HODKINSON

Sustainability Statement

Planning Reference 2015/5759/P

Royal Academy of Dramatic Arts

16-18 Chenies Street

Final

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ABOUT HODKINSON CONSULTANCY

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

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

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

Executive Summary

The purpose of this Sustainability Statement is to demonstrate that the proposed development at 16-18 Chenies Street by Royal Academy of Dramatic Arts in the London Borough of Camden is considered sustainable, as measured against relevant local, regional and national planning policies.

The proposed development will comprise alterations and extensions to 16-18 Chenies Street to create a theatre, new refectory, bar and kitchen, library, exhibition space, ancillary offices and 61 bed student accommodation. Through the incorporation of sustainable design and construction methods, energy and water saving measures, waste reduction techniques as well as measures to enhance the ecological value of the site, a good quality and sustainable development is proposed.

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

- **Management:** Stakeholder consultation, capital cost reporting, responsible construction practices, commissioning, handover and aftercare are to be carried out.
- **Health and Wellbeing:** Visual comfort is to be maximised; an Indoor Air Quality Plan is to be developed; and safe and secure use and access will be promoted across the site.
- **Energy:** A 47.6% reduction in Regulated CO_2 emissions will be achieved through energy efficient measures and Air Source Heat Pumps. In addition, sub-metering will be implemented and the site will install energy efficient lighting, lifts and equipment.
- **Water:** Efficient sanitaryware and equipment are to be installed, as well as water meters, leak detection systems and flow control devices.
- **Waste:** A Construction Resource Management Plan will be developed to reduce construction waste. During operation, designated waste and recycling storage areas will be provided;
- **Materials:** The Green Guide to Specification will be referenced in order to reduce the lifecycle impacts of the proposed major building elements, hard landscaping and insulation.
- **Pollution:** The impacts of refrigerants will be considered; the site is located in a low flood risk zone; and measures to reduce night time light pollution will be implemented.
- **Transport:** The development will benefit from its close proximity to amenities as well as on-site cyclist facilities; and a Travel Plan will be developed to further encourage sustainable transport modes.
- **Land Use and Ecology:** Ecological enhancements will be implemented through the provision of a green roof and bird and bat boxes

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1. INTRODUCTION

1.1 This Sustainability Statement has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Royal Academy of Dramatic Arts.

1.2 This Statement sets out the sustainable design and construction measures included in the planning application for the proposed development at 16-18 Chenies Street in the London Borough of Camden.

Sustainability Statement Structure and Methodology

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

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

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

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

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

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

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

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

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

1.5 **Chapter 2** provides an introduction to the site and the proposed development. **Chapter 3** sets out the relevant national, regional and local policy documents which have been used to guide and inform the sustainability strategy for the proposed development.

1.6 **Chapters 3 to 13** outline the sustainability strategy of the proposed development in relation to the policy documents listed in Chapter 3. **Chapter 14** provides a summary of the key sustainability features associated with the proposed development.

2. DEVELOPMENT OVERVIEW

Site Location

2.1 The proposed development site at 16-18 Chenies Street in the London Borough of Camden is located off the A400 (Tottenham Court Road) as shown in Figure 1 below.

Figure 1: Site Location – Map data © 2017 Google

Proposed Development

2.2 The proposed development is described as follows:

"Demolition of part of rear of 16 and 18 Chenies Street. Alterations, extensions (including at basement level) and general refurbishment to 16-18 Chenies Street to create 300 seat Richard Attenborough Theatre, new refectory, bar and kitchen, library, exhibition space, ancillary offices and 61 bed student accommodation."

2.3 The 61 bed student accommodation and guardians flat are being classed as Sui Generis. Other areas of the proposed development are being classed as D1 Non-residential institution and D2 Assembly and Leisure.

2.4 Figure 2 below illustrates the proposed site layout.

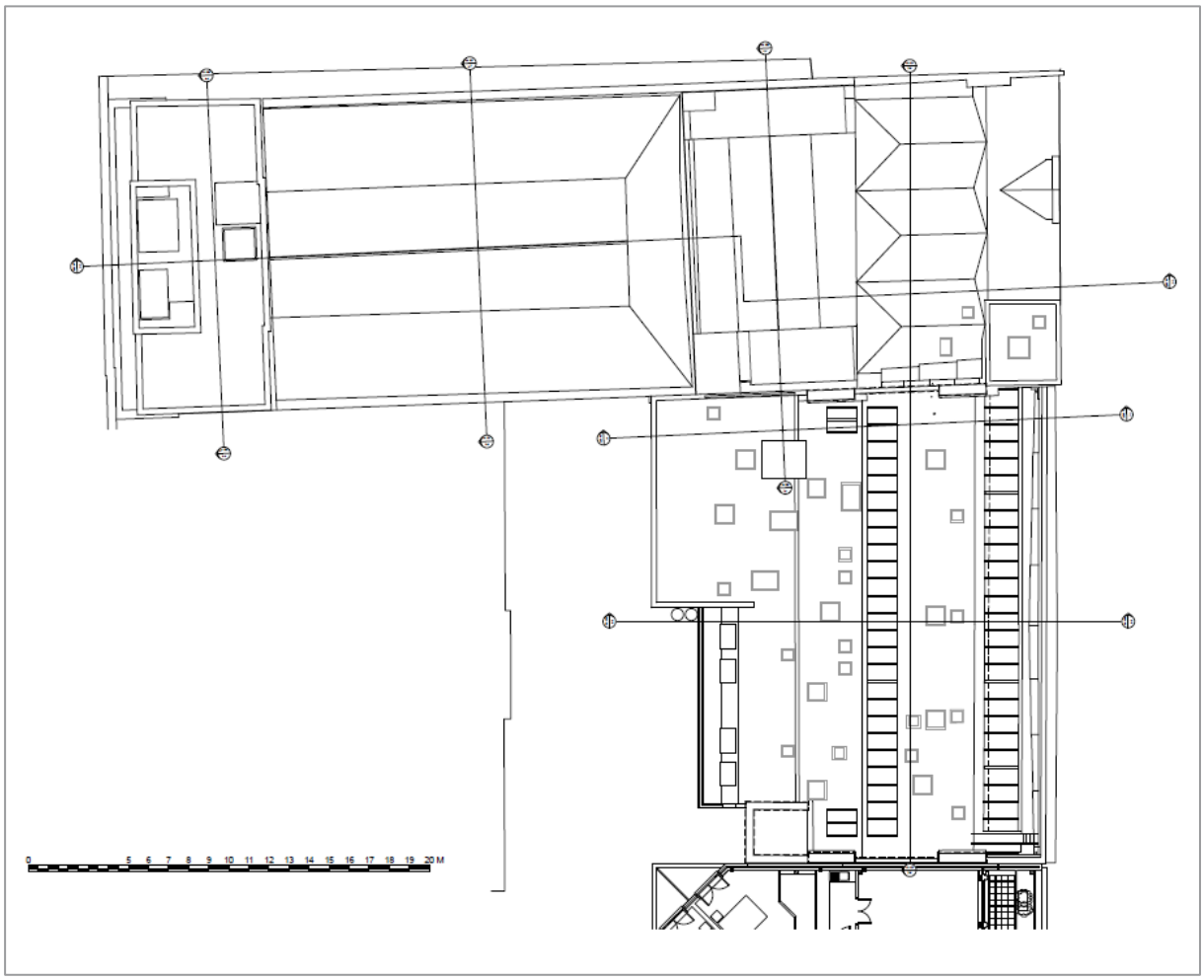


Figure 2: Proposed Site Layout – Haines Phillips Architects

Planning History

2.5 A planning application for the development was submitted in October 2015 (reference 2015/5759/P). This Sustainability Statement is superseding the Sustainability and Energy Statement presented by Bluesky Limited in January 2016.

3. RELEVANT PLANNING POLICY

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

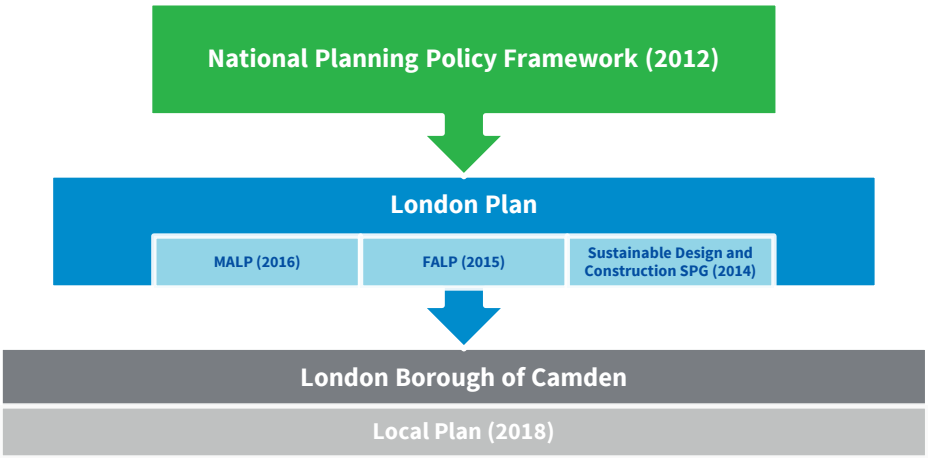


Figure 3: Relevant Planning Policy Documents

National Policy: NPPF

3.2 The Draft National Planning Policy Framework was published for consultation in March 2018, and is due to close on 10th May 2018. This documents sets out the Government's approach to sustainable development, and although in draft it is a material consideration in planning.

3.3 The National Planning Policy Framework (NPPF) was published in March 2012 and sets out the Government's planning policies for England.

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

3.4 The NPPF uses the United Nations General Assembly definition to describe sustainable development as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*". The framework also states that there are three dimensions to sustainable

development; economic, social and environmental which give rise to the need for the planning system to perform a number of roles:

> **An economic role** – Contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;

> **A social role** – Supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and

> **An environmental role** – Contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy

3.5 The document also makes it clear that the delivery of a wide choice of well-designed high quality homes is central to delivering sustainable development.

Regional Policy: The London Plan

3.6 The Draft London Plan was published for consultation on 1st December 2017, and consultation took place on this document up to 2nd March 2018. The Greater London Authority is now reviewing consultation feedback, with a view to formally publishing the document in Autumn 2019.

3.7 While the document is only currently in draft, it remains a material consideration in planning terms. Once adopted, it will inform decisions on London's development between 2019 and 2041.

3.8 The existing London Plan sets out an integrated economic, environmental, transport and social framework for the development of London. The following outlines key policies set out in the London Plan which are relevant to the proposed development and this Sustainability Statement.

3.9 **Policy 3.2 – Improving Health and Addressing Health Inequalities** encourages new developments to be designed, constructed and managed in ways that improve health and promote healthy lifestyles to help reduce health inequalities.

3.10 **Policy 5.2 – Minimising Carbon Dioxide Emissions** requires development proposals to make the fullest contribution to minimising carbon dioxide emissions in accordance with the Energy Hierarchy: *Be Lean, Be Clean and Be Green*. This includes a requirement for all residential buildings to achieve *Zero Carbon* status from 2016.

3.11 **Policy 5.3 – Sustainable Design and Construction** states that the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments. Major development should meet the minimum standards outlined in the London Plan Supplementary Planning Guidance and this should be clearly demonstrated. The standards include sustainable design principles such as minimising CO_2 emissions; avoiding internal overheating; efficient use of natural resources (including water); minimising pollution (including noise, air and urban run-off); minimising the generation of waste and maximising reuse and recycling; avoiding impacts from natural hazards (including flooding); ensuring developments are comfortable and secure for users; securing sustainable procurement of materials, using local suppliers where feasible; and promoting and protecting biodiversity and green infrastructure.

3.12 **Policy 5.6 – Decentralised Energy** requires that all developments should evaluate the feasibility of Combined Heat and Power (CHP) systems, and examine the opportunities to extend the system beyond the site boundary to adjacent sites.

3.13 **Policy 5.7 – Renewable Energy** states that within the framework of the energy hierarchy, major development proposals should provide a reduction in expected carbon dioxide emissions through the use of on-site renewable energy generation, where feasible.

3.14 **Policy 5.8 – Innovative Energy Technologies** encourages the more widespread use of innovative energy technologies to reduce use of fossil fuels and carbon dioxide emissions.

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

3.16 **Policy 5.12 – Flood Risk Management** states that new development must comply with the flood risk assessment and management requirements, and will be required to pass the Exceptions Test addressing flood resilient design and emergency planning.

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

3.18 **Policy 5.17 – Waste Capacity** requires new developments to provide suitable waste and recycling storage facilities.

3.19 **Policy 6.9 – Cycling** expects development proposals to provide secure, integrated and accessible cycle parking facilities in line with minimum standards, as well as on-site changing facilities and showers for cyclists.

3.20 **Policy 7.3 – Designing Out Crime** requires that development should reduce the opportunities for criminal behaviour and contribute to a sense of security without being overbearing or intimidating.

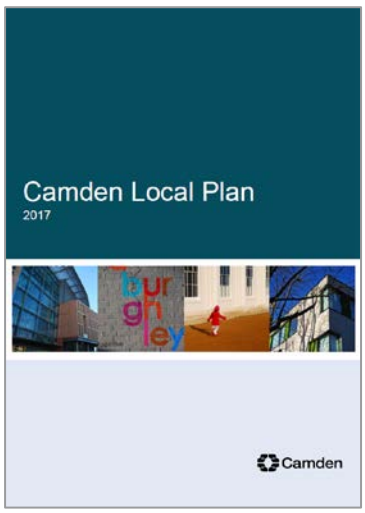
3.21 **Policy 7.19 – Biodiversity and Access to Nature** states that development proposals should wherever possible, make a positive contribution to the protection, enhancement, creation and management of biodiversity.

Sustainable Design and Construction Supplementary Planning Guidance (2014)

3.22 The London Plan Sustainable Design and Construction SPG was adopted in April 2014 and provides detail and best practice guidance on how to implement the sustainable design and construction and wider environmental sustainability London Plan policies.

3.23 The SPG provides guidance on topics such as energy efficient design; meeting carbon dioxide reduction targets; decentralised energy; how to off-set carbon dioxide where the targets set out in the London Plan are not met; retro-fitting measures; monitoring energy use during occupation; air quality; resilience to flooding; urban greening; pollution control; basements and local food growing.

Local Policy: London Borough of Camden



3.24 The London Borough of Camden's Local Plan document was adopted in July 2017, to replace The Core Strategy and Development Policies planning documents adopted in 2010. The following policies are considered relevant to this Statement:

3.25 **Policy CC1: Climate Change Mitigation** – The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. The Council will:

> Promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;

> Ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;

> Support and encourage sensitive energy efficiency improvements to existing buildings; and

> Expect all developments to optimise resource efficiency.

3.26 **Policy CC2: Adapting to Climate Change –** All development should adopt appropriate climate change adaption measures such as:

> The protection of existing green spaces and promoting new appropriate green infrastructure;

> Not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;

> Incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and

> Measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

The Council will promote and measure sustainable design and construction by:

> Ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;

> Encourage new build residential development to use the Home Quality Mark and Passivhaus design standards; and

> Expecting non-domestic developments of 500 sqm of floorspace of above to achieve 'excellent' in BREEAM assessments and encouraging zero carbon in new development from 2019.

3.27 **Policy CC3: Water and Flooding** – The council will require the development to incorporate water efficiency measures; consider the impact of development in areas at risk of flooding; and utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off where feasible.

3.28 **Policy CC4: Air Quality** – Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.

3.29 **Policy T1: Prioritising Walking, Cycling and Public Transport** – Developments must provide accessible, secure cycle parking facilities exceeding minimum standards outlined within the London Plan (Table 6.3).

4. BREEAM SUMMARY

4.1 In accordance with Policy CC2 of Camden Local Plan, the building will be assessed under the BREEAM Methodology.

4.2 A BREEAM Pre-Assessment was originally presented by Bluesky Unlimited within the Sustainability & Energy Statement (January 2016), in support of the planning application for the development (reference 2015/5759/P). This Pre-Assessment followed the BREEAM New Construction 2014 methodology for a multi-residential development.

4.3 Following consultation with the BRE it has been determined that it is neither feasible nor appropriate to assess the whole development under the BREEAM New Construction 2014 scheme, due to the proportions of refurbishment and new build areas and also the multiple use types of the building. Instead, a bespoke BREEAM assessment is required.

4.4 The bespoke process for BREEAM allows buildings that are not considered to be 'standard' to be assessed and certified against BREEAM. This includes part new build, part-refurbishment projects and buildings with different function areas. The part new build, part-refurbishment project at 16-18 Chenies Street falls into this category.

4.5 In the bespoke process, BREEAM criteria are selected and amended to reflect the specifics of the project. Amendments and additions to the standard criteria reflect the unique use and sustainability opportunities of the project and the location. Although the bespoke process involves amending criteria for individual developments, it still adheres to a set of standards in terms of BREEAM structure, credit methodology and content. This ensures the credibility of the BREEAM standard is maintained.

4.6 The BRE has reviewed the project details and provided a set of bespoke BREEAM criteria against which the project is to be assessed. Hodkinson Consultancy has undertaken a Pre-Assessment against these criteria which is discussed in detail in the following sections.

4.7 **Appendix A** contains a BREEAM Pre-Assessment demonstrating that a high 'Very Good' rating is achievable for the development, with a target rating of 68%. The Pre-Assessment demonstrates a route to achieving certification; the actual credits achieved in each section may differ at final certification stage. Achievement of credits will be reviewed as the developed design progresses.

4.8 A BREEAM 'Excellent' rating is not considered to be feasible for the proposed development for the following reason:

> The design stage Building Regulations UK Part L (BRUKL) compliance document provided for the new build areas does not meet the minimum standard for an 'Excellent' rating.

4.9 Although the pre-assessment shows 8 credits targeted for Ene 01, this does not meet the mandatory minimum for BREEAM 'Excellent' because the credits are determined as a weighted average of the new build and refurbished areas. Both areas must achieve a minimum of 5 credits.

4.10 The design stage BRUKL documents confirm that 12 credits can be achieved for the refurbished areas, however only 3 credits are feasible for the new build areas. Therefore the minimum standard cannot be met. All other minimum standards for an 'Excellent' rating will be met.

4.11 A BREEAM Technical Note was issued to Camden Council and email exchange following this suggests that this strategy will be accepted.

5. MANAGEMENT

5.1 Royal Academy of Dramatic Arts is committed to ensuring that sustainable management practices are adopted in relation to the design, construction, commissioning, handover and aftercare of the proposed development.

Stakeholder Consultation

5.2 Prior to completion of RIBA Stage 2 (Concept Design), roles and responsibilities for each key phase of the project will be defined in order to recognise and encourage an integrated design process that optimises building performance.

5.3 The following roles and responsibilities will be considered:

> End user requirements;

> Aims of the design and design strategy;

> Particular installation and construction requirements and limitations;

> Occupiers budget and technical expertise in maintaining any proposed systems;

> Maintainability and adaptability of the proposals;

> Requirements for the production of project and end user documentation; and

> Requirements for commissioning, training and aftercare support.

Capital Cost Reporting

5.4 The predicted capital cost for the building (£k/m^2) will be reported to the BRE in order to assist research into the cost and savings of developing sustainable buildings to inform the business case for sustainability and the ongoing development of BREEAM.

Considerate Constructors Scheme

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

> Enhancing the appearance;

> Respecting the community;

> Protecting the environment;

> Securing everyone's safety;

> Caring for the workforce.

5.6 In order to gain credits under Man 03 'Responsible Construction Practices', the site will target an exemplary level of CCS performance, achieving a score of 40 or more, with all of the above five sections scoring at least seven points.

Monitoring Construction Site Impacts

5.7 During the construction process, the site's energy (in kWh) and water consumption (in m^3) will be monitored and recorded as a result of the use of construction plant, equipment and site accommodation.

Commissioning and Handover

5.8 A schedule of commissioning will be developed to include a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services, control systems and building fabric. This will be carried out in accordance with current Building Regulations, BSRIA and CIBSE guidelines, where applicable.

5.9 A specialist Commissioning Manager will be appointed during the design stage with responsibility for the following activities:

> Undertaking design reviews and giving advice on suitability for ease of commissioning;

> Providing commissioning management input to the construction programme and during installation stages; and

> Management of commissioning, performance testing and handover/post hand-over stages.

5.10 Prior to handover, a Building User Guide will be provided to the staff and management of the Academy. The guide will provide advice and information on how to operate the building efficiently and in a manner that is in keeping with the original design intent.

5.11 The Guide will likely include the following information:

> An overview of the energy, water and waste efficiency strategy;

- The building's services and access to controls;
- Pre-arrival information for visitors (e.g. access and security procedures);
- Details on the shared facilities and how to access them;
- Safety and emergency instructions;
- Building related operational procedures and maintenance arrangements;
- Incident reporting and feedback arrangements;
- Building related training information;
- Access to transport facilities; and
- Provision and access to local amenities.

Aftercare

5.12 Prior to initial occupation, a meeting will take place with the aftercare team and the building occupiers and management in order to provide aftercare support. Onsite facilities management training will be provided, including a walkabout of the building and an introduction to the building systems and their controls.

5.13 Given The Royal Academy of Dramatic Arts on-going involvement in the building, aftercare support will be provided throughout the lifetime of the building.

5.14 Once the building has been substantially occupied, a series of seasonal commissioning activities will be completed over a 12 month period. This will include the testing of all building services (i.e. heating equipment and cooling/ventilation systems), interviews with building occupants to identify problems or concerns and re-commissioning of the systems if required.

5.15 Following a year of occupation, The Royal Academy of Dramatic Arts have committed to carrying out Post Occupancy Evaluation, which will aim to gain in-use performance feedback from building users to inform operational processes and maintain/improve comfort, health, safety and productivity.

6. HEALTH AND WELLBEING

6.1 The proposed further education facility will be designed to maximise comfort, health and safety of the building occupants. Issues such as visual comfort, indoor air quality and safe access have been considered.

Visual Comfort

6.2 Glare will aim to be minimised using a glare control strategy, either through building form and layout and/or building design measures. This will avoid increasing energy consumption from lighting and maximising daylight levels. The building will be designed to provide an adequate view out through either a window or permanent opening.

6.3 All internal lighting will be designed to avoid flicker and stroboscopic effects and will be designed to provide an appropriate illuminance (lux) level. Lighting will be zoned to allow for occupant control, particularly in classrooms, workshops and studios. Manual lighting controls will be easily accessible for teachers and on entering and leaving the teaching space.

6.4 All external lighting will be designed in accordance with BS5489-1:2013 'Code of practice for the design of road lighting' and will provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately.

Indoor Air Quality

6.5 In accordance with the requirements of BREEAM Hea 02 'Indoor Air Quality', it is anticipated that an Indoor Air Quality Plan will be produced to encourage a healthy internal environment which will consider the following:

> Removal of contaminant sources;

> Dilution and control of contaminant sources;

> Procedures for pre-occupancy flush out;

> Third party testing and analysis; and

> Maintaining indoor air quality in-use.

6.6 In addition, all of the following products will be specified to meet the recognised international standards for Volatile Organic Compounds (VOCs):

> Paints and varnishes;

- Wood panels (including particle board, fibreboard, OSB, cement bonded particle board, plywood and acoustic board);
- Timber structures;
- Wood flooring;
- Resilient textiles and laminated flooring;
- Suspended ceiling tiles;
- Flooring adhesives; and
- Wall coverings.

Security

6.7 The Royal Academy of Dramatic Art's is committed to ensuring the development is safe and secure for the occupants; reduce the risks and costs associated with crime; and improve occupiers' quality of life by reducing the fear of crime.

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

Inclusive Design

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

6.10 London Borough of Camden expects 10% of dwellings to either meet wheelchair housing standards (Part M4(3)) or be easily adaptable to meet wheelchair housing standards. Where proposals involve re-use of an existing building the percentage will be applied flexibly, taking into account any constraints that limit adaptation. Approximately 7% of the student bedrooms will be wheelchair accessible. As the proposed development involves the alterations of an existing building and provides significant improvements in terms of accessibility within the building, the provision of 4 wheelchair accessible rooms is considered acceptable.

7. ENERGY AND CO_2 CONSERVATION

7.1 The Royal Academy of Dramatic Art's will aim to minimise the building's operational demand, primary energy consumption and CO_2 emissions where possible through an energy efficient building fabric, energy monitoring and energy efficient lighting and equipment.

Energy Strategy

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

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

7.4 A range of energy efficiency (***Be Lean***) measures are proposed to enable the development to meet the Part L2B baseline which is based on an assumed specification of the existing building. This represents a good level of sustainable design and construction and indicates the Applicant's commitment to reducing energy demands across the site. The combination of energy efficiency measures will achieve a reduction of 34.4% in Regulated CO2 emissions over the assessed baseline.

7.5 In line with the London Plan, the feasibility of decentralised energy production as a ***Be Clean*** measure has been carefully examined. It has been determined that due to tight time scales, connection to the existing district heating networks will not be available on time. Dedicated boilers for a site-wide heat network will be installed to provide heating and hot water, while provision will be made for future connection.

7.6 Camden's Local Plan requires a **20%** reduction of regulated carbon dioxide emissions over ***Be Lean*** and ***Be Clean*** reductions to be achieved, if feasible. The full spectrum of ***Be Green*** renewable energy sources has been considered. It has been concluded that a benefit from specifying high efficiency Air Source Heat Pumps (**ASHPs**) for heating can be accounted for. Additionally, it has been calculated that there is available roof space to accommodate **4kWp** of PV panels and achieve the **20%** required additional reduction on top of the Be Lean carbon dioxide reductions already predicted.

7.7 Table 2 overleaf summarises the Regulated and Total CO2 emissions for the development after on-site measures have been applied. A 47.6% reduction over the assessed baseline case is predicted.

Table 2: Site Wide Reduction in CO_2 Emissions

Summary Table – Site Wide Reduction in CO_2 Emissions				
	Regulated CO_2 (kg/year)	Total CO_2 (kg/year)	% Regulated CO_2 Saving	% Total CO_2 Saving
Assessed Baseline	**536,700**	**638,500**	**-**	**-**
Emissions after *Be Lean* Measures	352,100	454,000	34.4%	28.9%
Emissions after *Be Clean* Measures	-	-	-	-
Emissions after *Be Green* Measures	281,000	382,900	20.2%	15.7%
Reduction Achieved over Baseline	**255,700**		**47.6%**	**40%**

Energy Monitoring

7.8 An appropriate energy monitoring and management system (BMS) or separate accessible sub-metering strategy will be put in place to facilitate the monitoring of energy consumption from the major energy-consuming systems and plant. This will cover the supply for all relevant function areas within the building, including the workshops, student accommodation, theatre and café.

Lighting

7.9 All internal lighting will be designed to avoid flicker and stroboscopic effects and will be designed to provide an appropriate illuminance (lux) level. Lighting will be zoned to allow for occupant control, particularly in classrooms, workshops, labs and seminar room. Manual lighting controls will be easily accessible for teachers and on entering and leaving the teaching space.

Energy Efficient Transportation

7.10 Two new lifts, serving student accommodation and the office/library building, will be designed to have the following energy efficient features:

> A stand-by function during off-peak periods;

> Lighting with an average lamp efficacy of >55 lamp lumens/circuit Watt which will switch off once lift left idle; and

> A drive controller capable of variable speed, voltage and frequency.

Energy Efficient Equipment

7.11 To ensure optimum performance and energy savings during operation, energy efficient equipment will be identified and installed across the building.

7.12 For example, small power plug-in equipment will have an Energy Star rating or will be procured in accordance with the Government Buying Standards. IT-intensive operating areas, such as the classrooms and reception/office will have an appropriate ventilation and cooling strategy and will have an automatic power-down function.

7.13 In addition, the kitchen appliances will be procured in accordance with the CIBSE Guide TM50 'Energy efficiency in commercial kitchens' criteria (sections 8, 9, 11-15). This document provides industry-specific guidance and advice on sustainability and how to reduce energy consumption.

8. WATER REDUCTION

8.1 The proposed development will promote sustainable water consumption through the specification of water efficient fixtures and fittings, water monitoring and a leak detection system.

Water Use in Student Accommodation

8.2 All student accommodation will target a minimum water efficiency standard of **105 litres/person/day** in accordance with the above planning policy and the optional tighter Building Regulations Approved Document G requirement (110 litres/person/day). An evaluation of the proposed fixtures and fittings will be undertaken during the detailed design however an illustrative strategy to achieve this water target is set out in Table 2 below and the Water Efficiency Calculator in **Appendix B.**

Table 3: Student Accommodation Sanitaryware

Installation Type	Water Capacity/Flow Rate
WC	6/3 litres dual flush
Shower	6 litres/minute flow rate
Kitchen tap	5 litres/minute flow rate
Basin tap	4.5 litres/minute flow rate

Education and Theatre Water Use

8.3 The internal water consumption of the non-residential areas of the development will aim to achieve a 40% improvement (over baseline water consumption) through the use of water efficient fixtures and fittings in line with the BREEAM Wat 01 'Water consumption' requirements. Table 3 overleaf provides an indication of the types of sanitary-ware and appliances that could be installed to meet the required performance level.

Table 4: Education and Theatre Sanitaryware

Installation Type	Water Capacity/Flow Rate
WC	6/3 litres effective flush volume
Basin tap	4.5 litres/minute flow rate
Shower	6 litres/minute flow rate
Urinals (2 or more)	1.5 litres/bowl/hour
Kitchen tap	5 litres/minute flow rate
Dishwasher (domestic size)	12 litres/cycle
Washing machine (domestic size)	40 litres/use
Dishwasher (commercial size)	5 litres/rack
Washing machine (commercial size)	7.5 litres/kg

Water Monitoring

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

Leak Detection and Prevention

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

8.6 In addition, flow control devices that regulate the supply of water to each WC area will be installed with an aim of minimising water leaks and wastage from sanitaryware.

Greywater Harvesting System

8.7 A greywater harvesting system will be installed and it is estimated that this will meet 7.1% of the proposed developments flushing demand.

9. WASTE MANAGEMENT

9.1 The sustainable management of construction and operation waste has been considered by The Royal Academy of Dramatic Arts through good design and construction practices.

Construction Waste Management

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

9.3 Prior to construction, a Construction Resource Management Plan which will be developed to establish ways of minimising waste at source; assess the use, reuse and recycling of materials on and off-site; and prevent illegal waste activities. This plan will then be disseminated to all relevant personnel on and off-site.

9.4 The following waste minimisation actions will be considered:

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

> Return packaging for reuse;

> Consider reuse of surplus materials or off-cuts on the wider Southall development; and

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

9.5 As part of their commitment to divert construction waste from landfill, the applicant will regularly monitor and record the site's waste reduction performance. This will be compared against a target benchmark where at least 70% (by volume) of non-hazardous waste is to be diverted from landfill.

Operational Waste

9.6 Dedicated and adequate space for the segregation and storage of operational waste and recycling will be provided by 5x770 litre bins at the rear of the theatre. This will be easily accessible to the residential, the kitchen, the refectory and the theatre. This space will meet the following BREEAM requirements:

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

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

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

Functional Adaptability

9.7 A building specific functional adaptation strategy appraisal will take place in order to recognise measures which could be taken to accommodate future changes of use of the building over its lifespan.

10.MATERIALS

10.1 The Royal Academy of Dramatic Arts is committed to ensuring that the proposed construction materials are sourced in a responsible way and have a low embodied impact over their lifetime.

Life Cycle Impacts

10.2 As part of the BREEAM Assessment, the BRE Green Guide to Specification will be used to assess the main building elements and insulation materials. Materials and components are allocated a rating of between 'A+' to 'E', based on Life Cycle Assessments. The best performing materials ('A+' and 'A' rated) will be specified where possible.

Hard Landscaping and Boundary Protection

10.3 The specification of materials for boundary protection and external hard surfaces will consider those with low environmental impact. At least 80% of these materials (by area) will achieve an 'A+' or 'A' rating under the Green Guide to Specification.

Responsible Sourcing of Materials

10.4 All timber used on the project, including timber used in the construction phase such as hoarding, fencing and scaffolding, will be legally harvested and traded. This will require a government licence, from the UK Forestry Commission, for example.

10.5 The main contractor will follow a Sustainable Procurement Policy which ensures that new building materials are selected to ensure that they minimise environmental impact and have low embodied energy – from manufacture, transportation and operational stages, through to eventual demolition and disposal.

10.6 This will involve sourcing the main building materials from suppliers with responsible sourcing credentials, such as BES 6001 and PEFC or FSC certified timber.

Designing for Durability and Resilience

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

> A fire-rated façade;

> Bollards and barriers to delivery areas;

> Hard-wearing floor finishes;

> Protection rails to corridor walls; and

> Kick plates on doors.

Material Efficiency

10.8 Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life are to be identified, investigated and implemented by the design and construction team.

11. POLLUTION

11.1 The Royal Academy of Dramatic Arts are committed to preventing and controlling pollution and surface water run-off associated with the building's location and use. The impact of refrigerants, surface water run-off and external lighting have all been considered.

Flood Risk & Surface Water Run-Off

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

11.3 According to the Environment Agency's Flood Map shown in Figure 5 below, the proposed development lies in a low risk flood zone (Flood Zone 1), indicating that the probability of flooding is 0.1% (1 in 1000 years).

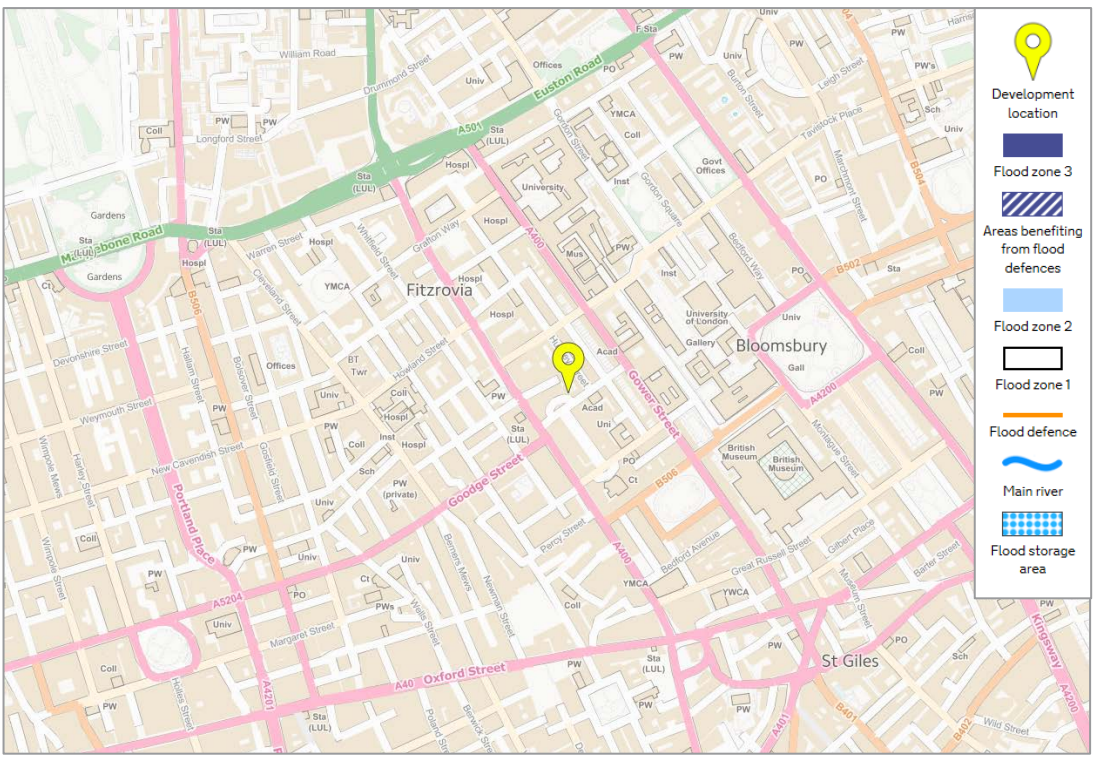


Figure 5: Environment Agency Flood Map – https://flood-map-for-planning.service.gov.uk

11.4 In the event of a local drainage system failure, the proposed development will be designed to withstand flooding. In addition, an Appropriate Consultant will be appointed to confirm that there will be no discharge from the developed site for rainfall up to 5mm.

Impact of Refrigerants

11.5 Where air-conditioning or refrigeration systems are to be installed, the refrigerants will have a Global Warming Potential (GWP) of ≤ 10. GWP is defined as the potential for global warming that a chemical has, relative to one unit of CO_2 (the primary greenhouse gas).

Reduction of Night Time Light Pollution

11.6 The external lighting strategy of the development will be designed in accordance with the ILP Guidance notes for the reduction of obtrusive light (2011). All external lighting, except from security lighting, will be automatically switched off between the hours of 23:00 and 07:00.

11.7 In addition, should the interchangeable display screen be illuminated, this will be designed in compliance with the ILE Technical Report 5 – The Brightness of Illuminated Advertisements.

11.8 The above measures will aim to ensure that lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

12. TRANSPORT AND LOCAL AMENITIES

Local Amenities

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

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

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

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

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

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

Public Transport

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

> **Goodge Street Underground Station** is 150m west of the site is served by the Northern line;

> **Euston Square Underground Station** is 650m north of the site and is served by the Metropolitan, Circle and Hammersmith and City lines;

> **Tottenham Court Road Underground Station** is 600m south of the site and is served by the Central line. The station is also on the Crossrail Network which will operate by mid-2019. This will provide a connection west to Paddington and east to Shenfield and Abbey Wood;

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

12.3 The Transport for London Public Transport Accessibility Level (PTAL) map for the site is presented in Figure 6 overleaf. The site's PTAL rating of 6b represents the highest possible level of transport accessibility.

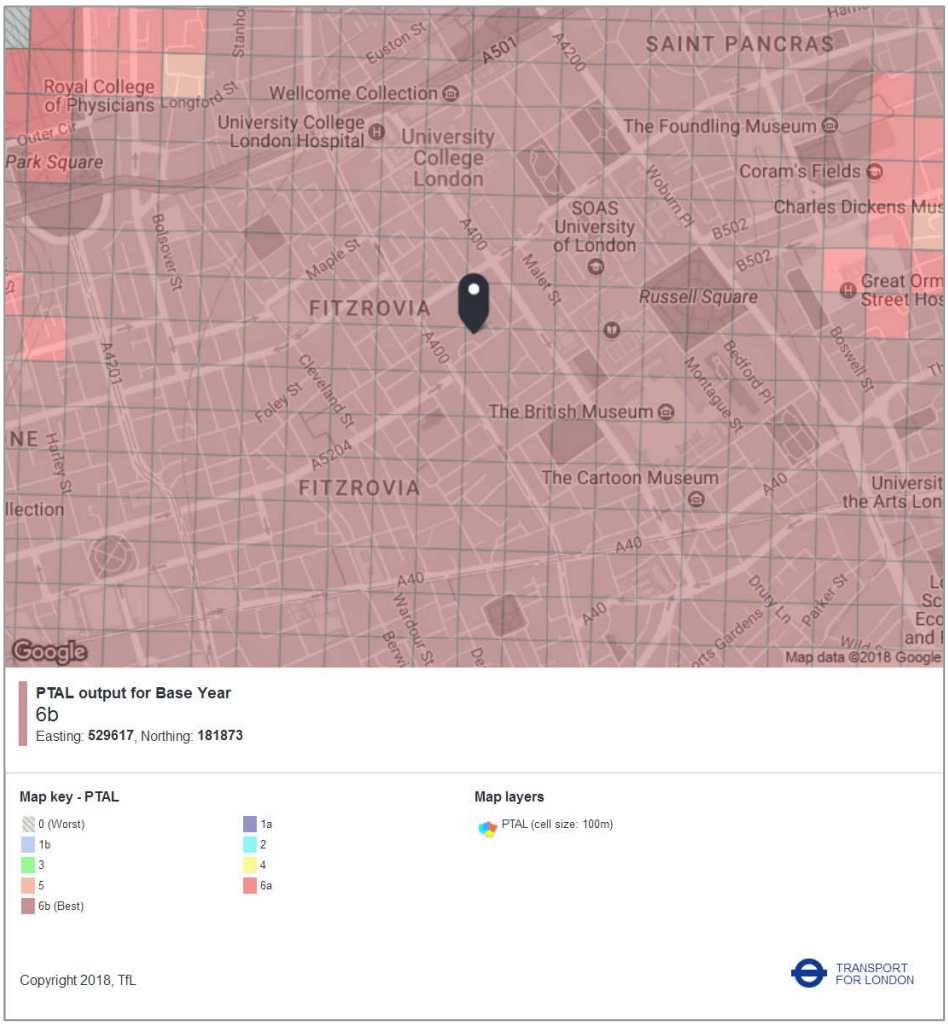


Figure 6: PTAL Map – www.tfl.gov.uk

Sustainable Transport

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

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

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

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

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

12.6 A Transport Statement was prepared by Motion, on behalf of Royal Academy of Dramatic Arts, for the planning application reference 2015/5759/P.

12.7 The TRICS database was analysed in order to estimate the likely number of trips associated with the proposals to accommodate 60 resident students within the development. The TRICS analysis suggests that the student residential development will generate 110 total person trips per day. However, it is not anticipated that the development will create a material change in the volume of trips the site attracts; this is due to 60 less students having to travel to the site each day for study purposes.

12.8 The Transport Statement concluded that there is no reason why the proposals should be resisted on traffic or transportation grounds.

Cycle Parking

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

12.10 A total of 30 secure parking spaces in vaults and 2 secure cycle spaces on a Sheffield Stand in the rear service yard have been provided. This will be cycle parking provided at a ratio of 1 space per 2 bedrooms, in line with London Plan standards.

12.11 A Santander cycle hire docking station is also located on Alfred Place, approximately 150 metres south of the site.

Car-Club

12.12 There are 25 car club locations within 1.6km radius of the site; the nearest car club bay is situated 180 metres from the site on Store Street and is operated by ZipCar. Car clubs can offer resident students the convenience of a car without owning one.

Travel Plan

12.13 Transport for London define a Travel Plan as a '*long term management strategy for an organisation or site that seeks to deliver sustainable transport objectives through action and is articulated in a document that is regularly reviewed*'.

12.14 It sets out a series of proposed measures to promote sustainable modes of transport, such as walking and cycling. These measures are used to meet the specific targets of the Travel Plan, often relating to a specific increase in cycling rates or to minimise the need to travel to and from the site, especially by private car, taken from a baseline situation. It also includes a monitoring regime, whereby surveys will be done to assess progress towards these targets.

12.15 A site-wide Travel Plan has been developed to promote sustainable transport and has been submitted with the planning application reference 2015/5759/P. A series of measures have been provided to ensure that sustainable travel options are promoted, giving students and employees access to key amenities and to employment, including those without access to a car. These include, but are not limited to: the provision of Travel Information Packs; Website Travel Information; a notice board; and promotion of sustainable travel events.

13. BIODIVERSITY AND ECOLOGY

Enhancement of Ecological Value

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

13.2 The strategy for the new planting will include the following:

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

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

> Green roof installation, primarily made up of wildflower meadow, will support invertebrates and provide an area of foraging habitat for bats and birds; and

> Installation of 2 bat boxes and 2 bird boxes to the rear façade;

Green Roofs

13.3 An area of 60.8m^2 green roof is to be provided in order to meet Policy 5.11 of the London Plan. Green roofs have demonstrable sustainability benefits, including:

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

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

> Reduction in surface water run-off.

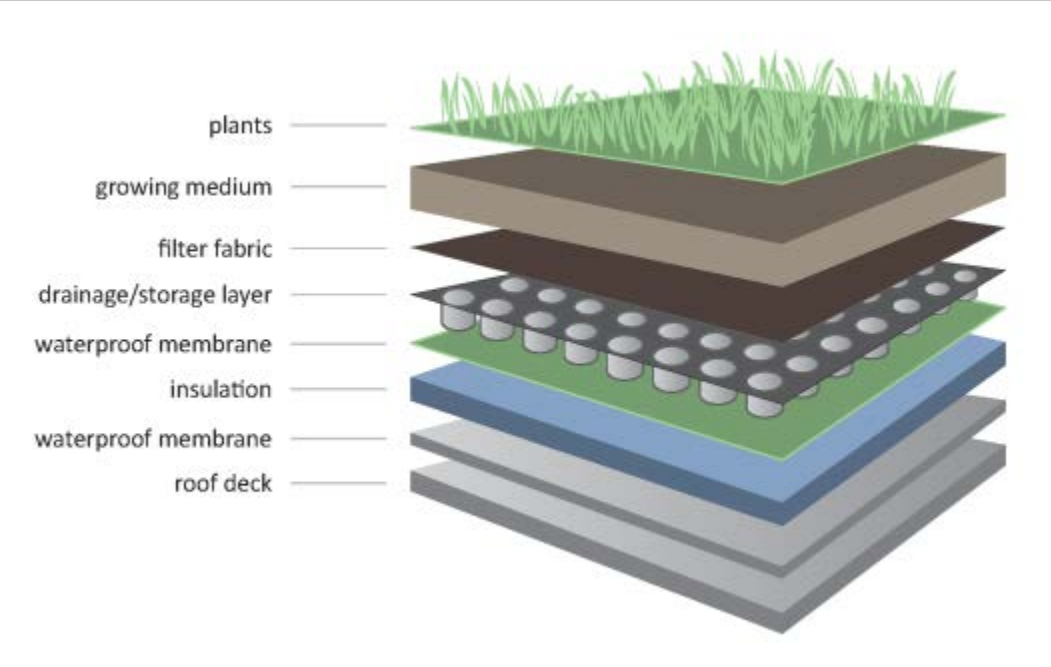


Figure 7: Indicative Build-up of Green/Brown Roof

14.CONCLUSION

14.1 The issue of sustainable development has been considered throughout the design of the proposed development at 16-18 Chenies Street by Royal Academy of Dramatic Arts in the London Borough of Camden. In particular, the incorporation of sustainable design and construction methods, energy and water saving measures, waste reduction techniques as well as measures to enhance the ecological value of the site, a good quality and sustainable development is proposed.

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

> **Management:** Stakeholder consultation, capital cost reporting, responsible construction practices, commissioning, handover and aftercare are to be carried out.

> **Health and Wellbeing:** Visual comfort is to be maximised; an Indoor Air Quality Plan is to be developed; and safe and secure use and access will be promoted across the site.

> **Energy:** A 47.6% reduction in Regulated CO_2 emissions will be achieved through energy efficient measures and Air Source Heat Pumps. In addition, sub-metering will be implemented and the site will install energy efficient lighting, lifts and equipment.

> **Water:** Efficient sanitaryware and equipment are to be installed, as well as water meters, leak detection systems and flow control devices.

> **Waste:** A Construction Resource Management Plan will be developed to reduce construction waste. During operation, designated waste and recycling storage areas will be provided;

> **Materials**: The Green Guide to Specification will be referenced in order to reduce the lifecycle impacts of the proposed major building elements, hard landscaping and insulation.

> **Pollution:** The impacts of refrigerants will be considered; the site is located in a low flood risk zone; and measures to reduce night time light pollution will be implemented.

> **Transport:** The development will benefit from its close proximity to amenities as well as on-site cyclist facilities; and a Travel Plan will be developed to further encourage sustainable transport modes.

> **Land Use and Ecology:** Ecological enhancements will be implemented through the provision of a green roof and bird and bat boxes

APPENDICES

Appendix A
BREEAM Bespoke 2014 Pre-Assessment

Appendix B
Water Efficiency Calculator

APPENDIX A

BREEAM Bespoke 2014 Pre-Assessment

HODKINSON

RADA 16-18 Chenies Street - Bespoke 2014 Other Assessment
BREEAM Very Good - Fully Fitted Out Other

Pre-Assessment Stage Summary

Project Name - Number	RADA 16-18 Chenies Street - 2643		
Client	Fraser Jopp - Royal Academy of Dramatic Art	BREEAM Assessor	Kate Paxton
Project Town - Postcode	London - WC1E 7EX	Project Manager	Kate Paxton
Development Description	The Richard Attenborough Theatre and associated development for the Royal Academy of Dramatic Art		

	Credits Available	Credits Targeted	Contribution	Mandatory
Man01	4	2	1.14%	
Man02	4	2	1.14%	
Man03	6	6	3.43%	
Man04	4	4	2.29%	
Man05	3	3	1.71%	
Management Total	**21**	**17**	**9.71%**	
Hea01	7	2	1.50%	
Hea02	5	3	2.25%	
Hea04	3	0	0.00%	
Hea05	4	3	2.25%	
Hea06	1	1	0.75%	
Health & Wellbeing Total	**20**	**9**	**6.75%**	
Ene01	13	8	4.44%	
Ene02	2	2	1.11%	Yes
Ene03	1	1	0.56%	
Ene04	3	0	0.00%	
Ene05	2	2	1.11%	
Ene06	3	3	1.67%	
Ene08	2	2	1.11%	
Ene09	1	1	0.56%	
Energy Total	**27**	**19**	**10.55%**	
Tra01	5	5	4.50%	
Tra02	2	2	1.80%	
Tra03	2	2	1.80%	
Tra05	1	1	0.90%	
Transport Total	**10**	**10**	**9.00%**	
Innovation Total	**10**	**2**	**2.00%**	

	Credits Available	Credits Targeted	Contribution	Mandatory
Wat01	5	3	2.63%	Yes
Wat02	1	1	0.88%	Yes
Wat03	2	2	1.75%	
Water Total	**8**	**6**	**5.25%**	
Mat01	6	3	3.12%	
Mat03	4	3	3.12%	Yes
Mat04	1	1	1.04%	
Mat05	1	1	1.04%	
Mat06	1	1	1.04%	
Materials Total	**13**	**9**	**9.34%**	
Wst01	7	5	3.86%	
Wst02	1	0	0.00%	
Wst03	1	1	0.77%	
Wst05	1	0	0.00%	
Wst06	1	1	0.77%	
Waste Total	**11**	**7**	**5.40%**	
LE01	2	1	1.00%	
LE02	2	2	2.00%	
LE03	2	2	2.00%	Yes
LE04	2	1	1.00%	
LE05	2	0	0.00%	
Land Use/Ecology Total	**10**	**6**	**6.00%**	
Pol01	3	2	1.54%	
Pol02	3	0	0.00%	
Pol03	5	2	1.54%	
Pol04	1	1	0.77%	
Pol05	1	1	0.77%	
Pollution Total	**13**	**6**	**4.61%**	

Indicative Target Building Score	Indicative Target Building Rating
68%	Very Good

Current Building Score	Current Building Rating

Revision	Date	Revision Details	Author	Checked By
v1	30.01.18	Draft pre-assessment for comment	KP	ZW
v2	31.01.18	Pre-assessment for submission to Local Planning Authority	KP	ZW

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RADA 16-18 Chenies Street - Bespoke 2014 Other Assessment
BREEAM Very Good - Fully Fitted Out

Pre-Assessment Tracker

Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Management	Man01 Project brief and design	Stakeholder Consultation (project delivery)	Roles and responsibilities of the delivery stakeholders to be defined in accordance with BREEAM	1	1	
		Stakeholder Consultation (third party)	During RIBA stage 4 conduct BREEAM compliant consultation with the relevant parties	1	1	
		Sustainability Champion (design)	Sustainability Champion to be appointed during the feasibility stage (stage 1) and targets are agreed for BREEAM assessment no later than RIBA stage 2.	1	0	
		Sustainability Champion (monitoring progress)	Sustainability Champion to monitor and report throughout RIBA stages to 2-4.	1	0	
	Man02 Life Cycle Costs and Service Life Planning	Elemental life cycle cost (LCC)	Conduct Elemental life cycle costing (LCC) at RIBA stage2 to be conducted in accordance with PD15686-5:2008	2	0	
		Component level LCC plan	Conduct life cycle costing (LCC) at RIBA stage C/D and a further LCC at RIBA stage D/E to be conducted in accordance with BS ISO 15686-5:2008	1	1	
		Capital cost reporting	Report the capital cost for the building in £ per m2.	1	1	
	Man03 Responsible Construction Practices	Pre-Requisite	All timber and timber based products used on the project will need to be legally harvested	-	-	
		Environmental Management	The principal contractor will need to operate an Environmental Management System (EMS)	1	1	
		Sustainability Champion (Construction)	A sustainability champion (AP) is to be appointed to monitor the project during the construction, handover and close out.	1	1	
		Considerate Construction	Developer to register site to CCS.	2	2	
		Monitoring of Construction Site Impacts - Utility	Monitor and record data on principal contractors/subcontractors' potable water consumption (m3) and energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation.	1	1	
		Monitoring of Construction Site Impacts - Transport	Monitor and record data on transport movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site	1	1	
	Man04 Commissioning and Handover	Commissioning and Testing Schedule and Responsibilities	Commissioning schedule and testing that identifies includes a timescale for commissioning and re-commissioning of all complex/non-complex building services and control systems.	1	1	
		Commissioning Building Services	A specialist commissioning manager will need to be appointed during the design stage to provide commissioing advice during installation and handover/post handover.	1	1	
		Testing and Inspecting Building Fabric	Thermographic survey to be carried out	1	1	
		Handover	Training schedules and a building user guide to be developed prior to handover for the building occupiers and premises managers.	1	1	
	Man05 Aftercare	Aftercare Support	Resources to be put in place to offer aftercare support to the building occupiers	1	1	
		Seasonal Commissioning	Seasonal commissioning activities to be completed over a minimum 12-month period once the building becomes substantially occupied	1	1	
		Post Occupancy Evaluation	Post-occupancy evaluation (POE) exercise to be carried out one year after initial building occupation	1	1	
			Total for Management	**21**	**17**	

RADA 16-18 Chenies Street - Bespoke 2014 Other Assessment
BREEAM Very Good - Fully Fitted Out

Pre-Assessment Tracker

Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Health and Wellbeing	Hea01 Visual Comfort	Glare Control	Demonstrate that all relevant building areas are using a glare control strategy	1	1	
		Daylighting	Demonstrate that at least 80% of floor area in each occupied space is adequately day lit with a daylight factor of 2%.	3	0	
		View Out	Demonstrate that 95% of the floor area in relevant building areas is within 7m of a wall which has a window or permanent opening that provides an adequate view out	2	0	
		Internal and External Lighting Levels, Zoning and Control	Internal lighting in all relevant areas of the building to be designed to provide an illuminance (lux) level appropriate to the tasks undertaken, accounting for building user concentration and comfort levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. External lighting located within the construction zone to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. Internal lighting to be zoned to allow for occupant control in accordance with the criteria below for relevant areas present within the building.	1	1	
	Hea02 Indoor Air Quality	Indoor Air Quality Plan	An air quality plan for the building will need to be developed and carried out.	1	1	
		Ventilation	The building should been designed to minimise the concentration and recirculation of pollutants in the building	1	0	
		Volatile organic compound (VOC) emission levels (products)	Decorative paints and varnishes will need to meet the necessary criteria	1	1	
		Volatile organic compound (VOC) emission levels (post construction)	Demonstrate that the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels as demonstrated by the applicable BS.	1	1	
		Adaptability - Potential for natural ventilation	The building ventilation strategy will need to be designed to be flexible and adaptable to potential building occupant needs and climatic scenarios.	1	0	
	Hea04 Thermal Comfort	Thermal Modelling	Demonstrate that thermal comfort levels in occupied spaces of the building are assessed at the design stage to evaluate appropriate servicing options; ensuring appropriate thermal comfort levels are achieved.	1	0	
		Adaptability for a Projected Climate Change Scenario	The thermal modelling demonstrates that the relevant requirements set out in criteria 3 (thermal modelling) are achieved for a projected climate change environment	1	0	
		Thermal Zoning and Controls	Demonstrate that the modelling will inform the thermal zoning and controls strategy	1	0	
	Hea05 Acoustic Performance	Appointed Acoustician	Acoustician to be appointed to define a set of performance requirements for all function areas..	4	3	
	Hea06 Safety and Security	Security of the Building	Security specialist to provide recommendations that ensure the design of the building is done to address issues raised in the security needs assessment (SNA)	1	1	
			Total for Health and Wellbeing	**20**	**9**	

RADA 16-18 Chenies Street - Bespoke 2014 Other Assessment
BREEAM Very Good - Fully Fitted Out

Pre-Assessment Tracker

Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Energy	Ene01 Reduction of Energy Use and Carbon Emissions	Energy Performance	Up to 12 credits to recognise and encourage buildings designed to minimise operational energy demand consumption and Carbon emissions.	13	8	
	Ene02 Energy Monitoring	Sub-Metering of Major Energy Consuming Systems	Demonstrate the provision of a BMS or accessible sub-metering strategy of major energy uses within the building.	1	1	First Credit
		Sub-Metering of High Energy Load and Tenancy Areas	Demonstrate the provision of a BMS or accessible sub-metering strategy of major energy uses within the building.	1	1	
	Ene03 External Lighting	External Lighting	Energy-efficient external lighting to be specified with all light fittings controlled by the presence of daylight.	1	1	
	Ene04 Low Carbon Design	Passive design analysis	Analysis of the proposed building design/development to influence decisions made for the implementation of passive design solutions that reduce demands for energy consuming building services.	1	0	
		Free cooling	Passive design analysis includes opportunities for the implementation of free cooling solutions and these strategies are used.	1	0	
		Low zero carbon feasibility study	A feasibility study considering local (on-site and/or near site) low or zero carbon (LZC) technologies is to be carried out with the results implemented.	1	0	
	Ene05 Energy Efficient Cold Storage	Refrigeration energy consumption	Install energy efficient refrigeration systems	1	1	
		Indirect greenhouse gas emissions	Install energy efficient refrigeration systems	1	1	
	Ene06 Energy Efficient Transportation Systems	Energy consumption	Demonstrate the installation of energy-efficient lift's and escalators and moving walkways.	1	1	
		Energy efficient features	As above with additional energy efficient features.	2	2	
	Ene08 Energy Efficient Equipment	Energy Efficient Equipment	To recognise and encourage procurement and commissioning of energy-efficient equipment to ensure optimum performance and energy savings.	2	2	
	Ene09 Drying Space	Drying Space	Provide a reduced energy means of drying clothes.	1	1	
			Total for Energy	**27**	**19**	
Transport	Tra01 Public Transport Accessibility	Public Transport Accessibility	5 credits are available on a sliding scale based on the assessed buildings' accessibility to the public transport network.	5	5	
	Tra02 Proximity to Amenities	Proximity to Amenities	1 credit is available where evidence provided demonstrates that the building is located within 500m of accessible local amenities appropriate to the building type and its users.	2	2	
	Tra03 Cyclist Facilities	Cycle Storage	1 credit available where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities are provided for all building users.	1	1	
		Cyclist Facilities	2 credits available where, in addition to the above, adequate changing facilities are provided for staff use.	1	1	
	Tra05 Travel Plan	Travel Plan	1 credit available where evidence provided demonstrates that a travel plan has been developed and tailored to the specific needs of the building users.	1	1	
			Total for Transport	**10**	**10**	

RADA 16-18 Chenies Street - Bespoke 2014 Other Assessment
BREEAM Very Good - Fully Fitted Out

Pre-Assessment Tracker

Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Water	Wat01 Water Consumption	Water Consumption	5 credits available where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings.	5	3	One Credit
	Wat02 Water Monitoring	Water Monitoring	1 credit available where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit. (Minimum requirement for a pulsed water meter on mains for Good)	1	1	Criterion 1 only
	Wat03 Water Leak Detection and Prevention	Leak detection systems	Demonstrate that a leak detection system will be installed on the buildings main water supply.	1	1	
		Flow control devices	Flow control devices that regulate the supply of water to each WC area to be installed.	1	1	
			Total for Water	**8**	**6**	
Materials	Mat01 Life Cycle Impacts	Life Cycle Impacts	The credits are determined using the Green Guide to Specification ratings for the major building elements.	6	3	
	Mat03 Responsible Sourcing of Materials	Responsible Sourcing of Materials	All timber is legally harvested and traded	-	-	Criterion 1 Only
		Responsible Sourcing of Materials	Materials to be sourced in accordance with a procurement plan	1	1	
		Responsible Sourcing of Materials	3 credits available where evidence provided demonstrates that 80% of the assessed materials in the building elements are responsibly sourced. Additionally 100% of any timber must be sourced in accordance with the UK Governments Timber Procurement policy. (This is mandatory for pass)	3	2	
	Mat04 Insulation	Embodied Impact	Thermal insulation products used in the building are to have a low embodied impact relative (insulation index the same as or greater than 2.5) to their thermal properties.	1	1	
	Mat05 Designing for durability and resilience	Designing for durability and resilience	Encourage the adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials optimisation.	1	1	
	Mat06 Material Efficiency	Material Efficiency	Opportunities will need to be identified in order to optimise the use of materials in all stages of the design.	1	1	
			Total for Materials	**13**	**9**	
Waste	Wst01 Construction Waste Management	Construction Resource Efficiency	1 credit available for a pre-refurbishment audit. 2 credits available for reuse and direct recycling of materials. 3 credits available where evidence provided demonstrates that the amount of non-hazardous construction waste (m3/100m2 or tonnes100m2) generated on site by the development is the same as or better than good or best practice levels.	6	4	
		Diversion from Landfill	1 credit available where evidence provided demonstrates that a significant majority of non-hazardous construction and demolition waste generated by the development will be diverted from landfill and reused or recycled.	1	1	
	Wst02 Recycled Aggregates	Recycled Aggregates	1 credit available where evidence provided demonstrates the significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses.	1	0	
	Wst03 Operational Waste	Operational Waste	1 credit available where a central, dedicated space is provided for the storage of the building's recyclable waste streams.	1	1	
	Wst05 Adaptation to climate change	Adaptation to climate change – structural and fabric resilience	Conduct a climate change adaptation strategy appraisal for structural and fabric resilience. An Exemplary credit can be awarded where a holistic approach on adaptation to climate change has been covered.	1	0	
	Wst06 Functional Adaptability	Functional Adaptability	Encourage measures taken to accommodate future changes of use of the building over its lifespan.	1	1	
			Total for Waste	**11**	**7**	

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Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Land Use and Ecology	Le01 Site Selection	Previously Developed Land	1 credit available where evidence is provided to demonstrate that the majority of the footprint of the proposed development falls within the boundary of previously developed land.	1	1	
		Contaminated Land	1 credit available where evidence is provided to demonstrate that the land used for the new development has, prior to development, been defined as contaminated and adequate remedial steps have been taken to decontaminate the site prior to construction.	1	0	
	Le02 Ecological Value of Site and Protection of Ecological Features	Ecological Value of Site	Demonstrate that the site's construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damage during site preparation and construction works.	1	1	
		Protection of Ecological Features	Where evidence provided demonstrates that the site's construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damage during site preparation and construction works.	1	1	
	Le03 Minimising impact on existing site ecology	Change in ecological value.	The change in ecological value of the site is to be equal to or greater than zero plant species.	2	2	One Credit
	Le04 Enhancing Site Ecology	Ecologist's report and recommendations	Ecologist's report to be undertaken to include appropriate recommendations to enhance the sites ecology.	1	1	
		Increase in ecological value	Encourage actions taken to enhance the ecological value of the site as a result of development.	1	0	
	Le05 Long Term Impact on Biodiversity	Long Term Impact on Biodiversity	1 credit available where the client has committed to achieving the mandatory requirements and at least two of the additional requirements. 2 credits available where the client has committed to achieving the mandatory requirements and at least four of the additional requirements.	2	0	
			Total for Land Use and Ecology	**10**	**6**	

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Section	Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Pollution	Pol01 Impact of Refrigerants	Impact of Refrigerants	2 credits available where there are refrigerants with a global warming potential (GWP) of less than 10. 1 credit available where systems using refrigerants have direct effect life cycle Carbon equivalent emissions of 1000 kgCarbon/kW cooling capacity	2	2	
		Leak detection	1 credit available where systems are also enclosed in moderately air tight containers or a mechanically ventilated plant room with automatic shut down system with alarm.	1	0	
	Pol02 NOx Emissions	NOx Emissions	The plant installed is to have NOx emission levels (measured on a dry basis at 0% excess O2) of either <100, <70 or <40 mg/kWh	3	0	
	Pol03 Surface Water Run Off	Flood Resilience - Low Risk	2 credits available where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding.	2	2	
		Surface Water Run Off	1 credit available where drainage measures are specified to ensure peak rate of run-off from the site to the watercourses is no greater for the developed site than it was for the pre-development site.	1	0	
		Surface Water Run Off	1 credit where flooding of property will not occur in the event of a local drainage system failure.	1	0	
		Minimising Watercourse Pollution	Confirmation that there will be no discharge from the development site for rainfall events up to 5mm.	1	0	
	Pol04 Reduction of Night Time Light Pollution	Reduction of Night Time Light Pollution	1 credit available where evidence provided demonstrates that the external lighting design is in compliance with the guidance in the Institution of Lighting Engineers (ILE) Guidance notes for the reduction of obtrusive light, 2005.	1	1	
	Pol05 Noise Attenuation	Noise Attenuation	1 credit available where evidence provided demonstrates that new sources of noise from the development do not give rise to the likelihood of complaints from existing noise-sensitive premises and amenity or wildlife areas that are within the locality of the site.	1	1	
			Total for Pollution	**13**	**6**	

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Pre-Assessment Tracker							
Section		Issue	Issue Sub-Title	Summary Requirements	Credits Available for sub-title	Credits Targeted	Minimum for Very Good Rating
Innovation	Man03	Responsible Construction Practices	Criteria 7	Exemplary level performance: a CCS score of 40 or more and a score of 7 in each of the 5 sections	1	1	
	Man05	Aftercare	Criteria 6	Implement the resources to carry out the collection of data over a 3 year period.	1	1	
	Hea01	Visual Comfort	Criteria 14	Exemplary daylight factors have been met.	1	0	
	Hea02	Indoor Air Quality	Criteria 15-18	Minimising sources of air pollution - volatile organic compound (VOC) emission levels (products	1	0	
	Ene01	Reduction of Carbon Emissions	Criteria 2-4	Up to 5 credits can be awarded when a building improves upon he EPR of 0.9 and is a net Carbon zero building.	5	0	
	Wat01	Water Consumption	Criteria 2	1 credit where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings (65% improvement)	1	0	
	Mat01	Life Cycle Impacts	Criteria 4-5	Route 1: Where assessing four or more applicable building elements, the building achieves at least two points in addition to the total points in addition to the total points required to achieve maximum credits under the standard BREEAM criteria	1	0	
	Mat01	Life Cycle Impacts	Criteria 6-8	Route 2: Where the design team has used an IMPACT compliant software to measure the environmental impact of the building. Where the design team can demonstrate how the use of an IMPACT compliant software has benefited the building terms of measuring and reducing its environmental impact. Where the design team submit BIIM from the IMPACT compliant software tool for the assessed building to BRE global.	2	0	
	Mat03	Responsible Sourcing of Materials	Criteria 4	Where 70% of the points available have been achieved.	1	0	
	Wst01	Construction Site Waste Management	Criteria 6-8	If the development achieves less than 1.6m3 per 100m2 or 1.9tonnes per 100m2 a exemplary credit is awarded.	1	0	
	Wst02	Recycled Aggregates	Criteria 4-6	Where the total amount of recycled and/or secondary aggregate specified is greater than 35% of the total high grade aggregate specified for the project. To contribute to the total amount the percentage of high grade aggregate specified per application that is recycled and/or secondary aggregate must meet the exemplary minimum levels.	1	0	
	Wst05	Adaptation to Climate change	Criteria 2	A holistic approach to the design and construction of the current building's life cycle, to mitigate against the impacts of climate change, is represented by the achievement of criteria within Hea04, Ene01, Ene04, Wat01, Mat05, Pol03.	1	0	
				Total for Innovation	**10**	**2**	

APPENDIX B

Water Efficiency Calculator

Water Efficiency Calculator
16-18 Chenies Street

	Internal Water Consumption			
Installation Type	**Unit of Measure**	**Capacity / Flow Rate**	**Litres/person/day**	**Notes**
WC	Full Flush Volume (Litres)	**6**	8.76	Low flush WCs will be installed to reduce the volume of water consumed during flushing. All WCs will have dual flush cisterns which will provide both part (3L) and full (6L) flushes.
	Part Flush Volume (Litres)	**3**	8.88	
Basin Tap	Flow Rate (Litres/minute)	**4.5**	8.69	All taps (excluding kitchen taps) will be reduced to 4.5 litres/minute using flow restrictors. Where multiple taps are to be provided the average flow rate will be used.
Shower	Flow Rate (Litres/minute)	**6**	26.22	Shower flow rates will be reduced to a maximum of 6 litres/minute using flow restrictors fixed to the shower heads. These contain precision-made holes or filters to restrict water flow and reduce the outlet flow and pressure.
Kitchen Tap	Flow Rate (Litres/minute)	**5**	12.56	Kitchen taps will be reduced to 5 litres/minute using flow restrictors which will be fitted within the console of the tap or in the pipework.
		Net Internal Water Consumption (Litres/person/day)	**65.1**	
		Normalisation Factor	**0.91**	
		Total Internal Water Consumption (Litres/person/day)	**59.3**	The total *internal* water consumption target of ≤105 litres/person/day will be achieved in accordance with Regulation 36 para (2)b optional requirement Approved Document G.
		Allowance for External Water Consumption (Litres/person/day)	**5**	
		Total Water Consumption (Litres/person/day)	**64.3**	The *total* water consumption target of ≤110 litres/person/day will be achieved in accordance with Regulation 36 para (2)b optional requirement of Approved Document G.