout).
j. Application B – detailed planning application for the school (on land to the west of Ship Lane).
k. Application C – detailed planning application for highways and landscape works at Chalkers Corner.

This document replaces the Sustainability Statement submitted in support of the original applications.

The Applications were submitted in February 2018 to LBRuT. The Applications are related and were proposed to be linked via a Section 106 Agreement. In May 2019, a package of substitutions was submitted to LBRuT for consideration, which sought to address comments raised by consultees during determination. On 29 January 2020, the Applications were heard at LBRuT's Planning Committee with a recommendation for approval. This scheme is thereafter referred to as "the Original Scheme".

The Committee resolved to grant Applications A and B, and refuse Application C. The granting of Applications A and B was subject to the following:

l. Conditions and informatives as set out in the officer's report, published addendum and agreed verbally at the meeting;
m. Amendments to the Heads of Terms and completion of a Section 106 Legal Agreement which was delegated to the Assistant Director to conclude;
n. No adverse direction from the Greater London Authority ('GLA'); and
o. No call in by the Secretary of State for Housing, Communities and Local Government.

The Applications have been referred to the GLA and the Mayor has given a direction that he will take over the determination of the Applications and act as local planning authority in relation to all three applications.

The Applicant has engaged with the GLA in respect of the proposed amendments to the scheme, referred to throughout this document as the 'Revised Scheme'. As a result of these discussions, a number of changes have been made to the scheme proposals which are summarised as follows:

p. Increase in residential unit provision from up to 813 units (this includes the up to 150 flexible assisted living and / or residential units) to up to 1,250 units;
q. Increase in affordable housing provision from up to 17% to up to 30%;
r. Increase in height for some buildings, of up to three storeys compared to the Original Scheme;
s. Change to the layout of Buildings 18 and 19, conversion of Block 20 from a terrace row of housing to two four storey buildings;
t. Reduction in the size of the western basement, resulting in an overall reduction in car parking spaces of 186 spaces, and introduction of an additional basement storey beneath Building 1 (the cinema);
u. Other amendments to the masterplan including amendments to internal layouts, re-location and change to the quantum and mix of uses across the Site, including the removal of the nursing home and assisted living in Development Area 2;
v. Landscaping amendments, including canopy removal of four trees on the north west corner of the Site; and
w. Associated highways works may be carried out on adopted highways land.

The submission documents have tested an affordable housing provision of 30%. However, it should be noted that the final affordable housing level is subject to further viability testing and discussions with the GLA.

Minor amendments have also been made to the road and pedestrian layouts for the school (Application B). No other amendments are proposed to Application B. No amendments are proposed to the physical works proposed under Application C, although alternative options within the highway boundaries for mitigating the highway impact of the amended proposals have been assessed within the relevant substitution documents for Applications A and B and are the subject of ongoing discussions with the GLA and TfL.

A more detailed summary is included within the Planning Statement Addendum and Design and Access Statement Addendum submitted with the Revised Scheme documents.

These changes are being brought forward as substitutions to Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL), which are related applications (to be linked via a Section 106 Agreement).

It is important to note that no changes are proposed to the physical works proposed under Application C – the only change to this application is that the supporting documents (which include all documents submitted under Applications A and B) have been updated in the context of the proposed changes to the scheme as sought under Applications A and B. Application C was resolved to be refused by LBRuT at Committee on 29 January 2020. As a result, whilst the works proposed in Application C are still an available option, the Applicant has progressed alternative approaches for addressing and mitigating the impacts on surrounding highways, and these have been tested within the relevant substitution documents for Applications A and B. All of these options are subject to ongoing discussions and testing with TfL. They are all within the existing highway boundaries and if agreed would not, in themselves, require planning consent.

Accordingly, Application C remains 'live' within this substitution package.

Aim
This report presents the sustainability strategy for the redevelopment and responds to relevant policies contained within the Greater London Authority (GLA) London Plan (2016), the supplementary planning guidance on Sustainable Design and Construction (2014), and the policies of the London Borough of Richmond upon Thames (LBRuT) Local Plan (2018) document.

Summary of Policy Framework
A policy review has been undertaken and is detailed in Appendix C. Planning policy documents applicable to the proposed development include:

- National Planning Policy Framework (NPPF)
- Building Regulations Part L (2013)
- The London Plan (2016)
- London Borough of Richmond upon Thames Local Plan (2018).
- London Plan Intend to Publish Version (dated December 2019)

1.1 Emerging Policy

The New London Plan was launched for consultation in December 2017. The GLA published an 'Intend to Publish' version of the draft London Plan in December 2019. Whilst this Plan has not yet been adopted, this document considers relevant emerging policies where they differ from the adopted London Plan position for completeness.

The Intend to Publish London Plan key policy targets are as follows:

- Major development to be Net Zero Carbon (taken to mean a 100% reduction in regulated CO_2 emissions from the relevant Building Regulations baseline).
- Minimum 35% on-site emissions reduction.
- Minimum 15% (commercial)/reduction in regulated CO_2 through energy efficiency measures.
- Proposed developments to demonstrate a pathway to zero carbon on-site by 2050.

Figure 1: The location of the Proposed Development.

2. Sustainability statement.

The following statement is written in reference to the applicable 'priorities' and 'best practice' as outlined in the Mayor of London's Supplementary Planning Guidance on Sustainable Design and Construction (2014), as required by Policy 5.3 of the London Plan (2016). The responses provided below also seek to respond to the draft new London Plan (2019) where it is appropriate, for completeness. Although it is considered that the draft policies should not be applied to the application.

Table 2: Sustainability statement.

<table>
<tr><td colspan="2">GLA Sustainable Design & Construction SPG</td><td>Policy References</td><td rowspan="2">Proposed Development Response</td></tr>
<tr><td>Priority</td><td>Best Practice</td><td>London Plan (2016)</td></tr>
<tr><td colspan="4">Resource management – land.</td></tr>
<tr><td colspan="4">Optimising the use of land</td></tr>
<tr><td>Through both their Local Plans and planning decisions, boroughs should aim for 100% of development to be delivered on previously developed land.</td><td>-</td><td>1.1, 3.3</td><td>The Proposed Development is a mix of new buildings and refurbishment, situated on the former Stag Brewery site. The Proposed Development has sought to maximise the use of previously developed land.</td></tr>
<tr><td>Developers should optimise the scale and density of their development, considering the local context, to make efficient use of London's limited land.</td><td>-</td><td>3.4, 4.3, 7.6</td><td>The Site's density will be optimised through providing a suitable mix of uses in buildings and spaces which efficiently use land, at the same time as responding to local context and delivering architectural and planning benefits.

The Proposed Development is approximately 172,081 sqm in Gross Internal Area (GIA).

The useful floor space is split (in GIA) by use as follows:
<table>
<tr><td colspan="2" rowspan="2">Space use</td><td colspan="3">GIA (m^2)</td></tr>
<tr><td>Application A Development Area 1</td><td>Application A Development Area 2</td><td>Application B</td></tr>
<tr><td rowspan="2">Domestic</td><td>Private residential</td><td>59,110</td><td>29,107</td><td>-</td></tr>
<tr><td>Affordable</td><td>4,037</td><td>31,285</td><td>-</td></tr>
<tr><td rowspan="5">Non-domestic</td><td>Flexible Use</td><td>5,023</td><td>-</td><td>-</td></tr>
<tr><td>Office</td><td>5,532</td><td>-</td><td>-</td></tr>
<tr><td>Cinema</td><td>1,606</td><td>-</td><td>-</td></tr>
<tr><td>Hotel</td><td>1,765</td><td></td><td></td></tr>
<tr><td>School</td><td>-</td><td>-</td><td>9,319</td></tr>
</table>
Flexible Use spaces will consist of restaurant/ bar/ retail/ office/ community/ leisure and boat house (sui generis). The development also includes a basement car park that will be within the basement of Development Area 1 and Development Area 2.

The London Plan Intend to Publish Version (dated December 2019) policy D1B principles have been included within the application.</td></tr>
<tr><td colspan="4">Basement and lightwells</td></tr>
<tr><td>When planning a basement development, developers should consider the geological and hydrological conditions of the Site and</td><td>-</td><td>5.12, 5.13, 7.13, 7.19</td><td></td></tr>
</table>

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
surrounding area, proportionate to the local conditions, the size of the basement and lightwell and the sensitivity of adjoining buildings and uses, including green infrastructure.			The structural engineers have considered all applicable geological and hydrological conditions in accordance with relevant design guidance and standards. Wherever possible, the basements will be constructed to avoid any adverse impact on the roots of retained trees.
When planning and constructing a basement development, developers should consider the amenity of neighbours.	-	5.3, 5.18, 6.3, 7.14, 7.15	It is anticipated that there will be limited impact to the amenity of neighbours as the contractor will be targeting a high score in the Considerate Constructors Scheme (CCS) in accordance with BREEAM.
Local food growing			
To protect existing established food growing spaces.	-	2.18, 3.2, 5.3, 5.10, 5.11, 7.18, 7.22.	The Site does not contain any existing established spaces for growing food.
-	To provide space for individual or communal food growing, where possible and appropriate.	2.18, 3.2, 5.3, 5.10, 5.11, 5.21, 7.18, 7.22.	Dwellings in Application A (Development Area 1) at the Proposed Development will be provided with rooftop gardens, terraces and balconies which will enable residents to plant a variety of species for food growth, should this be desired. How amenity areas in Development Area 2 could be utilised for communal food growing will also be considered. To the south west of Application B (School) there is a community park, which could have space dedicated for food growing, if desired.
-	To take advantage of existing spaces to grow food, including adapting temporary spaces for food growing.	2.18, 3.2, 5.3, 5.10, 5.11, 5.21, 7.18, 7.22.	
Site layout and building design			
-	Any existing buildings that can be practically refurbished, retrofitted, altered, or extended should be retained and reused.	5.3, 5.4	The proposal for the former Maltings building (building 4) incorporates several sensitive amendments to the existing building facades. The building is being retained in its entirety, with works proposed to the windows and internal layouts. New floors would be inserted, and the upper floors would be partitioned to create apartments. The proposals for the existing former Bottling and hotel building (building 5) aims to convert this into a hotel and office. It is proposed that the South and West facades of the building will be retained in their entirety and that the North and East facades will be largely demolished and rebuilt to an extended footprint. All other existing buildings are brewery buildings which would not be suitable to retain. These would be difficult to refurbish and would not deliver a high-quality scheme, from a practical, aesthetic and energy efficiency perspective.
-	A mix of uses, where suitable should be included to provide a range of services commensurate to the public transport accessibility.	4.3, 6.1	The Proposed Development will contain a combination of retail, community, leisure, office and residential space, as well as a school. Generally, the whole Site falls within the PTAL 2 category. A PTAL rating of 2 represents a 'poor' level of accessibility to public transport services. In reality though, as demonstrated in the Travel Plan, the public transport accessibility can be considered to be much better.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			The rail services from Mortlake provide for easy access to a very extensive area through interchange at Clapham Junction, Richmond, Victoria or Waterloo whilst the various bus services that serve the area provide links to a very extensive area of London and again provide access to a number of important strategic interchanges, including Hammersmith.
The design of the Site and building layout, footprint, scale and height of buildings as well as the location of land users should consider:	-	2.18, 5.2, 5.3, 5.4, 5.6, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, 5.16, 5.18, 5.21, 6.1, 6.7, 6.9, 6.10, 6.11. 6.13, 7.1, 7.6, 7.14, 7.15, 7.18, 7.19, 7.21, 7.22	The Proposed Development is a mix of new buildings and refurbishment, located on the former Stag Brewery site. The Proposed Development has sought to maximise the use of previously developed land.
– The possible retention and reuse of existing buildings and structures; – The retention of existing green infrastructure, including trees and other ecological features, and potential for its improvement and extension; and – Access routes to public transport and other facilities that minimise the use of private transport.			The proposal for the former Maltings building (building 4) incorporates several sensitive amendments to the existing building facades. The building is being retained in its entirety, with works proposed to the windows and internal layouts. New floors would be inserted, and the upper floors would be partitioned to create apartments. The proposals for the existing former Bottling and hotel building (building 5) aims to convert this into a hotel and office. It is proposed that the South and West facades of the building will be retained in their entirety and that the North and East facades will be largely demolished and rebuilt to an extended footprint. All other existing buildings are brewery buildings which would not be suitable to retain. These would be difficult to refurbish and would not deliver a high-quality scheme, from a practical, aesthetic and energy efficiency perspective. There are areas of the Proposed Development that would be suitable for ecological features to be included, and this has been considered as part of the design process. Proposals include improvements to bus services and infrastructure as well as routes towards Mortlake Rail Station to increase the attractiveness of the public transport network. The overall pedestrian and cycle access strategy is described in further detail within Chapter 8 of the Travel Plan which also shows how the on-site proposals link into the wider networks serving the area.

– The existing landform
– The potential to take advantage of natural systems such as wind, sun and shading;
– The principles set out London Plan (2016) policies 7.1 and 7.6;
  – The potential for adaption and reuse in the future;
  – Potential for incorporating green infrastructure, including enhancing biodiversity;
  – Potential for incorporating open space, recreation space and child play space;
			<u>Detailed Elements (Application A (Development Area 1) and Application B (School):</u>
			The Proposed Development has been designed to benefit from natural sunlight, in particular the upper storeys, for light and warmth in winter. Measures such as internal blinds will be used to control excessive solar gain in summer months.
			
			Regarding LP (2016) Policy 7.1, it is considered that the Proposed Development will:
			– Improve access to green infrastructure by providing green space throughout the Proposed Development.
			– Enable people to live healthy and active lifestyles due to the provision of suitable cycle parking to encourage commuting by bike which is a low-carbon mode of transport;
			– Allow staff/occupiers and visitors of all ages and stages of life to access the Proposed Development's non-residential areas by ensuring suitable access provisions.
			
			Regarding LP (2016) Policy 7.6, it is considered that the Proposed Development is of high architectural quality and is of a proportion, composition, scale and orientation that enhances, activates and defines the public realm. The Proposed Development will comprise details and materials that complement the local character through the re-use of the façade on The Maltings, existing former Bottling and hotel building (building 5) and the materials

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
– Energy demands and the ability to take advantage of natural systems and low and zero carbon energy sources; – Site wide infrastructure; – Access to low carbon transport modes; – The promotion of low carbon transport modes, including walking and cycling; – Potential to address any local air quality, noise disturbance, flooding and land contamination issues; and – The potential effect on the micro-climate.			used in construction of the new buildings. The buildings will incorporate best practice in terms of resource management. The following measures will be targeted for the Proposed Development: – Secured by design principles will be incorporated; and – The buildings will contribute to the adaption and mitigation of the effects of climate change, designed to enable sunlight access, and to minimise overshadowing and adverse wind conditions. – Implementation of acoustic measures to ensure high levels of noise are not transferred into the spaces. – Mechanical ventilation will be designed with air intake louvres away from sources of air pollution. – A reduced level of limited car parking will be provided for Application A through a reduction in the Western basement area. A School Travel Plan will be utilised to promote access and use of low carbon transport. – Application B (School) will include a playing pitch and Multi Use Games Area. The playing pitch will incorporate flood lighting to ensure use is possible throughout all times of the year. – Proposals in Application A also include a community park and green roofs with links to wider green infrastructure. The landscape plan is proposed to deliver a mix of types of open areas throughout the site, supplemented by extensive tree planting and soft landscaping. A range of character areas will be provided within a number of green areas across the site, each of which will contribute to green infrastructure provision. Landscape elements include play facilities, paths and seating areas as well as soft landscape and pedestrian and cycle circulation <u>Outline element (Application A Development Area 2):</u> The measures detailed above would also be considered for Development Area 2 of the Proposed Development. <u>London Plan Intend to Publish Version (dated December 2019) policies</u> The London Plan Intend to Publish Version (dated December 2019) policy D2 and policy D4 principles have been included in the application with an assessment against these policies included within the supporting information. Housing quality and good design have been emphasised in the consultation and therefore are anticipated to have been included in the application. The London Plan Intend to Publish Version (dated December 2019) policy D8 on tall buildings has been assessed within the supporting information. The principles of sustainability for these buildings will be the same as the other buildings on the site and therefore it is expected that the are in accordance with the current policy. An assessment of the play areas provided in the scheme will be undertaken in line with the London Plan Intend to Publish Version (dated December 2019) policy S4 and included in the supporting information for the application. An assessment of the transport standards set out in the London Plan Intend to Publish Version (dated December 2019) policies T5, T6 and T6.1 to T6.5 is provided in the applications supporting documents although it is not considered that the London Plan Intend to Publish Version (dated December 2019) standards should apply to the application.

<table>
<tr><td colspan="2">GLA Sustainable Design & Construction SPG</td><td>Policy References</td><td rowspan="2">Proposed Development Response</td></tr>
<tr><td>Priority</td><td>Best Practice</td><td>London Plan (2016)</td></tr>
<tr><td colspan="4">Resource management – land.</td></tr>
<tr><td colspan="4">Resource management - energy and carbon dioxide emissions.</td></tr>
<tr><td>The overall carbon dioxide emissions from a development should be minimised through the implementation of the energy hierarchy set out in London Plan Policy 5.2.

Developments should be designed to meet the regulated carbon dioxide standards, in line with London Plan Policy 5.2.</td><td>-</td><td>5.2, 5.3</td><td>A summary of the anticipated CO_2 emissions and reduction at each step of the energy hierarchy is given in Table 2 below.

Table 2 Summary of CO_2 emissions reductions and carbon offset for Application A.

<table>
<tr><td>Non-Dwellings</td><td colspan="2">Carbon Dioxide Emissions (tonnes CO_2 per annum)</td></tr>
<tr><td></td><td>(Regulated)</td><td>(Unregulated)</td></tr>
<tr><td>Part L Gas Boiler Baseline</td><td>2,411</td><td>455</td></tr>
<tr><td>Reduction from Be Lean</td><td>2,288</td><td>455</td></tr>
<tr><td>Reduction from Be Clean</td><td>1,428</td><td>455</td></tr>
<tr><td>Reduction from Be Green</td><td>1,396</td><td>455</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">Regulated Carbon Dioxide Emission Savings</td></tr>
<tr><td></td><td>(tonnes/yr)</td><td>(%)</td></tr>
<tr><td>Reduction from Be Lean</td><td>122</td><td>5.1%</td></tr>
<tr><td>Reduction from Be Clean</td><td>860</td><td>35.7%</td></tr>
<tr><td>Reduction from Be Green</td><td>32</td><td>1.3%</td></tr>
<tr><td>Total Reduction</td><td>1015</td><td>42.1%</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Dwelling Reduction</td><td>864</td><td>35.8%</td></tr>
<tr><td>Non-Dwelling Reduction</td><td>150</td><td>6.2%</td></tr>
</table>
</td></tr>
</table>

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			Application A - Development Area 1 A summary of the targeted CO_2 emissions and reductions at each step of the energy hierarchy is given in Table 3 below. Development Area 1 of Application A achieves an overall 41.6% reduction in regulated CO_2 emissions when considering the overall area of the Full application. Table 3 Summary of CO_2 emissions reductions for Development Area 1 areas.

	Carbon Dioxide Emissions (tonnes CO_2 per annum)	
	(Regulated)	(Unregulated)
Part L Gas Boiler Baseline	1,499	444
Reduction from Be Lean	1,419	444
Reduction from Be Clean	907	444
Reduction from Be Green	875	444

	Regulated Carbon Dioxide Emission Savings	
	(tonnes/yr)	(%)
Reduction from Be Lean	80	5.3%
Reduction from Be Clean	511	34.1%
Reduction from Be Green	32	2.2%
Total Reduction	623	41.6%
Dwelling Reduction	473	31.6%
Non-Dwelling Reduction	150	10.0%
Total Target Reduction	1140	76.1%
Annual Surplus / Shortfall	-517	34.5%

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			Application B (School) A summary of the anticipated CO_2 emissions and reduction at each step of the energy hierarchy is given in Table 3 below. The application for Application B (School) achieves an overall 29.9% reduction in regulated CO_2 emissions when considering Application B (School).

Table 3: Summary of CO_2 emissions reductions and carbon offset for Application B (School)

	Carbon Dioxide Emissions (tonnes CO_2 per annum)	
	(Regulated)	(Unregulated)
Gas Boiler Baseline	177	99
Reduction from Be Lean	167	99
Reduction from Be Clean	124	99
Reduction from Be Green	124	99

Non-Dwellings	Regulated Carbon Dioxide Emission Savings	
	(tonnes/yr)	(%)
Reduction from Be Lean	10	5.65%
Reduction from Be Clean	42	23.90%
Reduction from Be Green	0	0.00%
Total Reduction	**53**	**29.90%**
Total Target Reduction	**62**	**35.00%**
Annual Surplus / Shortfall	**-9**	**5.10%**

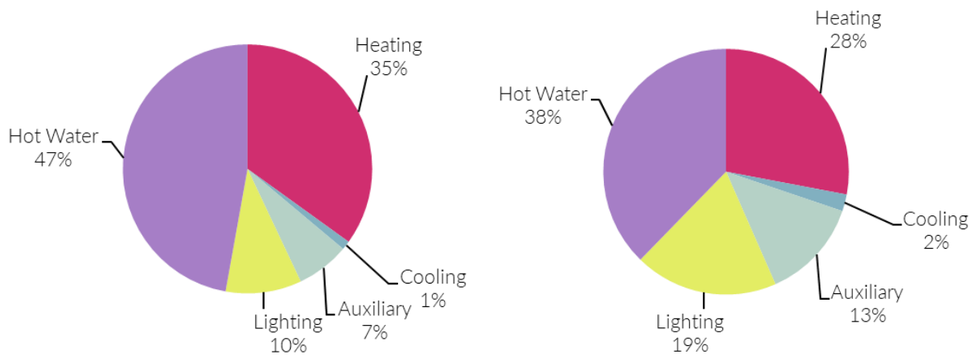
Table 4: Carbon Offset

Whole Site (Application A and B) Total		Carbon Offset (tonnes)	Cost (£)
Development Area 1	Annual Offset (Residential Areas)	474 tCO_2	£853,200
	Annual Offset (Non-residential Areas)	43 tCO_2	£77,400
Development Area 2	Annual Offset (Residential Areas)	521 tCO_2	£937,800
	Annual Offset (Non-residential Areas)	n/a	
School	Annual Offset (School)	9 tCO_2	£16,200

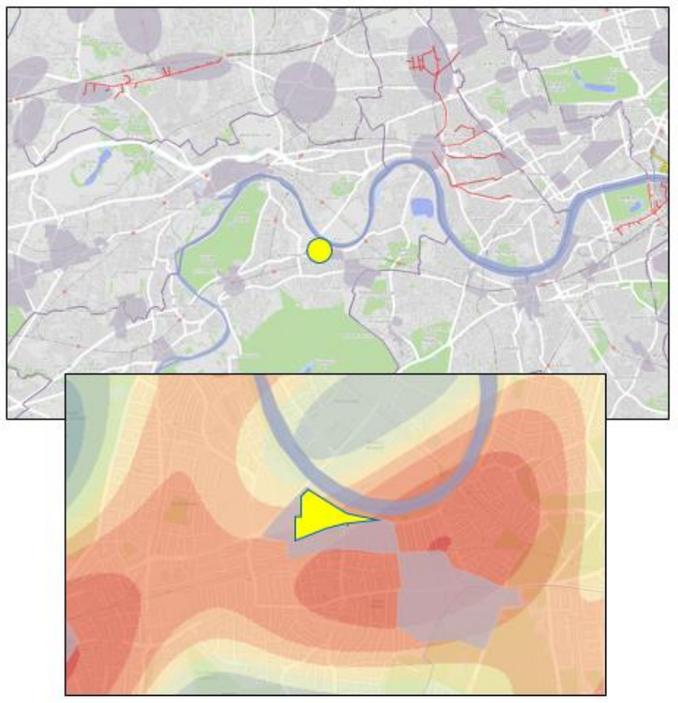
GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			Total carbon offset 1,047 £ 1,884,600 The School (application B) carbon offset charge is £16,200 which is included in the table above but set out separately here for clarity.
-	Developments should contribute to ensuring resilient energy infrastructure and a reliable energy supply, including from local low and zero carbon sources.	5.1, 5.4A, 5.5, 5.6, 5.7, 5.8, 5.17	The Proposed Development is proposing a staggered approach across the two Development Areas of Application A. The overall emissions are calculated using the SAP 2012 carbon factors (as per March 2016 GLA guidance). These are the carbon factors used in the submitted energy strategy. An energy centre is proposed to be provided within the basement of each development area as per discussions with the GLA. The energy centre in Development Area 1 will include gas fired boilers to serve Development Area 1 prior to the construction of Development Area 2, therefore this represents a temporary solution for serving the thermal demands within Development Area 1. At the time of the submission of the reserved matters submission it is expected that a gas-fired CHP will be connected to Development Area 1 and Development Area 2 within the energy centre for Development Area 2. Condition wording has been agreed for details relating to the creation of a site-wide heat network to be provided with the reserved matters application for the outline element of application A (Development Area 2). Condition wording has also been agreed for a review of low carbon energy options at the point of submission of reserved matters and for provision of a low and zero carbon feasibility report setting out the options to achieve carbon dioxide emissions reductions commensurate with the Energy Strategy submitted for Application A if the outline element of Application A are not brought forward within a defined timescale. The school will be serviced by its own energy centre independently from the heat networks associated with Application A. The programme for construction of the school is anticipated to be brought forward at the same time as Development Area 1. The development of the school site is not under the applicants control and therefore the energy strategy allows for Application B to be brought forward independently. The townhouses within Development Area 2 are also to be serviced separately with individual boilers located within each town house. **Whole Site – Application A** On the basis that the CHP engine within the energy centre would supply 90% of the hot water requirements and up to 50% of the space heating requirements of the areas within the whole Application A site, it is expected that a reduction in regulated CO_2 emissions of 860tonnes per annum can be achieved using Part L 2013 carbon factors. This is equivalent to a further 35.7% reduction in CO_2 emissions beyond the requirements of the gas boiler 'baseline'. When considering the dwellings in Application A separately, the contribution of the CHP engine is equivalent to ~40.2% reduction beyond the gas boiler 'baseline' and 748 tonnes of CO_2. **Application A – Development area 1** When considering all of the areas within the Development Area 1 of Application A the contribution of the CHP engine is equivalent to ~34.1% reduction beyond the gas boiler 'baseline', equivalent to 511 tonnes of CO_2 emissions. When considering the dwellings within Development Area 1 separately and on the basis that the CHP engine will supply the hot water requirements and up to 47% of the space heating requirements of the Proposed Development, it is expected that a reduction in regulated CO_2 emissions of 399 tonnes per annum can be

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			achieved. This is equivalent to a further 42.1% reduction in CO_2 emissions beyond the requirements of the gas boiler 'baseline' after the Be Lean improvements. **Application A – Development area 2** On the basis that the heat network with CHP would provide for the domestic hot water demand in Development Area 2 and up to 50% of the space heating demand. It is anticipated that this would reduce regulated CO_2 emissions by approximately 349 tonnes per annum. This is equivalent to a reduction of ~38.2% beyond the gas boiler 'baseline'. At reserved matters submission an energy strategy that provides beneficial CO_2 emissions reductions in accordance with policy and building regulations at the time of the reserved matters submission would be submitted for consideration with the application at that time. **Application B - School** For the school a CHP engine has been assessed to supply 100% of the hot water and 50% of the space heating demands. It is expected that if a CHP is feasible for the school a reduction in regulated CO_2 emissions of 42tonnes per annum can be achieved. This is equivalent to a further 23.9% reduction in CO_2 emissions beyond the requirements of the gas boiler 'baseline'.
-		5.2, 5.17	
-	Developers are encouraged to include innovative low and zero carbon technologies to minimise carbon dioxide emissions within developments and keep up to date with rapidly improving technologies.	5.2, 5.17	The inclusion of on-site renewable energy generation has been assessed. **Whole site – Application A** It is anticipated that a PV array with a total area of 360m^2 would be provided on the roof area of the Proposed Development. Based on the solar irradiance data for London, an array of this size would generate approximately 62,400kWh of electricity per annum, reducing CO_2 emissions by 32 tonnes per annum. This is equivalent to a reduction in regulated CO_2 emissions of 1.3% beyond the gas boiler 'baseline' for the anticipated emissions of the Proposed Development (Application A). Further opportunities to increase the area of the PV array will be provided in the reserved matters submission(s). When considering the non-domestic use areas separately if this array was to be connected to the supply to the offices the contribution is equivalent to a 5.9% reduction in CO_2 emissions beyond the gas boiler 'baseline'. PV is therefore is anticipated to be a suitable addition to the Proposed Development in pursuit of further reductions in regulated CO_2 emissions. **Application A – Development area 1** Considering the available roof space of Development Area 1, and allowing for access and maintenance requirements, a total solar PV system size in the region of 360m^2 array area will be included in the Proposed Development as shown in Appendix F of the Energy Strategy. Based on the solar irradiance data for London, an array of this size would reduce CO_2 emissions by 32tonnes per annum. This is equivalent to a reduction in regulated CO_2 emissions of 2.2% beyond the Building Regulations Part L (2013) 'baseline' on the CO_2 emissions of Development Area 1. When considering the non-residential elements separately, the contribution is equivalent to a 5.9% reduction in CO_2 emissions beyond the gas boiler 'baseline'.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			PV is therefore deemed to be a suitable addition to the Proposed Development in pursuit of further reductions in regulated CO_2 emissions. **Application A – Development area 2** At the reserved matters submission, the available roof space of Development Area 2, for the installation of a solar PV system size would be considered. It is anticipated that this array would contribute to a reduction in CO_2 emissions of at least 1% beyond Part L 2013. This has been agreed in wording of a condition in determination of the application by the GLA and LBRuT. **Application B – School** PV is not proposed to be located on the school building as the roof area is being used to provide a play area and is also allocated for plant.
Development applications are to be accompanied by an energy demand assessment	-	5.2	The results summarised overleaf demonstrate that prior to the implementation of any 'be clean' or 'be green' measures, on a site wide (Application A and B) basis the annual regulated energy requirement of the Proposed Development is anticipated to be approximately 9,080 MWh with associated regulated CO_2 emissions of 2,454tonnes. The majority of the regulated energy requirement, approximately 82%, is as a result of thermal energy requirements (domestic hot water and space heating), of which hot water is the most significant contributor. It is anticipated that the cooling requirement would be minimised through the implementation of passive design and energy efficiency measures and represent approximately 1% of the total regulated annual energy requirement. It is anticipated that based on the calculations undertaken on a site wide (Application A and B) basis, ~5.1% reduction in annual regulated CO_2 emissions would be made beyond the requirements of the Building Regulations Part L 2013 with a gas boiler baseline, through passive design and energy efficiency measures. Therefore, the Proposed Development achieves Part L 2013 compliance via Be Lean measures, i.e. prior to the consideration of any LZC technologies. When considering the domestic uses in isolation, an anticipated annual regulated energy requirement of 6,905 MWh with associated CO_2 emissions of 1,859 tonnes has been calculated. The majority of the regulated energy requirement (~88%) for the residential uses is associated with thermal energy requirements (domestic hot water and space heating). Consequently, thermal loads contribute most to regulated CO_2 emissions from the domestic uses (~71%). It is anticipated that the domestic uses would achieve ~6.3% reduction in annual regulated CO_2 emissions beyond the requirements of the Building Regulations part L 2013 through passive design and energy efficiency measures alone. It would be demonstrated that on an area weighted basis, the dwellings fabric energy efficiency levels calculated alongside the CO_2 emissions calculation would improve upon the requirements of the Building Regulations Part L 2013. When considering the non-domestic elements (excluding the school) in isolation, these spaces have been calculated to have an annual regulated energy requirement of 1,217 MWh with associated CO_2 emission of 546tonnes.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			The majority of the regulated energy requirement (~63%) for the non-domestic uses is associated with thermal energy, i.e. space heating and hot water. However, non-thermal energy use contributes the greatest proportion of CO_2 emissions (~51%) due to the higher carbon intensity of electricity compared to mains gas (Part L2013 figures). When considering the **school** in isolation, it has been calculated to have an annual regulated energy requirement of **614MWh** with associated CO_2 emission of **167tonnes**. The majority of the regulated energy requirement (~58%) for the school is associated with heating and hot water requirements. Heating and hot water also contribute the greatest proportion of CO_2 emissions (~66%). **Summary Tables & Charts** The following figures provide a summary of the anticipated the annual energy requirement and associated CO_2 emissions at the Proposed Development.  **Figure 2: Summary of Regulated Energy Requirement (left) and CO_2 emissions (right) for the Whole Site, Application A and B.**
The design of developments should prioritise passive measures.	Developers should aim to achieve Part L 2013 Building Regulations requirements through design and energy efficiency alone, as far as is practical.	5.2, 5.3, 5.9	The following tables summarise the anticipated passive design and energy efficiency targets for the dwellings and commercial areas at the Proposed Development. These parameters have been used to inform the initial outline energy strategy.
Developers should assess the potential for their developments to:	-	5.5, 5.6	By reference to the London Heat Map (http://www.londonheatmap.org.uk), the proposed development is not in close proximity to an existing energy network, the closest being some 5.4miles away in Westminster. This is an unavailable connection, with no known plans to develop or extend as far as Richmond. There are opportunities for potential networks in the Hammersmith area although this remains at a distance that is beyond what could

<table>
<tr><td colspan="2">GLA Sustainable Design & Construction SPG</td><td>Policy References</td><td rowspan="2">Proposed Development Response</td></tr>
<tr><td>Priority</td><td>Best Practice</td><td>London Plan (2016)</td></tr>
<tr><td colspan="4">Resource management – land.</td></tr>
<tr><td>– Connect to an existing district heating or cooling network;
– Expand an existing district heating or cooling network, and connect to it; or
– Establish a Site wide network, and enable the connection of existing buildings in the vicinity of the developers.</td><td></td><td></td><td>be considered reasonable to connect to at 2.3miles. Figure 4.10 shows the area of the site and the potential networks from the London Heat Map.
Fabric parameters
The fabric performance parameters used to model the Proposed Development are as follows.
Table 3: Target building fabric performance parameters.
<table>
<tr><th>Parameter</th><th>Dwellings</th><th>Non-dwellings</th></tr>
<tr><td>Exposed Floor U-value (W/m²K)</td><td>0.15</td><td>0.20</td></tr>
<tr><td>External Wall U-value (W/m²K)</td><td>0.12</td><td>0.18 – 0.20</td></tr>
<tr><td>Roof U-value (W/m²K)</td><td>0.15</td><td>0.15 - 0.20</td></tr>
<tr><td>Glazing U-value (W/m²K)</td><td>1.20 (g value: 0.29)</td><td>1.30 – 1.60</td></tr>
<tr><td>Roof Light Glazing U-value (W/m²K)</td><td>N/A</td><td>0.40</td></tr>
<tr><td>Air Permeability (m³/h.m²) @ 50Pa</td><td>3.00</td><td>5.00</td></tr>
</table>
System parameters
The systems performance parameters used to model the Proposed Development are as follows.
<table>
<tr><td>Space Heating & Cooling</td><td>DEN fuelled by CHP and high-efficiency condensing gas boilers (94% efficiency) with Heat Interface Units (HIU) per dwelling coupled to hot water systems and fan coil units / underfloor heating.</td><td rowspan="2">DEN fuelled by CHP and high-efficiency condensing gas boilers (94% efficiency) with heat exchangers and Fan Coil Units.</td></tr>
<tr><td>Domestic Hot Water</td><td>Water efficient fixtures and fittings to minimise water demand. HIU with minimal heat loss</td></tr>
<tr><td>Cooling</td><td>No cooling.</td><td>High-efficiency chillers with an SEER of 5.0.</td></tr>
<tr><td>Ventilation</td><td>MVHR with specific fan power 0.4-0.53 with Heat Recovery of 91-94%</td><td>Target SFP of 1.6W/l/s and HR of 75%</td></tr>
<tr><td>Lighting</td><td>High efficiency lighting. Daylight and presence detection in common areas / roof terraces.</td><td>Target efficacy of >70 luminaire lumens per circuit Watt.</td></tr>
</table>
Table 4: System parameters per space type.</td></tr>
</table>

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			 From viewing the current London Heat Map data for the area, we understand that there are no current plans to create new or extend existing networks to the proximity of the site. Consideration will therefore be given for the Proposed Development to develop a heat network on the site with an on-site CHP district energy system that allows simple and easy means of connection to any future DEN so that benefit can be taken should an opportunity arise and should a connection be deemed technically, legally and commercially viable. The calculations include for Application B (School) to be serviced by a CHP of its own. This is accounted for within the calculations presented for the Be Clean stage of the whole site in this Energy Strategy. The feasibility of Application B (School) utilising a CHP engine of its own will be reviewed in the detailed design stages. <u>London Plan Intend to Publish Version (dated December 2019)</u> The development is assessed against the current London Plan (2016) policies and the Energy Assessment Guidance of 2016 as agreed with officers. The broad principles of the London Plan Intend to Publish Version (dated December 2019) policy SI 3 have been met in the proposals set out in the application by consideration of the current London Plan and LBRuT policies.

<table>
<tr><td colspan="2">GLA Sustainable Design & Construction SPG</td><td>Policy References</td><td rowspan="2">Proposed Development Response</td></tr>
<tr><td>Priority</td><td>Best Practice</td><td>London Plan (2016)</td></tr>
<tr><td colspan="4">Resource management – land.</td></tr>
<tr><td></td><td></td><td></td><td>The heating hierarchy set out in policy SI 3 of the London Plan Intend to Publish Version (dated December 2019) allows for the use of low emissions CHP and ultra-low NOx gas boilers as the proposals have set out. Allowance has been made in the condition wording agreed with LBRuT and GLA to undertake a review of low carbon energy options for the reserved matters submission of Development Area 2 to identify technologies that could provide a reduction in emissions in accordance with energy policy in place at the time of the reserved matters submission.</td></tr>
<tr><td>Major developments should incorporate renewable energy technologies to minimise overall carbon dioxide emissions, where feasible.</td><td>-</td><td>5.7</td><td>An appraisal of the available roof space at the Proposed Development has been undertaken. The roof layouts have been designed in response to the need to balance many factors such as:
a) area required for plant (chillers, flues from boilers, CHP and generator)
b) area required for access
c) building heights in respect of the parameter plan thresholds
d) potential area for PV arrays
e) green roof areas
Considering the available roof space, and allowing for access and maintenance requirements, a total solar PV system size in the region of 360m^2 array area could be included on Development Area 1 at the Proposed Development. At reserved matters stage for the outline element of Application A consideration would be given to include a further area of PV to reduce CO_2 emissions for Development Area 2.
Based on the solar irradiance data for London, an array of this size would generate approximately 62,400kWh of electricity per annum, reducing CO_2 emissions by 32.4 tonnes per annum. This is equivalent to a reduction in regulated CO_2 emissions of 1.3% beyond the Building Regulations Part L (2013) ‘baseline’.
PV is therefore anticipated to be a suitable addition to the Proposed Development in pursuit of further reductions in regulated CO_2 emissions.
The school has limited roof space available for the installation of a PV array due to the location of plant, rooflights and the location of the play area on the roof. Therefore, PV is not currently proposed for the school application.</td></tr>
<tr><td>Where developments do not achieve the Mayor’s carbon dioxide reduction targets set out in London Plan Policy 5.2, the developer should make a contribution to the local borough carbon dioxide off-setting fund.</td><td>-</td><td>5.2, 5.4</td><td>The Proposed Development is anticipated to yield a reduction in regulated CO_2 emissions of 1068 tonnes beyond the Part L ‘baseline’. In this case it would be necessary to offset the remaining 1,029 tonnes for 30 years. The GLA has set the price for Carbon Offset at £60 per tonne per year.
The calculation of the Carbon Offset payment needs to be dealt with on a bespoke basis for a mixed-use scheme of this scale.
<table>
<tr><td colspan="2">Whole Site (Application A and B) Total</td><td>Carbon Offset (tonnes)</td><td>Cost (£)</td></tr>
<tr><td rowspan="2">Development Area 1</td><td>Annual Offset (Residential Areas)</td><td>474 tCO_2</td><td>£853,200</td></tr>
<tr><td>Annual Offset (Non-residential Areas)</td><td>43 tCO_2</td><td>£77,400</td></tr>
<tr><td></td><td>Annual Offset (Residential Areas)</td><td>521 tCO_2</td><td>£937,800</td></tr>
</table></td></tr>
</table>

<table>
<tr><th colspan="2">GLA Sustainable Design & Construction SPG</th><th>Policy References</th><th rowspan="2">Proposed Development Response</th></tr>
<tr><th>Priority</th><th>Best Practice</th><th>London Plan (2016)</th></tr>
<tr><td colspan="4">Resource management – land.</td></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Development Area 2</td><td>Annual Offset (Non-residential Areas)</td><td>n/a</td><td></td></tr>
<tr><td>School</td><td>Annual Offset (School)</td><td>9 tCO_2</td><td>£16,200</td></tr>
<tr><td colspan="2">Total carbon offset</td><td>1,047</td><td>£ 1,884,600</td></tr>
</table>
The School (application B) carbon offset charge is £16,200 which is included in the table above but set out separately here for clarity.
</td></tr>
<tr><td>Where works to existing developments are proposed developers should retrofit carbon dioxide and water saving measures.</td><td>-</td><td>5.4, 5.15</td><td>The Maltings Building and the existing former Bottling and hotel building (building 5) will include the retrofitting of leak detection and presence detection and solenoid shut-off valves to WC fittings.

Energy display devices will be provided to residential units in order to encourage the efficient use of water and energy.
The refurbished buildings will connect to the proposed district heat network from the Development Area 1 energy centre.
2.5 credits are also targeted under Wat 01 in BREEAM 2014 Domestic refurb for The Maltings and a consumption level of <105 l/p/day is also targeted.</td></tr>
<tr><td></td><td>Developers are encouraged to incorporate monitoring equipment, and systems where appropriate to enable occupiers to monitor and reduce their energy use.</td><td>5.2, 5.3</td><td>Sub metering of end energy using systems will be specified for Development Area 1 (Application A) and Application B (School). This will include sub-metering of space heating, cooling, ventilation, hot water, small power and lighting. The sub-meters will have pulsed outputs to enable connection to a Building Management System. In residential areas, energy display devices will be installed to enable tenants to monitor their energy consumption. These measures would also be considered for the reserved matters submission(s) for Development Area 2 (Application A).</td></tr>
<tr><td colspan="4">Resource management - water efficiency.</td></tr>
<tr><td>Developers should maximise the opportunities for water saving measures and appliances in all developments, including the reuse and using alternative sources of water.</td><td>-</td><td>5.3, 5.13, 5.15</td><td>Application B (School) and non-domestic spaces in Development Area 1 of Application A will be provided with water efficient fixtures, fittings and appliances.
For the non-domestic elements, two credits are currently being targeted under Wat 01 in BREEAM 2014 New Construction. This approximately equates to water use ratings of:
- WC = 4.5 l/flush
- Hand Basin Taps = 7.5 l/m
- Showers = 8 l/m
- Urinal = 3 l/Bowl/hour
- Kitchenette tap = 7.5 l/m
- Dishwashers = 13 l/cycle

2.5 credits are also targeted under Wat 01 in BREEAM 2014 Domestic refurb for The Maltings, and a water consumption level of <105 l/p/day will be targeted.</td></tr>
</table>

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
			It is also anticipated that Development Area 2, Application A would consider the provision of water efficient fixtures, fittings and appliances.
Developers should design residential schemes to meet a water consumption rate of 105 litres per person per day.	-	5.3, 5.15	The residential spaces for Development Area 1 of Application A will aim to achieve a water consumption rate of 105 litres per person per day. For The Maltings, 2.5 credits under BREEAM Domestic Refurbishment, Wat 01 is targeted, and a water consumption rate of 105 litres per person per day will also be targeted. *The residential spaces within Development Area 2* of Application A *would also consider the potential to incorporate this target.*
New non-residential developments, including refurbishments, should aim to achieve the maximum number of water credits in a BREEAM assessment or the 'best practice' level of the AECB (Association of Environment Conscious Building) water standards.	-	5.3, 5.15	Water efficient fixtures and fittings will be installed to the non-domestic spaces. The Proposed Development is targeting 2 credits for Water Consumption reductions in the BREEAM assessments for Application B (School) and The Maltings. Fitted out non-domestic spaces in Development Area 1 of Application A will be provided with water efficient fixtures, fittings and appliances. For the non-domestic elements, two credits are currently being targeted under Wat 01 in BREEAM 2014 New Construction. This approximately equates to water use ratings of: *- WC = 4.5 l/flush* *- Hand Basin Taps = 7.5 l/m* *- Showers = 8 l/m* *- Urinal = 3 l/Bowl/hour* *- Kitchenette tap = 7.5 l/m* *- Dishwashers = 13 l/cycle* Tenants will be encouraged to fit-out their spaces appropriately to meet the requirements of the Building Regulations Part G (2013) as a minimum, with the aspiration to achieve a reduction beyond this level for BREEAM credits.
Where a building is to be retained, water efficiency measures should be retrofitted.	-	5.3, 5.4, 5.15	Refurbishment of The Maltings (Development Area 1 of Application A) will include the complete refit of all WCs fixtures and fittings. The target efficiencies of these new fixtures and fittings is to meet a reduction in the overall water consumption to achieve 2.5 BREEAM credits.
All developments should be designed to incorporate rainwater harvesting.	-	5.3, 5.13, 5.15	The potential for inclusion of rainwater harvesting would be further investigated at detailed design stage.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
	All residential units, including individual flats / apartments and commercial units, and where practical, individual leases in large commercial properties should be metered.	5.15	All domestic uses within Development Area 1 (Application A), and the School in Application B, will include pulsed-output water meters, with sub-metering where feasible. Non-domestic units will be metered by tenancy, and tenants will be encouraged to fit sufficient sub-meters to identify different areas of use such as toilets, kitchens and showers. Sub-metering would also be considered for inclusion in Development Area 2, (Application A) where feasible.
Resource management - materials and waste.			
The design of development should prioritise materials that: – Have a low embodied energy, including those that can be re-used intact or recycled; – At least three of the key elements of the building envelope (external walls, windows roof, upper floor slabs, internal walls, floor finishes / coverings) are to achieve a rating of A+ to D in the BRE's The Green Guide of specification; – Can be sustainably sourced; – At least 50% of timber and timber products should be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source; – Are durable to cater for their level of use and exposure; and – Will not release toxins into the internal and external environment, including those that deplete stratospheric ozone.	-	5.3, 5.17, 5.20, 7.6, 7.14	<u>Detailed elements (Application A (Development Area 1) and Application B (School):</u> 100% of the timber used at the Proposed Development will be FSC certified. Wherever feasible, selected materials will be in the range of A+ to D as confirmed by the BRE Green Guide to Specification. Where specified by the developer (e.g. low VOC paint), finishes and other materials will not contain or emit toxic substances. <u>Outline element (Application A, Development Area 2):</u> The measures outlined above for Development Area 1 (Application A) and Application B (School) would also be considered for Development Area 2 (Application A).
	The design of developments should maximise the potential to use pre-fabrication elements.	5.3, 7.6	During detailed design stages, consideration will be given to the use of pre-fabricated elements such as bathroom pods or modular construction. Where practical and suitable, it is intended that these could be used to improve construction time and reduce on-site waste.
	-	5.3, 5.17, 5.20	

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan (2016)	
Resource management – land.			
Developers should maximise the use of existing resources and materials and minimise waste generated during the demolition and construction process through the implementation of the waste hierarchy.			BREEAM credits are targeted that require the main contractor to produce a Resource Management Plan prior to commencement of any demolition or construction works on-site. One of the aims of the document will be to investigate how recycling of construction, demolition and excavation material can be maximised, and to highlight means to divert specific waste streams from landfill.
Developers should provide sufficient internal space for the storage of recyclable and compostable materials and waste in their schemes.	-	5.3, 5.17	All spaces at the Proposed Development will be provided with suitable internal and communal waste storage facilities for the segregation of recyclable materials, designed to meet the requirements of BS5096 (Waste Management in Buildings), LBRuT and BREEAM.
The design of development should meet borough requirements for the size and location of recycling, composting and refuse storage, and its removal.	-	5.3, 5.17	
Resource management - nature conservation and biodiversity.			
There is no net loss in the quality and quantity of biodiversity.	-	5.3, 7.19	The existing site for Application B (School) includes playing fields, however these contain little ecological value, and so with the addition of ecological enhancements as part of the proposals, it is anticipated that there will be ecological enhancements and accordingly enhanced quantity of biodiversity. Proposals in Application A also include a community park and green roofs with links to wider green infrastructure. The landscape plan is proposed to deliver a mix of types of open areas throughout the site, supplemented by extensive tree planting and soft landscaping. A range of character areas will be provided within a number of green areas across the site, each of which will contribute to green infrastructure provision. Landscape elements include play facilities, paths and seating areas as well as soft landscape and pedestrian and cycle circulation A number of the ecology credits in BREEAM are being targeted in order to achieve the target of BREEAM 'Excellent'. In order to achieve these credits a Suitably Qualified Ecologist will complete an assessment of biodiversity and suggest measures to improve the ecological value of the site. Implementing the recommendations of the ecologist will ensure that the proposed development will make a positive contribution to biodiversity and subsequently fulfil the policy requirements of the London Plan and LBRuT. In Development Area 1 of Application A and Application B (School) it is proposed that 10 bat boxes will be provided and 10 bird nesting boxes. Improvements and protection of ecology would be considered in the design of Development Area 2 of Application A.
Developers make a contribution to biodiversity on their development Site.	-	5.3, 7.19	

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Climate change adaption - tackling increased temperature and drought.			
	-	5.3, 5.9	The results of additional risk assessments undertaken following the amendments of the development design and layouts are summarised below.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Developers should include measures, in the design of their schemes, in line with the cooling hierarchy set out in London Plan Policy 5.9 to prevent overheating over the scheme's lifetime.			The typical floor for Block 08 has been used as a best representation of apartments on the site. An assessment has been carried out using weather scenarios Design Summer Year (DSY) 1, 2 and 3 have been used for the appropriate location for completeness. A hybrid ventilation scenario (i.e. openable windows and mechanical ventilation with heat recovery (MVHR)), improved performance parameters and blinds has been included in the analysis. The following scenarios were also tested but the overheating criteria were not met: – Natural ventilation only with blinds – Natural ventilation with improved performance parameters and blinds Please refer to the Energy Strategy for key modelling input parameters. The results for each summer year are included below and also in the Energy Strategy. Table 5 to Table 7 summarise the results of the overheating risk assessments. Results are presented in terms of the percentage of rooms that meet the adaptive comfort criteria. Please refer to the Energy Strategy appendix for the results on a room by room basis. **Overheating Risk Criteria** The sample units have been assessed against the CIBSE TM59 adaptive comfort criteria to assess the risk associated with the dwellings with operable windows. The following criteria have been applied (adaptive comfort): – The operative temperature in living rooms, kitchens and bedrooms shall not exceed the adaptive threshold comfort temperature for more than 3% of occupied hours in summer months (May to September). – The operative temperature in bedrooms shall not exceed 26°C for more than 1% of annual hours during the night (22:00 to 07:00). **DSY1** As shown, using DSY1, all spaces meet the overheating risk criteria when utilising the hybrid ventilation approach. **Table 5: Summary of adaptive criteria results based on various ventilation scenarios – DSY1.** % meeting adaptive comfort criteria / Corridors TM59 criterion 1 Kitchens, living rooms and bedrooms <3% occ. hours exceed comfort temp (May – Sept) / TM59 criterion 2 Bedrooms only <26°C for <1% occ. hours / 28°C operative temperature target <3% of annual hours Improved parameters with hybrid ventilation: **100%** (43/43) / **100%** (30/30) / **100%** (2/2) **DSY2** As shown, using DSY2, the majority of spaces meet the overheating risk criteria. **Table 6: Summary of adaptive criteria results based on various ventilation scenarios – DSY2.**

<table>
<tr><th colspan="2">GLA Sustainable Design & Construction SPG</th><th>Policy References</th><th>Proposed Development Response</th></tr>
<tr><th>Priority</th><th>Best Practice</th><th>London Plan</th><th></th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th></th><th>% meeting adaptive comfort criteria</th><th></th><th>Corridors</th></tr>
<tr><th></th><th>TM59 criterion 1
Kitchens, living rooms and bedrooms <3% occ. hours exceed comfort temp
(May – Sept)</th><th>TM59 criterion 2
Bedrooms only <26°C for <1% occ. hours</th><th>28°C operative temperature target <3% of annual hours</th></tr>
<tr><td>Improved parameters with hybrid ventilation</td><td>72% (31/43)</td><td>83% (25/30)</td><td>100% (2/2)</td></tr>
</table>
DSY3
As shown, using DSY3, there is anticipated to be a risk of overheating for the majority of spaces.
Table 7: Summary of adaptive criteria results based on various ventilation scenarios – DSY3.
<table>
<tr><th></th><th>% meeting adaptive comfort criteria</th><th></th><th>Corridors</th></tr>
<tr><th></th><th>TM59 criterion 1
Kitchens, living rooms and bedrooms <3% occ. hours exceed comfort temp
(May – Sept)</th><th>TM59 criterion 2
Bedrooms only <26°C for <1% occ. hours</th><th>28°C operative temperature target <3% of annual hours</th></tr>
<tr><td>Improved parameters with hybrid ventilation</td><td>7% (3/43)</td><td>3% (1/30)</td><td>0% (0/2)</td></tr>
</table>
The Proposed Development has been designed in accordance with the overheating checklist and the cooling hierarchy to minimise cooling demand and limit the likelihood of high internal temperatures. Mitigation measures such as suitable glazing ratio and g-value, appropriate ventilation levels and minimisation of internal heat gains will be implemented. Through these measures, relevant areas of the Proposed Development will achieve compliance with Criterion 3 of the Building Regulations Part L (2013).
It is not anticipated that active cooling will be provided for the residential areas of Development Area 1 (Application A). A completed overheating checklist has also been provided in this report.
</td></tr>
<tr><td>-</td><td>The design of developments should prioritise landscape planting that is drought resistant and has a low water demand for supplementary watering.</td><td>5.3, 5.15</td><td>The species selected for soft landscaping and green/brown roofs will aim to reduce supplementary watering while still being in keeping with the native ecological environment.
Drought resistant planting would also be considered for the landscaping and green roofs of the Outline submission (Development Area 2 of Application A).</td></tr>
<tr><td>-</td><td>Developers should consider any long term potential for extreme weather events to affect a building's foundations and to ensure they are robust.</td><td>5.3, 7.6</td><td>The Structural Engineers have considered all applicable geological and hydrological conditions in accordance with relevant design guidance and standards.

The BREEAM credit for Wst 05 – Adaptation to Climate Change is targeted for all BREEAM assessments included in Development Area 1 of Application A and Application B (School). A report will identify the main hazards associated with extreme weather events and the predicted impact of climate change, and list of mitigations measures which could be included into the design produced.

The Outline submission (Development Area 2 of Application A) would also consider the long term impact of climate change and appropriate mitigation measures would be considered.</td></tr>
</table>

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Climate change adaption – increasing green cover.			
Developers should integrate green infrastructure into development schemes, including by creating links with wider green infrastructure network.	-	2.18, 5.3, 5.10, 5.11	Native species, or species of benefit to wildlife, will be incorporated throughout the development. New planting will be incorporated close to the river edge, responding to the existing riverside vegetation. The recommendations from the Suitably Qualified Ecologist's report will also include the most appropriate measures to increase the ecological value of the development. Soft landscaping as well as artificial habitats would be provided in the Development. Application A would include: – hedge planting (1.5 m high) enclosing all ground level residential courtyards east of Ship Lane in the detailed part of the Stag Brewery component of the Development – a minimum of ten bat boxes – provision of new trees including the use of native species, or species of benefit to wildlife. This includes littoral plant species in areas close to the river edge responding to existing riverside vegetation and the proposed school provision of biodiversity roofs, including a mix of green and brown roofs – a green link connecting the River Thames and Mortlake Green. The recommendations of the ecologist would also be considered for the Outline application of Development Area 1 of Application A, in order to integrate green infrastructure to link to the site of Development Area 1 of Application A and Application B (School) and wider areas. The London Plan Intend to Publish Version (dated December 2019) policy G5 on urban greening will be assessed for the application and provided in supporting information.
Major developments in the Central London Activity Area (CAZ) should be designed to contribute to the Mayor's target to increase green cover by 5% in this zone by 2030.	-	5.10	The Proposed Development is not included in the Central Activities Zone (CAZ) and so the London Plan (2016) target for the CAZ does not apply.
Developments should contribute to the Mayor's target to increase tree cover across London by 5% by 2025.	-	-	The Proposed Development (Application A) will include park/recreation areas which will include the planting of new evergreen and deciduous trees. With Application A and B it is proposed that there will be a net increase in trees on the site.
Any loss of a trees resulting from development should be replaced with an appropriate tree or group of trees for the location, with the aim of providing the same canopy cover as that provided by the original trees.	-	-	In order to deliver a comprehensive mixed use development on the Site, some trees will need to be removed. The majority of trees on Site will be retained, and protected during construction. In order to mitigate against tree removal, up to 406 new trees are proposed to be planted across the Stag Brewery site (application A & B). The new trees will be a mix of species to respond to their locations and provide ecological and biodiversity benefits, and a number will be planted at semi-mature age.
Climate change adaptation – flooding.			
Surface Water / Sustainable Drainage Developers should maximise all opportunities to achieve greenfield runoff rates in their developments.	-	5.12, 5.13	The Drainage Strategy confirms that Application A and B will aim to restrict surface water runoff to 70% of the existing rate. This is set out in the Drainage Strategy for the site. Where applicable the surface water run-off will discharge directly to the Thames at an unrestricted rate. The Application A and Application B areas of the site are expected to require 2667m^3 of attenuation to achieve the restricted run off rate and this would be considered for inclusion in Application A and B appropriately.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Surface Water / Sustainable Drainage When designing their schemes developers should follow the drainage hierarchy set out in London Plan Policy 5.13.	-	5.13	The Drainage Strategy confirms that in line with the drainage hierarchy, the Proposed Development in Application A will discharge surface water runoff from the northeast part of the Site into the adjacent River Thames. Due to the tidal nature of the Thames, LBRuT accept that surface water runoff can discharge to it unrestricted. Refer to the Drainage Strategy for details. The provision of SuDs will be considered for the Proposed Development in Application A and B, which could include green planting and rainwater harvesting. The Drainage Strategy provided in support of the applications states: Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would be achieved through the incorporation of green roofs, and the potential inclusion of blue roofs, rainwater harvesting, permeable paving, and swales. If required, a biomat filtration system, downstream defender or other hard engineered solution could also be incorporated to ensure discharge is appropriately treated. This report sets out the principals of the SuDS scheme, however the final proposed SuDS would be confirmed at the detailed design stage. A London Plan Intend to Publish Version (dated December 2019) is yet to be adopted. Accordingly, although not yet adopted, it is important to note the changes to the current London Plan relating to drainage, as per draft Policy SI 13 Sustainable Drainage. The most favourable form of surface water management in the drainage hierarchy has been amended within this draft policy to read ‘rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation’. The draft policy further states that development proposals for impermeable surfacing should be refused unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways. The potential for SuDS was considered throughout the design process with workshops being held by the design team to discuss the various constraints and opportunites for each of the SuDS devices. In line with the draft London Plan Policy SI13 “Sustainable Drainage”, rainwater harvesting and parmeable paving would be incorporated along with a number of other SuDS features
Sustainable Drainage Developers should design Sustainable Drainage Systems (SuDS) into their schemes that incorporate attenuation for surface water runoff as well as habitat, water quality and amenity benefits.	-	5.3, 5.13, 5.14	
Development in areas at risk from any form of flooding should include flood resistance and resilience measures in line with industry best practice.	-	5.3, 5.12, 5,13	By reference to the Environment Agency Flood Risk Map, it is understood that Application A and B of the Proposed Development is within Flood Zone 3, however it is within the area that benefits from the Thames flood defences.

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
			 The existing site boundary walls will be removed or modified as required and new flood defence walls will be provided. Full details of Flood Risk Management Measures have been provided in the Flood Risk Assessment submitted as part of Application .
Developments incorporate the recommendation of the TE2100 plan for the future tidal flood risk management in the Thames estuary.	-	5.3, 5.12	The Proposed Development is located within the area protected by existing flood defences. In addition to this, the existing site boundary walls will be removed or modified as required and new flood defence walls will be provided. Additional Flood Risk Management measures will be considered for Development Area 1 of Application A and Application B (School), as appropriate.
Where development is permitted in a flood risk zone, appropriate residual risk management measures are to be incorporated into the design to ensure resilience and the safety of occupiers.	-	5.3, 5.12	Appropriate Flood Risk Management measures would also be considered for Development Area 2 of Application A to be confirmed in the reserved matters submission(s). Full details of Flood Risk Management Measures have been provided in the Flood Risk Assessment submitted as part of Application A.
All sources of flooding need to be considered when designing and constructing developments.	-	5.3, 5.12, 5.13	All sources of flooding have been considered when designing and constructing developments. Please refer to the Flood Risk Assessment.
Pollution management - land contamination.			

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Developers should set out how existing land contamination will be addressed prior to the commencement of their development.	-	3.2, 5.3, 5.21	The Environmental Statement and associated addendums sets out the issues of existing ground contamination, the risks and remediation measures. Owing to the reduction in basement volume at the western side of the Site (West of Ship Lane), a smaller volume of potentially contaminated shallow soils would be excavated. However, mitigation measures to be undertaken as part of the Works, informed by findings of previous and proposed ground investigation, would prevent any contamination in residual soils impacting any identified receptors (as set out in the replacement Preliminary Environmental Risk Assessment). Minor expansion of the proposed basement to the east of Ship Lane with a sub-basement level under Building 01 would excavate some additional natural material, however there would be no additional impact to ground conditions or contamination risks. Below ground Development infrastructure would be inherently suitably designed and specified for the ground conditions at the Site and to withstand the potential adverse effects from any residual contamination which could give rise to chemical attack. The likely effect is therefore considered to be insignificant
Potentially polluting uses are to incorporate suitable mitigation measures.	-	3.2, 5.3, 5.21	The Proposed Development is not proposing to include uses that would lead to land contamination.
Pollution management - air quality.			
Developers are to design their schemes so that they are at least 'air quality neutral'.	-	7.14	Systems at the Proposed Development (Application A and B) will be selected to minimise emissions of Nitrous Oxide (NOx) and other pollutants which can lead to adverse air quality impacts.
Developments should be designed to minimise the generation of air pollution.	-	5.3, 7.14	The Proposed Development, Application A and B, will be serviced through the provision of CHP engines with NOx abatement technologies and low NOx emission boilers to minimise the generation of air pollution, and cycling will be encouraged through the provision of cyclist facilities in order to reduce the use of cars. Electric car charging points will also be provided. These measures are consistent with those identified by LBRuT within their Air Quality Action Plan. The energy strategy that provides beneficial CO_2 emissions reductions in accordance with policy and building regulations at the time of the reserved matters submission(s) would be submitted for consideration with the application at that time. This approach would provide more flexibility in the longer term with respect to energy sources, and maximising carbon emissions reductions throughout the lifetime of the Proposed Development and the associated impact on air quality. The London Plan Intend to Publish Version (dated December 2019) policy SI 1 has been assessed in the Environmental Impact Assessment and associated addendums. It is maintained that this is not required as part of the application, but an assessment has been included as the Applicant is aware that air quality is a key area of concern.
Developments should be designed to minimise and mitigate against increased exposure to poor air quality.	-	3.2, 5.3, 7.14	The Proposed Development will be serviced through the provision of CHP engines with appropriate NOX abatement technologies located in a dedicated energy centre, supported by additional gas boilers. The boilers will be selected with low NOx emissions to reduce the impact on local air quality. The Environmental Impact Assessment and associated addendums will review and assess mitigation techniques that will be incorporated into the Proposed Development, with the aim of minimising the generation of air pollution and mitigating against increased exposure to poor air quality.
	-	7.14	

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants set out in Appendix 7.			The CHP engine and NOx abatement will be selected to meet the criteria for pollutant emissions as provided in Appendix 7 of the Sustainable Design and Construction Guide (2014) for Development Area 1 of Application A and Application B (School). The appropriate use of CHP with NOx abatement would be considered for Development Area 2 of Application A, to be confirmed by the reserved matters submission(s).
Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during Construction and Demolition SPG when constructing their development.	-	5.3, 7.14	It is intended that contractors for Application B (School) and Development Area 1 of Application A will comply with The Control of Dust and Emissions during Construction and Demolition SPG, and will also be required to identify potential sources of dust and other air pollution and ensure appropriate dust control measures are implemented. It is also intended that the main contractors will register under the Considerate Constructors Scheme and achieve a best practice score, in order to achieve the associated BREEAM credits. These measures would also be considered for inclusion in the contractor's requirements for Development Area 2 of Application A.
Pollution management – noise.			
Areas identified as having positive sound features or as being tranquil should be protected from noise.	-	3.2, 7.15	The Site does not include areas identified as having positive sound features or as being tranquil.
Noise should be reduced at source, and then designed out of a scheme to reduce the need for mitigation measures.	-	3.2, 5.3, 7.6, 7.15	Detailed elements (Application A (Development Area 1), and Application B (School)): Noise attenuation measures will be incorporated on-site where required, to ensure that any noise generated by equipment or services will not generate a source of noise pollution or negatively impact the surrounding area. Acoustic fencing is specified for the school sports field to reduce noise breakout from these areas to the surrounding residential streets. The Site is located in an area with a high level of background noise. High efficiency mechanical ventilation will be available to provide ventilation to the spaces in addition to the option to use natural ventilation. This will aid noise attenuation as occupants will not be reliant on opening windows to maintain good indoor air quality and control internal temperatures. Outline element (Application A, Development Area 2) The strategy detailed above would also be considered for Development Area 2 of the Proposed Development.
Pollution management - light pollution.			
Developments and lighting schemes should be designed to minimise light pollution.	-	5.2, 5.3, 6.7	All external lighting provided as part of the Proposed Development will be energy efficient. It is anticipated that suitable controls such as daylight detection and time-switches will be provided to minimise inappropriate use. Luminaires will be selected with suitable light output ratio and polar curve to ensure light is distributed appropriately. This will minimise light lost to the night sky.
Pollution management - water pollution.			
In their aim to achieve a greenfield runoff rate developers should incorporate sustainable urban	-	5.3, 5.13, 5.14	

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
drainage systems (SuDS) into their schemes which also provide benefits for water quality.			A number of SuDS have been assessed for their suitability for the Proposed Development as part of the Drainage Strategy. Green/Brown roofs, Blue roofs, Rainwater harvesting and underground attenuation have been considered for the Proposed Development. The final proposed SuDS would be confirmed at the detailed design stage. For Application A the Drainage Strategy submitted in support of the applications states: Surface water runoff from the northeast of the Application A site (Stag Brewery component of the Site) would discharge by gravity to the River Thames (adjacent to the northern boundary of the Site) via three outfalls. As the River Thames is tidal in this location, direct discharge to the river would be unrestricted. The area to discharge into the River Thames has been maximised using shallow geocellular conveyance channels, in order to relieve the Thames Water network of flows. Surface water runoff from the remainder of the Stag Brewery component of the Site would discharge via gravity to the Thames Water sewer network in the surrounding highways, maximising the attenuation volume within each drainage catchment to restrict surface water flows as much as possible. Based on an area of 5.89ha currently draining into the Thames Water network, the existing discharge rate was calculated to be 841 l/s. The incorporation of permeable paving, rain gardens, and underground attenuation tanks achieves a reduction of surface water flows to 249 l/s, equal to a 70% reduction compared to the existing rate. This approach has been agreed with the Greater London Authority. Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would be achieved through the incorporation of green roofs, permeable paving aggregate sub-base, rain gardens, and rainwater harvesting. A biomat filtration system within the attenuation tanks and downstream defenders or similar hard engineered solution would also be incorporated if deemed necessary at detailed design to ensure discharge is appropriately treated. The on-Site drainage networks and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the Stag Brewery development (Applications A and B), ensuring they remain fit for purpose and function appropriately. The management company / operator would be appointed post-planning. The school drainage system (Application B) would be delivered and maintained separately from the Application A site. This report confirms that surface water runoff from the Site (Applications A and B) can be managed sustainably to ensure that flood risk is not increased elsewhere. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework (NPPF) and the London Plan.
-	Encourage good environmental practice to help reduce the risk from business activities on the London water environment.	5.3, 5.13, 5.14	It is intended that commercial tenants will be advised of good environmental practice to reduce risk on the London water environment.
-	Encourage those working on demolition and construction sites to prevent pollution by incorporating prevention measures and following best practice.	5.3, 5.14	The main contractor will be required to operate in an environmentally conscious manner to prevent pollution. It is also intended that the main contractor shall register under the Considerate Constructors Scheme and achieve a best practice score.
Pollution management - wastewater treatment.			

GLA Sustainable Design & Construction SPG		Policy References	Proposed Development Response
Priority	Best Practice	London Plan	
Commercial developments discharging trade effluent should connect to the public foul sewer or combined sewer network where it is reasonable to do so subject to a trade effluent consent from the relevant sewerage undertaker.	-	5.3, 5.14	All spaces at the Proposed Development will be provided with suitable connections to the public foul sewer or combined sewer network, as appropriate.
Developments should be properly connected and post construction checks should be made by developers to ensure that misconnections do not occur.	-	5.3, 5.14	

3. Conclusion.

This statement demonstrates that high standards of environmental sustainability have been considered in the design of the Proposed Development. This is demonstrated by the commitment to energy efficiency, water efficiency, waste management and cyclist facilities.

The strategy highlights how the Proposed Development achieves the sustainability objectives. The features of the Development include:

a. The non-domestic areas of Application A at the Proposed Development seek to target BREEAM 'Excellent' as a minimum as is required by LBRuT policy. This includes the office, and cinema areas.

b. The School (application B) would aspire to achieve a BREEAM 'Excellent' rating. An education provider will deliver the school.

c. The energy strategy is designed to achieve regulated CO_2 emissions reductions, with the following targets for CO_2 emissions reductions beyond Part L 2013 baseline:

Be Lean	**5.1% sitewide betterment achieved against GLA gas boiler baseline.** Highly energy efficient building fabric and building services have been utilised to reduce carbon emissions and energy demand through good practice passive measures.
Be Clean	**'Be Clean' measures have been selected to achieve a further 34.9% reduction.** Incorporation of an onsite district heating network and a CHP system. The Proposed Development would seek to utilise a Combined Heat and Power engine within the energy centre for Development Area 2 as the lead generator of heating, hot water and also supplying some electricity to landlord uses. This would be backed up by high efficiency gas fired condensing boilers.
Be Green	**A further 1.3% sitewide betterment achieved through LZC technologies.** The incorporation of a 360m^2 74KWp photovoltaic array offsets the proposed development's carbon emissions.

d. Water efficient devices will be installed to target a reduced water consumption in the non-domestic areas sufficient to achieve two credits for the New Construction elements and 2.5 credits for the domestic refurbishment element.

e. The Proposed Development (Application A) will include park/recreation areas which will include the planting of new evergreen and deciduous trees. With Application A and B it is proposed that there will be a net increase in trees on the site.

f. A number of SuDS have been assessed for their suitability for the Proposed Development as part of the Drainage Strategy. Green/Brown roofs, Blue roofs, Rainwater harvesting and underground attenuation have been considered for the Proposed Development of Application A. Application B will include attenuation to limit run off rate to the required limit.

g. The Maltings building (Building 4) is being retained in its entirety, with works proposed to the windows and internal layouts. New floors would be inserted and the upper floors would be partitioned to create apartments. The proposals for the existing former Bottling and hotel building (building 5) aims to convert to a hotel and office. It is proposed that the South and West facades of the building will be retained in their entirety and that the North and East facades will be largely demolished and rebuilt to an extended footprint. Where new materials are introduced they will be specified, where possible and practicable, to be sustainably sourced, recycled or re-used building materials.

h. A Resource Management Plan will be produced by the Principal Contractors to monitor, sort and recycle construction waste on or off site.

i. Recyclable waste storage will be provided for the occupants to manage their operational waste. Waste storage areas are provided throughout Application A to enable the management of waste.

j. Secure cycle storage and facilities will be provided to encourage the use of bicycles.

k. Contractors will be required to sign up to the Considerate Constructors Scheme (CCS) and target a beyond best practice score.

l. Systems at the Proposed Development (Application A and B) will be selected to minimise emissions of Nitrous Oxide (NOx) and other pollutants which can lead to adverse air quality impacts. The Proposed Development, Application A and B, will be serviced through the provision of CHP engines with NOx abatement technologies and low NOx emission boilers to minimise the generation of air pollution, and cycling will be encouraged through the provision of cyclist facilities in order to reduce the use of cars. Electric car charging points will also be provided. These measures are consistent with those identified by LBRuT within their Air Quality Action Plan. Details provided in the Environmental Impact Assessment..

It is also anticipated that all occupied spaces of the Proposed Development of Application A and B will achieve compliance with the Building Regulations Part L 2013 criterion three requirements and that the risk of overheating is mitigated by the inclusion of features such as internal blinds, g-value of the glazing, an appropriate glazing ratio and mechanical ventilation rates in excess of the minimum requirements of building regulations. The overheating risk assessment for the development demonstrates that with DSY1 weather file and the hybrid ventilation strategy, the CIBSE TM59 overheating criteria are met.

4. Appendix A: BREEAM new construction pre-assessment summary.

This report provides an indicative BREEAM 2014 New Construction pre-assessment for the Proposed Development.

The development falls under multiple assessment type categories as set out in table 1 and a Shell and Core assessment has been assumed for the Office and Cinema. A 'Fully Fitted' assessment has been assumed for Application B (School). The proposed development is targeting a BREEAM 'Excellent' rating for each of the assessment types outlined below.

The Proposed Development is a mixed-use scheme of apartments, retail premises, office, cinema, a school, a and a basement with car park. However, this report focuses solely on the non-residential elements of Application A, Development Area 1 and Application B, The School; that is, the office, cinema, retail, and school spaces as shown in Table 8 below:

Table 8: BREEAM assessment types.

Assessment Type	Assessed Accommodation	Floor Area (sqm)
BREEAM Offices	Office Units	2,650
BREEAM Other	Cinema	1,606
BREEAM School	School	9,319

The current anticipated baseline score is as per Table 9.

Table 9: Anticipated BREEAM 2014 performance summary.

	BREEAM Target Score	Rating
Office Units	74.0%	'Excellent'
Cinema	71.4%	'Excellent'
School	72.3%	'Excellent'

A margin of at least 3% – 5% is recommended above the minimum required score at this stage to secure the target rating against design changes and potential constraints identified during the construction stage.

The summary table below highlights the list of targeted credits for the current BREEAM 2014 pre-assessment. Mandatory credits to achieve a 'Very Good' rating and above are highlighted by **(M).** Additional mandatory credits for an 'Excellent' or 'Outstanding' rating are highlighted by **(M_e) and (M_o)** respectively. Exemplary (innovation) credits are written in brackets; e.g. (+1).

The different assessment types have differing available credits. These are noted where applicable in Table 10.

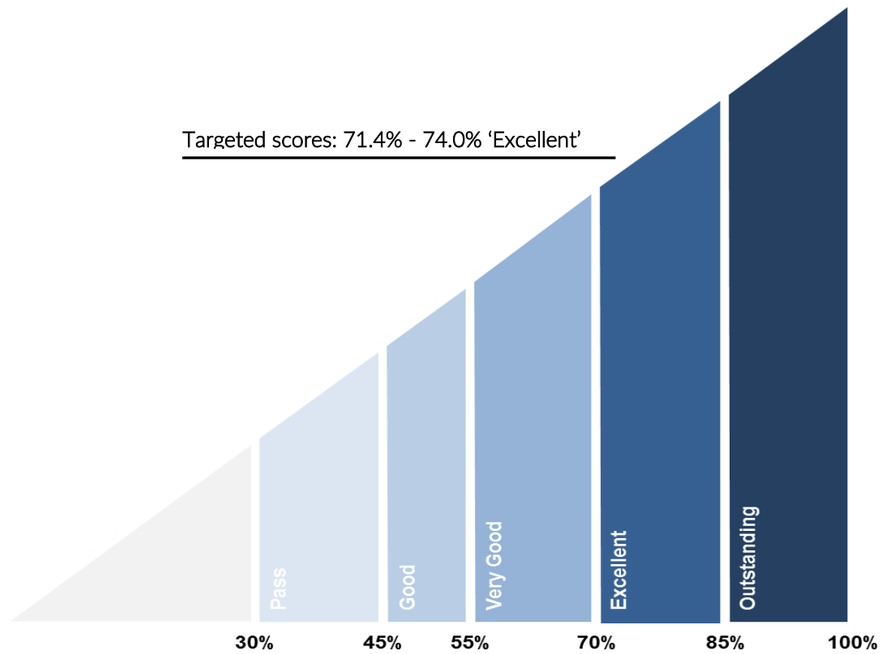


Figure 3: BREEAM 2014 scale and anticipated performance scores.

Table 10: Summary of credits targeted.

Category	Issue	Available	Targeted Credits		
			Office	Cinema	School
Management	Man 01: Project Brief and design	4	4	4	4
	Man 02: Lifecycle Cost and Service Life Planning	4	4	4	4
	Man 03: Responsible Construction Practices **(M_e), (M_o)**	6	6	6	6
	Man 04: Commissioning and Handover **(M_e), (M_o)**	4	4	4	4
	Man 05: Aftercare	3	-	-	3
Health & Wellbeing	Hea 01: Visual Comfort	3 5 - School	2	1	3
	Hea 02: Indoor Air Quality	2 5 - School	1	1	3
	Hea 04: Thermal Comfort	2 3 - School	2	2	3
	Hea 05: Acoustic Performance	1 3 - School	1	1	3
	Hea 06: Safety and Security	2	2	2	2
Energy	Ene 01: Reduction of CO_2 Emissions **(M_e)**	12	6	6	6
	Ene 02: Energy Monitoring **(M)**	2	2	2	2
	Ene 03: External Lighting	1	1	1	1
	Ene 04: Low Carbon Design	3	1	1	1
	Ene 05: Energy Efficient Cold Storage	2	-	-	-
	Ene 06: Energy Efficient Transportation Systems	3	3	3	3
	Ene 08: Energy Efficient Equipment	2	-	-	0
Transport	Tra 01: Public Transport Accessibility	5 – Cinema 3 – School & Office	2	2	2
	Tra 02: Proximity to Amenities	1	1	1	1
	Tra 03: Cyclist Facilities	2	2	2	2
	Tra 04: Maximum Car Parking Capacity	2	2	2	-
	Tra 05: Travel Plan	1	1	1	1
Water	Wat 01: Water Consumption **(M)**	5	2	2	2
	Wat 02: Water Monitoring **(M)**	1	1	1	1
	Wat 03: Water Leak Detection and Prevention	2	2	2	2
	Wat 04: Water Efficient Equipment	1	1	1	1
Materials	Mat 01: Life Cycle Impacts	5 - Office 6 – School, & Cinema	3	3	3
	Mat 02: Hard Landscaping and Boundary Protection	1	1	1	1
	Mat 03: Responsible Sourcing of Materials **(M)**	4	2	2	2
	Mat 04: Insulation	1	1	1	1
	Mat 05: Designing for Durability and Resilience	1	1	1	1
	Mat 06: Material Efficiency	1	1	1	1
Waste	Wst 01: Construction Waste Management **(M_o)**	4	3	3	3
	Wst 02: Recycled Aggregates	1	0	0	0
	Wst 03: Operational Waste **(M_e), (M_o)**	1	1	1	1
	Wst 04: Speculative Floor and Ceiling Finishes	1	1	-	-
	Wst 05: Adaptation to Climate Change	1	1	1	1
	Wst 06: Functional Adaptability	1	0	1	0
Land Use and Ecology	LE 01: Site Selection	2	1	1	1
	LE 02: Ecological Value of Site and Protection of Ecological Features	2	2	2	2
	LE 03: Minimising Impact on Existing Site Ecology **(M)**	2	2	2	2
	LE 04: Enhancing Site Ecology	2	2	2	2
	LE 05: Long Term Impact on Biodiversity	2	2	2	2
Pollution	Pol 01: Impact of Refrigerants	3	0	0	0
	Pol 02: NO_x Emissions	3	0	0	0
	Pol 03: Surface Water Run-off	5	3	3	3
	Pol 04: Reduction of Night-time Light Pollution	1	1	1	1
	Pol 05: Noise Attenuation	1	1	1	1
Innovation	Inn 01: Approved Innovation and Exemplary Level Credits	10	1	1	1
	Targeted weighted score & rating:		74.0%	71.4%	72.3%
			'Excellent' rating		

5. Appendix B: BREEAM domestic refurbishment pre-assessment summary.

This report relates the areas of the Proposed Development that will be refurbished into dwellings. It is recommended the building should be registered under the BREEAM 2014 Domestic Refurbishment (DR) scheme and assessed under the BREEAM 2014 New Domestic Refurbishment (DR) Scheme.

This report is relevant to the refurbishment of Block 4 – The Maltings and Block 5. The assessment is targeting a BREEAM 'Excellent' rating. The building contains non-domestic areas on the ground floor and residential areas on the upper floors.

This draft pre-assessment has been carried out independently by a qualified BREEAM assessor prior to a review by the project design team. This report sets out a route to achieving the target rating and highlights the design team members responsible for each credit issue.

– Baseline score / rating: 73.41% equivalent to an 'Excellent' rating.

Note: All mandatory and minimum standards for the 'Excellent' rating have been targeted within the baseline score.

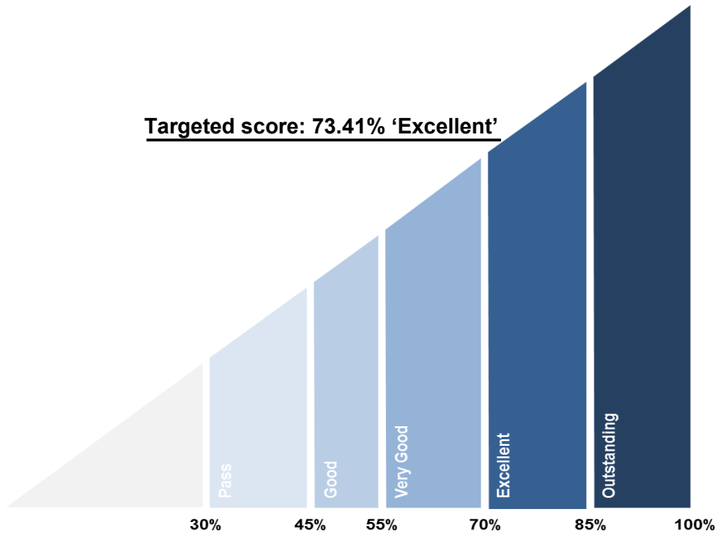


Figure 4: BREEAM 2014 scale and anticipated performance score.

Table 11 highlights the list of targeted credits for the current BREEAM Domestic Refurbishment 2014 pre-assessment. Mandatory credits to achieve a "Very Good' rating and above are highlighted by (M).

Table 11: Summary of credits targeted.

Category	Issue	Credits	
		Available	Targeted
Management	Man01: Home User Guide	3	3
	Man02 Responsible Construction Practices	2	2
	Man03 Construction Site Impacts	1	1
	Man04 Security	2	2
	Man05 Protection and Enhancement of Ecological Features	1	1
	Man06 Project Management	2	2
Health & Wellbeing	Hea01 Daylighting	2	0
	Hea02 Sound Insulation	4	4
	Hea03 Volatile Organic Compounds	1	1
	Hea04 Inclusive Design	2	1
	Hea05 Ventilation (M)	2	2
	Hea06 Safety (M)	1	1
Energy	Ene01 Improvement in Energy Efficiency Rating	6	3.5
	Ene02 Energy Efficiency Rating Post Refurbishment (M)	4	2.5
	Ene03 Primary Energy Demand	7	4.5
	Ene04 Renewable Technologies	2	0
	Ene05 Energy Labelled White Goods	2	2
	Ene06 Drying Space	1	1
	Ene07 Lighting	2	2
	Ene08 Energy Display Devices	2	2
	Ene09 Cycle Storage	2	2
	Ene10 Home Office	1	1
Water	Wat01 Internal Water Consumption (M)	3	2
	Wat02 External Water Use	1	0
	Wat03 Water Meter	1	1
Materials	Mat01 Life Cycle Impacts (M)	25	15
	Mat02 Responsible Sourcing of Materials	15	9
	Mat03 Insulation (M)	8	4
Waste	Was01 Household Waste	2	2
	Was02 Refurbishment Site Waste Management	3	3
Pollution	Pol01 Impact of Refrigerants	3	2
	Pol02 Surface Water Runoff	3	0
	Pol03 Flooding	2	2
Innovation	Man02 Responsible Construction Practices	1	0
	Man05 Protection and Enhancement of Ecological Value	1	0
	Man06 Project Management	2	0
	Hea04 Inclusive Design	1	0
	Ene02 Energy Efficiency Rating	1	0
	Ene08 Display Energy Devices	1	1
	Wat01 Internal Water Use	1	0
	Was02 Refurbishment Site Waste Management	1	0
	Pol02 Surface Water Run-off	1	0
Total			**73.41% 'Excellent' rating**

6. Appendix C: Policy framework.

6.1 Building regulation Part L2013.

Criterion one of the Building Regulations Part L 2013 requires that the building as designed is not anticipated to generate CO_2 emissions in excess of that set by a Target Emission Rate (TER) calculated in accordance with the approved Standard Assessment Procedure (SAP) v9.92 2012 for dwellings and the National Calculation Methodology (NCM) 2013 for non-dwellings.

On aggregate, Part L 2013 requires the following CO_2 emissions reductions:

- 6% beyond the requirements of Part L 2010 for dwellings
- 9% beyond the requirements of Part L 2010 for non-domestic buildings

Criterion two places upper limits on the efficiency of controlled fittings and services for example, an upper limit to an external wall U-value of 0.30W/m^2.K (dwellings).

Part L 2013 requires the following performance targets to be met:

Target Fabric Energy Efficiency (TFEE). The TFEE is calculated independently for each dwelling, based upon an elemental recipe of efficiency parameters, applied to the geometry of the dwelling in question. This will generate a notional value which will then be relaxed by 15% to generate the TFEE.

Criterion three requires that dwellings are not at 'high' risk of overheating in summer months (June, July & August) and that zones in commercial buildings are not subject to excessive solar gains. This is demonstrated using the procedure given in SAP 2012 Appendix P for dwellings and the National Calculation Methodology (NCM) 2013 for non-dwellings.

6.2 GLA planning policy.

6.2.1 The London Plan

Consolidated with alterations since 2011 (March 2016)
The regional policies of the GLA are contained within the London Plan.

The latest version of the consolidated London Plan (2016) was published and adopted in March 2016. This constitutes the London Plan 2011 consolidated with:

- Revised Early Minor Alterations to the London Plan (October 2013)
- Further Alterations to the London Plan (March 2015)
- Housing Standards Minor Alterations to the London Plan (March 2016)
- Parking Standards Minor Alterations to the London Plan (March 2016).

Consolidated with alterations since 2011 (March 2015)
On the 10th March 2015, Further Alterations to the London Plan was issued. The updated London Plan document is now a material consideration for planning applications. Key alterations to the document are as follows:

- A new policy is in place relating to electricity and gas supply.
- Policy guidance changes relating to increased provision of waste capacity.
- Funding to create cycle friendly 'mini Hollands' for up to four outer London Borough town centres.

Further guidance is given which highlights the importance of demand side energy management and minimum standards for cycle parking.

Policy
Development within LBRuT is subject to the policy requirements of the London Plan 2016. The following policies of the London Plan (2016) have informed this strategy.

Policy 5.2: Minimising CO_2 emissions
Policy 5.2 requires new-build domestic and non-domestic development to reduce CO_2 emissions.

The target reduction in CO_2 emissions for Residential Buildings is to achieve 'zero carbon homes' for Stage 1 applications. The definition of this is clarified in the GLA's publication G*uidance on Preparing Energy Assessments*. The target for 'Non-Domestic Buildings' is to achieve 35% reduction in CO_2 emissions.

This document was produced by the GLA to provide further detail on how to prepare an energy assessment to accompany strategic planning applications. Within this, the definition of 'zero carbon homes' is made as follows:

'Zero carbon' homes are homes forming part of major development applications where the residential element of the application achieves at least a 35 per cent reduction in regulated carbon dioxide emissions (beyond Part L 2013) on-site. The remaining regulated carbon dioxide emissions, to 100 per cent, are to be off-set through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere (in line with policy 5.2E).

The cash in lieu payment is currently set at £1,800 per tonne of CO_2 (equivalent to £60 per tonne per year over 30 year period).

Table 12: Uplift in CO_2 emission targets.

Use Type	CO_2 Reduction Target (beyond Part L 2013)	
	2013 – 2016	2016 – 2019 (1st October 2016)
Residential Buildings	35%	'Zero Carbon'
Non-Domestic Buildings	35%	35%

Policy 5.1: Climate change mitigation
Policy 5.2 sets out the target CO_2 emission reductions as described above.

Policy 5.3 Sustainable Design and Construction
Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.

Policy 5.4: Retrofitting
The environmental impact of existing urban areas should be reduced through policies and programmes that bring existing buildings up to the Mayor's standards on sustainable design and construction. In particular, programmes should reduce carbon dioxide emissions, improve the efficiency of resource use (such as water) and minimise the generation of pollution and waste from existing building stock.

Policy 5.5: Decentralised energy networks
The Mayor expects 25 per cent of the heat and power used in London to be generated through the use of localised decentralised energy systems by 2025. In order to achieve this target the Mayor prioritises the development of decentralised heating and cooling networks at the development and area wide levels, including larger scale heat transmission networks.

Policy 5.6: Decentralised energy in development proposals.
Policy 5.6 requires development proposals to evaluate the feasibility of Combined Heat & Power (CHP) systems and where a new CHP system is appropriate, examine opportunities to extend the system beyond the Site boundary. Developments should select energy systems on the following hierarchy:

m. connection to existing heating or cooling networks

n. site wide CHP network

o. communal heating and cooling

Where future network opportunities are identified, proposals should be designed to connect to these networks.

Policy 5.7: Renewable Energy
Policy 5.7 requires that developments should provide a reduction in expected CO_2 emissions through the use of on-site renewable energy generation, where feasible.

Policy 5.9: Overheating and Cooling
Policy 5.9 requires that development proposals reduce potential overheating & reliance on air conditioning systems, demonstrated in consideration of the following cooling hierarchy:

a. minimisation of internal heat generation through efficient design

b. reduction of external heat gains through consideration of orientation, shading, albedo, fenestration, insulation, and green roofs & walls

c. management of internal heat gains through exposed thermal mass

d. passive ventilation

e. mechanical ventilation

f. active cooling

Development proposals should demonstrate how the design, materials, construction and operation of the development would minimise overheating and also meet its cooling needs.

6.3 Supplementary planning guidance documents.

6.3.1 Sustainable Design and Construction (2014)

This SPG provides more detailed guidance to aid London Plan policies. It updates the standards that were developed for the Mayor's SPG on Sustainable Design and Construction in 2006 and identifies these as priorities for the Mayor. The SPG provides guidance and practical advice for those designing schemes including architects, developers and engineers as well as those developing planning policy and neighbourhood plans.

To support the policies in the London Plan the Sustainable Design and Construction SPG includes guidance on:

- Energy efficient design
- Meeting the carbon dioxide reduction targets
- Decentralised energy
- How to offset carbon dioxide where the targets set out in the London Plan are not met
- Retro-fitting measures
- Support for monitoring energy use during occupation
- An introduction to resilience and demand side response
- Air quality neutral
- Resilience to flooding
- Urban greening
- Pollution control
- Basements policy and developments
- Local food growing

6.3.2 Energy Planning - Greater London Authority guidance on preparing energy assessments (March 2016)

This document was produced by the GLA to provide further detail on how to prepare an energy assessment to accompany strategic planning applications.

6.4 Emerging policy - London Plan Intend to Publish Version (dated December 2019)

Policy GG2 Making the Best Use of Land
- Creating high density development in order to "make the best use of land", whilst protecting London's open spaces.
- Promote urban greening.
- Encourage development that can encourage sustainable transport connections.

Policy GG3 Creating a healthy city
- Improve overall health and reduce health inequality.
- Promote a more active and healthy lifestyle, encouraging healthy choice (empowering healthy choice).
- Healthy streets approach, prioritise health in planning.
- Consider health and wellbeing on communities in planning applications - both health and health inequality (use Health Impact Assessments)
- Include access to green spaces and provision of green infrastructure.
- Ensure high quality, well insulated ventilated to avoid issues associated with damp, heat and cold.
- Create healthy food environments. Restrict unhealthy options.

Policy GG5 Growing a Good Economy
- Promote strength and potential of the wider city region
- Encourage diversified economy, with the benefits being shared more equitably across London.
- Plan for sufficient employment and industrial space in the right locations - supporting development/regeneration.
- Provide high quality housing and infrastructure to support growth
- Continue to provide innovation. Be an incubator and centre for learning
- Develop/enhance future transport network.

Policy GG6 Increasing Efficiency and resilience
- Improve energy efficiency, movement toward low carbon, circular economy. Target of zero carbon city by 2050.
- Buildings/infrastructure resilient against a changing climate, efficient use of water, reduction of impact from natural hazards such as flooding and heatwaves
- Avoid contribution to the heat island effect.
- Safe and secure environments, resilient against impacts such as fire/terrorism etc.
- Stakeholder contributions taken from all relevant public, private, community sectors.

Policy D1 London's form and characteristics
- Developments should optimise density and connectivity, be inclusive and use street spaces that have well defined public and private realm, provide outlook, privacy and amenity, be safe and secure, provide spaces for social interaction, play relaxation and physical activity.
- Provide and facilitate active travel with convenient and inclusive pedestrian and cycling routes.
- Mitigate or prevent the impacts of noise and poor air quality.
- Development design should respond to local context by delivering developments of appropriate scale, appearance and shape that responds successfully to the character of the local area.

- Be of high quality architecture that includes flexibility and appropriate building lifespan, delivering attractive robust materials that will mature well.
- Respect/enhance the heritage assets
- Maximise opportunities for urban greening to create attractive resilient places that effectively manage surface water.
- Achieve comfortable indoor and outdoor environments.

Policy D2 Delivering good design
- Boroughs should determine Development Plans and Strategies that include a wide range of physical and socio economic factors.
- Development should inform the type and scale of development projects taking account of:
  - Design analysis and visualisation
  - Design quality and development certainty
  - Design scrutiny
  - Managing design quality

Policy D3 Inclusive design
Deliver an inclusive environment and meet the needs of all Londoners: Proposals to be accessible and inclusive to allow development that can be entered and used safely (and with dignity by all), are convenient and welcoming with no disabling barriers. That can provide independent access without undue effort separation or special treatment including safe and dignified emergency evacuation to all users.

Policy D7 Public realm
- Development plans should ensure they are of good design, including being safe attractive spaces, landscaping, planting etc. The spaces should maximise the contributions public realm can make to active travel, discouraging travel by car and excessive on street parking, traffic noise etc.
- Public realm should develop sense of place and enhance relationships between the realm and its surrounding buildings.
- Incorporate Green Infrastructure to support rainwater/surface water management, exposure to air pollution, urban heat island and nature corridors
- Create spaces that are attractive and encouraging for community events.

Policy D8 Tall buildings
Tall building locations should be considered as part of development plans, identifying where tall buildings would be appropriate and their potential heights. Visual, Functional and Environmental Impact should be fully considered and include Wind, daylight, sunlight penetration and temperature conditions. The buildings must not compromise comfort or enjoyment of open spaces including around the building, air movement around the building and the building itself should not reduce the quality of surrounding spaces in terms of noise and air pollution.

Cumulative impacts from consented buildings should be fully included.

Policy D12 Agent of Change
Particularly in reference to the noise environment, the Agent of Change aims to encourage mitigation of existing impacts through the design of the Proposed Development (particularly in the case of residential development).

Policy D13 Noise
- Reduce manage and mitigate noise levels. The policy aims to encourage the use of the Agent of Change principle to ensure measures do not unduly impact on existing noise levels. Where levels unduly impact on the development, mitigation of the existing noise levels is considered.
- Noise levels of the development itself are limited. Quiet areas and spaces of Tranquillity are protected, and if possible improved and enhanced. Separation of new noise sensitive development from major noise sources, through the use of distance, screening or internal layout in preference to using sound insulation is encouraged. If standards are not achieved, acoustic design principles and insulation are then encouraged.

Policy D1 London's form and characteristics
- Developments should optimise density and connectivity, be inclusive and use street spaces that have well defined public and private realm, provide outlook, privacy and amenity, be safe and secure, provide spaces for social interaction, play relaxation and physical activity.
- Provide and facilitate active travel with convenient and inclusive pedestrian and cycling routes.
- Mitigate or prevent the impacts of noise and poor air quality.
- Development design should respond to local context by delivering developments of appropriate scale, appearance and shape that responds successfully to the character of the local area.
- Be of high quality architecture that includes flexibility and appropriate building lifespan, delivering attractive robust materials that will mature well.
- Respect/enhance the heritage assets
- Maximise opportunities for urban greening to create attractive resilient places that effectively manage surface water.
- Achieve comfortable indoor and outdoor environments.

Policy E1 Offices
- New office developments of varying sizes in new, refurbished and mixed us development types to be supported. This should be based on the anticipated demand for office floorspace to 2041 (100% increase by 2041).
- Spatial development areas should be supported by development works for offices.

Policy G1 Green infrastructure
Green network of infrastructure to be protected and managed as integrated features across the city. Boroughs to prepare green infrastructure strategies that integrate open space provision, biodiversity, flood management, health and wellbeing and sports and recreation.

Policy G5 Urban greening
Major development should contribute to greening as a fundamental part of the design. Boroughs to develop urban greening factor to identify appropriate level for new development proposals.

Policy G6 Biodiversity and access to nature
- Site of importance should be fully protected, including identifying all relevant areas within the proximity of any development proposals. Any locations or linkages that may be impacted upon by development proposals should be assessed and mitigated.
- Proposals should seek to create or enhance habitats of relevance in an urban context.
- Where harm is identified to be unavoidable, a hierarchy approach should be taken to limit the proposed damage as much as possible.

Policy G7 Trees and woodlands

- Trees should be protected wherever possible with new trees provided wherever possible to increase the urban forest proportion.
- Boroughs to identify locations for strategic tree planting.

Policy SI2 Minimising Greenhouse Gas Emissions

A. Major development should be net zero-carbon. This means reducing carbon dioxide emissions from construction and operation, and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

2. Be lean: use less energy and manage demand during construction and operation.
3. Be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly. Development in Heat Network Priority Areas should follow the heating hierarchy in Policy SI3 Energy infrastructure.
4. Be green: generate, store and use renewable energy on-site.

As a minimum, energy strategies should contain the following information:

a. A calculation of the energy demand and carbon dioxide emissions covered by Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (i.e. the unregulated emissions), at each stage of the energy hierarchy.

b. Proposals to reduce carbon dioxide emissions beyond Building Regulations through the energy efficient design of the site, buildings and services, whether it is categorised as a new build, a major refurbishment or a consequential improvement.

c. Proposals to further reduce carbon dioxide emissions through the use of zero or low-emission decentralised energy where feasible, prioritising connection to district heating and cooling networks and utilising local secondary heat sources. (Development in Heat Network Priority Areas should follow the heating hierarchy in Policy SI3 Energy infrastructure).

d. Proposals to further reduce carbon dioxide emissions through the generation and use of on-site renewable energy, utilising storage technologies where appropriate.

e. Proposals to address air quality risks (see Policy SI1 Improving air quality). Where an air quality assessment has been undertaken, this could be referenced instead.

f. The results of dynamic overheating modelling which should be undertaken in line with relevant Chartered Institution of Building Services Engineers (CIBSE) guidance, along with any mitigating actions (see Policy SI4 Managing heat risk).

g. Proposals for demand-side response, specifically through installation of smart meters, minimising peak energy demand and promoting short-term energy storage, as well as consideration of smart grids and local micro grids where feasible.

h. Proposals for how energy demand and carbon dioxide emissions post-construction will be monitored annually (for at least five years).

i. Proposals explaining how the site has been future-proofed to achieve zero-carbon on-site emissions by 2050.

j. Confirmation of offsetting arrangements, if required.

k. Proposals to minimise the embodied carbon in construction.

l. Analysis of the expected cost to occupants associated with the proposed energy strategy.

B. Major development should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy and will be expected to monitor and report on energy performance.

C. In meeting the zero-carbon target a minimum on-site reduction of at least 35 per cent beyond Building Regulations is expected. Residential development should aim to achieve 10 per cent, and non-residential development should aim to achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided:

5. Through a cash in lieu contribution to the relevant borough's carbon offset fund, and/or
6. Off-site provided that an alternative proposal is identified and delivery is certain.

D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver greenhouse gas reductions. The operation of offset funds should be monitored and reported on annually.

Policy SI3 Energy Infrastructure

A. Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy requirements and infrastructure arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.

B. Energy masterplans should be developed for large-scale development locations which establish the most effective energy supply options. Energy masterplans should identify:

7. major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
8. heat loads from existing buildings that can be connected to future phases of a heat network
9. major heat supply plant
10. possible opportunities to utilise energy from waste
11. secondary heat sources
12. opportunities for low temperature heat networks
13. possible land for energy centres and/or energy storage
14. possible heating and cooling network routes
15. opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
16. Infrastructure and land requirements for electricity and gas supplies
17. Implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector.

C. Development Plans should:

18. Identify the need for, and suitable sites for, any necessary energy infrastructure requirements including upgrades to existing infrastructure
19. Identify existing heating and cooling networks and opportunities for expanding existing networks and establishing new networks.

D. Major development proposals within Heat Network Priority Areas should have a communal heating system

20. The heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

    a. connect to local existing or planned heat networks

b. use available local secondary heat sources (in conjunction with heat pump, if required, and a lower temperature heating system)

c. generate clean heat and/or power from zero-emission sources

d. use fuel cells (if using natural gas in areas where legal air quality limits are exceeded all development proposals must provide evidence to show that any emissions related to energy generation will be equivalent or lower than those of an ultra-low NOx gas boiler)

e. use low emission combined heat and power (CHP) (in areas where legal air quality limits are exceeded all development proposals must provide evidence to show that any emissions related to energy generation will be equivalent or lower than those of an ultra-low NOx gas boiler)

f. use ultra-low NOx gas boilers.

21. CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that there is no significant impact on local air quality.

22. Where a heat network is planned but not yet in existence the development should be designed for connection at a later date.

Policy SI4 Managing heat risk
A. Development proposals should minimise internal heat gain and the impacts of the urban heat island through design, layout, orientation and materials.

B. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

23. minimise internal heat generation through energy efficient design

24. reduce the amount of heat entering a building through orientation, shading, albedo, fenestration, insulation and the provision of green roofs and walls

25. manage the heat within the building through exposed internal thermal mass and high ceilings

26. provide passive ventilation

27. provide mechanical ventilation

28. provide active cooling systems.

Policy SI5 Water infrastructure
- Development plans to be produced to identify areas of specific water stress. Development proposals should minimise the use of water in residential developments in line with Building Regulations. Commercial developments should achieve at least the BREEAM Excellent standard.
- Smart metering encouraged including in retrofit situations.
- Development proposals to take account of local wastewater infrastructure, reduce instanced of shared sewerage connections.

Policy SI6 Digital connectivity infrastructure
Provide sufficient digital infrastructure to allow for current and future connections of digital infrastructure. Use public realm features, such as street furniture to camouflage mobile digital infrastructure

Policy SI7 Reducing waste and supporting the circular economy
Waste reduction, improved recycling rates and improved reuse rates are targeted by:

- Promotion of a circular economy, improving resource efficiency and innovation, encourages waste minimisation waste avoidance through reuse of materials and through using fewer resources in the production and distribution of products.
- Target of zero biodegradable or recyclable waste to landfill by 2026.
- Recycling targets for London in line with the below:
  - Municipal waste: 65% by 2030.
  - Construction, demolition and excavation waste: 95% by 2020
- Applications where relevant to include a circular economy statement identifying how above aims will be achieved.

6.5 London Borough of Richmond upon Thames.

The policies of the London Borough of Richmond upon Thames (LBRuT) applicable to the Proposed Development are contained in the development plan. The following documents have been reviewed:

- London Borough of Richmond upon Thames (LBRuT) Local Plan (2018)

Local Plan Policy (LP)10: Local Environmental Impacts, Pollution and Land Contamination
The Council will seek to ensure that local environmental impacts of all development proposals do not lead to detrimental effects on the health, safety and the amenity of existing and new users or occupiers of the development site, or the surrounding land. These potential impacts can include, but are not limited to, air pollution, noise and vibration, light pollution, odours and fumes, solar glare and solar dazzle as well as land contamination.

Developers should follow any guidance provided by the Council on local environmental impacts and pollution as well as on noise generating and noise sensitive development. Where necessary, the Council will set planning conditions to reduce local environmental impacts on adjacent land uses to acceptable levels.

Air Quality
The Council promotes good air quality design and new technologies. Developers should secure at least 'Emissions Neutral' development. To consider the impact of introducing new developments in areas already subject to poor air quality, the following will be required:

29. an air quality impact assessment, including where necessary, modelled data;

30. mitigation measures to reduce the development's impact upon air quality, including the type of equipment installed, thermal insulation and ducting abatement technology;

31. measures to protect the occupiers of new developments from existing sources;

32. strict mitigation for developments to be used by sensitive receptors such as schools, hospitals and care homes in areas of existing poor air quality; this also applies to proposals close to developments used by sensitive receptors.

Noise and Vibration

The Council encourages good acoustic design to ensure occupiers of new and existing noise sensitive buildings are protected. The following will be required, where necessary:

33. a noise assessment of any new plant and equipment and its impact upon both receptors and the general background noise levels;

34. mitigation measures where noise needs to be controlled and managed;

35. time limits and restrictions for activities where noise cannot be sufficiently mitigated;

36. promotion of good acoustic design and use of new technologies;

37. measures to protect the occupiers of new developments from existing sources.

Light Pollution

The Council will seek to ensure that artificial lighting in new developments does not lead to unacceptable impacts by requiring the following, where necessary:

38. an assessment of any new lighting and its impact upon any receptors;

39. mitigation measures, including the type and positioning of light sources;

40. promotion of good lighting design and use of new technologies.

Odours and Fume Control

The Council will seek to ensure that any potential impacts relating to odour and fumes from commercial activities are adequately mitigated by requiring the following:

41. an impact assessment where necessary;

42. the type and nature of filtration to be used;

43. the height and position of any chimney or outlet;

44. promotion and use of new abatement technologies;

Land Contamination

The Council promotes, where necessary, the remediation of contaminated land where development comes forward. Potential contamination risks will need to be properly considered and adequately mitigated before development proceeds.

Construction and demolition

The Council will seek to manage and limit environmental disturbances during construction and demolition as well as during excavations and construction of basements and subterranean developments. To deliver this the Council requires the submission of Construction Management Statements (CMS) for the following types of developments:

45. all major developments;

46. any basement and subterranean developments;

47. developments of sites in confined locations or near sensitive receptors; or

48. if substantial demolition/excavation works are proposed.

Where applicable and considered necessary, the Council may seek a bespoke charge specific to the proposal to cover the cost of monitoring the CMS.

Local Plan Policy (LP)12: Green Infrastructure

Green infrastructure is a network of multi-functional green spaces and green features, which provides multiple benefits for people, nature and the economy.

To ensure all development proposals protect, and where opportunities arise enhance, green infrastructure, the following will be taken into account when assessing development proposals:

49. the need to protect the integrity of the green spaces and features that are part of the wider green infrastructure network; improvements and enhancements to the green infrastructure network are supported;

50. its contribution to the wider green infrastructure network by delivering landscape enhancement, restoration or re-creation;

51. incorporating green infrastructure features, which make a positive contribution to the wider green infrastructure network.

The hierarchy of open spaces, as set out in the table within the local plan, will be protected and used in accordance with the functions shown.

Local Plan Policy (LP)15: Biodiversity

The Council will protect and enhance the borough's biodiversity, in particular, but not exclusively, the sites designated for their biodiversity and nature conservation value, including the connectivity between habitats. Weighted priority in terms of their importance will be afforded to protected species and priority species and habitats including National Nature Reserves, Sites of Special Scientific Interest (SSSI) and Other Sites of Nature Importance as set out in the Biodiversity Strategy for England, and the London and Richmond upon Thames Biodiversity Action Plans. This will be achieved by:

52. protecting biodiversity in, and adjacent to, the borough's designated sites for biodiversity and nature conservation importance (including buffer zones), as well as other existing habitats and features of biodiversity value;

53. supporting enhancements to biodiversity;

54. incorporating and creating new habitats or biodiversity features, including trees, into development sites and into the design of buildings themselves where appropriate; major developments are required to deliver net gain for biodiversity, through incorporation of ecological enhancements, wherever possible;

55. ensuring new biodiversity features or habitats connect to the wider ecological and green infrastructure networks and complement surrounding habitats;

56. enhancing wildlife corridors for the movement of species, including river corridors, where opportunities arise; and

57. maximising the provision of soft landscaping, including trees, shrubs and other vegetation that support the borough-wide Biodiversity Action Plan.

Where development would impact on species or a habitat, especially where identified in the relevant Biodiversity Action Plan at London or local level, or the Biodiversity Strategy for England, the potential harm should:

58. firstly be avoided (the applicant has to demonstrate that there is no alternative site with less harmful impacts),

59. secondly be adequately mitigated; or

60. as a last resort, appropriately compensated for.

Local Plan Policy (LP)16: Trees, Woodlands and Landscape

The Council will require the protection of existing trees and the provision of new trees, shrubs and other vegetation of landscape significance that complement existing, or create new, high quality green areas, which deliver amenity and biodiversity benefits.

To ensure development protects, respects, contributes to and enhances trees and landscapes, the Council, when assessing development proposals, will:

Trees and Woodlands

61. 1. resist the loss of trees, including aged or veteran trees, unless the tree is dead, dying or dangerous; or the tree is causing significant damage to adjacent structures; or the tree has little or no amenity value; or felling is for reasons of good arboricultural practice; resist development that would result in the loss or deterioration of irreplaceable habitat such as ancient woodland;

62. resist development which results in the damage or loss of trees that are considered to be of townscape or amenity value; the Council will require that site design or layout ensures a harmonious relationship between trees and their surroundings and will resist development which will be likely to result in pressure to significantly prune or remove trees;

63. require, where practicable, an appropriate replacement for any tree that is felled; a financial contribution to the provision for an off-site tree in line with the monetary value of the existing tree to be felled will be required in line with the 'Capital Asset Value for Amenity Trees' (CAVAT);

64. require new trees to be of a suitable species for the location in terms of height and root spread, taking account of space required for trees to mature; the use of native species is encouraged where appropriate;
65. require that trees are adequately protected throughout the course of development, in accordance with British Standard 5837 (Trees in relation to design, demolition and construction – Recommendations).

The Council may serve Tree Preservation Orders or attach planning conditions to protect trees considered to be of value to the townscape and amenity and which are threatened by development.

Landscape

66. require the retention of important existing landscape features where practicable;
67. require landscape design and materials to be of high quality and compatible with the surrounding landscape and character; and
68. encourage planting, including new trees, shrubs and other significant vegetation where appropriate.

Local Plan Policy (LP)17: Green roofs and walls

Green roofs and/or brown roofs should be incorporated into new major developments with roof plate areas of 100sqm or more where technically feasible and subject to considerations of visual impact. The aim should be to use at least 70% of any potential roof plate area as a green / brown roof.

The onus is on an applicant to provide evidence and justification if a green roof cannot be incorporated. The Council will expect a green wall to be incorporated, where appropriate, if it has been demonstrated that a green / brown roof is not feasible.

The use of green / brown roofs and green walls is encouraged and supported in smaller developments, renovations, conversions and extensions.

Local Plan Policy (LP)20: Climate Change Adaption

The Council will promote and encourage development to be fully resilient to the future impacts of climate change in order to minimise vulnerability of people and property.

New development, in their layout, design, construction, materials, landscaping and operation, should minimise the effects of overheating as well as minimise energy consumption in accordance with the following cooling hierarchy:

69. minimise internal heat generation through energy efficient design
70. reduce the amount of heat entering a building in summer through shading, reducing solar reflectance, fenestration, insulation and green roofs and walls
71. manage the heat within the building through exposed internal thermal mass and high ceilings
72. passive ventilation
73. mechanical ventilation
74. active cooling systems (ensuring they are the lowest carbon options).

Opportunities to adapt existing buildings, places and spaces to the likely effects of climate change should be maximised and will be supported.

Local Plan Policy (LP)21: Flood Risk and Sustainable Drainage

All developments should avoid, or minimise, contributing to all sources of flooding, including fluvial, tidal, surface water, groundwater and flooding from sewers, taking account of climate change and without increasing flood risk elsewhere. Development will be guided to areas of lower risk by applying the 'Sequential Test' as set out in national policy guidance, and where necessary, the 'Exception Test' will be applied.

Unacceptable developments and land uses will be refused in line with national policy and guidance, the Council's Strategic Flood Risk Assessment (SFRA) and as outlined in the table within the policy.

In Flood Zones 2 and 3, all proposals on sites of 10 dwellings or more or 1000sqm of non-residential development or more, or on any other proposal where safe access/egress cannot be achieved, a Flood Emergency Plan must be submitted.

Where a Flood Risk Assessment is required, on-site attenuation to alleviate fluvial and/or surface water flooding over and above the Environment Agency's floodplain compensation is required where feasible.

Local Plan Policy (LP)22: Sustainable Design and Construction

Developments will be required to achieve the highest standards of sustainable design and construction to mitigate the likely effects of climate change. Applicants will be required to complete the following:

75. Development of 1 dwelling unit or more, or 100sqm or more of non-residential floor space (including extensions) will be required to complete the Sustainable Construction Checklist SPD. A completed Checklist has to be submitted as part of the planning application.
76. Development that results in a new residential dwelling, including conversions, change of use, and extensions that result in a new dwelling unit, will be required to incorporate water conservation measures to achieve maximum water consumption of 110 litres per person per day for homes (including an allowance of 5 litres or less per person per day for external water consumption).
77. New non-residential buildings over 100sqm will be required to meet BREEAM 'Excellent' standard.
78. Proposals for change of use to residential will be required to meet BREEAM Domestic Refurbishment 'Excellent' standard (where feasible).

Reducing Carbon Dioxide Emissions

Developers are required to incorporate measures to improve energy conservation and efficiency as well as contributions to renewable and low carbon energy generation. Proposed developments are required to meet the following minimum reductions in carbon dioxide emissions:

79. All new major residential developments (10 units or more) should achieve zero carbon standards in line with London Plan policy.
80. All other new residential buildings should achieve a 35% reduction.
81. All non-residential buildings over 100sqm should achieve a 35% reduction. From 2019 all major non-residential buildings should achieve zero carbon standards in line with London Plan policy.

Targets are expressed as a percentage improvement over the target emission rate (TER) based on Part L of the 2013 Building Regulations.

This should be achieved by following the Energy Hierarchy:

82. Be lean: use less energy
83. Be clean: supply energy efficiently
84. Be green: use renewable energy

Decentralised Energy Networks

The Council requires developments to contribute towards the Mayor of London target of 25% of heat and power to be generated through localised decentralised energy (DE) systems by 2025. The following will be required:

85. All new development will be required to connect to existing DE networks where feasible. This also applies where a DE network is planned and expected to be operational within 5 years of the development being completed.
86. Development proposals of 50 units or more, or new non-residential development of 1000sqm or more, will need to provide an assessment of the provision of on-site decentralised energy (DE) networks and combined heat and power (CHP).

87. Where feasible, new development of 50 units or more, or new non-residential development of 1000sqm or more, as well as schemes for the Proposal Sites identified in this Plan, will need to provide on-site DE and CHP; this is particularly necessary within the clusters identified for DE opportunities in the borough-wide Heat Mapping Study. Where on-site provision is not feasible, provision should be made for future connection to a local DE network should one become available.

Applicants are required to consider the installation of low, or preferably ultra-low, NOx boilers to reduce the amount of NOx emitted in the borough.

Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged where appropriate.

Local Plan Policy (LP)23: Water Resources and Infrastructure

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

Water Quality

The Council encourages proposals that seek to increase water availability or protect and improve the quality of rivers or groundwater.

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

Where rivers have been classified by the Environment Agency as having 'poor' status, any development affecting such rivers is encouraged to improve the water quality in these areas.

Water and sewerage provision

New major residential or major non-residential development will need to ensure that there is adequate water supply, surface water, foul drainage and sewerage treatment capacity to serve the development. Planning permission will only be granted for developments which increase the demand for off-site service infrastructure where:

88. sufficient capacity already exists, or

89. extra capacity can be provided in time to serve the development, which will ensure that the environment and the amenities of local residents are not adversely affected.

Applicants for major developments will be required to provide evidence in the form of written confirmation as part of the planning application that capacity exists in the public sewerage and water supply network to serve their development.

Any new water supply, sewerage or waste water treatment infrastructure must be in place prior to occupation of the development. Financial contributions may be required for new developments towards the provision of, or improvements to, such infrastructure.

Local Plan Policy (LP)24: Waste Management

The Council will ensure that waste is managed in accordance with the waste hierarchy, which is to reduce, reuse or recycle waste as close as possible to where it is produced. The Council will require the following:

90. All developments, including conversions and changes of use are required to provide adequate refuse and recycling storage space and facilities, which allows for ease of collection and which residents and occupiers can easily access, in line with the guidance and advice set out in the Council's SPD on Refuse and Recycling Storage Requirements.

91. All developments need to ensure that the management of waste, including the location and design of refuse and recycling facilities, is sensitively integrated within the overall design of the scheme, in accordance with policies on Local Character and Design.

92. Development proposals, where appropriate, should make use of the rail and the waterway network for the transportation of construction, demolition and other waste. Development proposals in close proximity to the river should utilise the river for the transport of construction materials and waste where practicable.

93. All major developments, and where appropriate developments that are likely to generate large amounts of waste, are required to produce site waste management plans to arrange for the efficient handling of construction, excavation and demolition waste and materials.

Proposals affecting existing waste management sites, as well as proposals for new or additional waste management facilities, will be assessed against the policies of the West London Waste Plan (2015).

Local Plan Policy (LP)28: Social and Community Infrastructure

The Council will work with service providers and developers to ensure the adequate provision of community services and facilities, especially in areas where there is an identified need or shortage.

New social and community infrastructure

Proposals for new or extensions to existing social and community infrastructure will be supported where:

94. it provides for an identified need;

95. is of a high quality and inclusive design providing access for all; and

96. where practicable is provided in multi-use, flexible and adaptable buildings or co-located with other social infrastructure uses which increases public access.

Loss of social or community infrastructure

Loss of social or community infrastructure will be resisted. Proposals involving the loss of such infrastructure will need to demonstrate clearly:

97. that there is no longer an identified community need for the facilities or they no longer meet the needs of users and cannot be adapted; or

98. that the existing facilities are being adequately re-provided in a different way or elsewhere in a convenient alternative location accessible to the current community it supports, or that there are sufficient suitable alternative facilities in the locality; and

99. the potential of re-using or redeveloping the existing site for the same or an alternative social infrastructure use for which there is a local need has been fully assessed. This should include evidence of completion of a full and proper marketing exercise of the site for a period of at least two consecutive years in line with the requirements set out in Appendix 5.

Where the Council is satisfied that the above evidence has been provided and the change of use away from social and community infrastructure use has been justified, redevelopment for other employment generating uses or affordable housing should be considered.

Impacts on existing social infrastructure

Development proposals for 10 or more residential units should assess the potential impacts on existing social and community infrastructure in order to demonstrate to the Council that there is sufficient capacity within the existing infrastructure to accommodate the needs arising from the new development.

Local Plan Policy (LP)29: Education and Training

The Council will work with partners to encourage the provision of facilities and services for education and training of all age groups to help reduce inequalities and support the local economy, by the following means:

100. supporting the provision of facilities to meet the needs for primary and secondary school places as well as pre-school and other education and training facilities;

101. safeguarding land and buildings in educational use;

102. identifying new sites for educational uses as part of this Plan; the Council will work with landowners and developers to secure sites for pre-schools, primary and secondary schools as well as sixth forms to ensure sufficient spaces can be provided for children aged 2-18;

103. encouraging the potential to maximise existing educational sites through extensions, redevelopment or refurbishment to meet identified educational needs;

104. encouraging flexible and adaptable buildings, multi-use and co-location with other social infrastructure.

The Council will promote local employment opportunities and training programmes. Where the employment opportunities generated by construction as well as the end use of the development create more than 20 (Full Time Equivalent) jobs, a Local Employment Agreement, secured through a Section 106 agreement, will be required.

Local Plan Policy (LP)30: Health and Wellbeing

Planning, at all levels, can play a crucial role in creating environments that enhance people's health and wellbeing. The Council promotes and supports healthy and active lifestyles and measures to reduce health inequalities.

The Council will support development that results in a pattern of land uses and facilities that encourage:

105. Sustainable modes of travel such as safe cycling routes, attractive walking routes and easy access to public transport to reduce car dependency.

106. Access to green infrastructure, including river corridors, local open spaces as well as leisure, recreation and play facilities to encourage physical activity.

107. Access to local community facilities, services and shops which encourage opportunities for social interaction and active living, as well as contributing to dementia-friendly environments.

108. Access to local healthy food, for example, allotments and food growing spaces.

109. Access to toilet facilities which are open to all in major developments where appropriate (linked to the Council's Community Toilet Scheme).

110. An inclusive development layout and public realm that considers the needs of all, including the older population and disabled people.

111. Active Design which encourages wellbeing and greater physical movement as part of everyday routines.

This policy will be delivered by requiring developments to comply with the following:

112. A Health Impact Assessment must be submitted with all major development proposals.

113. The Council will manage proposals for new fast food takeaways (A5 uses) located within 400 metres of the boundaries of a primary or secondary school in order to promote the availability of healthy foods.

114. Existing health facilities will need to be retained where these continue to meet, or can be adapted to meet, residents' needs.

115. Applications for new or improved facilities or loss of health and social care facilities will be assessed in line with the criteria set out in the Social and Community Infrastructure policy.

Local Plan Policy (LP)40: Employment and local economy

The Council will support a diverse and strong local economy in line with the following principles:

116. Land in employment use should be retained in employment use for business, industrial or storage purposes.

117. Major new employment development should be directed towards Richmond and Twickenham centres. Other employment floorspace of an appropriate scale may be located elsewhere.

118. The provision of small units, affordable units and flexible workspace such as co-working space is encouraged.

119. In exceptional circumstances, mixed use development proposals which come forward for specific employment sites should retain, and where possible enhance, the level of existing employment floorspace. The inclusion of residential use within mixed use schemes will not be appropriate where it would adversely impact on the continued operation of other established employment uses within that site or on neighbouring sites.

Local Plan Policy (LP)44: Sustainable Travel Choices

The Council will work in partnership to promote safe, sustainable and accessible transport solutions, which minimise the impacts of development including in relation to congestion, air pollution and carbon dioxide emissions, and maximise opportunities including for health benefits and providing access to services, facilities and employment. The Council will:

Location of development

Encourage high trip generating development to be located in areas with good public transport with sufficient capacity, or which are capable of supporting improvements to provide good public transport accessibility and capacity, taking account of local character and context.

Walking and cycling

Ensure that new development is designed to maximise permeability within and to the immediate vicinity of the development site through the provision of safe and convenient walking and cycling routes, and to provide opportunities for walking and cycling, including through the provision of links and enhancements to existing networks.

Public transport

Ensure that major new developments maximise opportunities to provide safe and convenient access to public transport services. Proposals will be expected to support improvements to existing services and infrastructure where no capacity currently exists or is planned to be provided.

Protect existing public transport interchange facilities unless suitable alternative facilities can be provided which ensure the maintenance of the existing public transport operations. Applications will need to include details setting out how such re-provision will be secured and provided in a timely manner.

The road network

Ensure that new development does not have a severe impact on the operation, safety or accessibility to the local or strategic highway networks. Any impacts on the local or strategic highway networks, arising from the development itself or the cumulative effects of development, including in relation to on-street parking, should be mitigated through the provision of, or contributions towards, necessary and relevant transport improvements.

In assessing planning applications the cumulative impacts of development on the transport network will be taken into account. Planning applications will need to be supported by the provision of a Transport Assessment if it is a major development, and a Transport Statement if it is a minor development.

Safeguarding of routes and facilities

Land required for proposed transport schemes as identified in the London Plan and the Council's Local Implementation Plan for Transport will be protected from developments which would prevent their proper implementation.

Local filling stations and supporting services such as car repair facilities will be protected from redevelopment for alternative uses unless exceptional circumstances can be demonstrated that warrant their loss.

7. Appendix D: LBRuT sustainability checklist.

RICHARD HARPER
PRINCIPAL SUSTAINABILITY CONSULTANT

+44 1454 806 692
richardharper@hoarelea.com

HOARELEA.COM

155 Aztec West
Almondsbury
Bristol
BS32 4UB
England