



ECOUNICO

Sustainability Statement

School of Art, University of Reading



On Behalf of **University of Reading**

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Executive Summary

This Sustainability Statement supports the planning application for the proposed School of Art development in the Reading Borough Council. This report details how the design has considered the potential environmental impacts and how these impacts can be managed and mitigated in line with the relevant planning policies.

The proposed development has targeted sustainability throughout the lifetime of the building. In particular energy and water efficiency measures integral to the building's design.

The UoR aims to achieve the highest possible energy efficiency targets and carbon reduction targets for this project by following the LETI guidance for schools where possible with an aspiration to meet the operational Net Zero target.

The Energy Strategy follows the Energy Hierarchy: Be Lean, Be Clean and Be Green. The overarching objective in the formulation of the strategy is to maximise the reductions in total CO₂ emissions through the application of the hierarchy with a technically appropriate and cost-effective approach.

After reduction of the energy demand by using LETI guidance where possible, the energy strategy proposes to connect the development to an existing district heating network with CHP as well as providing a large PV system for the building to generate renewable electricity.

The proposed energy strategy exceeds the regulated operational Net Zero Target against the Part L 2013 baseline with the current carbon factors. The strategy also has a potential to meet and exceed the regulated operational Net Zero Target against the Part L 2013 baseline adjusted to the part L 2021 carbon factors when the existing heating network CHP is replaced with the ground coupled, water source heat pump system

Water consumption will be reduced through the incorporation of water efficient fixtures and fittings. A BREEAM compliant water meter and leak detection system will be provided on the mains water supply of the building.

The proposed development is located within Flood Zone 1, and as such is at a low risk of flooding from fluvial and tidal sources. Flood risk from other sources such as surface water, groundwater, sewers, reservoirs and artificial sources is demonstrated to be low.

The design has been prepared so as to prevent on and offsite flooding for any storm event, up to and including a 1 in 100 year event, plus an allowance for the potential effects of climate change (+ 40%).

The waste storage and recycling facilities will follow the UoR campus wide waste management strategy. This includes colour coded mixed recycling bins throughout the internal spaces. 50% capacity of external bins will be for recycling. In most cases 1100L wheeled external bins will be used.

The construction waste will be minimised by implementation various construction waste minimisation measures. Consideration will be given to selecting a waste contractor with a high diversion rate of all waste that is processed from landfill.

The scheme will include good practice design standards in regard to air, light and noise pollution.

To minimise air quality impacts during construction a number of best practice mitigation measures will be implemented by the contractor.

The existing on site district heating network will be used to supply most of the heating and hot water demand of the development. It is therefore considered that the local emissions will not be increased significantly as the development will utilise the existing energy generating facilities. In addition, there are plans in place by the UoR to decarbonise and convert the existing central heating plant to a ground coupled, water source heat pump system which is likely to take place within the next 10 years. This will mean that the local emissions will be reduced to zero when the existing plant is replaced by the new heat pump system.

Natural ventilation is proposed in the studio spaces, with openable windows and openable roof lights that are automatically operated. Indoor air quality will be controlled utilising CO₂ sensors, linked to the high-level windows.

It is proposed to comply with the Reading Borough Council noise emission limit requirements. Therefore, the proposed development will unlikely result in adverse effects at nearby noise sensitive receptors.

Mitigation to achieve internal noise levels will consist of enhanced glazing and mechanical ventilation for habitable rooms.

Sound insulation will be provided on separating walls and floors between spaces to high noise insulation requirements where possible.

Health and wellbeing of the occupants will be improved by providing good daylight levels, sufficient private and semi-private outdoor space and indoor comfort.

The site is expected to be registered with the Considerate Constructors Scheme with the aim of achieving Beyond Best Practice standards, which will ensure that the site's impacts on the environment, the workforce and the general public are minimised.

The site is considered to have low ecological value. The ecology of the site will be protected and improved introducing new ecological measures.

A Transport Assessment has been prepared for the proposed development. A number of 'hard' infrastructural and 'soft' information-led measures such as encouraging walking, cycling and public transport use have been proposed.

The BREEAM pre-assessment carried out for the development demonstrates that the proposed development can achieve a 'Very Good' rating.

The proposed development accords with the high standards of sustainability as prescribed by the planning policies.

1 Introduction

1.1 Background

Ecounico has been instructed by University of Reading (UoR) to prepare a Sustainability Statement for the proposed School of Art development in the Reading Borough Council.

The document accompanies the full planning application, to redevelop the site of the existing Central Kitchen building to accommodate Reading School of Art, which is being relocated from its existing location within the eastern part of the Whiteknights Campus to the Pepper Lane entrance.

The main aim of this report is to provide an assessment of the sustainability credentials for the proposed development and to describe how the applicable sustainability policies and standards can be met by the proposed design.

The information provided in this report should be treated as indicative at this stage and should be used to inform the planning application for the proposed development with respect to relevant national, regional and local planning policies.

1.2 Description of Development

Reading School of Art is part of the School of Arts and Communication Design. The existing School of Art is located within building TOB1 which lies within Wokingham Borough. As part of future proposals at the campus, the existing School of Art building is to be demolished.

To ensure the School of Art remains at the Whiteknights Campus, the proposal subject to this application is to re-locate the School of Art to the current unoccupied Central Kitchen building, which lies within Reading Borough.

The proposal would see the Central Kitchen building refurbished and extended to house the School of Art, with the extension located on the existing hardstanding forecourt area to the east of the existing building. The refurbishment and extension will provide workshops, studio and gallery space as well as a staff and student welfare area, shop and visitor space.

The proposed School of Art building will accommodate the following:

- Circa 1,900 sq.m. of gross internal floor space and circa 1400 sq.m of net internal floor space. This includes 970 sq.m. of existing gross internal floor space and 920 sq.m new gross internal floor space from an extension.
- The existing Car Park 11 will be utilised in connection with these proposals. There is no increase in student numbers proposed.

The aim is to remain at an intake of 80 undergraduate students.

The ground floor plan of the proposed development is presented in Figure 1.1.

2 Planning Policies

This section summarises the relevant energy policy context for the development. The national and local policies and regulations related to energy and sustainability are summarised below.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) document sets out the Government's planning policies for England and was updated July 2021.

The NPPF is designed to consolidate all policy statements, circulars and guidance documents into a single, simpler National Planning Policy Framework, making the planning system more user-friendly and transparent. The framework's primary objective is a sustainable development, therefore focussing on the 3 pillars of sustainability. The framework is split into three sections; planning for prosperity (Economic), planning for people (Social) and planning for places (Environmental), each of which outlines guidance to tackle issues such as housing, transport infrastructure, climate change, business and economic development, etc.

In regard to climate change, the NPPF supports a reduction in greenhouse gas emissions and the delivery of renewable and low carbon energy. Climate change is covered in Section 14 '*Meeting the challenge of climate change, flooding and coastal change*'. In summary the framework advises:

To support the move to a low carbon future, local planning authorities should:

- plan for new developments in locations and ways which reduce greenhouse gas emissions;
- actively support energy efficiency improvements to existing buildings; and
- adopting nationally described standards when setting any local requirement for a building's sustainability.

In determining planning applications, local planning authorities should expect a new development to:

- comply with adopted Local Plan policies on local requirements for decentralised energy supply, unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
- take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

2.2 Reading Borough Council Local Planning Policy

A new Reading Borough Local Plan was adopted on 4th November 2019. This document sets out our planning policies for development in Reading up to 2036. It is the main policy document in deciding planning applications which contains the following energy policies.

Policy CC1: Presumption in Favour of Sustainable Development

A positive approach to considering development proposals will be taken that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework (NPPF). Where appropriate, the Council will work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible.

Planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise. Planning applications that accord with the policies in the development plan (including, where relevant, with policies in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise. Proposed development that conflicts with the development plan will be refused, unless other material considerations indicate otherwise.

Where there are no policies relevant to the application or the policies which are most important to determining the application are out of date at the time of making the decision then permission will be granted unless material considerations indicate otherwise – taking into account whether:

- *The application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
- *Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the NPPF taken as a whole.*

Policy CC2: Sustainable Design and Construction

Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

To meet these requirements:

- *All major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Excellent' standards, where possible;*
- *All minor non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Very Good' standard as a minimum;*
- *All non-residential development or conversions to residential should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.*

For some types of development, such as industrial uses, warehouses and schools might find it more difficult to meet these standards. In these cases, developments must demonstrate that the standard to be achieved is the highest possible for the development, and at a minimum meets the BREEAM 'Very Good' standard.

Policy CC3: Adaptation to Climate Change

All developments will demonstrate how they have been designed to incorporate measures to adapt to climate change. The following measures shall be incorporated into development:

- *Wherever possible, new buildings shall be orientated to maximise the opportunities for both natural heating and ventilation and reducing exposure to wind and other elements;*
- *Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, thermal mass, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc;*

- *Use of trees and other planting, where appropriate as part of a landscape scheme, to provide shading of amenity areas, buildings and streets and to help to connect habitat, designed with native plants that are carefully selected, managed and adaptable to meet the predicted changed climatic conditions; and*
- *All development shall minimise the impact of surface water runoff from the development in the design of the drainage system, and where possible incorporate mitigation and resilience measures for any increases in river flooding levels as a result of climate change.*

Policy CC4: Decentralised Energy

In meeting the sustainability requirements of this plan, developments of the sizes set out below shall demonstrate how consideration has been given to securing energy for the development from a decentralised energy source.

Any development of more than 20 dwellings and/ or non-residential development of over 1,000 sq m shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision.

Where there is existing decentralised energy provision present within the vicinity of an application site, further developments of 10 dwellings or more or non-residential development of 1,000 sq m or more will be expected to link into the existing decentralised energy network or demonstrate why this is not feasible.

Policy CC5: Waste Minimisation and Storage

Development should demonstrate measures to minimise the generation of waste in the construction, use and life of buildings and promote more sustainable approaches to waste management, including the reuse and recycling of construction waste and the promotion of layouts and designs that provide adequate, well-designed space to facilitate waste storage, reuse, recycling and composting.

Policy CC6: Accessibility and the Intensity of Development

The scale and density of development will be related to its level of accessibility by walking, cycling and public transport to a range of services and facilities, with the densest and largest scale development taking place in the most accessible locations. Unless it can be demonstrated that the accessibility of a site is to be significantly upgraded, for example, by providing high quality pedestrian routes or providing access to good public transport services, any new development must be at a scale, density and intensity appropriate to that level of accessibility.

Policy CC7: Safeguarding Amenity

Development will not cause a detrimental impact on the living environment of existing residential properties or unacceptable living conditions for new residential properties, in terms of:

- *Privacy and overlooking;*
- *Access to sunlight and daylight;*
- *Visual dominance and overbearing effects of a development;*
- *Harm to outlook;*
- *Noise and disturbance;*
- *Artificial lighting;*
- *Vibration;*

- *Dust and fumes;*
- *Smell;*
- *Crime and safety; or*
- *Wind, where the proposals involve new development of more than 8 storeys.*

The position of habitable rooms, windows and outdoor living spaces will be particularly important. A back-to-back distance of 20 metres between dwellings is usually appropriate, although the circumstances on individual sites may enable dwellings to be closer without a detrimental effect on privacy. As well as immediate impacts, other aspects to which this policy applies will include matters such as hours of operation of businesses, and effects of traffic movements, particularly of heavy goods vehicles (HGVs). Proposals which would generate regular movements of HGVs on residential roads will not be acceptable. Where an otherwise acceptable development could change its character to a use that would have a greater impact on amenity without needing planning permission, conditions will be applied to restrict such changes.

Policy EN12: Biodiversity and the Green Network

a) The identified Green Network, the key elements of which are shown on the Proposals Map, shall be maintained, protected, consolidated, extended and enhanced. Permission will not be granted for development that negatively affects the sites with identified interest or fragments the overall network. The Green Network comprises:

- *Sites with identified biodiversity interest - Local Wildlife Sites, Local Nature Reserves, Biodiversity Opportunity Areas, protected and priority species and their habitats, Priority and Biodiversity Action Plan habitats, and the River Thames and all its tributaries (including the River Kennet and the Kennet & Avon Canal); and*
- *Areas with potential for biodiversity value and which stitch the Green Network together – designated Local Green Space and open green spaces, and existing and potential Green Links.*

New development shall demonstrate how the location and type of green space, landscaping and water features provided within a scheme have been arranged such that they maintain or link into the existing Green Network and contribute to its consolidation. Such features should be designed to maximise the opportunities for enhancing this network. All new development should maximise opportunities to create new assets and links into areas where opportunities are as yet unidentified on the Proposals Map.

b) On all sites, development should not result in a net loss of biodiversity and geodiversity, and should provide a net gain for biodiversity wherever possible. Development should:

- *Protect and wherever possible enhance features of biodiversity interest on and adjacent to the application site, incorporating and integrating them into development proposals wherever practicable; and*
- *Provide new tree planting, wildlife friendly landscaping and ecological enhancements (such as wildlife ponds, bird and bat boxes) wherever practicable.*

In exceptional circumstances where the need for development clearly outweighs the need to protect the value of the site, and it is demonstrated that the impacts cannot be: 1) avoided; 2) mitigated or; 3) compensated for on-site; then new development will provide off-site compensation to ensure that there is “no net loss” of biodiversity. Provision of off-site compensation shall be calculated in accordance with nationally or locally recognised guidance and metrics. It should not replace existing alternative habitats, and should be provided prior to development.

Policy EN15: Air Quality

Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:

- Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
- Whether the development is within, or accessed via, an Air Quality Management Area; and*
- Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*

ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.

iii. Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring.

Policy EN16: Pollution and Water Resources

Development will only be permitted where it would not be damaging to the environment and sensitive receptors through land, noise or light pollution; where it would result in no deterioration in, or ideally enhance, ground and surface water quality; and where adequate water resources, sewerage and wastewater treatment infrastructure will be in place to support the proposed development prior to occupation.

Proposals for development that are sensitive to the effects of noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution.

Development will only be permitted on land affected by contamination where it is demonstrated that the contamination and land gas can be satisfactorily managed or remediated so that it is suitable for the proposed end use and will not impact on the groundwater environment, human health, buildings and the wider environment, during demolition and construction phases as well as during the future use of the site.

Policy EN17: Noise Generating Equipment

Where noise generating equipment is proposed, the noise source specific level (plant noise level) should be at least 10dBA below the existing background level as measured at the nearest noise sensitive receptor.

Policy EN18: Flooding and Sustainable Drainage Systems

Development will be directed to areas at lowest risk of flooding in the first instance, following the Sequential and Exceptions Test set out in the NPPF, and taking into account the effects of climate change. It will consider flooding from all sources, including fluvial, surface water, groundwater and sewer flooding. Where development in areas at risk of flooding is necessary, it will not reduce the capacity of the flood plain to store floodwater, impede the flow of floodwater or in any way increase the risks to life and property arising

from flooding. Wherever possible, development should be designed to reduce flood risk, both on- and off-site.

All major developments must incorporate sustainable drainage systems (SuDS) as appropriate and in line with the Government's Technical Standards⁶⁴. Smaller schemes are encouraged to incorporate SuDS, where possible. Runoff rates should aim to reflect greenfield conditions and, in any case, must be no greater than the existing conditions of the site. Schemes should ensure that the movement of water through vertical infiltration as well as horizontal run-off does not worsen contamination effects. Wherever possible, SuDS provision should maximise ecological benefits, link into the existing Green Network, incorporate tree planting and landscaping and avoid damage to existing significant trees, including through changes to the site hydrology. All new developments in areas of flood risk should give priority to SuDS.

3 Sustainability Assessment Approach

3.1 Achieving a Sustainable Outcome

Sustainable development is often thought of solely in terms of its environmental impact, however as stated in the National Planning Policy Framework, there are three elements to sustainable development: economic, social and environmental. It is therefore important to realise that these roles are mutually dependent and that each element should be addressed and carry equal importance. This report therefore illustrates the strategies and approaches employed on the development to create:

- Social Responsibility
- Environmental Stewardship
- Economic Prosperity

By providing integrated and mutual support across each of these elements, local communities can be given the tools that will enable them to be self-sustaining and not draw unnecessarily on a diminishing supply of resources.

Developments should be assessed for their potential to contribute to the local community, and to ensure that they provide a sufficient and balanced contribution across each of the social, economic and environmental aspirations. This in turn will underpin the necessary integration required to deliver a commensurate quality of life for the people it is designed to support.

This report addresses the socio-economic and environmental impact that the development will have on the site itself and surrounding area.

3.2 Assessment Methodology

The design objective for the School of Art is to achieve BREEAM Very Good in line with policy. As the development is partly new build and partly refurbishment project, it is assessed using a Bespoke BREEAM Refurbishment and Fit-out 2014 methodology. BREEAM assesses the sustainability rating of the development against 10 categories of sustainable design including:

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution
- Innovation

Each category consists of a number of issues, and each issue seeks to mitigate the impact of the building against performance targets and assessment criteria. BREEAM uses a scale of 'Pass', 'Good', 'Very Good', 'Excellent' and 'Outstanding' to assess the overall level of the environmental performance.

BREEAM Level	% Points Required
Outstanding	≥ 85
Excellent	≥ 70
Very Good'	≥ 55
Good	≥ 45
Pass	≥ 30
Unclassified	< 30

At least 55 BREEAM points will need to be achieved through sustainable design to achieve a BREEAM Very Good rating. The BREEAM points will need to be achieved by accomplishing mandatory standards and tradable credits.

Further credits are available on a tradable basis from other categories so that the developer may choose how to add performance credits to achieve the rating for which they are aiming.

A BREEAM pre-assessment carried out for this development indicates that it is possible to achieve a BREEAM Very Good rating with the proposed sustainable design. It should be noted that this pre-assessment has been undertaken early in the design process and is therefore subject to change. It is also important to note that the threshold for BREEAM Very Good can be achieved by attaining other credits within the BREEAM scheme, and not achieving some of those allocated in the pre-assessment. A copy of the pre-assessment is provided in Appendix A.

4 Sustainability Measures and Strategy

4.1 Energy and CO₂ Emissions

Ecounico produced an Energy Statement for this development which describes the design and technology options appraised and proposes the preferred energy strategy option.

According to the local planning policies, the development is only required to meet Part L of the building regulations. However, the UoR has an aspiration to become Net Zero by 2030. Therefore, the UoR aims to achieve the highest possible energy efficiency and carbon reduction targets for this project by following the LETI guidance for schools where possible with an aspiration to meet the operational Net Zero target.

The Energy Strategy follows the Energy Hierarchy: Be Lean, Be Clean and Be Green. The overarching objective in the formulation of the strategy is to maximise the reductions in total CO₂ emissions through the application of the hierarchy with a technically appropriate and cost-effective approach.

After reduction of the energy demand by using LETI guidance where possible, the energy strategy proposes to connect the development to an existing district heating network with CHP as well as providing a large PV system for the building to generate renewable electricity.

The energy and carbon assessments are carried out based on the current Part L 2013 building regulations and the associated carbon factors. In order to provide a more realistic carbon assessment for the future, in addition to the Part L 2013 carbon assessment outputs, adjusted Part L 2013 carbon assessment outputs are provided which are based on the upcoming Part L 2021 carbon factors. The Part L 2021 carbon emission factors listed below:

- Natural gas: 0.210 kgCO₂/kWh
- Grid electricity: 0.136 kgCO₂/kWh

The summary of the overall reduction in Part L 2013 CO₂ emissions after each stage of the energy hierarchy is presented in Table 4.1.

Table 4.1 Summary of Part L 2013 CO₂ emissions after each stage of the Energy Hierarchy

	CO ₂ emissions (tonnes/year)		
	Regulated	Unregulated	Total
School of Art CO ₂ Part L2A 2013 Baseline	33.3	24.6	57.9
After energy demand reduction	26.2	24.6	50.8
After energy efficient supply from DH network	21.7	24.6	46.3
After use of renewable energy	-9.0	24.6	15.6

The regulated and total CO₂ savings for the entire development expressed in terms of actual and percentage reduction after each stage of the energy hierarchy are presented in Table 4.2.

Table 4.2 Summary of Part L 2013 CO₂ savings from each stage of the Energy Hierarchy

	Regulated Energy CO ₂ savings		Unregulated Energy CO ₂ savings
	Tonnes per annum	%	%
Savings from energy demand reduction	7.4	22%	13%
Savings from heat network	4.2	13%	7%
Savings from renewable energy	30.5	92%	53%
Total cumulative savings	42.2	127%	73%
Carbon shortfall/surplus	-9.0	-	16

The energy assessment shows that the proposed energy supply strategy may result in circa 42.2 tCO₂ reduction of regulated CO₂ emissions per annum which equates to circa 127% reduction over the regulated Part L 2013 carbon baseline. The overall CO₂ emissions from both regulated and unregulated energy can be reduced by circa 73% over the baseline. The assessment results show that the proposed energy strategy can achieve the regulated operational Net Zero target.

The summary of the overall reduction in adjusted Part L 2013 CO₂ emissions using the new Part L 2021 carbon emission factors after each stage of the energy hierarchy is presented in Table 4.3.

Table 4.3 Summary of adjusted Part L 2013 CO₂ emissions after each stage of the Energy Hierarchy

	CO ₂ emissions (tonnes/year)		
	Regulated	Unregulated	Total
School of Art CO ₂ Part L2A 2013 Baseline adjusted to Part L2A 2021	18.9	6.4	25.3
After energy demand reduction	15.1	6.4	21.5
After energy efficient supply from DH network	18.5	6.4	25.0
After use of renewable energy	10.5	6.4	17.0

The regulated and total CO₂ savings for the entire development expressed in terms of actual and percentage reduction after each stage of the energy hierarchy are presented in Table 4.4.

Table 4.4 Summary of adjusted Part L 2013 CO₂ savings from each stage of the Energy Hierarchy

	Regulated Energy CO ₂ savings		Unregulated Energy CO ₂ savings
	Tonnes per annum	%	%
Savings from energy demand reduction	3.8	20%	15%
Savings from heat network	-3.4	-18%	-14%
Savings from renewable energy	8.0	42%	32%
Total cumulative savings	8.4	44%	33%
Carbon shortfall/surplus	10.5	-	17

The energy assessment shows that with the new Part L 2021 carbon factors the proposed energy strategy may result in circa 10.5 tCO₂ reduction of regulated CO₂ emissions per annum which equates to circa 44% reduction over the adjusted regulated Part L 2013 carbon baseline. The overall CO₂ emissions from both regulated and unregulated energy can be reduced by circa 33% over the baseline.

The increase in the CO₂ savings from the heat network is associated with the use of CHP technology and use of significantly reduced electricity carbon factor which represent decarbonisation of electricity grid. This issue will be resolved by converting the existing CHP and boiler heating plant to a ground coupled, water source heat pump system which could deliver circa 35-55%.

It is anticipated that with the use of the water source heat pump system the development will likely be able to achieve the regulated operational Net Zero target and potentially even the regulated and unregulated operational Net Zero target.

4.2 Water Consumption and Efficiency

There are several different water efficiency measures which incorporate into the design of the development to reduce water consumption.

It is proposed to provide water efficient fixtures and fittings to reduce water consumption. These measures will help to place less of a burden on the fresh water infrastructure and reduce water bills for the homeowners.

To ensure water consumption can be monitored and managed by the future occupants, a water meter will be provided on the mains water supply to the building. A pulsed output will be provided to enable connection of the meter to a Building Management System (where applicable).

A water leak detection system is also proposed on the buildings mains water supply to reduce the risks of water leaks and ensure good water conservation.

4.3 Materials

To tie in with the materiality of the existing building, the new extension is to be a vertical metal profile cladding with a brick plinth. The glazing responds the surroundings, with portrait windows to highlight the views to the trees and buildings opposite.

The energy that has been used during manufacture, processing and the transportation of the materials to site, contributes to embodied carbon emissions. These emissions shall be minimised by the selection of materials for walls, floors and windows that are characterised by reduced environmental and life cycle impacts.

All timber and timber-based products used on the project will be legally harvested and traded timber.

Preference will be given to the use of local materials and suppliers where feasible to reduce the transport distances and to support the local economy.

4.4 Flood Risk and Surface Water Management

4.4.1 Flood Risk

The Flood Risk Assessment (FRA) for the development has been carried out by Curtins. The FRA complies with the NPPF and Planning Practice Guidance, demonstrating that flood risk from all sources has been considered in the proposed development. It is also consistent with the Local Planning Authority requirements with regard to flood risk.

The proposed development site lies wholly within Flood Zone 1, correlating to land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding, and is considered to be at low risk of flooding from all other sources. The proposed development is classified as a More Vulnerable development type and is therefore appropriate for the Flood Zone classification.

The proposed development site does not lie within close proximity to any major rivers or the sea. It is not expected that climate change will result in the flood risk from rivers or the sea increasing significantly at the proposed development site.

The proposed development will include a dedicated surface water network designed to accommodate the 1 in 100-year event plus a climate change allowance. Given this accounting for climate change within the proposed drainage, the flood risk to the development from the impact of changes on rainfall intensities across the site is again considered low.

4.4.2 Sustainable Drainage Systems

The drainage strategy for the site has been developed by Curtins. Dedicated foul and surface water drainage networks are proposed to serve the development. Where possible, aspects of the existing networks serving the existing catering building will be retained and reused, with additional infrastructure provided where this is not possible and to serve the new portion of the building. Both networks will continue to discharge to the wider UoR private foul and surface water drainage infrastructure to the north and east of the site.

Discharge from the surface water network will be limited to 5l/s for storms up to and including the 1 in 100-year event plus a 40% climate change allowance.

4.5 Waste

4.5.1 Waste Storage and Recycling Facilities

The waste storage and recycling facilities will follow the UoR campus wide waste management strategy. This includes colour coded mixed recycling bins throughout the internal spaces.

50% capacity of external bins will be for recycling. In most cases 1100L wheeled external bins will be used.

4.5.2 Waste Minimisation

Using good waste management practices onsite will help to reduce disposal costs, avoidance of waste transportation costs, increase recycling of materials and lower levels of material wastage.

Design of building has been developed to significantly reduce the amount of waste generated during the construction of a project.

It is decided to retain as much of the existing building structure as possible as well as recycle and reuse of demolished parts of the building to minimise waste from the site.

The storage of materials has been identified as an area where material wastage can be reduced. The majority of waste can be due to poor housekeeping. Applying good housekeeping techniques by site operatives can help to reduce material losses and waste.

Demolition waste can often be reclaimed and reused for backfilling, cut and fill requirements; provided the materials are free from contamination.

Remaining materials that cannot be re-used/reclaimed will be removed from site as waste and recycled where possible. The demolition contractor will be actively involved in reducing the amount of waste that is sent to landfill.

Waste segregation should be considered. The materials that are to be segregated should be based on the volumes of waste that will be generated to efficiently recycle waste. Segregated waste skips will need to be clearly marked and located in accessible areas. If there is a shortage of space for multiple skips, a licenced waste management company will recover recyclable materials from mixed skips.

Consideration will be given to selecting a waste contractor with a high diversion rate of all waste that is processed from landfill.

4.6 Pollution

4.6.1 Air Quality

The UoR is served by an existing site wide district heating network powered from central gas fuel CHP plant. Waste heat is distributed around the site via a network of underground heating flow and return pipework to all the designated buildings.

Both the existing Energy Centre (EC) and the associated underground heating distribution pipework are in close proximity to the School of Art building. This presents an ideal opportunity to connect the new building to the DH network, powered by gas-fired Combined Heat and Power (CHP) engine and gas boilers.

It is therefore considered that the local emissions will not be increased significantly as the development will utilise the existing energy generating facilities.

In addition, there are plans in place by the UoR to decarbonise and convert the existing central heating plant to a ground coupled, water source heat pump system which is likely to take place within the next 10 years. This will mean that the local emissions will be reduced to zero when the existing plant is replaced by the new heat pump system.

Natural ventilation is proposed in the studio spaces, with openable windows and openable roof lights that are automatically operated. Indoor air quality will be controlled utilising CO₂ sensors, linked to the high-level windows. The strategy for the building is to remain naturally ventilated for the studio spaces. Where specialist equipment is required, local extract ventilation will be provided to maintain good level of air quality within the spaces.

4.6.2 Noise

A Noise Impact Assessment (NIA) has been carried out by RPS and NIA report has been produced. The report states that at this stage of the project details of the likely noise generating plant and equipment associated with the development are not available. Therefore, noise emission limits have been set for the proposed development based on Reading Borough Council requirements and the results of the noise survey.

A simple assessment of the impact of the existing noise climate on the proposed development has also been undertaken. It has been found that appropriate internal ambient noise levels are likely to be achieved using standard façade materials.

Assuming that the noise emission limits, based Reading Borough Council requirements, will be complied with, it is unlikely that that the proposed development will result in adverse effects at nearby noise sensitive receptors. It is therefore considered that, with, respect to noise, there is no reason why planning permission should not be granted for the development.

4.6.3 Lighting

High efficiency internal and external lighting will be used throughout the development in conjunction with a lighting control system incorporating daylight and presence detection as appropriate. This will ensure that lights are switched off when not required to minimise light pollution.

4.7 Health and Wellbeing

4.7.1 Daylighting

The design proposes maximise daylighting levels by adding windows in the existing part of the development and providing rooflights in the new part of the building.

Using north lights in the extension brings good quality day lighting in the studio spaces and views out, dimmable lights in the studio spaces also allow flexibility of use.

4.7.2 Sound Insulation

Sound insulation will be provided on separating walls and floors between spaces to high noise insulation requirements were possible.

4.8 Management

4.8.1 Construction Site Impacts

The Considerate Constructors Scheme is the national initiative set up by the construction industry to improve its image. Sites and companies that register with the scheme are monitored against five-point code of considerate practice, designed to encourage performance. The Code consists of the five sections; Enhancing the appearance, Respecting the community, Protecting the environment, Securing everyone's safety and Caring for the workforce.

The site is expected to be registered under the Considerate Constructors Scheme prior to the commencement of construction. It is anticipated that the development will target Beyond Best Practice standards which equates to a score of between 35 and 39 in accordance with the requirements of the CCS Code of Considerate Practice.

Overall, the scheme will ensure that the site's impacts on the environment, the workforce and the general public area minimised.

4.8.2 Security

An access control system will be operated on all entry doors. All fire escape doors will be inaccessible from the outside and only for use in an escape situation. The main entrance will be well lit to safe lighting levels. A full intruder alarm system will be fitted to the premises as part of the University's wider site security plan

The site has existing CCTV coverage across the site. New CCTV covering the main access zones will be added to the UoR monitoring system in accordance with the general site security plan.

The main entrance will be well lit to safe lighting levels. A full intruder alarm system will be fitted to the premises as part of the UoR site security plan.

4.9 Ecology and Biodiversity

An Ecological Appraisal Report for the site has been produced by EPR. The following opportunities for incorporating impact avoidance and mitigation measures into the scheme are listed below for delivering net biodiversity gains in accordance with National aspirations enshrined in the NPPF and 25 Year Environment Plan:

- Clearance of woody vegetation >1 m in height should be undertaken where possible outside the nesting bird season (March – August inclusive). Where this is not possible, a nesting bird check must precede any clearance. Should an active nest be found, an appropriate buffer is to be established and works here may only take place once the nest has become inactive of its own accord.;
- Lighting design with consideration to bats;
- Retention of existing log piles;

- Installation of 1 Hedgehog hibernation box within the southern woodland boundary within existing undergrowth;
- Installation of 2 bird nest boxes (such as Schwegler 1B and 2H Robin nest box, or similar approved) on suitable retained trees;
- Installation of 2 bat boxes (such as Schwegler 2F and 1FF bat boxes, (or similar approved) on existing Horse Chestnut *Aesculus hippocastanum* monoliths within the southern woodland); and
- Planting of native scrub and species of known benefit to wildlife, such as Hawthorn *Crataegus monogyna*, Small-leaved Lime *Tilia Cordata* and Hazel will be carried out in three distinct locations to the south / south-east of the site. Bulb planting will be incorporated below retained trees and the areas will be managed in parallel to existing habitats in and around the site, undertaken by Reading University Grounds Team.

With the proposed mitigation in place the ecological impacts of the proposals outlined in Appendix 1 are considered to have no significant effect on the important ecological features within the ZOI and the proposals will comply with applicable nature conservation related legislation and policy. Impacts to Species of Principal Importance for Nature Conservation (s41 species) are considered to be not significant.

With the proposed mitigation and enhancement measures listed above, the effects of the proposals on the ecology of the site are considered to be positive.

4.10 Transport

A Transport Statement have been prepared for the site by Curtins. The report shows that the site is highly accessible by a range of sustainable modes of travel. There is a good level of high-quality pedestrian and cycling infrastructure surrounding the site providing access to a range of key services and amenities. Likewise, there are numerous bus services and train services within proximity to the site. It is therefore considered that the site is accessible by public transport and active modes.

A holistic approach to cycle parking for staff, students and visitors is adopted across the campus. A total of 20 cycle parking spaces (8 existing and 12 proposed) are to be accessible on the western perimeter of the development adjacent to the main pedestrian entrance into the building.

It has been demonstrated that the proposed development would not generate any additional trips during the network peak hours and over the course of typical day due to the relocation of the existing Arts Centre building facilities.

The Transport Statement demonstrates that the proposed development at the site will not have a significant impact on the operation of the surrounding roads as there is high opportunity for non-car-based and active travel to and from the site. The site benefits from good accessibility to rail services and local bus services, in addition to seamless and connected walking and cycling links.

It is concluded that the proposed development is in accordance with the NPPF, which is in favour of sustainable development and advises that 'development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe'.

It is considered that the development's transport impacts cannot be regarded as severe in the context of the NPPF. Therefore, the local Highway Authority should be able to recommend approval of the planning application.

5 Summary and Conclusions

The sustainability approach has been developed to meet the targets and standards set by the relevant planning policies. The proposed development has incorporated a number of key sustainability measures and features which are summarised in Table 5.1

Table 5.1 Summary of proposed sustainability measures

Issue	Proposed Key Sustainability Measures
Energy	- Optimised design to enable controlled solar gain and improve direct and indirect natural lighting - Natural ventilation in most of the building areas - Highly efficient building fabric standards based on LETI specification - Highly efficient lighting and M&E services - Existing DH network powered by CHP and gas boiler to supply heating and hot water to most of the spaces. There are plans in place to decarbonise and convert the existing central heating plant to a ground coupled, water source heat pump within the next 10 years. - Provision of space cooling and heating to some of the rooms using (Direct Expansion Heat Pumps) DXHPs. - PV covering circa 70% of the roof to supply renewable electricity.
Water	- Water efficient fixtures and fittings to reduce water consumption. - A water meter on the mains water supply. - Water leak detection system is also proposed on the buildings mains water supply to reduce the risks of water leaks and ensure good water conservation.
Materials	- Material with low environmental impact will be used where possible. - Reused and recycled materials will be used where feasible. - Preference will be given to the use of local materials and suppliers where feasible.
Flood Risk and Surface Water Management	- The development is located within Flood Zone 1, and as such is at a low risk of flooding. - The development is a low risk of flooding from surface water, ground water, fluvial, sewer and reservoir flooding. - The design has been prepared so as to prevent on and offsite flooding for any storm event, up to and including a 1 in 100 year event, plus an allowance for the potential effects of climate change (+ 40%).
Waste	- The waste storage and recycling facilities will follow the UoR campus wide waste management strategy. This includes colour coded mixed recycling bins throughout the internal spaces. 50% capacity of external bins will be for recycling. In most cases 1100L wheeled external bins will be used. - Minimisation of waste on site through a variety of design and site measures.

Pollution	- Existing decentralised gas CHP and boiler energy plant will be used to minimise impact on air quality. The exiting plant will be replaced with a new heat pump system to reduce local emissions to zero. - Natural ventilation to be provided in the studio spaces, with openable windows and openable roof lights that are automatically operated. Indoor air quality will be controlled utilising CO₂ sensors, linked to the high-level windows. - Sustainable travel measures such as cycle storage, encouraging walking, use of public transport and cycling are proposed. - Noise nuisance will be minimised by providing improved façade design. - High efficiency internal and external lighting throughout the development in conjunction with a lighting control system incorporating daylight and presence detection as appropriate.
Health and Wellbeing	- Maximised daylighting levels via added windows in the existing part of the development and rooflights in the new part of the building. - Sound insulation on separating walls and floors between spaces to high noise insulation requirements were possible.
Management	- The site is expected to be registered under Considerate Constructors Scheme and will aim to meet beyond best practice standards. - Construction mitigation measures implemented throughout the duration of the construction period to minimise the potential impact of construction surrounding. - Access control system on all entry doors. all fire escape doors will be inaccessible from the outside and only for use in an escape situation. - The site has existing CCTV coverage across the site. New CCTV covering the main access zones to be provided and incorporated into the UoR general site security plan. - A full intruder alarm system will be fitted to the premises as part of the UoR site security plan.
Ecology and biodiversity	- The site provides negligible low value for foraging and commuting bats. - Lighting design with consideration to bats; - Retention of existing log piles; - Installation of 1 Hedgehog hibernation box within the southern woodland boundary within existing undergrowth; - Installation of 2 bird nest boxes (such as Schwegler 1B and 2H Robin nest box, or similar approved) on suitable retained trees; - Installation of 2 bat boxes (such as Schwegler 2F and 1FF bat boxes, (or similar approved) on existing Horse Chestnut Aesculus hippocastanum monoliths within the southern woodland); and - Planting of native scrub and species of known benefit to wildlife, such as Hawthorn Crataegus monogyna, Small-leaved Lime Tilia Cordata and Hazel will be carried out in three distinct locations to the south / south-east of the site. Bulb planting will be incorporated below retained trees and the areas will be managed in parallel to existing habitats in and around the site, undertaken by Reading University Grounds Team.

Transport	• A good level of high-quality pedestrian and cycling infrastructure surrounding the site provides access to a range of key services and amenities. • Numerous bus services and train services within proximity to the site. • The site is accessible by public transport and active modes. • A holistic approach to cycle parking for staff, students and visitors is adopted across the campus. A total of 20 cycle parking spaces (8 existing and 12 proposed) are proposed. • The proposed development would not generate any additional trips during the network peak hours and over the course of typical day due to the relocation of the existing Arts Centre building facilities. • Proposed development will not have a significant impact on the operation of the surrounding roads as there is high opportunity for non-car-based and active travel to and from the site. The site benefits from good accessibility to rail services and local bus services, in addition to seamless and connected walking and cycling links.
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This Sustainability Statement demonstrates that the proposed development is targeting good standards of design and build-quality. Much attention has been given to reducing the environmental impact throughout the lifetime of the development and not just during occupation.

The BREEAM pre-assessment demonstrates that School of Art can potentially achieve a BREEAM Very Good rating. It should be noted that this pre-assessment has been undertaken early in the design process and is therefore subject to change. It is also important to note that the threshold for BREEAM Very Good can be achieved by attaining other credits within the BREEAM scheme, and not achieving some of those allocated in the pre-assessment.

In conclusion, this report demonstrates that the proposed development can meet the sustainability planning policy requirements. The design team has carefully considered the site's potential environmental impacts, which will be managed and mitigated in line with the relevant planning policies.

Appendix A – BREEAM Pre-assessment



School of Art

BREEAM Pre-Assessment Summary Report

Pre-assessment

Uncontrolled revision

23 Mar 2022

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1.0 Introduction

This report is intended as a summary of the BREEAM pre-assessment review for the following project:

Project Name	School of Art
BREEAM Version	BREEAM 2014 NC + RFO Combined Bespoke
Assessment Stage	Pre-Assessment Stage
Lead Assessor	Sergey Barekryan
Target Rating	Very Good (55%)
Downloaded By	Sergey Barekryan
Download Date	23/03/22
Download Time	16:08:56 (GMT)

Please note that this is an uncontrolled copy and is for information only and a more detailed, formal pre-assessment report may be issued by your appointed assessor. If you have any queries on the content of this report or the award of any of the credits please contact your licensed assessor as noted above.

2.0 Scoring scenarios

It should be noted that the pre-assessment scores have been based on the following scoring scenarios;

- Current - The number currently achieved.
- Potential - Additional credits which could be achieved.
- - .

On this basis, the following scores are considered achievable under each scenario;

Scenario	Score	BREEAM Rating
Current	62.39	Very Good
Potential	64.34	Very Good

2.1 Minimum Standards

In addition performance against the minimum standards (required for the specified target rating) under each scenario is summarised below;

Issue	Current	Potential
Man 03 - Responsible construction practices	✓	✓
Man 04 - Commissioning and handover	✓	✓
Man 05 - Aftercare	✓	✓
Ene 01 - Reduction of energy use and carbon emissions	✓	✓
Ene 02 - Energy Monitoring	✓	✓
Wat 01 - Water Consumption	✓	✓
Wat 02 - Water Monitoring	✓	✓
Mat 03 - Responsible Sourcing of Materials	✓	✓
Wst 01 - Construction Waste Management	✓	✓
Wst 03 - Operational Waste	✓	✓

If the required minimum standards are not met then the target rating will not be achieved regardless of overall score.

3.0 - Credits and Comments Table

		Available	Current	Potential	Comments
Management					
Man 01	Project brief and design	4	2	2	
Man 02	Life cycle cost and service life planning	4	1	1	
Man 03	Responsible construction practices	6 (+1)	6	6	
Man 04	Commissioning and handover	4	4	4	
Man 05	Aftercare	3 (+1)	2	2	
Management Totals: (+exemplary)		21 (+2)	15	15	
Management score totals:		13.53	9.66	9.66	
Health & Wellbeing					
Hea 01	Visual Comfort	7 (+1)	4	4	
Hea 02	Indoor Air Quality	5 (+2)	4	4	
Hea 04	Thermal comfort	3	2	2	
Hea 05	Acoustic Performance	3	3	3	
Hea 06	Safety and Security	1	0	0	
Health & Wellbeing Totals: (+exemplary)		19 (+3)	13	13	
Health & Wellbeing score totals:		14.6	9.99	9.99	
Energy					
Ene 01	Reduction of energy use and carbon emissions	13.5 (+5)	8	10	
Ene 02	Energy Monitoring	2	2	2	
Ene 03	External Lighting	1	1	1	
Ene 04	Low carbon design	3	2	3	
Ene 08	Energy Efficient Equipment	2	2	2	
Energy Totals: (+exemplary)		21.5 (+5)	15	18	
Energy score totals:		13.95	9.73	11.68	
Transport					
Tra 01	Public Transport Accessibility	3	3	3	
Tra 02	Proximity to amenities	1	1	1	
Tra 03	Cyclist facilities	2	2	2	
Tra 04	Maximum Car Parking Capacity	2	0	0	
Tra 05	Travel Plan	1	1	1	
Transport Totals: (+exemplary)		9	7	7	
Transport score totals:		6.76	5.26	5.26	

Water					
Wat 01	Water Consumption	5 (+1)	3	3	
Wat 02	Water Monitoring	1	1	1	
Wat 03	Leak Detection	2	2	2	
Wat 04	Water Efficient Equipment	1	1	1	
Water Totals: (+exemplary)		9 (+1)	7	7	
Water score totals:		6.76	5.26	5.26	
Materials					
Mat 01	Life Cycle Impacts	6 (+1)	0	0	
Mat 03	Responsible Sourcing of Materials	4 (+1)	2	2	
Mat 04	Insulation	1	1	1	
Mat 05	Designing for durability and resilience	1	1	1	
Mat 06	Material efficiency	1	0	0	
Materials Totals: (+exemplary)		13 (+2)	4	4	
Materials score totals:		14.09	4.34	4.34	
Waste					
Wst 01	Construction Waste Management	7 (+1)	2	2	
Wst 02	Recycled Aggregates	1 (+1)	0	0	
Wst 03	Operational Waste	1	1	1	
Wst 05	Adaptation to climate change	1 (+1)	0	0	
Wst 06	Functional adaptability	1	0	0	
Waste Totals: (+exemplary)		11 (+3)	3	3	
Waste score totals:		7.75	2.11	2.11	
Land Use & Ecology					
LE 02	Protection of Ecological Features	1	1	1	
LE 04	Enhancing site ecology	1	1	1	
LE 05	Long Term Impact on Biodiversity	2	0	0	
Land Use & Ecology Totals: (+exemplary)		4	2	2	
Land Use & Ecology score totals:		11.27	5.64	5.64	
Pollution					
Pol 01	Impact of Refrigerants	3	2	2	
Pol 02	NOx emissions	3	3	3	
Pol 03	Surface Water Run Off	5 (+1)	5	5	
Pol 04	Reduction of Night Time Light Pollution	1	1	1	

Pol 05	Noise Attenuation	1	1	1	
Pollution Totals: (+exemplary)		13 (+1)	12	12	
Pollution score totals:		11.27	10.4	10.4	
Innovation					
AI	Approved Innovation	1	0	0	
Innovation Totals: (+exemplary)		1	0	0	
Innovation score totals:		1	0	0	
OVERALL SCORE TOTALS:		100.98	62.39	64.34	