

Planning Report

Sustainability Statement

The Abbey Senior School

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Assessment information

Prepared by:
Joanna Peacock

Quality assured by:
Chris Hocknell

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Executive Summary

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Executive summary

The project consists of an extension and addition of a new storey to the existing Abbey School in Reading. The total gross internal floor area of the proposed scheme is approximately 3,100m². The project is also targeting a BREEAM 2018 Very Good rating with a score of 58%, refer to the BREEAM pre-assessment report date 11th Dec 2019.

This Sustainability Statement will be provided as evidence to Reading Council to demonstrate the development's holistic approach to sustainable design and construction ensuring that all items within Table A1.2: Sustainable design checklist for non-residential development have been addressed. It summarises the contribution that the design will make to creating a more sustainable development, drawing on information provided by specialist consultants and design reports, and identifying key features intrinsic to achieving low carbon developments. In summary the proposed development will achieve the following sustainable design and construction criteria:

- Reduce total carbon dioxide (CO₂) emissions by 36.9% over Building Regulations Part L (using SAP 2012 emission factors).
- Reduce energy consumption by targeting high insulation and thermal bridging standards, air permeability and highly efficient lighting.
- Mechanically ventilate all areas with heat recovery with a specific fan power of 1.4W/(l/s), and heat recovery with an efficiency of 80%.
- Install a photovoltaic panel system of 13.2 kWp.
- Minimise embodied carbon through efficient design, procurement of materials from a local source, or with a high-recycled content.
- Ensure that materials are responsibly sourced and of low environmental impact.
- Promote sustainable transport by the use of public transport and provision of safe cycle storage.
- Incorporate health and wellbeing measures through design and operational procedures, including daylight, optimum indoor air quality and thermal comfort.
- Protect and enhance the ecological value of the site.
- Follow best practice policies in terms of air, water and ground pollution during construction, manage and minimise construction waste and follow the principles of the Considerate Constructors Scheme.

Key sustainability measures

In summary, the key measures incorporated to result in a sustainable development address the following key areas of sustainable design and construction:

- Energy and CO₂
 - Adaptation to climate change
 - Waste
 - Water Efficiency
 - Transport and connectivity
 - Materials
 - Health and wellbeing
 - Land use and ecology
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Introduction

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Sustainability introduction

The design team has significant experience in delivering schemes that are considered highly sustainable, either through application of formal green building rating systems, such as the Building Research Establishment Environmental Assessment Method (BREEAM) and Home Quality Mark (HQM) as well as applying benchmarks from standards such as Passivhaus Design, and adopting precedents from industry exemplar sustainable developments.

The scheme will reflect the holistic nature of sustainable development to Reading Council and ensure that all items in Table A1.2: Sustainable design checklist for non-residential development have been addressed. The project will also be targeting a BREEAM 2018 Very Good rating with a proposed score of 58%.

Description of development

The proposed development relates to the extension of the existing Abbey Senior School. The project consists of an extension and addition of a new storey to the existing Abbey School in Reading. The total gross internal floor area of the proposed scheme is approximately 3,100m².

The aspiration for the scheme is to significantly improve the existing site and its immediate environment by providing an efficient and inclusive development, which meets the policy recommendations of Reading Council.

Policy Context

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National context: The 2008 Climate Change Act

The UK Government is committed to reducing the UK's carbon emissions by 80% over 1990 levels through the Climate Change Act 2008. Achieving truly sustainable design and construction and forwarding the green agenda within the construction industry across the UK is inherent to meeting these emission targets. This development aims to do both of these.

To help monitor carbon reductions and to plot progress being made for future plans and investments in the UK's low-carbon economy, intermediary targets have been established to ensure that the UK remains on course for meeting the 80% reduction by 2050.

Concurrent with reducing CO₂ emissions by 80% by 2050 is the European Climate Change Policy targets. It sets the objective of ensuring 20% of energy consumption is generated from renewable sources by 2020 whilst also reducing Europe's carbon footprint by 20%. Ensuring a fabric first approach with consideration to renewable energy production fits both the climate change act and the European Commission's 2020 targets for reducing greenhouse gas (GHG) emissions.

Local context: The Reading Borough Local Plan (Nov 2019)

A new Reading Borough Local Plan was adopted on 4th November 2019 which sets out the planning policies for development in Reading up to 2036, and is the main consideration in deciding planning applications. The design development of this project at The Abbey Senior School has adhered to the following relevant policies:

- CC1: Presumption in favour of sustainable development.
- CC2: Sustainable design and construction.
- CC3: Adaptation to climate change.
- CC5: Waste minimisation and storage.
- EN18: Flooding and sustainable drainage systems.

Draft Sustainable Design and Construction Supplementary Planning Document

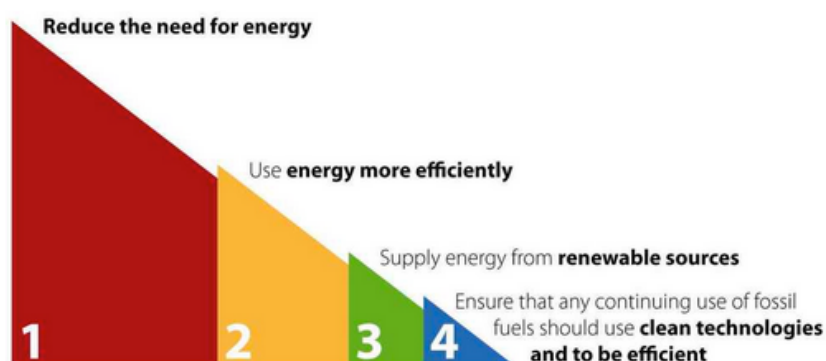
Reading has set out its commitment to become a zero carbon city by 2050. It also needs to consider carefully how it adapts to a changing climate, the impact that its built space has on its own natural resources and habitats as well as pollution of its ground, water and air. This SPD therefore explains planning requirements with regard to energy, climate change, water management and waste reduction. It is intended to supplement the policies of the Local Plan, particularly the policies mentioned above. Additionally, all questions in Table A1.2: Sustainable design checklist for non-residential development must be addressed, this report covers all of these aspects.

Energy and CO₂ Sustainability Statement The Abbey Senior School

Energy strategy

The Energy Assessment report, issued in December 2019 by Eight Associates, summarises the energy strategy for The Abbey Senior School scheme. The overall development will reduce total CO₂ emissions by 36.9% over Building Regulations Part L.

The energy hierarchy



The energy hierarchy, widely used in accordance with meeting the Sustainable Design and Construction Supplementary Planning Guidance (SPG), has been adopted for the scheme using a 'Lean', 'Clean', and Green' approach in addressing the Borough of Reading policy. A summary of the savings in carbon emissions are shown below:

GLA's Energy Hierarchy – Regulated Carbon Emissions
Calculated using SAP 2012 CO₂ emission factors

	Baseline:	Be Lean:	Be Clean:	Be Green:
CO ₂ emissions (Tonnes CO ₂ /yr)	66.74	47.10	–	42.08
CO ₂ emissions saving (Tonnes CO ₂ /yr)	–	19.65	–	5.01
Saving from each stage (%)	–	29.40	–	7.50
Total CO ₂ emissions saving (Tonnes CO ₂ /yr)		24.66		

36.9% of total CO₂ savings over Part L of the Building Regulations 2013 achieved (SAP 2012 CO₂ emission factors).

Energy and CO₂ Sustainability Statement The Abbey Senior School

Energy efficiency strategies

Energy efficiency measures that will be applied to The Abbey Senior School scheme include:

- Reduce total carbon dioxide (CO₂) emissions by 36.9% over Building Regulations Part L (using SAP 2012 emission factors).
- Energy consumption will be reduced by targeting high insulation and thermal bridging standards, air permeability and highly efficient lighting.
- All areas to be mechanically ventilated with a combined supply and extract SFP 1.4W/(l/s), and heat recovery with an efficiency of 80%.
- A photovoltaic panel system of 13.2 kWp has been specified.
- High efficacy lighting has been specified with a minimum efficacy of 110lm/W.

Thermal comfort and overheating risk

To minimise energy loss, the building fabric performance will be designed to achieve a balance between retaining heat during winter and allowing the building to dissipate heat during the summer months. Further measures to reduce overheating and the need for cooling include:

- Energy efficient design to minimise internal heat generation. Energy efficient appliances and lighting will be specified.
- Direct solar gains will be controlled through specifying appropriate location, size and type of windows. A g-value of 0.30 is specified.
- Reduced air permeability rate and maximised insulation levels.
- Natural ventilation through opening windows will be used as a passive cooling measure, alongside mechanical ventilation.

Commissioning and Handover

A member of the design team will be appointed to monitor commissioning in line with best practice (CIBSE, BSRIA and Current Building Regulations), and a specialist commissioning agent will be appointed at the design stage appointed for any complex systems.

The production of a technical manual and a non-technical building user guide in line with the BREEAM requirements is planned. In addition, a training schedule will be prepared for building occupiers / facilities managers to aid handover.

Management Sustainability Statement The Abbey Senior School

Design for Disassembly and Adaptability

An analysis of disassembly and adaptability of the design was undertaken with the design team in November 2019. A report was written summarising the key features of adaptability and future-proofing that could be implemented within the development. All recommendations outlined within this report will be implemented within the development, where feasible, to demonstrate that the building will allow for the following:

- Expandability: The potential for the building to be extended, horizontally or vertically.
- Refurbishment potential: The potential for major refurbishment, including replacing the façade.
- Versatility: The degree of adaptability of the internal environment to accommodate changes in working practices.
- Adaptability: The potential of the building ventilation strategy to adapt to future building occupant needs and climatic scenarios.
- Convertibility: The degree of adaptability of the internal physical space and external shell to accommodate changes in-use.
- Feasibility: The likelihood to contain multiple or alternative building uses, area functions and different tenancies over the expected life cycle.
- Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building, and accessibility to local services, such as local power, data infrastructure.

Crime Prevention

Creating a secure but fully accessible development is a key part of the proposed development. The proposed site layout will provide all potential users, regardless of ability, to enter and move within and through the site.

Maintenance of the Building

Sustainable maintenance involves the reduction of unnecessary maintenance. However a robust maintenance plan with clear responsibilities will be created to ensure the new space is kept clean and systems working optimally.

Adaptation to Climate Change

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Climate-resilient design

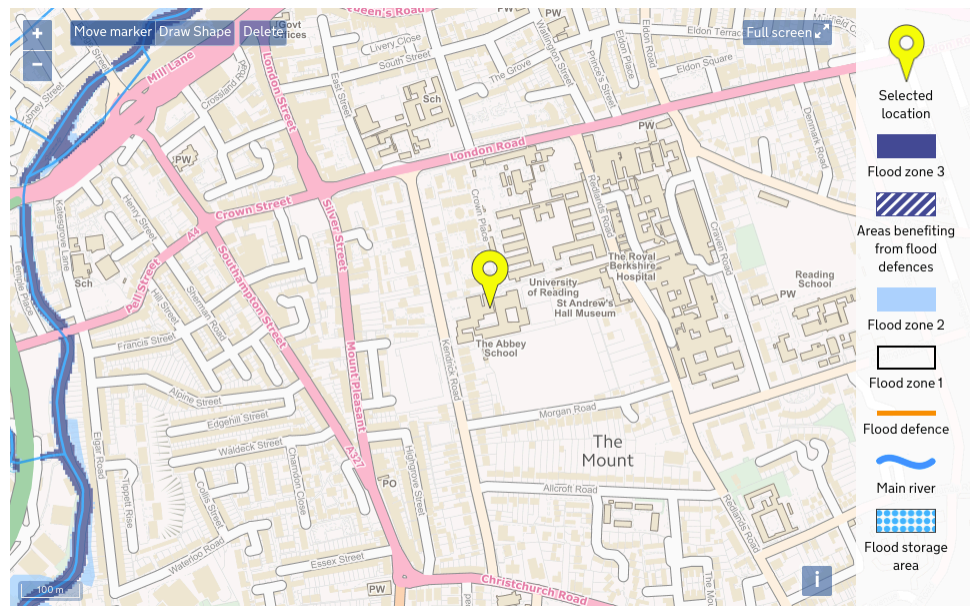
The proposed development will mitigate its climate change impact by reducing CO₂ emissions through energy efficiency strategies and solar PV panel system.

Further mitigation measures to reduce the risk posed by climate change hazards include:

- Thermal comfort modelling carried out for the building, including a projected climate change scenario.
- Ensuring new terrace features of the external envelope and roof provide passive shading.
- High building fabric performance and lighter coloured materials to be utilised within the design.
- Green infrastructure (trees and brown roof) to be utilised on site to encourage evapotranspiration.
- The Flood Risk Assessment recommendations and drainage design are to be implemented within the development, utilising SuDS measures where feasible.
- Maintenance plans to be produced and implemented to ensure building fabric is maintained appropriately during high temperatures.

Flood risk

The Abbey Senior School site is located within Flood Zone 1 of the Environment Agency's Flood Map for Planning (map shown below). This is defined as an area with little or no risk to flooding where the annual probability of river, tidal and coastal flooding (with defences where they exist) is <0.1% i.e. less than 1 in 1,000 years. There are no watercourses located within close proximity of the site.



Waste

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Pre-demolition Audit

The design team will complete a pre-demolition audit of any existing buildings or hard surfaces being considered for demolition. This will be used to determine whether reuse of materials is feasible.

Construction waste management

Resource efficiency will be promoted through effective and appropriate management of demolition and construction site waste.

In line with the waste hierarchy, during the construction phase, the approach will be the following:

- Use reclaimed materials;
- Use materials with higher levels of recycled content; and
- Use new materials.

For any demolition, the following approach will be adopted:

- Prioritise the on-site reuse of demolition materials;
- Adopt on site recycling and, where required, use off site recycling; and
- The least preferred option – disposal to landfill.

A BREEAM compliant Site Waste Management Plan will be produced and will ensure that non-hazardous waste generated by the building's design and construction (excluding demolition and excavation waste) is less than 13.3m³ (or 11.1 tonnes) per 100m² of gross internal floor area.

It is currently foreseen that at least 70% by volume (80% by weight) of non-hazardous waste generated by the project will be diverted from landfill, and 80% by volume (90% by weight) of demolition waste will be diverted from landfill.

The site waste management plan will also include procedures and commitments to sort and divert waste from landfill through the following:

- Re-use on site;
- Salvage/reclaim for re-use off-site;
- Return to supplier via a 'take-back' scheme;
- Recovery and recycling using an approved waste management contractor; and

Compost.

Operational waste

Dedicated external waste storage and recycling facilities are proposed to encourage recycling. The storage space will provide inclusive access and usability.

Construction Management Sustainability Statement The Abbey Senior School

Construction environmental management

Environmental impacts of the construction works will be mitigated as far as possible. This will include the incorporation of the following:

- The principal contractor will develop and implement a construction environmental management plan (CEMP), specific to the site.
 - The principal contractor will operate an Environmental Management System, certified under ISO14001.
 - Training and site induction of all site operatives.
 - Monitoring of energy, water and transport to and from site during construction.
 - Management of waste on site.
 - Following best practice pollution guidance from the Environment Agency.
 - Ensuring all site timber is responsibly sourced in line with the UK Government's Timber Procurement Policy.
 - Vehicle emissions would be minimised through the use of catalytic converters and the regular maintenance of vehicle engines.
 - Damping down of brick walls etc. during any building demolition.
 - Regularly inspecting and wet suppressing materials / soil stockpiles where necessary (including wind shielding or completely enclosing, storing away from site boundaries, and restricted height of stockpiles).
 - Appropriate orientating of material stockpiles.
 - Providing wheel washing and wet suppressing during the loading of wagons vehicles.
 - Covering vehicles carrying dry soil and other wastes.
 - Shielding of dust-generating construction activities.
 - Providing suitable site hoarding.
 - Restricting vehicle speeds on haul roads and other unsurfaced areas of the site.
 - Inspecting unsurfaced haulage routes, and wet suppressing should this be necessary (in times of prolonged dry periods).
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Water Efficiency

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Water conservation

The development proposals recognise the need to create a scheme that uses water efficiently and is adaptable to potential heightened water scarcity in a future climate scenario.

The design team is committed to achieve a 25% reduction in water use over a notional building for the project.

Water consumption will be reduced through the use of water efficient components for all specified regulated water-consuming components (including low-flow taps, dual flush toilets).

The design team has confirmed a major leak detection system on the mains water supply within the building and between the building and the utilities water meter will be provided.

The system will comply with the following:

- Permanent and automated.
 - Activated when the flow of water is at a flow rate above a pre-set maximum for a pre-set period of time.
 - Able to identify different flow and leakage rates.
 - Programmable to suit the owner/occupiers' water consumption criteria.
 - Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.
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Transport and Connectivity Sustainability Statement

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Public transport

The closest bus stops to The Abbey School are located along Kendrick Road , to the south of the main school entrance and offer four different bus line services in both directions. These stops are approximately 74m from the development site, and a further stop is located approximately 110m north of the site. A further bus stops is situated within approximately 230m from the site.

Reading rail station is located approximately 1.4km to the north-north-west of the site. This station is on the Great Western main line and benefits from regular services between London and Bristol.

The overall accessibility of the site for public transport is deemed to be moderate.

Cyclist facilities

It has been confirmed that 47 covered cycle spaces will be provided to the building users of this project.

Materials

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Materials and waste introduction

Sustainable material sourcing and waste management will be considered throughout the life of the building to ensure the scheme's environmental footprint is minimised as far as possible. The scheme will also ensure low embodied carbon throughout the procurement, transport and construction of building materials, together with end of life emissions.

Materials selection and sourcing

The design team has confirmed that efforts will be made to reuse materials where feasible, and that where required, new materials will be responsibly sourced. New construction materials will be selected, where feasible, with a low environmental impact. In addition, the project will aim for new materials to come from a recycled or reused source, including a high-recycled content in steel. Minimum standards apply to new timber, which must be sourced in accordance with the UK Government's Timber Procurement Policy.

In addition, all timber will be FSC / PEFC certified, all concrete will be BES 6001 certified and any other material will be ISO 14001 certified for both key processes and supply chain / extraction processes, where feasible to do so.

The Green Guide for Specification is a reference tool, providing guidance on the relative environmental impacts for a range of different building elemental specifications, based on Life Cycle Assessment and the Environmental Profile Methodology. The design team will reference the Green Guide to Specification to help specify materials with a low environmental impact, where feasible.

Insulation specifications will eliminate hydrochlorofluorocarbons (HCFCs) and ozone depleting materials, wherever possible. All insulation specified will have a Global Warming Potential (GWP) of less than 5, and be responsibly sourced to have a low embodied impact.

Embodied carbon analysis

The development will utilise a number of opportunities to reduce embodied carbon, as follows:

- The development will retain the existing elements of the building where feasible.
 - A materials efficiency strategy will be followed throughout the design, procurement and construction stages of the development, to ensure the scheme produces less waste on site. For example, adjustment of some sizes will be made to minimise offcuts of materials, and some bespoke materials will be developed off-site.
 - Materials will be procured from the local area where possible, to reduce carbon through transportation.
 - Materials and products with a higher recycled content will preferentially be procured where feasible, as these have a low embodied carbon.
 - Consideration has been made to use timber as a low embodied carbon alternative to steel and concrete where possible.
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Health and Wellbeing Sustainability Statement The Abbey Senior School

Occupant wellbeing

The development has been designed to ensure the wellbeing of occupants in terms of levels of fresh air, thermal comfort and reduction of overheating, access to natural light, good lighting levels internally and externally, acoustic performance and access to safe drinking water.

The building services strategy has been carefully considered in order to balance the need for energy-smart, low carbon technologies with the need for adequate and controllable ventilation, heating and cooling.

Air quality

The Reading Borough Council has declared an Air Quality Management Area (AQMA) for exceedances of the National Air Quality Objectives (NAQOs) for NO₂. This area spans a significant part of the area however The Abbey Senior School lies just outside the designated region.

As the scheme is a minor development and is not in the AQMA, an Air Quality Assessment is not required for the planning application. Nevertheless, the impact of the development on local air quality has been addressed as follows:

- Building emissions – localised NO_x emissions minimised by reducing energy consumption and specifying boilers that are ‘ultra-low NO_x’ (NO_x Class 6), with a maximum emissions rate of 40 mgNO_x/kWh.
- Transport emissions – cycling will be promoted by the provision of suitable cycle storage spaces.

In addition, the design team will take measures to ensure that internal air quality is optimised by reducing internal sources of pollution. The team will specify only low volatile organic compounds (VOC) finishing products, including sealants and paints. All composite wood products will contain no added urea formaldehyde.

Daylight

The design has been developed to allow the use of daylight within the space to be maximised as far as practical. Rooflights, as well as windows, are provided to maximise internal daylighting.

Light pollution

To minimise light pollution to the neighbours and wildlife the building’s external lighting will be designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011. All external lighting will have the capacity to be switched off automatically between 11pm and 7am.

Land Use and Ecology Sustainability Statement The Abbey Senior School

Ecological Assessment

Eight Associates was appointed to carry out a desktop study, Phase 1 habitat survey, protected species risk assessment, bat building and tree assessment and BREEAM ecology assessment in November 2019.

This report details an analysis of records from the local wildlife records centre, the existing ecology of the site, its potential for relevant protected species and how the development will enhance the ecological value of the surrounding area. It also outlines the legislation for these protected species, reviews Reading Borough Council biodiversity policy the likely BREEAM credits to be achieved against the BREEAM Land Use and Ecology 2018 criteria LE 02–LE 05, under the BREEAM UK New Construction 2018 scheme.

Enhancement of ecology

To ensure the proposed development improves the current ecological value of the site, the proposals should include a number of ecological enhancements. This is to ensure the ecological value found on the existing site is mitigated against, and the development contributes to the greening of the borough and an increase in biodiversity, whilst contributing to the requirements set out in Reading Borough Council local biodiversity policies.

Recommendations include:

- Incorporation of a Biodiverse Green Roof
- Installation of at least three bird nesting boxes on the site
- Installation of at least two bat boxes on the site
- External lighting in line with BCT guidelines
- Incorporation of native or fruiting and flowering plant species
- Incorporation of a stag beetle loggery/reptile habitat feature
- Hedgehog corridors.

In line with the current proposed plans for the development, an extensive biodiverse roof with an area of 492m² is installed. A light weight pre-grown 'wildflower blanket' will be installed over a substrate base with a depth of around 80mm, with a species diversity of over 20 species.

The installation of this green roof is in line with Reading's biodiversity policy and its aims to increase the amount of green infrastructure across the borough. The green roof will attract a diversity of invertebrates, and other fauna such as foraging bat and bird species, would be attracted to a roof featuring an abundance of wildflowers.

Land Use and Ecology Sustainability Statement The Abbey Senior School

Protection of biodiversity

The proposed development will promote the protection of any existing ecological features from damage during site demolition and the completion of the construction works. The design team is committed to protecting biodiversity on site and will implement the following measures:

- Confirm that all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with during the design and construction process.
- Ensure that any affected trees and shrubs are cleared out of bird breeding season (March–August). Alternatively, a suitably qualified ecologist should check for the presence of active nests prior to the commencement of works.
- Implement bat and bird protection in line with best practice.
- Implement working methods in line with best practice to manage dust and water run-off.
- During the construction phase a Biodiversity Champion will be appointed to monitor and limit environmentally detrimental activities. They will also train the workforce on the project to raise their awareness of environmental impacts during construction.

Arboriculture

A Tree Survey, Arboricultural Implication Assessment, Tree Constraints Plan and a draft Tree Protection Plan was produced by Eight Associates and Writtle Forest Consultancy in December 2019.

The following summarises the findings and recommendations:

- The four Scots Pine trees, T1, T2, T3 and T4 would be lost as a result of the proposed development. Three of these trees are moderate value 'B' Category trees and one a low value 'C' Category specimen.
 - It is proposed to plant four new trees set within planted area in the arrival space on the southern boundary of the site. The area to receive the new planting is located within the footprint of the existing sports courts and is indicated on the draft TPP.
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Conclusion

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Conclusion

This Sustainability Statement has responded to Reading Borough Council's local planning policy requirements. In summary the proposed development will achieve the following sustainable design and construction criteria:

- Reduce total carbon dioxide (CO₂) emissions by 36.9% over Building Regulations Part L (using SAP 2012 emission factors).
 - Energy consumption will be reduced by targeting high insulation and thermal bridging standards, air permeability and highly efficient lighting.
 - All areas to be mechanically ventilated with a combined supply and extract SFP 1.4W/(l/s) respectively, and heat recovery with an efficiency of 80%.
 - A photovoltaic panel system of 13.2 kWp has been specified for the residential part of the development.
 - Minimise embodied carbon through efficient design, procurement of materials from a local source, or with a high-recycled content.
 - Ensure that materials are responsibly sourced and of low environmental impact.
 - Sustainable transport will be promoted by the use of public transport and provision of safe cycle storage.
 - Incorporate health and wellbeing measures through design and operational procedures, including daylight, optimum indoor air quality and thermal comfort.
 - Protect and enhance the ecological value of the site.
 - Follow best practice policies in terms of air, water and ground pollution during construction, manage and minimise construction waste and follow the principles of the Considerate Constructors Scheme.
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