



S U S T A I N A B I L I T Y S T A T E M E N T

Hexham Road

Version 2

Contents

Version Control	2
1 Introduction.....	3
1.1 Document purpose	3
1.2 Proposed development.....	3
1.3 Existing site	3
1.4 Pre-Application Advice	3
2 Planning Policy	5
2.1 National Planning Policy Framework (NPPF).....	5
2.2 Local Plan	5
3 Passivhaus	6
4 Planning Policy Compliance	8
4.1 Energy efficiency and carbon emissions of the building	10
4.2 Water efficiency	10
4.3 Flood risk and drainage strategy	10
4.4 Community impacts	11
4.5 Transport.....	11
4.6 Health and wellbeing including day-lighting analysis and thermal comfort	12
4.7 Material usage, wastage, responsible sourcing and environmental impact, including embodied carbon.....	12
4.8 Pollution issues, low NOx, low global warming potential (GWP), reducing need for mechanical cooling	12
4.9 Ecological aspects to enhance the proposed developments for flora and fauna	13
4.10 Best practice management of the site.....	13
5 Summary	14
6 Conclusion	15

Version Control

Revision	Author	Date	Reviewer	Date
V1	Meena Bhogal Sustainability Assistant	6 February 2023	N/A	
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1 Introduction

1.1 Document purpose

This Sustainability Statement sets out the sustainable design and construction measures included in the planning application for a day centre providing social care services (Use Class E(f)) and specialist housing (Use Class C3) with landscaping, car parking and access at 2 Hexham Road, Reading.

The purpose of this Sustainability Statement is to demonstrate that the proposed development is considered sustainable, as measured against all relevant local and national planning policy.

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.

The following technical reports should be read in conjunction with this statement:

- Passivhaus report
- Energy statement
- Flood risk assessment and drainage strategy report
- Landscape statement
- Ecology report
- Transport statement
- Air quality statement
- Noise assessment

1.2 Proposed development

Address: 2 Hexham Road, Reading

Application description: Full planning application for a day centre providing social care services (Use Class E(f)) and specialist housing (Use Class C3) with landscaping, car parking and access.

1.3 Existing site

The existing building (The Willows Care Home) has been demolished. Thirty trees remain on the site which are primarily of moderate quality in terms of arboricultural value and condition.

The site is within an area of low risk of flooding, Flood Zone 1.

Consideration of the residential amenity in the pre-application stage was a deciding factor in the location, orientation, form, and massing of the buildings on the site. This has impacted the performance of some of the buildings in terms of energy efficiency.

There are multiple bus, pedestrian and cycling routes and the development includes cycle storage facilities, mobility scooter storage facilities, e-bike charging spaces, and electric vehicle charging points to facilitate sustainable transport movements for staff and visitors to and from the site.

1.4 Pre-Application Advice

Pre-application advice has been sought for the scheme (Enquiry Reference:201753, 28 October 2021). The response made the following comments in relation to energy and sustainability:

Sustainability & Energy

In accordance with Policy H5 (Standards for New Housing) the proposed 36 x C3 use class sheltered accommodation flats are required to be designed to achieve zero carbon homes standards (or if unachievable, a minimum 35% improvement in the dwelling emission rate over the target emission rate, as defined in the 2013 Building Regulations and a financial contribution to offset remaining carbon emissions to zero to be secured by way of section 106 legal agreement). The Council's Sustainable Design and Construction SPD provides information as to the level and nature of information required at application stage and the process to follow in relation to this. I understand that the pre-application proposals would adopt a 'Passivhaus' approach to achieving the zero-carbon standard. Policy H5 also requires that all new building housing is built to the higher water efficiency standard under Regulation 36(3) of Building Regulations and this should also be demonstrated as part of a sustainability statement.

In terms of sustainability standard requirements, the rest of the proposed development (D1 use class day centre and C2 use class respite care units) would be required to achieve a BREEAM standard of Excellent in accordance with Policy CC2 (Sustainable Design and Construction).

As part of the pre-application process, you have explained difficulties in the compatibility of the above two standards within a single building and that your preference is to design the whole development in line with the Council's zero carbon homes standards using the Passivhaus approach. Officers do not object to this approach given the majority of the development consists of C3 dwellings for which zero carbon standards is the correct approach as per the adopted policies and are satisfied that this would achieve a good standard of sustainability for the development as a whole. A design stage SAP report should be provided as part of a planning application to demonstrate the development's projected carbon saving in above the 2013 building regulations requirement. A comparative assessment of the Passivhaus approach relative to the BREEAM standard should be provided as part of any future application to set out any benefits or shortfalls of this approach. As set out above, any shortfall in achieving the zero-carbon standard would need to be off-set by way of a financial contribution to be secured by way of a unilateral undertaking legal agreement.

An energy statement would also be required to be submitted (in accordance with Policy CC4 – Decentralised Energy). Any development of more than 20 dwellings is required to consider the inclusion of decentralised energy provision. This will be expected within the site itself, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision. There is also an expectation in developments of over 10 dwellings to link into an existing district energy network, where one is present within the vicinity of an application site or demonstrate why this is not feasible. Please see chapter 8 of the SPD for more information.

As referred to in the Transport section of this letter under Policy TR5 (Car and Cycle Parking and Electric Vehicle Charging) 10% of vehicle parking spaces within the development should be provided with electric vehicle charging points and associated infrastructure.

In accordance with Policy EN18 (Flooding and Sustainable Drainage Systems) any development of the nature proposed is required to incorporate a Sustainable Drainage Systems (SuDS). 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, incorporate tree planting and landscaping and avoid damage to existing significant trees, including through changes to the site hydrology.

2 Planning Policy

2.1 National Planning Policy Framework (NPPF)

The latest NPPF was updated in July 2021 and sets out the Government's planning policies for England.

The NPPF provides a framework for achieving sustainable development, which has been summarised as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Resolution 42/187 of the United National General Assembly). At the heart of the framework is a presumption in favour of sustainable development.

The document states that the planning system has three overarching objectives which are interdependent and need to be pursued in mutually supportive ways:

- a) An economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- b) An economic objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- c) An environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

2.2 Local Plan

The Reading Borough Local Plan was adopted in November 2019. The following planning policies and supplementary planning document are relevant to the project in terms of sustainability:

- CC2: Sustainable Design and Construction
- CC3: Adaptation to Climate Change
- CC4: Decentralised Energy
- CC5: Waste Minimisation and Storage
- EN18: Flooding and Drainage
- H5: Housing Standards
- EN12: Biodiversity and the green network
- TR5: car and cycle parking and electric vehicle charging
- Sustainable-Design-and-Construction-SPD-Adopted-December-19

3 Passivhaus

The redevelopment been extensively modelled in Passivhaus Planning Package (PHPP) and tested against the Passivhaus Classic and Passivhaus Low Energy Building Standard.

The key design elements of a Passivhaus are:

- High levels of insulation
- Minimal thermal bridges
- High levels of air tightness
- Mechanical ventilation with heat recovery (MVHR)
- Protection from overheating risk.

These elements provide the following benefits:

- Lower space heating bills
- Good internal air quality and a healthy internal environment
- Comfortable internal temperatures all year
- Protection against fuel poverty and cold homes
- Meeting zero carbon targets
- Reduce the requirements for renewable energy
- Durable homes with longer lasting components

The key targets for meeting the Passivhaus Classic standard are detailed in table 1, below.

Table 1. Summary of the Passivhaus Classic standard

PASSIVHAUS CLASSIC DESIGN ELEMENTS	
Low space heating demand	Less than 15 kWh/m ² /year (as measured in PHPP)
Low U Values	Less than 0.15 W/m ² K
High levels of air tightness	Less than 0.6 ach _{n50}
Triple glazed windows	Whole window U value less than 0.85W/m ² K
Reduced thermal bridges	Less than 0.01W/mK
Overheating risk	Less than 10% of hour above 25°C UK guidance 5% of hours Best practice 0% of hours
Primary energy targets	Less than 85 kWh/m ² /year
Primary energy renewable	Less than 60 kWh/m ² /year
Quality assurance	Evidence of construction and commissioning to be given before certification

Table 2. modelling input in PHPP:

REFERENCE	DESCRIPTION
Block A1	Adult Day Care Centre
Block A2	8 x 2 bed flats 4 x 3 bed flats 38 x 1 bed flats

The design stage PHPP assessment demonstrates that the development of Block A1 and Block A2 achieve the requirements of the Passivhaus Classic Standard, this includes:

- Space heating demand of < 15 kWh/m²/year
- Space heating load < 10 W/m²/year
- Frequency of overheating +2°C <10% of hours
- PER demand 60 kWh/m²/year

The building modelling has considered the balance between, daylighting, winter heat loss through the windows and doors and overheating risk. All elements of Passivhaus design are met which includes:

- Very low U values 0.10 W/m²K to 0.12 W/m²K
- Very low levels of air tightness
- Triple glazed windows 0.85W/m²K
- Reduced overheating risk at +2°C
- Low space heating loads that can be met via the supply air MVHR
- Summer and winter comfort standards met

Based on the shading strategy, the building is not showing an overheating risk, even when modelled against a +2°C temperature increase in the summer. If there are peaks of summer temperatures, the PKOM unit can provide some limited cooling to the flats. The PHPP assessment will be refined as the design develops and recommendations provided if relevant.

4 Planning Policy Compliance

In accordance with the relevant policy requirements of the NPPF and Reading's Local Plan, the following section provides a summary of the proposed development's response. Further details are provided in the subsequent sections, supporting specialist reports and the Passivhaus Pre-Assessment.

Planning Requirement	Development Response
CC2: Sustainable Design and Construction NPPF H5: Housing Standards	Reading Local Plan states that major new residential development must be zero carbon or as a minimum meet 35% improvement on carbon emissions over Building Regulations. The dwellings in this project will achieve on average 121.57% carbon reduction on the baseline TER and so would meet the zero carbon homes requirement. The energy demand per square meter due to fabric efficiency would yield 42.37% reduction on baseline target fabric energy efficiency. This is achieved through Passivhaus design, through a fabric first approach, onsite energy generation through photovoltaic (PV) panels on the roof, and Air Source Heat Pump (ASHP) to heat the dwellings. The design also considers energy efficient lighting and appliances. Passivhaus design includes high levels of insulation in the thermal envelope, minimal thermal bridges, high levels of air tightness, mechanical ventilation with heat recovery (MVHR) and protection from overheating risk. The building meets the Passivhaus Classic standard. Low flow/ flush fittings and fixtures will be specified to meet the higher water efficiency standard under the Building Regulations of 110L per person per day. Sustainable modes of transport are encouraged, and cycle storage and electric vehicle charging are provided for staff and residents. During construction, energy and fuel use will be minimised through measures such as the use of electric and hybrid plant, diesel fuel alternatives and renewable site power (e.g., a green tariff).
EN12: Biodiversity and the green network	There are currently thirty trees on site and, resulting from the arboricultural survey, twenty-two trees will need to be removed. The trees removed will be replaced with more new trees provided on site and elsewhere within the Reading Borough Council estate. The proposed development includes ten very small trees/large shrubs, eight small trees, and four medium-sized trees. Green roofs and planting are also incorporated into the design. As result, the site will deliver Biodiversity Net Gain (BNG) and will use the 10% BNG requirement as a target.
CC3: Adaptation to Climate Change	The proposed new buildings have been designed to provide resilience to climate change including: • Heavy weight, durable construction consisting of a concrete frame and block walls.

Planning Requirement	Development Response
	• Orientation and glazing characteristics to optimise solar gain in winter to reduce the need for heating and limit overheating in summer. • Passivhaus design measures to protect against overheating and a facility for mechanical cooling. • Minimal energy consumption is achieved through Passivhaus design and on-site renewable energy generation (PV) reduces demand on the central energy grid. • Flow control devices and water efficient fixtures to minimise demand on the municipal water supply. • Adequate attenuation (green roof, permeable paving, planting and geo-cellular crates) to control site runoff. • Landscaping to provide shading, and green roofs to absorb heat from the sun, thereby reducing overheating in the building and local microclimate.
CC4: Decentralised Energy	There is no available heat network in Reading and the proposed scheme aims to be net zero in operation, so an all-electric approach has been adopted with on-site PV panels providing a proportion of the annual energy demand.
EN18: Flooding and Drainage	The new surface water drainage system will be designed as recommended by Building Regulations and the SUDS manual. The system will be capable of draining the site, without flooding, during a 1 in 30 year storm and catering for a 1 in 100 year storm flows plus 40% allowance for climate change. The drainage strategy includes Sustainable Drainage Systems (SuDS) features which limit pollution and control the rate of flow to the drainage network. SuDS features include green roofs, planting, and permeable paving. Water quality criteria will be met with a proprietary filter manhole and permeable paving. Flow rates will be reduced from the existing brownfield run-off rates to an approved flow rate of 2.5l/s.
CC5: Waste Minimisation and Storage	The contractor is required to implement a plan identifying strategies to avoid waste and details of waste segregation on site to increase re-use and recycling. This will be demonstrated via the contractors Waste Management Plan. The design includes adequate waste storage including internal recycling facilities and external storage to accommodate different waste streams and access for the municipal waste collection.
TR5: Car and Cycle Parking and Electric Vehicle Charging	The demand for on-site staff and visitor parking, for the new site, has been calculated using RBC's <i>Parking Standards and Design SPD (2011)</i>, in relation to the number of care staff expected to be employed by the day care facility. A lower level of parking has been proposed to suit the use of the building, encourage public transport, and providing alternative space for mobility scooters. As agreed with RBC through pre-application advice, 16 new on-site

Planning Requirement	Development Response
	car parking spaces have been designed which will include 10% electric charging facilities. New cycle parking will be provided, at one space per two dwelling flat (1-2 beds) and one space per two FTE staff for the PMLD day care service, in accordance with Reading's policy.

4.1 Energy efficiency and carbon emissions of the building

The proposed scheme enables net zero in operation. This is achieved through the following measures:

- All electric heating and hot water using air source heat pumps (ASHP).
- The inclusion of photovoltaic panels installed on the roof of the building.
- Reducing energy demand from the buildings as far as possible through Passivhaus design including the specification of high levels of insulation, minimal thermal bridge, high levels of air tightness, mechanical ventilation with heat recovery (MVHR) and protection from overheating risk.
- Extensive modelling in Passivhaus Planning Package (PHPP) and testing against the Passivhaus Classic Standard.
- Utilising a mixed mode ventilation strategy (MVHR and openable windows), to limit the need for mechanical cooling and to enable sufficient ventilation given the highly efficient and airtight thermal envelope.
- Each flat is provided with highly efficient mechanical supply and extract heat recovery ventilation (MVHR) via an air source combined heating and hot water heat pump unit. The unit also allows cool air to be introduced in summer.
- Off-site generated electricity will be a green electricity provider who procures 100% renewable energy (RBC are likely to source this from 'Octopus' or 'Green Energy').
- The metering strategy will allow energy use to be individually monitored for each flat. Landlord areas will be sub-metered in accordance Building Regulations Part L and CIBSE TM34.
- Users and occupants will be provided with a wall mounted controller. Remote access to the controller via a smart phone app is also available.
- During construction, energy and fuel use will be monitored. Measures to reduce emissions include the use of electric and hybrid plant, diesel fuel alternatives and renewable site power (e.g. a green tariff).

4.2 Water efficiency

Low flow/ flush fittings and fixtures will be specified to meet the higher water efficiency standard under the Building Regulations of 110L per person per day. Water conditioning devices will be introduced to prevent scale build up and extend the life of any hot water equipment.

4.3 Flood risk and drainage strategy

The flood risk assessment and drainage strategy confirms that the site is situated within Flood Zone 1 where the annual probability of flooding from Rivers or the Sea is less than 0.1%. Environment Agency (EA) surface water flood maps confirm that the site is at "low" risk of surface water flooding where the annual probability of flooding from surface water

(pluvial flooding) is between 0.1% and 1%. However, Hexham Road has a high to medium risk of surface water flooding.

The risk of flooding will be addressed by the development through incorporation of Sustainable Drainage Systems (SuDS) which will include green roofs, permeable paving, and geo-cellular storage to control surface water flows. The new surface water drainage system will be designed as recommended by Building Regulations and the SUDS manual. The system will be capable of draining the site, without flooding, during a 1 in 30 year storm whilst retaining the 1 in 100 year storm flows plus 40% allowance for climate change within the site boundary without putting existing buildings, the proposed development and any third party land at risk from flooding.

Water quality criteria will be met with a proprietary filter manhole and permeable paving.

Flow rates will be reduced from the existing brownfield run-off rates to an approved flow rate of 2.5l/s.

4.4 Community impacts

The development provides new and improved facilities and specialist affordable housing to meet the needs of the Reading Borough community. Regular consultation with Council Members and Planning Officers and design review and public consultation have ensured this.

The Passivhaus principles result in highly energy efficient buildings which means residents can expect lower space heating bills and protection against fuel poverty and cold houses. This meets a key aim of the development: to be affordable in use.

A 'good neighbour' policy and plan will be implemented with the Contractor to deliver a positive community impact. For example, to provide opportunities for community volunteering projects; engagement with a local school to promote careers in construction; provision for pupils to be involved in artwork competitions for site hoardings, local employment; community events such as charitable fund raising; spend with local SMEs and score highly in a Considerate Constructors Scheme audit.

The daylighting assessments to the neighbouring properties have demonstrated that acceptable levels of daylight and sunlight will be retained in the proposed condition, in accordance with the BRE guidelines. This will reduce any negative effects on the immediate community.

4.5 Transport

Sustainable modes of transport are encouraged, and the development delivers the following sustainable transport measures:

- Sufficient parking provision including accessible parking and Electric Pool Car Parking for whole community
- The central location of the site is close to amenities and public transport connections
- New cycle parking will be provided, at one space per two dwelling flat (1-2 beds) and one space per two FTE staff for the PMLD day care service, in accordance with Reading's policy
- 12 new mobility scooter places are planned within the building in a secure and safe room with electric charging points
- Direct and convenient access to/from good existing networks of pedestrian and cycle routes and public transport services.
- Construction Phase Traffic Management Plan implemented during the development to ensure no detrimental impact on the local highway network.

4.6 Health and wellbeing including day-lighting analysis and thermal comfort

A sample number of units within the overall development have been assessed for CIBSE TM59 (Residential) and TM52 (Non-Residential) Overheating Performance. All areas pass the relevant criteria. The assessments have been made using a 2050 DSY1 Swindon high emissions scenario, 50th Percentile weather file to account for future climate change.

Units are provided with large windows and views out over green roofs and landscaped areas to contribute to wellbeing.

Passivhaus design principles including high thermal efficiency and mechanical ventilation ensure good internal air quality and a healthy internal environment and comfortable internal temperatures all year.

A noise assessment has confirmed that acceptable internal and external noise environment can be achieved within the development.

Trees and planting provide seating, amenity and a buffer for housing from the roadway.

4.7 Material usage, wastage, responsible sourcing and environmental impact, including embodied carbon

The building has been designed for durability and longevity using blockwork instead of lightweight construction materials. Concrete replacement has been specified to reduce the embodied carbon of the project. All aggregates specified for use in concrete will allow a percentage of re-cycled aggregate with the exception of fair faced concrete. All steel reinforcement is specified to the CARES accreditation and is 100% re-cycled steel, and all steel frame components are to standard UK stock and their manufacture includes the use of re-cycled steel.

All timber is specified as Forest Stewardship Council (FSC) certified and key products will be selected with environmental certification where possible.

As the design progresses, there will also be consideration of offsite construction based on pre-cast elements such as pre-cast modular and pre-cast frame to reduce the amount of waste produced on site.

The contractor is required to provide a site waste management plan that identifies strategies to avoid waste (e.g., the use of standard sizes for materials and methods of construction that reduce wastage and temporary works) and how waste shall be segregated on site to increase re-use and recycling. During construction waste can be monitored to record how much is produced, transported and what percentage is diverted from landfill. Waste Transfer Notices will be kept as records of this.

The flats are designed with space for general waste, mixed recycling and organic food waste in the kitchen areas. During operation, waste chutes take waste to the storage location ready for the Council collection.

4.8 Pollution issues, low NOx, low global warming potential (GWP), reducing need for mechanical cooling

The development is all-electric with no on-site combustion for heating, cooking or hot water.

There is a cooling facility on the individual heat pump MVHR units in each flat to reverse cycle and provide cooling in extreme hot weather. These units contain a small amount of

refrigerant at low charge. A fault alarm on the unit would be raised if the fridge circuit developed a fault as a result of refrigerant leakage.

4.9 Ecological aspects to enhance the proposed developments for flora and fauna

Given that the existing site is demolished, with minimal vegetation, it is considered the development will not result in any net loss of biodiversity and will result in measurable biodiversity net gains. The existing site includes 30 trees, of which 20 will be removed (plus two which are dead or collapsing) and will be replaced by 20 new trees.

The survey concluded that badgers, bats, hazel dormice, reptiles, and notable amphibians are unlikely to be present at the site. However, the unmanaged scrub and trees at the site are likely to support a typical assemblage of more widespread urban bird species during the spring and summer breeding season. The site is also likely to be exploited by small numbers of foraging bats more associated with urban environments as a part of their wider foraging activity.

A formal Biodiversity Net Gain assessment was carried out. This identified that the development would result in a net gain of 14.82% in biodiversity value at the site. In addition, the project will secure the planting of a number of further street trees in the surrounding residential area, resulting in further net gains to biodiversity.

The landscape design of the development is in line with the aims of Reading Borough Council's Tree Strategy and Biodiversity Action Plan (BAP). The design includes new gardens, green roofs and habitats to provide a net gain for biodiversity. As recommended in the ecology report, in-wall bird nest bricks, invertebrate 'bee bricks', and integrated bat roost units as well as swift nest boxes at high level around the roof / top of walls are included. New planting will include trees, mixed scrub, grassland and ground cover, including a high proportion of native species and flowering plants.

The site will be subject to long-term habitat management as part of the management of the wider site.

4.10 Best practice management of the site

A construction management plan will outline how they will mitigate noise, air, and water pollution or where this is not possible how this will be managed.

During construction, energy and fuel use will be minimised through measures such as the use of electric and hybrid plant, diesel fuel alternatives and renewable site power (e.g., a green tariff).

The contractor is required to provide a site waste management plan that identifies strategies to avoid waste (e.g., the use of standard sizes for materials and methods of construction that reduce wastage and temporary works) and how waste shall be segregated on site to increase re-use and recycling. During construction waste can be monitored to record how much is produced, transported and what percentage is diverted from landfill. Waste Transfer Notices will be kept as records of this.

The project will be registered with the Considerate Contractor Scheme and deliver positive social value as outlined in the *Community Impacts* section of this report.

5 Summary

The key features set out within this Energy and Sustainability Statement are outlined as follows:

- **Energy efficiency:** The development enables net zero carbon in operation through Passivhaus design such as high levels of insulation, minimal thermal bridge, high levels of air tightness, mechanical ventilation with heat recovery (MVHR) and protection from overheating risk. In addition, energy will be provided through onsite energy generation via PVs and ASHP and supplemented with off-site energy generation via a green energy tariff.
- **Water efficiency:** Flow control devices and water efficient fixtures and fittings to reduce water consumption in line the higher water efficiency standard under the Building Regulations of 110L per person per day.
- **Flood risk and SuDs:** The proposed development site incorporates SuDs to manage pollution and flow rates.
- **Community impacts and best practice site management:** Inherent community benefits through the provision of a day centre providing social care services and specialist affordable housing. Considerate construction measures and activities to deliver social value.
- **Sustainable transport:** Sustainable modes of transport are encouraged for staff, residents and visitors through the provision of cycle storage facilities and electric vehicle charging points.
- **Health and wellbeing:** The promotion of health and wellbeing for future occupants has been a consideration, particularly in terms of thermal, acoustic and visual comfort, site security, access to nature and promoting active modes of travel.
- **Materials:** Materials will be selected based on their environmental and ethical impacts.
- **Waste and recycling:** Designated waste chutes and space for the separation, recycling and collection of solid waste streams. Minimisation of waste and maximum re-use and recycling of construction waste.
- **Pollution:** Measures are included to minimise noise, air, and light pollution both during construction and operation.
- **Biodiversity and ecology:** New planting for biodiversity net gain and bird, bee, bat and swift nesting boxes to encourage wildlife habitation.

6 Conclusion

This statement demonstrates that the proposed development is considered sustainable, as measured against relevant local and national planning policy.

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