HOARE LEA

Caversham Road. Reading. S2 Estates.

SUSTAINABILITY
SUSTAINABILITY STATEMENT

REVISION 2 – 30 OCTOBER 2019

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
1	06/09/2019	Draft Sustainability Statement	TC	KC	KC
2	30/10/2019	Sustainability Statement	TC	KC	KC

This document has been prepared for S2 Estates only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

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1. Introduction

1.1 Existing site

This statement has been prepared on behalf of S2 Estates in support of the proposed mixed-use development located on Caversham Road in Reading.

The existing site consists of a 2-storey retail warehouse, known as 71-73 Caversham Road, with a service yard and car parking area situated on the eastern part of the site fronting Caversham Road, together with 2 no. detached 2.5 storey office buildings, known as The Brewery and The Malthouse, with further car parking situated on the western part of the site. Figure 1 shows the site location.

SITE LOCATION MAP - BIRD EYE VIEW FROM WEST

SITE LOCATION MAP - BIRD EYE VIEW FROM SOUTH

Figure 1: Existing Site Plans (source – Draft jtp Design Review Panel Document, April 2019).

This statement summarises the relevant regulatory and planning policies relating to sustainability, that are applicable to the proposed development, and the design response to them.

1.2 Proposed development

The retail warehouse on the site is vacant whilst the office buildings are fully let and to be retained.

The proposed development consists of the construction of;

- A c.240m^2 ground floor A1 unit;
- 17 one-bedroom dwellings;
- 24 two-bedroom dwellings;
- 3 three-bedroom dwellings;
- 2 residential shared podium garden courtyards (c.236m^2 in total);
- 1 residential refuse store;
- 1 residential cycle store;
- 1 residential lobby;
- Associated plant space; and
- 9 residential parking spaces and 7 non-residential space (incl. 2 disabled access spaces).

1.3 Structure of this report

Section 1.1 of the Ministry of Housing Communities & Local Government National Planning Policy Framework dated February 2019 states that there is a presumption in favour of sustainable development.

In addition, the Reading Borough Council Revised Sustainable Design and Construction Supplementary Planning Document, and Draft Supplementary Planning Document, say that a Sustainability Statement should be submitted with all major developments, this statement should cover the relevant Sustainable Design Checklists (contained in Appendix 1 and 2 of this report). It should also cover;

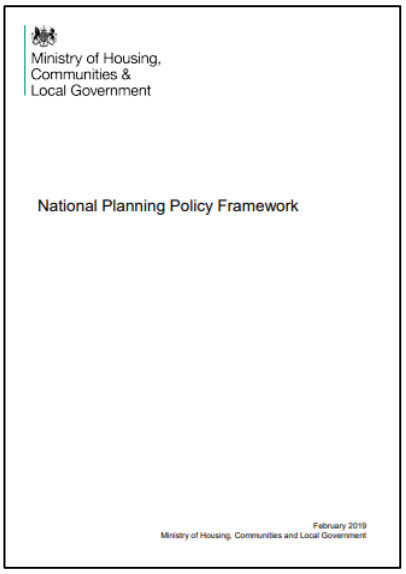
- Climate Change and Adaptation (section 3);
- Water Management, including water conservation and flood risk and drainage (section 4);
- Waste Reduction (section 5);
- Material Usage (section 6);
- Transport (section 7);
- Ecology (section 8);
- Pollution (section 9);
- A BREEAM Pre-Assessment (section 10 and Appendix 3);
- Energy Efficiency of the Building (section 11); and
- Health and Wellbeing (section 12).

The sections within this report have been structured so that they each contain the following;

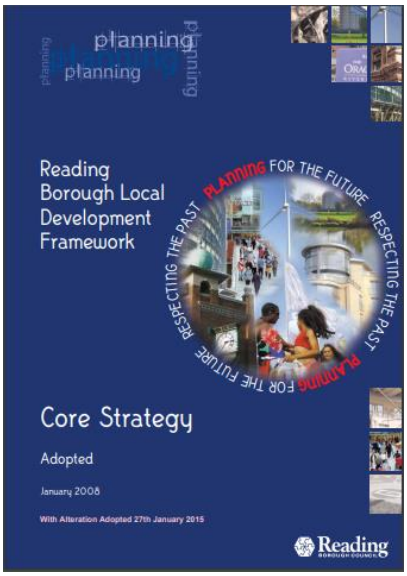
- An introduction to the section;
- The planning policy context for the Site;
- The sustainability considerations for the Site; and
- A conclusion.

2. Planning policy context

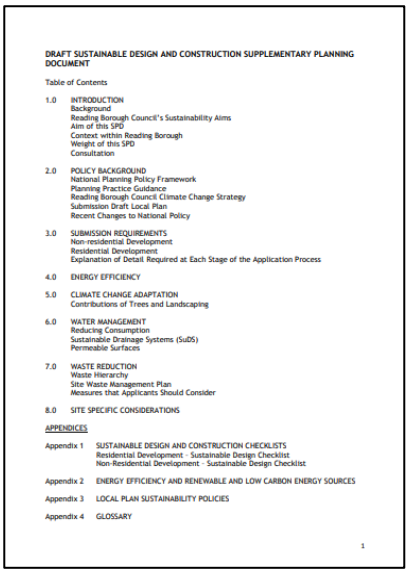
The existing Reading Borough Council Local Development Framework applicable to the Site consists of;



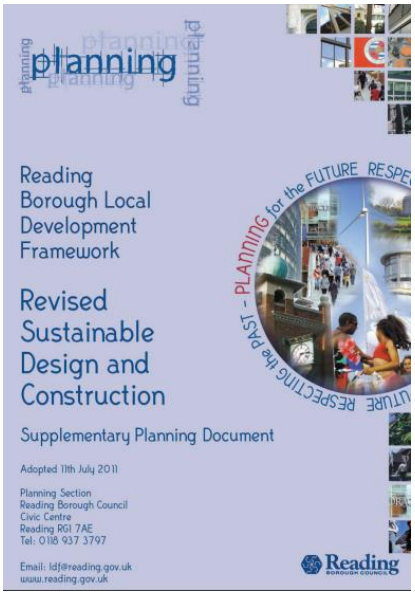
Ministry of Housing, Communities & Local Government, National Planning Policy Framework, dated February 2019.



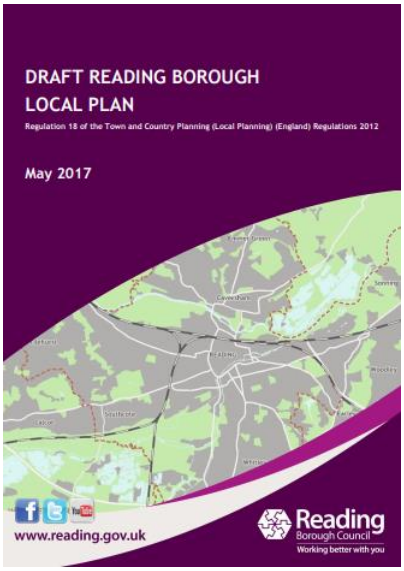
Reading Borough Council Core Strategy, adopted January 2008, with alterations adopted 27th January 2015.



Reading Borough Council DRAFT Sustainable Design and Construction, Supplementary Planning Document, 2019.



Reading Borough Council Revised Sustainable Design and Construction, Supplementary Planning Document, Adopted 11th July 2011.



Reading Borough Council DRAFT Reading Borough Local plan, dated May 2017.

3. Climate change and adaption

3.1 Introduction

One of the key requirements for any development is that it has the ability to adapt to future changes in the environment. The phenomenon of climate change is a global problem, affecting both existing and proposed developments as well as all aspects of life on earth. Due to the complex nature of climatology, it is difficult to predict the exact course that the global climate will take, although there are a number of key trends, for example rising global temperatures, which are generally agreed upon.

There are two key approaches that can be taken with regards to climate change:

- Mitigate the factors which lead to increased climate change.
- Implement adaptation measures to enable buildings to cope with the changing climate.

Usually, a combination of these two approaches is adopted; offering the best compromise between effectiveness and required investment. This section discusses the site's ability to adapt to the predicted effects of climate change and to be designed to be resilient to them.

3.2 Policy context

3.2.1 National planning policy

Section 14 of the National Planning Policy Framework, dated February 2019 states that development should meet the challenge of climate change by;

a) Avoiding increased vulnerability to the range of impacts arising from climate change.
b) Helping to reduce greenhouse gas emissions, such as through the location, orientation and design of the building.

3.2.2 Local planning policy

The Draft Local Plan dated May 2017 Draft Policy CC3: Adaption to Climate Change says;

> *"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:*
>
> - *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, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, 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 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 consider mitigation and resilience measures for any increases in river flooding levels as a result of climate change."*

3.3 Sustainability considerations

The RPS FRA and SuDS strategy confirms that *'it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation techniques'*.

Details on the energy-related considerations for the building have been provided in the Hoare Lea Energy Strategy (dated 17.10.2019).

The current BREEAM pre-assessment for the scheme (contained in Appendix 3) demonstrates that the scheme is currently targeting the 'Adaption to climate change' credit. The aim of this credit is to minimise the future need of carrying out works to adapt the building to take account of more extreme weather changes resulting from climate change and changing weather patterns. This credit has the following desired outcomes;

- Maximise asset resilience and value through consideration of the likely impacts of future climate change on the project.
- Reduce future risks to end user safety arising from extreme weather events and climate change.
- Contribute to business continuity, planning in response to the risks of extreme weather events and climate change.
- Reduce the need for future adaptation, maintenance and disruption associated with responding to climate change and extreme weather events.

The credit requires the design team to conduct a climate change adaption strategy appraisal to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes;

- Hazard identification
- Hazard assessment
- Risk estimation
- Risk evaluation
- Risk management.

It then requires recommendations and solutions to be implemented into the design to mitigate any of the identified impacts.

3.4 Conclusion

An Energy Strategy has been produced as part of the planning application for the scheme.

The FRA and SuDS Strategy confirms that flood risk is not considered to be an issue for the development.

The existing BREEAM Assessment for the scheme targets the 'Adaption to climate change credit', which, as the design progresses, will require recommendations to be incorporated into the scheme to minimise identified hazards to the development.

4. Water management

4.1 Introduction

The water industry is at the forefront in the fight against climate change as all the main impacts; temperature change, more intense rainfall, changing rainfall patterns, and sea level rises, all directly affect water companies, water sources, and the likelihood of flooding.

Some of the impacts, such as severe droughts and flooding can be obvious; however, others, such as saline intrusion into groundwater sources and the changes to peak demand can be subtler and could lead to concerns regarding the supply of fresh potable water and the impact and security of buildings against future flooding.

This section looks at the measures incorporated into the project that consider the efficient use of potable water for the building, and the measures which minimise the risk and impact of localised flooding on and off-site.

4.2 Policy context

4.2.1 National planning policy

Section 14 of the National Planning Policy Framework dated February 2019 states that development should meet the challenge of climate change and flooding by directing development away from areas at greatest risk of flooding. Where this is not possible, the development should be made safe for its lifetime without increasing risk elsewhere. In addition, major developments should incorporate Sustainable Drainage Systems.

4.2.2 **Local planning policy**

The Core Strategy, adopted January 2015, policy CS35: Flooding says;

> *"Planning permission will not be permitted for development in an area identified as being at high risk of flooding, where development would 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."*

The Core Strategy, adopted January 2015, Policy CS1: Sustainable Construction and Design says;

> *"…All developments reduce mains water use and demonstrate that water conservation measures are incorporated so that predicted per capita consumption does not exceed the appropriate levels set out in the Code for Sustainable Homes or BREEAM Standards.*
>
> *Developments incorporate sustainable urban drainage facilities and techniques as part of the layout of a development as appropriate and as advised by the Environment Agency, including minimising the size of impermeable areas so that peak run-off and annual water run-off is reduced where possible and in any case is no greater than the original conditions of the site. Particular care will be needed in areas of flood risk where different solutions may be required."*

The Draft Local Plan dated May 2017 Draft policy EN17: Flooding and Sustainable Drainage Systems says;

> *"Planning permission will not be permitted for development in an area identified as being at high risk of flooding, where development would 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.*
>
> *All major developments must incorporate sustainable drainage systems (SuDS) as appropriate and in line with the Government's Technical Standards.*
>
> *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 does not worsen contamination effects. Wherever possible, SuDS provision should link into the existing Green Network and incorporate tree planting. All new developments in areas of flood risk should give priority to SuDS."*

The Draft Local Plan dated May 2017 Draft policy CC2: Sustainable Design and Construction says;

> *"All non-residential development 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. "*

The Draft Local Plan dated May 2017 Draft policy H4: Standards for Housing says,

> *"New build housing will be built to the higher water efficiency standard under regulation 36(3) of the Building Regulations."*

4.3 Sustainability considerations

4.3.1 Flood risk and drainage

Flood Risk

As of August 2019, the Environment Agency Flood Map for Planning states that the Site is located within an area with medium probability of fluvial flooding. This is land which has between a 1 in 100 and 1 in 1000 annual probability of fluvial flooding.

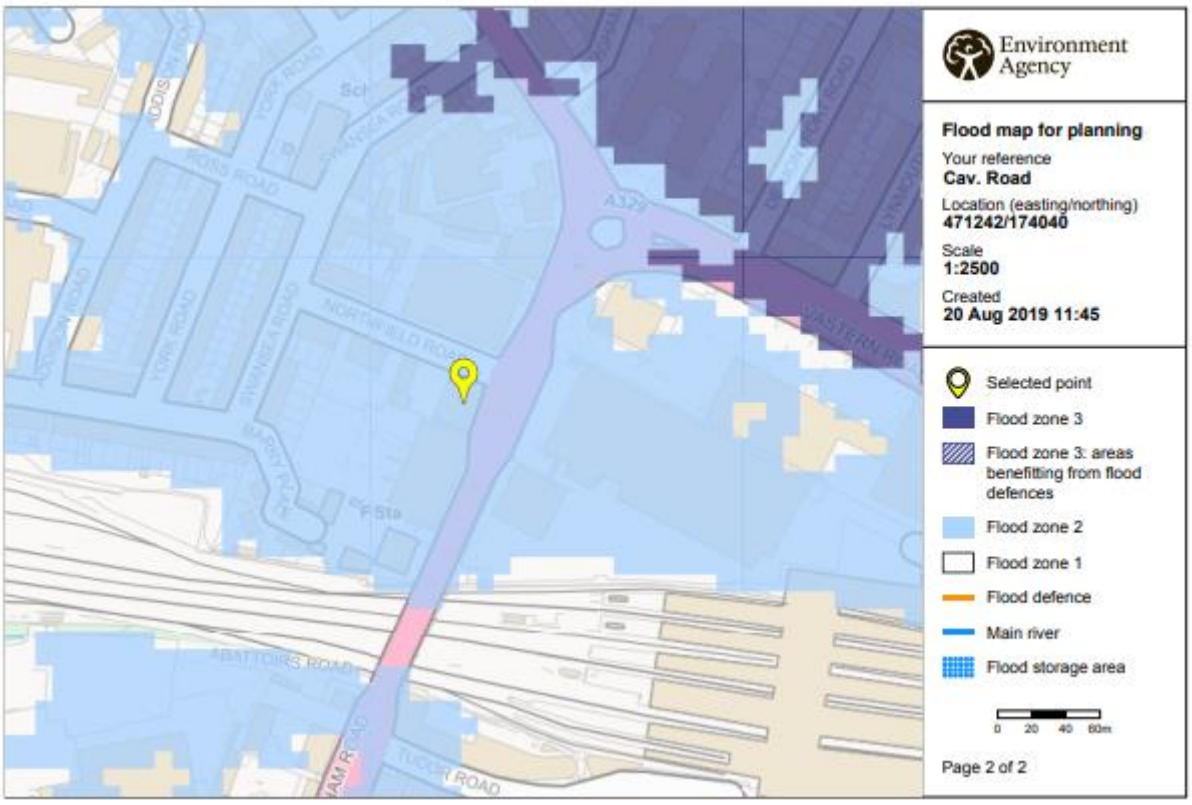


Figure 2: Environment Agency Flood Map for Planning (August 2019)

The site is at low risk of flooding from tidal, sewers, surface water, groundwater and other sources (e.g. reservoirs, water mains).

The RPS FRA and SuDS Strategy confirms that;

- The site is located within the catchment of the River Thames.
- The site is located on a 'major aquifer with high permeability'.

- The site is not recorded to have been affected by historic flooding from fluvial, drainage or 'other' sources.
- No groundwater flood events were recorded to have occurred on site.
- No road flooding was recorded to have occurred on Caversham Road.
- The site is not located within the modelled reservoir flood extent if a failure of Whiteknights Lake were to occur.
- The site is located within 1km square area of which 25% and 50% is considered susceptible to groundwater flooding.
- As of February 2016, 21-50 sewer flood incidents were reordered within the postcode area.
- The site is not located within a groundwater source protection zone.

The RPS FRA and SuDS Strategy provides the following recommendations;

- Flood resilience and resistance techniques are incorporated into the ground floor level up to 38.35m AOD, where appropriate.
- A Flood Management Plan is prepared to detail how residents would receive flood warnings, and the procedure if they receive a flood warning. An additional plan should also be prepared for the retail unit.

The following mitigation measures have also been provided;

- All residential accommodation is located on the first-floor level and above, significantly above the modelled flood level.
- Flood resistance / resilience techniques to be incorporated into the ground floor level up to 38.35m AOD, where feasible. This could include the elevation of electrical sockets and main utility components above this level, flood resistant airbrick covers up to this level, use of solid concrete floors and incorporation of non-return valves in toilets. The use of flood barriers for doorways could also be considered, however, it is acknowledged that the site would only be impacted by fluvial flooding during an extreme event or when an allowance for climate change is made.
- All residents and site managers should sign up to the EA's free Flood Warning service. It is also recommended that a Flood Management Plan is prepared to educate site occupants on the risk of flooding at the site and the actions to be taken upon receipt of a flood warning.
- There should be no elevation of external site levels as part of the proposed development.
- The finished ground floor level of both the residential ancillary uses and the retail unit are elevated by 150mm, where feasible, to mitigate against residual risk of sewer surcharging.

Drainage

The following sustainable drainage systems have been considered to provide attenuation within the development;

- *Infiltration SuDS features* – given the geology beneath the site soakaways or other infiltration techniques are unlikely to provide a feasible method for disposal of surface water runoff.
- *Rainwater harvesting* – the attenuation benefits provided through the use of rainwater harvesting are considered to be limited, and therefore it is not proposed.
- *Green roofs* – Green roofs are not provided; however, planters are proposed on the roof as part of amenity areas. These planters will provide limited water storage in the soil substrate and reduce runoff through evapotranspiration.
- *Swales, Detention Basins and Ponds* – due to the limited size of the site, this is not feasible.
- *Permeable paving/porous paving* – A minimum area of 170m^2 of permeable/porous paving will be provided.
- *Modular underground attenuation tanks* – underground attenuation crates will be provided.

The proposed permeable paving and underground attenuation crates will reduce the surface water discharge to 2 l/s.

The RPS FRA and SuDS strategy confirms that *'it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation techniques.'*

4.3.2 Potable water use

The sanitaryware specification will be completed at a later stage for the development. However, at this stage it is understood that appropriate and feasible measures will be taken to minimise the water use for the dwellings. The sanitaryware is expected to meet the minimum water efficiency standards set out in Building Regulations.

As the retail unit is 'Shell only', the sanitaryware will not be considered until a tenant is on board to fit-out the unit.

4.4 Conclusion

The Site is located in Flood Zone 2.

The FRA and SuDS Strategy has provided measures to be incorporated into the scheme to minimise any impacts associated with flooding.

The sanitaryware specification will be completed at a later stage, however is anticipated to include water reduction measures and meet the water efficiency standards set out in Building Regulations.

5. Waste reduction

5.1 Introduction

More than 400 million tonnes of materials get delivered to building sites each year. Of these around 60 million tonnes of UK waste go straight to waste collection facilities due to inappropriate or over-ordering and damage resulting from poor storage.

The effects of construction activity on waste production are enormous. The industry produces 109m tonnes of construction waste each year (24% of total waste), of which up to 13% is delivered but unused, It produces, on average, three times more waste than all UK households combined.

Around 25 million tonnes of construction waste are disposed to landfill each year.

This section looks at the measures to specify and source materials with the least environmental impact. It also looks at the sustainable management of construction and operational waste (including the future maintenance and repairs) associated with the proposed building structure. It also highlights measures which might be implemented to reduce construction and operational waste.

5.2 Policy context

5.2.1 Local planning policy

The Core Strategy, adopted January 2015, policy CS2: Waste Minimisation says,

> *"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 space to facilitate waste storage, reuse, recycling and composting."*

The Draft Local Plan dated May 2017 Draft policy CC5: Waste Minimisation and Storage says,

> *"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 space to facilitate waste storage, reuse, recycling and composting."*

The Draft Local Plan dated May 2017 Draft policy TR3: Access, Traffic and Highway-Related Matters says,

> *"In determining proposals involving a new or altered access onto the transport network, improvement works to the transport network, the creation of new transport infrastructure or the generation of additional trips on the transport network, consideration will be given to the effect on safety, congestion and the environment.*
>
> *Development will only be permitted where: …-*
>
> *i. The proposal would not generate regular movement of heavy goods vehicles (HGVs) on unsuitable roads, or on roads without easy access to the Classified Highway Network; and*
> *ii. For non-residential uses, or new dwellings on classified roads, off-street servicing would be provided.*

5.3 Sustainability considerations

5.3.1 Design waste

The detailed design for the building will be completed at a later stage, however the following could be considered;

- The internal layout of the building floors could be repetitive so that the standardised arrangement could lead to increased repetition in the construction process, which could ultimately reduce site cutting and minimise off-cuts.
- Pre-cast concrete panels could be utilised. WRAP, the Waste and Resources Action Programme Charity, who are circular economy and resource efficiency experts, have estimated that the amount of waste which can be saved by using pre-cast concrete elements is between 20-50% of what may be generated on a similar site using more traditional construction approaches.
- Surplus ordering is a key component to waste generation. The use of BIM could help produce more accurate estimates of material requirements which should lead to a reduction in excess materials being delivered to site. Should surplus orders be procured, an area could be provided on Site to manage the materials for use on other local schemes, to avoid sending these materials to landfill.
- In order to reduce reworking and waste of materials as part of the design, late design changes have been avoided through a process of internal and external design freeze approvals.

In addition, as part of the current BREEAM strategy for the Site, the design for disassembly and functional adaptability credit has been targeted. This study requires the following to be considered;

- Feasibility: The likelihood to contain multiple or alternative building uses, area functions and different tenancies over the expected life cycle, e.g. related to the structural design of the building.
- Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building, e.g. panels in floors and walls that can be removed without affecting the structure, providing lifting beams and hoists. Accessibility also involves access to local services, such as local power, data infrastructure etc.
- 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 of in-use.
- Expandability: The potential for the building to be extended, horizontally or vertically.
- 'Refurbishment potential': The potential for major refurbishment, including replacing the façade.

This will continue to be reviewed as the design progresses and encourages measures that accommodate future changes of the use of the building over its lifespan.

5.3.2 Construction waste

Minimising the overall creation of waste will reduce the quantity sent to landfill and environmental impact of the development. The Principal Contractor should aim to target the diversion of 100% of waste from landfill, with a minimum of 80% of non-demolition waste (by tonnage) and 90% of demolition waste (by tonnage) required as part of the current BREEAM Assessment for the Site.

Damage to internal parts of the building could be minimised by considering water tightness early in the build. The careful protection of completed elements could be written into the Employers Works Information to further avoid rework and waste.

Materials with high recycled contents should be explored and the use of suppliers who offer take-back schemes should be encouraged.

A Site Waste Management Plan (SWMP) typically promotes the reuse, recycling and recovery of waste through the implementation of a tailor-made SWMP. As part of the current BREEAM Assessment for the Site, the Principal Contractor should abide by a SWMP which includes the following;

1. A target benchmark for resource efficiency, i.e. m^3 of waste per $100m^2$ or tonnes of waste per $100m^2$
2. Procedures and commitments for minimising hazardous and non-hazardous waste in line with the target benchmark
3. A waste minimisation target and details of waste minimisation actions to be undertaken
4. Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste. If waste data is obtained from licensed external waste contractors, the data needs to be reliable and verifiable, e.g. by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms
5. Procedures for sorting, reusing and recycling construction waste into defined waste groups (see additional guidance section), either on-site or through a licensed external contractor
6. Procedures for reviewing and updating the plan
7. The name or job title of the individual responsible for implementing the above

In addition, in order to reduce construction waste from the Site, the Principal Contractor should aim to minimise wherever possible, the amount of waste produced during construction. The current BREEAM Assessment requires the Principal Contractor to produce ≤ 6.5 tonnes of waste per $100m^2$ (gross internal floor area). This will continue to be reviewed as the design progresses with the aim of targeting the higher benchmark of ≤ 3.2 tonnes of waste per $100m^2$ (gross internal floor area).

Waste minimisation will also be addressed through review of the design and construction process at regular intervals. It is best practice for waste figures and lessons learnt to be collected from the contractor and design team. Reducing the quantity of waste can result in significant cost savings from the cost of landfill and associated taxes. It could also reduce the environmental impact of construction as it avoids the need to transport waste material which reduces the associated CO_2 emissions.

5.3.3 Operational waste

Waste management should be carefully considered to minimise waste and to operate an effective waste management procedure.

As part of the BREEAM Assessment for the Site, sufficient recyclable waste storage will be provided which is;

- Clearly labelled to assist with segregation, storage and collection of the recyclable waste streams;
- Accessible to the building occupants or facilities operators;
- Of a capacity appropriate to the buildings; and
- Provides food storage space.

As sufficient space for the segregation of the waste is to be provided, this enables the building occupants to set waste targets for the operation of the building.

The jtp Design and Access Statement confirms that a communal refuse store beneath the development is provided for the apartments, and the size and location of the residential refuse store has been designed in accordance with current borough policy as described in the Reading Borough Council Waste Management Guidelines which specify the waste capacity required. The proposed location of the communal refuse store and route of the refuse collection vehicle has been given careful consideration as part of the servicing strategy of the residential apartments on site. Please see Figure 3 below.

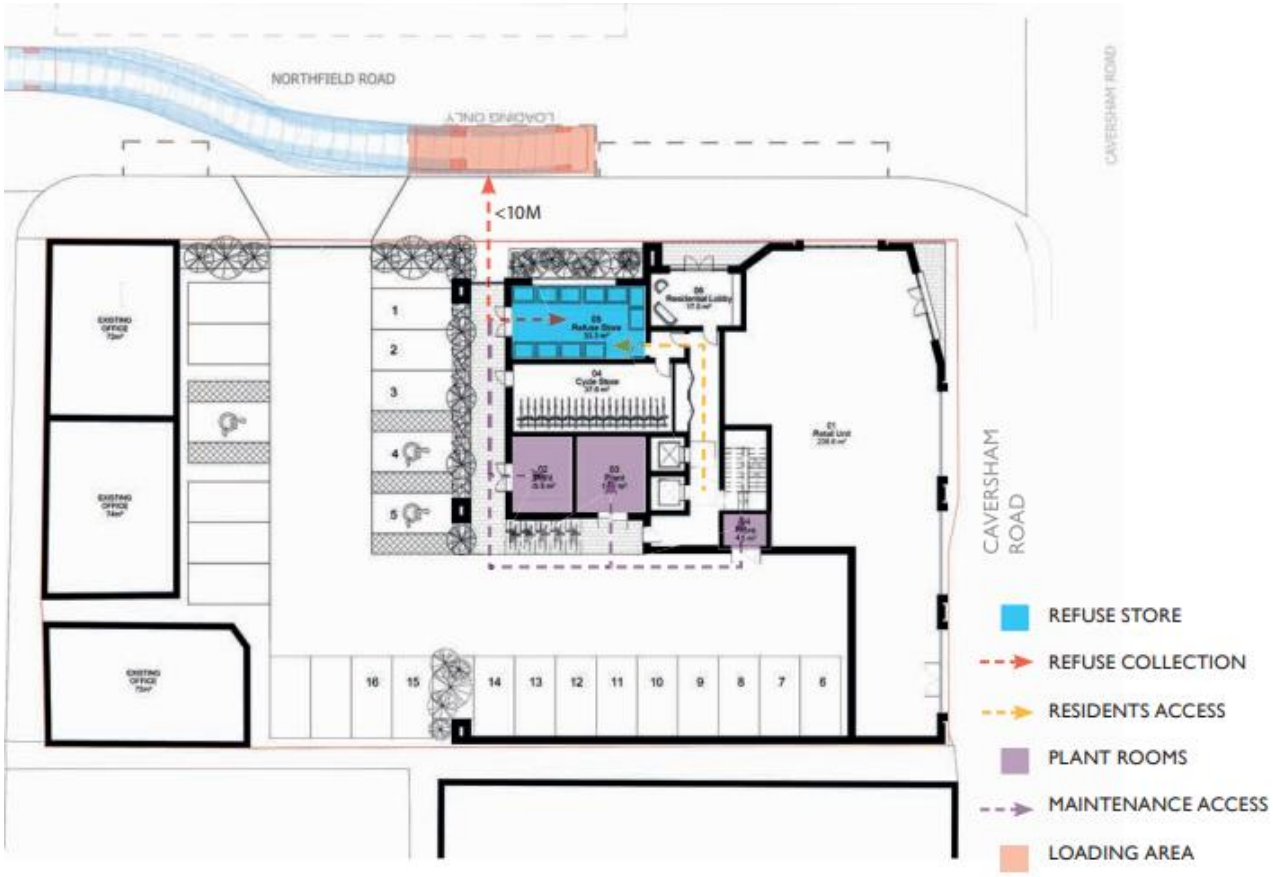


Figure 3: Waste Storage

5.4 Conclusion

The design team have implemented design measures such as standardising the building arrangement and specifying pre-cast materials in order to minimise waste production on Site.

The Principal Contractor should implement measures to reduce the waste produced on Site, as well as the waste sent to landfill in accordance with a Site Waste Management Plan.

Sufficient waste storage is being provided on site in order to allow for on Site operational waste collection.

A series of design, construction and operational waste minimisation and management measures have therefore been considered for the building.

6. Material use

6.1 Introduction

The Building Research Establishment (BRE) publishes a 'Green Guide to Specification' where materials and construction build ups are assessed in terms of their environmental impacts, across their entire life cycle. The BRE methodology rates these materials on a scale from A+ (least environmental impact) to E (greatest environmental impact). All recycled materials would achieve an A+ rating as they do not require the use of virgin materials, whilst those which require extensive (and environmentally unfriendly) sourcing methods (such as concrete) typically achieve lower green guide ratings. Selecting materials which are sourced to reduce their overall impact on the environment are always preferred; however, the structural requirements of the building will typically outweigh the environmental impact savings.

In addition to selecting (where possible) materials with low environmental impacts, materials can also be sourced using manufacturers/suppliers with responsible sourcing certification. Responsible sourcing of construction products takes a holistic approach to sustainability by considering the way in which the materials are mined/harvested, manufactured, processed and are able to be treated at the end of their life. Materials with responsible sourcing certification (such as ISO 14001, FSC, PEFC or BES 6001) typically have a lower embodied impact over their life including extraction, processing, manufacturing and recycling. Manufacturers with responsible sourcing certification could therefore be selected over those without.

This section looks at the measures implemented to specify and source materials with the best environmental impact.

6.2 Policy context

6.2.1 National planning policy

Section 17 of the National Planning Policy Framework dated February 2019 states that where possible proposals should utilise secondary and recycled materials before considering primary materials.

6.2.2 Local planning policy

The Reading Borough Council Revised Sustainable Design and Construction Supplementary Planning Document, and Draft Supplementary Planning Document, say that a Sustainability Statement should be submitted with all major developments and should cover material usage.

6.3 Sustainability considerations

6.3.1 Design stage considerations

In addition to reducing the amount of materials required on Site, recycling existing materials reduces the need to extract, refine and process raw materials. These processes all require energy and therefore reusing existing materials that have already been through this process can reduce greenhouse gas emissions. As the detailed design progresses, opportunities to re-use materials will be considered.

As discussed in Section 6.1, the BRE Green Guide to Specification assesses the environmental impact of construction materials and build ups using a rating system that ranges from A+ to E. The Green Guide ratings for the major building elements on the Site will be reviewed as the design progresses with the aim of maximising the number of materials which are A+ - B rated. Unfortunately, the structural requirements of the building, as it has multiple story's, mean that concrete (typically a D green guide rating) is required for support rather than better rated green guide materials, such as timber (typically an A or A+ green guide rating). This is likely to mean that an A or B Green Guide rating for the structural frame is not likely to be achieved. In many instances the structural requirement of the building and the safety of the future building occupants takes precedent over the green guide ratings targeted. This issue will however be reviewed throughout the design process with the aim of maximising the major components which can achieve an A+, A or B within the Green Guide.

Furthermore, as discussed in Section 5, as the design develops, it should incorporate the principles of best practice design to minimise the use of materials on site. A selection of the panels used across the Site could be pre-cast off-site which, alongside the use of BIM, could produce more accurate estimates of material requirements which could lead to a reduction in surplus orders, and therefore a reduction in the material used on Site.

6.3.2 Construction stage considerations

The UK Government Timber Procurement Policy requires the purchase of legal, sustainable or recycled timber products across Site. As part of the current BREEAM Assessment for the Site, the Principal Contractor will be required to source all site timber and timber-based products in accordance with this UK Government Timber Procurement Policy so that all timber is legally harvested and traded in accordance with certification schemes such as FSC and PEFC.

To recognise and encourage the specification and procurement of responsibly sourced materials across the Site, the Principal Contractor could source materials in accordance with a sustainable procurement plan. This plan should set out a clear framework for the responsible sourcing of materials to guide procurement throughout a project and by all involved in the specification and procurement of construction materials. Following this, the current BREEAM Assessment for the scheme requires the Principal Contractor to source materials from suppliers with responsible sourcing certification such as ISO 14001 and BES 6001. These requirements should be reviewed throughout the project so that the number of credits targeted for Mat 03 can be maximised as far as possible.

The BRE determined that on average is it estimated that demolition arisings are made up of;

- Concrete (59%),
- Inert (21%),
- Metals (10%),
- Timber (7%),
- Plasterboard (1.4%);
- Insulation and plastics materials are both below 1%.

Therefore, a pre-demolition audit could be completed for the scheme with the aim of recovering items, such as the above, that could be re-used and recycled either on site or on a different site.

6.4 Conclusion

The design process should be focused on implementing best practice design measures to minimise material use on Site, these include using off-site pre-cast panels and BIM to provide accurate estimates on the materials required and therefore potentially reducing a surplus in materials ordered. In addition, recycled materials have been considered, and the BRE Green Guide to Specification is being used with the aim of maximising the building elements with an A+, A or B rating.

The Principal Contractor will be required to source all site timber and timber-based products in accordance with the UK Government Timber Procurement Policy and will have to source all site materials in accordance with a sustainable procurement plan. The responsible sourcing requirements are being reviewed throughout the design and construction process, with the aim of maximising the number of credits which can be achieved in issue Mat 03 of the BREEAM assessment.

7. Transport

7.1 Introduction

Transport relates to around a quarter of UK greenhouse gas emissions and affects air quality. The UK government have therefore committed to reducing emissions by promoting public transport choices, supporting the market for innovative forms of transport, and encouraging the move to cleaner and lower carbon vehicles.

This section looks at the measures incorporated to enable better access to sustainable means of transport for building users, in particular by focussing on the accessibility of public transport and transport solutions (e.g. cycle storage, provision of amenities, electric car schemes etc.) which, when implemented, can support the reduction in car journeys, and therefore congestion and CO_2 emissions over the life time of the building.

7.2 Policy context

7.2.1 National planning policy

Section 9 of the National Planning Policy Framework, dated February 2019, promotes sustainable transport so that;

a) The potential impacts of development on transport networks are addressed
b) Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised
c) Opportunities to promote walking, cycling and public transport are identified and pursued
d) The environmental impacts of traffic and transport infrastructure can be identified, assessed and considered
e) Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality spaces

Applications for developments should;

a) Give priority first to pedestrian and cycle movements, second, to facilitating access to high quality public transport and appropriate facilities that encourage public transport use
b) Address the needs of people with disabilities and reduced mobility in relation to all modes of transport
c) Create places that are safe, secure and attractive
d) Allow for efficient delivery of goods, and access by service and emergency vehicles
e) Be designed to enable charging of plug-in and other ultra-low-emission vehicles in safe, accessible and convenient locations

All developments that will generate significant movement should produce a travel plan and transport assessment.

7.2.2 Local planning policy

The Core Strategy, adopted January 2015, policy CS22: Transport Assessments says,

> *"Planning permission will not be granted unless development proposals make appropriate provision for works and contributions to ensure an adequate level of accessibility and safety by all modes of transport from all parts of a development, particularly by public transport, walking and cycling, in accordance with an agreed transport assessment submitted as part of the application."*

The Core Strategy, adopted January 2015, policy CS23: Sustainable Travel and Travel Plan says,

> *"Planning permission will not be granted for major development proposals unless there is a commitment to implement measures to promote and improve sustainable transport facilities, such as through provision to encourage walking, cycling and the use of public transport; and through agreed travel plans, safe routes to schools, safe routes to parks and similar measures."*

The Core Strategy adopted January 2015, policy CS24: Car/Cycle Parking says,

> *"Maximum car parking standards and cycle parking requirements will be applied in relation to the accessibility of locations within the Borough to sustainable transport facilities, particularly public transport."*

The Draft Local Plan dated May 2017 Draft policy CC6: Accessibility and the Intensity of Development says,

> *"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."*

7.3 Sustainability considerations

7.3.1 Existing development

7.3.1.1 Walking and cycling

The existing Site is bounded to the north by Northfield Road and to the East by Caversham Road.

Both roads have wide, street lit pavements with dropped curbs and controlled crossing facilities.

Opposite the Site, located on Caversham Road, is a pedestrian crossing, controlled by traffic lights.

There are several cycle routes through the town centre, this is alongside numerous cycle parking facilities.

7.3.1.2 Public transport

Train stations

The Site is located c.550m or a 7-minute walk, from Reading Mainline Train Station, which is served by Cross Country, GWR and South Western Railway providing access to the following locations shown in Table 1 below.

Table 1: Rail Services from Reading Station

Stations Served	Destination	Peak Frequency		
		Weekday	Saturday	Sunday
Reading – Reading West – Mortimer – Bramley (Hampshire) – Basingstoke	Basingstoke	4 per hour	4 per hour	2 per hour
Reading – Theale – Thatcham – Newbury – Klinbury – Hungerford - Bedwyn	Bedwyn	1 per hour	1 per hour	1 every 2 hours
Reading – Basingstoke – Winchester – Southampton Airport Parkway – Southampton Central – Brockenhurst - Bournemouth	Bournemouth	1 per hour	1 per hour	1 per hour
Reading – Didcot Parkway – Swindon (Wilts) – Bristol Parkway	Bristol Parkway	2 per hour	1 per hour	1 per hour
Reading – Didcot Parkway – Swindon (Wilts) – Chippenham – Bath Spa – Bristol Temple Meads	Bristol Temple Meads	2 per hour	2 per hour	2 per hour
Reading – Didcot Parkway – Swindon (Wilts) – Bristol Parkway – Newport (South Wales) – Cardiff Central	Cardiff Central	2 per hour	1 per hour	1 per hour
Reading – Didcot Parkway – Swindon (Wilts) – Kemble – Stroud (Gloucs) – Stonehouse – Gloucester –Cheltenham Spa	Cheltenham Spa	1 every 2 hours	1 every 2 hours	1 every 2 hours

Stations Served	Destination	Peak Frequency		
		Weekday	Saturday	Sunday
Reading – Tilehurst – Pangbourne – Goring & Streatley – Cholsey – Didcot Parkway	Didcot Parkway	7 per hour	4 per hour	4 per hour
Reading - Twyford – Maidenhead – Slough – Langley (Berks) – Iver – West Drayton – Hayes & Harlington – Southall – Ealing Broadway	Ealing Broadway	4 per hour	4 per hour	4 per hour
Reading – Wokingham – Blackwater – North Camp – Guildford – Dorking (Deepdene) – Reigate – Redhill – Gatwick Airport	Gatwick Airport	1 per hour	1 per hour	1 per hour
Reading – Didcot Parkway – Oxford – Hanborough – Charlbury – Kingham – Moreton-in-Marsh – Honeybourne – Evesham – Pershore – Worcester Shrub Hill – Worcester Foregate Street – Malvern Link – Great Malvern	Great Malvern	1 per hour	1 per hour	1 per hour
Reading – Oxford – Hanborough – Charlbury – Kingham – Moreton-in-Marsh – Honeybourne – Evesham – Pershore – Worcester Shrub Hill – Worcester Foregate Street – Malvern Link – Great Malvern – Colwall – Ledbury – Hereford	Hereford	1 per hour	1 every 2 hours	1 every 2 hours
Reading – Twyford – Maidenhead – Slough – London Paddington	London Paddington	18 per hour	11 per hour	9 per hour
Reading – Earley – Winnersh Triangle – Winnersh – Wokingham – Bracknell – Martins Heron – Ascot (Berks) – Sunningdale – Virginia Water – Egham – Staines – Feltham – Twickenham – Richmond (London) – Clapham Junction – London Waterloo	London Waterloo	15 per hour	10 per hour	7 per hour
Reading – Oxford – Banbury – Leamington Spa – Coventry – Brimingham International – Birmingham New Street – Wolverhampton – Stafford – Stoke-on-Trent – Macclesfield – Stockport – Manchester Piccadilly	Manchester Piccadilly	1 per hour	1 per hour	1 per hour
Reading – Reading West – Theale – Aldermaston – Midgham – Thatcham –Newbury Racecourse – Newbury	Newbury	3 per hour	3 per day	2 per hour
Reading – Oxford – Banbury – Leamington Spa – Birmingham New Street – Derby – Sheffield – Doncaster – York – Darlington – Durham - Newcastle	Newcastle	1 per hour	1 per hour	1 per hour
Reading – Didcot Parkway - Oxford	Oxford	5 per hour	4 per hour	3 per hour
Reading – Newbury – Pewsey – Castle Cary – Taunton – Exeter St David's Dawlish – Teignmouth – Newton Abbot – Torquay - Paignton	Paignton	3 per day	1 per day	1 per day

Stations Served	Destination	Peak Frequency		
		Weekday	Saturday	Sunday
Reading – Exeter St David's – Newton Abbot – Plymouth – Liskeard – Bodmin Parkway – St Austell – Truro – Redruth - Penzance	Penzance	2 per hour	1 per hour	1 every 2 hours
Reading – Exeter St David's - Plymouth	Plymouth	2 per hour	1 per hour	1 per hour
Reading – Wokingham – Crowthorne – Sandhurst (Berks) – Blackwater – Farnborough North – North Camp – Ash – Guildford – Shalford (Surrey) – Dorking West – Dorking (Deepdene) – Betchworth – Reigate - Redhill	Redhill	2 per hour	2 per hour	2 per hour
Reading – Basingstoke – Winchester – Southampton Airport Parkway –Southampton Central	Southampton Central	2 per hour	2 per hour	1 per hour
Reading – Swindon (Wilts) – Bristol Parkway – Newport (South Wales) – Cardiff Central – Bridgend – Port Talbot Parkway – Neath - Swansea	Swansea	1 per hour	1 per hour	1 per hour
Reading – Taunton	Taunton	3 per hour	2 per hour	2 per hour
Reading – Swindon (Wilts) – Chippenham – Bath Spa – Bristol Temple Meads – Weston-super-Mare	Weston-super-Mare	1 per hour	1 per hour	1 per hour
Reading – Oxford – Hanborough – Charlbury – Kingham – Moreton-in-Marsh – Evesham – Worcester Shrub Hill – Worcester Foregate Street	Worcester Foregate Street	2 per hour	1 per hour	1 per hour
Reading – Oxford – Banbury – Leamington Spa – Birmingham New Street – Tamworth – Burton-on-Trent – Derby – Chesterfield – Sheffield – Doncaster - York	York	1 per hour	1 per hour	1 per hour

Bus

The Site is located within 500m of a series of bus stops, shown in Table 2 below.

Table 2: Bus Stop Accessibility Details

Stop Location / Name	Distance from the Site (m)	Walking Time in Minutes (80m/minute)	Service(s)	Bus Stop Facilities
A329 Caversham Road/Fire Station (Northbound)	27	<1	22S, 23S, 29, 42 Buzz, F10, F11, F12, F13, F14	Raised Kerb
A329 Caversham Road/Fire Station (Southbound)	60	<1	22 Pink, 23 Berry, 24 Berry, 25 Pink, 23S, 27, 29, 42 Buzz, F10, F11, F12, F13, F14	Bin, Raised Kerb

Stop Location / Name	Distance from the Site (m)	Walking Time in Minutes (80m/minute)	Service(s)	Bus Stop Facilities
A4155 Caversham Road/Swansea Road (Northbound)	240	3	22 Pink, 24 Berry, 42 Buzz, 800, F10, F11, F12, X38, River Rapids, X39 River Rapids, X40 River Rapids	Raised Kerb
A4155 Caversham Road/Swansea Road (Southbound)	230	3	22 Pink, 23 Berry, 27, 42 Buzz, 81, 800, F10, F11, F12, X39 River Rapids, X40 River Rapids	Bin, Raised Kerb
Station North Interchange (Stop NA)	450	6	23 Berry, 24 Berry, 25 Pink, 25S, 800, X388 River Rapids, X39 River Rapids, X40 River Rapids	Bus shelter, seating, raised kerb, bus layby
Station North Interchange (Stop NB)	450	6	22 Pink, 24 Berry, 25 Pink, 800	Bus shelter, seating, raised kerb, bus layby
Station North Interchange (Stop NC)	450	6	22 Pink, 23 Berry	Bus shelter, seating, raised kerb, bus layby
Station North Interchange (Stop NE)	500	6	TVP	Bus shelter, seating, raised kerb, bus layby

In addition, Table 3 below shows the bus stop services, routes and peak frequency;

Table 3: Bus Service Route Information

Service	Route	Peak Frequency		
		Weekday	Saturday	Sunday
22 Pink	Reading Friar Street – Caversham Library – Caversham Heights	3 per hour (05:40 – 23:29)	1 per hour (05:58 – 00:15)	1 every 2 hours (09:15 – 17:48)
22S	Caversham Road Fire Station – Caversham Heights Richmond Road – Emmer Green – Sonning Common	1 inbound and 1 outbound service (Schooldays only)	No Service	No Service
23 Berry	Reading Friar Street – Caversham Park Village – Emmer Green – Caversham Library – Reading Friar Street	Every 30 minutes (05:30 – 00:00)	Every 30 minutes (06:30 – 00:00)	1 per hour (08:45 – 23:15)
23S	Caversham Road Fire Station – Lower Caversham – Caversham Park Village – Emmer Green – Sonning Common	1 inbound and 1 outbound service (Schooldays only)	No Service	No Service

Service	Route	Peak Frequency		
		Weekday	Saturday	Sunday
24 Berry	Reading Friar Street – Caversham Library – Emmer Green – Henley Road County Boundary – Reading Friar Street	Every 30 minutes (05:15 – 23:42)	Every 30 minutes (06:05 – 23:42)	1 per hour (09:00 – 19:41)
25 Pink	Reading Friar Street – Emmer Green – Peppard Common The Unicorn PH	2 per hour (05:25 – 20:27) (School holidays only)	1 per hour (06:40 – 20:00)	1 every 2 hours (08:05 – 18:27)
25S	Reading Friar Street – Lower Caversham – Henley Road – Emmer Green – Sonning Common – Peppard Common The Unicorn PH	1 inbound and 1 outbound service (Schooldays only)	No Service	No Service
27	Reading Friar Street – Reading Forbury Road – Lower Caversham	1 per hour (06:56 – 20:28)	1 per hour (06:30 – 20:28)	1 per hour (08:48 – 18:57)
29	Lower Caversham –Blagrace Street – Reading Station Road – Friar Street	2 per hour (06:37 – 23:23)	1 per hour (06:37 – 23:23)	1 per hour (08:58 – 19:10)
42 Buzz	Kenavon Drive – Forbury Road – Minister Street – St Marys Butts – Greyfriars Road – Leisure Centre	2 per hour (08:30 – 16:46)	2 per hour (07:00 – 18:46)	No Service
81	Caversham Heights – Caversham Library – The Mount – University of Reading – Whiteknights – University of Reading – Whitley – Maiden Erlegh – Burmershe Sports Centre – Woodley (Bulmershe School)	1 inbound and 1 outbound service (Schooldays only)	No Service	No Service
800	High Wycombe Station – High Wycombe Bus Station – Cressex Marlow Road – High Wycombe Coachway – Marlow Wiltshire Road – Marlow West Street – Medmenham – Henley-on-Thames Hart Street – Lower Shiplake – Binfield Heath – Bridge Street Caversham – Reading Friar Street	2 per hour (05:25 – 00:20)	1 per hour (06:40 – 00:20)	1 per hour (07:45 – 22:33)
F10	Sonning Common – Chalkhouse Green – Emmer Green – Caversham Church Street – Caversham Road Fire Station – Madejski Stadium	No Service	No Service	1 inbound and 1 outbound service (Reading FC matches only)
F11	Emmer Green – Caversham Church Street – Caversham Road Fires Station – Madejski Stadium	No Service	No Service	1 inbound and 1 outbound service (Reading FC matches only)
F12	Emmer Green – Caversham Library – Caversham Road Fire Station –	No Service	No Service	1 inbound and 1

Service	Route	Peak Frequency		
		Weekday	Saturday	Sunday
	Madejski Stadium			outbound service (Reading FC matches only)
F13	Caversham Park Village – Emmer Green – Henley Road County Boundary – Lower Caversham – Madejski Stadium	No Service	No Service	1 inbound and 1 outbound service (Reading FC matches only)
F14	Henley-on-Thames Hart Street – Lower Shiplake – Shiplake – Binfield Heath – Dunsden Green – Henley Road County Boundary – Lower Caversham – Madejski Stadium	No Service	No Service	1 inbound and 1 outbound service (Reading FC matches only)
TVP	Winnersh Triangle Railway Station – Reading Station North Interchange – Reading Market place – Thames Valley Park	Every 6 minutes (06:45 – 19:38)	No Service	No Service
X38 River Rapids	Oxford Westgate – Oxford St Aldates – Nuneham Courtenay – Berinsfield A4074 Layby – Shillingford – Benson – Crowmarsh Gifford – Wallingford Market Place – Nuffield – Nettlebed – Henley-on-Thames Hart Street – Lower Shiplake – Henley Road County Boundary – Caversham Church Street – Reading Friar Street	1 per hour (06:15 – 20:51)	1 per hour (06:59 – 20:10)	No Service
X39 River Rapids	Reading Station Road – Caversham Heights – Cane End Horsepond Road – Cholsey & Wallingford Railway Station – Wallingford Market Place – Crowmarsh Gifford – Benson – Shillingford – Berinsfield A4074 Layby – Nuneham Courtenay – Oxford Westgate	1 per hour (06:10 – 20:04)	1 per hour (06:15 – 20:25)	No Service
X40 River Rapids	Reading Station Road – Caversham Heights – Cane End Horsepond Road – Woodcote – Wallingford Market Place – Crowmarsh Gifford – Benson – Shillingford – Berinsfield A4074 Layby – Nuneham Courtenay – Oxford Westgate – Oxford St Aldates	2 per hour (05:25 – 23:59)	2 per hour (06:20 – 00:27)	1 per hour (08:17 – 23:59)

7.3.1.3 Car parking

The existing Site currently includes 16 car parking spaces.

7.3.2 Proposed development

7.3.2.1 Cycle parking

The proposed development is to include 44 residential cycle parking spaces and 10 further spaces for other uses and visitors.

To encourage their use, these spaces will be;

- Secured within spaces in racks with overhead covering.
- Be distanced apart so that the distance between each cycle rack, and the cycle racks and other obstructions, e.g. a wall, allows appropriate access to the cycle storage space for easy storage and access to bikes.
- Be in a prominent location.
- Have adequate lighting which is controlled to avoid out of hours use and operation during daylight hours.

7.3.2.2 Car parking

The proposed development is to include 16 residential parking spaces and 8 non-residential spaces (incl. 3 disabled access spaces in total).

7.4 Conclusion

The accessibility of the Site has been rated as 'Very Good'.

The development proposes;

- 24 car parking spaces;
- Sufficient cycle parking spaces.
- Servicing and deliveries will take place from Northfield Road.

As a result of the redevelopment, it is estimated that;

- Eight additional vehicle trips in the AM peak hour, and 18 less in the PM peak hour.
- Five additional public transport trips during the weekday peak hours.

The change in activity is unlikely to result in any noticeable effect on the operation of the local transport network.

The Transport Statement, September 2019, concludes that 'there is no reason why the scheme should be resisted on transport grounds'.

8. Ecology

8.1 Introduction

Land is a finite resource, and is required by all aspects of every-day life, i.e. housing, agriculture, parks etc. Therefore, one of the most widely agreed land-use planning principles is encouraging the effective use of land by reusing land that has been previously developed (brownfield land).

Biodiversity can be defined as the variety of species of plants, animals and microorganisms that exist on the earth. A healthy biodiversity could provide a number of natural services for everyone, ranging from ecosystem services such as pollution breakdown and soil formation, to biological resources such as providing food, medicinal resources and pharmaceutical drugs, wood products and social benefits such as research and education, recreation and tourism and cultural values.

This section will consider the measures incorporated into the design to promote effective land use and enhance the ecological value and biodiversity of the Site.

8.2 Policy context

8.2.1 National planning policy

Section 11 of the National Planning Policy Framework dated February 2019 states that the effective use of land which utilises previously developed land or 'brownfield' land should be encouraged.

Section 15 of the National Planning Policy Framework, dated February 2019 states;

a) The natural environment should be conserved and enhanced by;
   a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils
   b) Recognising the intrinsic value of the countryside
   c) Maintaining the character of the coast
   d) Minimising impacts on, and providing net gains for, biodiversity
   e) Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land
b) Where significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated, or compensated for, planning permission will be refused.
c) A Site must be suitable for use, considering ground conditions and any risks arising from land instability and contamination.

8.2.2 Local planning policy

The Core Strategy adopted January 2015, policy CS36: Biodiversity and Geology says;

> *"a) Development should retain, protect and incorporate features of biodiversity or geological interest (including protected species and their habitats) found within the application site into their schemes.*
>
> *On sites with recognised biodiversity or geological value, development will not be permitted where there would be a direct or indirect adverse impact on the site, unless it can be clearly demonstrated that:*
>
> *1. The need for development clearly outweighs the need to protect the value of the site; and*
>
> *2. Appropriate compensation, impact minimisation, mitigation and compensation are provided.*
>
> *b) Local Nature Reserves and Wildlife Heritage Sites will be safeguarded and where possible, enhanced. Permission will not be granted for any development that would adversely affect a designated nature reserve or Wildlife Heritage Site.*
>
> *c) Any development that would sever or threaten the integrity of an established wildlife link, as indicated on an adopted proposals map, will not be permitted. Where applicable, developments should be designed to protect, consolidate, extend and enhance the network of wildlife links and corridors in and adjoining the Borough, working with neighbouring authorities where appropriate."*

The Core Strategy adopted January 2015, policy CS38: Trees, Hedges and Woodlands says

> *"Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal, and the Borough's vegetation cover will be extended."*

The Draft Local Plan dated May 2017 Draft policy EN12: Biodiversity and the Green network says,

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

The Draft Local Plan dated May 2017 Draft policy EN14: Trees, Hedges and Woodlands says,

> *"Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal where they are of importance, and Reading's vegetation cover will be extended. The quality of waterside vegetation will be maintained or enhanced.*
>
> *New development shall make provision for tree planting within the application site, particularly on the street frontage, or off-site in appropriate situations, to improve the level of tree coverage within the Borough, to maintain and enhance the character and appearance of the area in which a site is located, to provide for biodiversity and to contribute to measures to reduce carbon and adapt to climate change."*

8.3 Sustainability considerations

8.3.1 Existing conditions

The Middlemarch Environmental Ltd Preliminary Ecological Appraisal (dated October 2019) confirmed that there are;

- no European statutory sites within 5km of the Site
- no UK statutory sites within 2km of the Site
- 2 non-statutory sites within 1km of the Site.
- no statutory site designated for bats within 10kkm of the Site.

The report further confirmed that the following habitats were recorded on Site during the field survey;

- Boundaries – the southern boundary was bordered by a high brick wall and the northern boundary was bordered by a high metal fence and access gate. There were no significant areas of vegetation noted on these features.
- Buildings – a two storey brick-built office building with a hipped slate tiled roof was situated within the west of the site. A brick-built disused warehouse with a pitched corrugated metal rood was situated within the east of the site.
- Hardstanding – the intervening space between the buildings on site consisted of a hardstanding car park. This habitat was generally in good condition with no significant areas of vegetation noted
- Scattered Introduced Shrub – scattered patches of buddleja *Buddleia davidii* and ragwort *Jacobaea vulgaris* were present along the southern boundary wall and adjacent to the warehouse building.

In addition;

- There were no field signs of faunal species recorded.
- No invasive species were observed on Site.
- Bats, reptiles, bony fish and otters are not deemed to be notable and are therefore not considered further.

- No evidence of badger or hedgehogs were identified during the walkover survey. However, due to the residential gardens within proximity of the Site, it is considered possible that hedgehogs may commute onto Site on occasion. A precautionary recommendation regarding terrestrial mammals has been made in section 8.3.2 below.
- The Site provides no suitable habitat for nesting birds due to a lack of vegetation and internal access to shelter within the buildings.

Overall the report concludes that the buildings, hardstanding and scattered introduced shrub are not deemed notable as they do not support any kind of dependent ecological community.

8.3.2 Proposal development

The following recommendations have been provided by Middlemarch Environmental;

- Biodiversity Enhancement
    - Planting of habitats which will be of a value to wildlife such as;
        - Native seed/fruit bearing species to provide foraging habitat for mammals and birds;
        - Nectar-rich species to attract bees, butterflies and moths;
        - Species which attract night flying insects which will be of value to foraging bats.
    - Inclusion of hedgehog passes under any fence lines to allow connectivity between the site and the wider area.
    - Provision of nesting/roosting habitat, such as installation of nest boxes for species such as house sparrow, dense scrub for species such as song thrush, and bat boxes for species such as pipistrelle.
- Terrestrial Mammals
    - Any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape.
    - Any open pipework with an outside diameter of greater than 120mm must be covered at the end of each workday to prevent animals entering/becoming trapped.

8.4 Conclusion

The Site is not considered to hold any kind of dependent ecological community.

Recommendations have been provided by the ecologists to enhance the biodiversity of the Site post-development.

There do not appear to be any ecological issues associated with the planning application.

9. Pollution

9.1 Introduction

Pollution is the process of making land, water, air or other parts of the environment dirty, unsafe or unsuitable for use. Any substance that is not naturally found in an environment could cause environmental pollution. A significant issue with environmental pollution is that the effects are not always immediate or completely understood, furthermore, mitigation measures are not always completely effective. The prevention of environmental pollution should therefore always be considered rather than mitigation.

It is therefore important to recognise the importance and value of incorporating pollution prevention measures into the building design, construction and operation to prevent the effects of mitigation.

This section will consider the measures incorporated into the design of the building to minimise the building impact with regard to pollution on the surrounding communities and environment.

9.2 Policy context

9.2.1 National planning policy

Section 15 of the National Planning Policy Framework, dated February 2019 states that;

- The natural environment should be conserved and enhanced by preventing new and existing development from contributing to unacceptable risk from soil, air, water or noise pollution.
- Proposals should mitigate and reduce to a minimum, potential adverse impacts resulting from noise from a new development
- Proposals should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.
- Proposals should contribute towards compliance with Air Quality Management Areas.

9.2.2 Local planning policy

The Core Strategy, adopted January 2015, policy CS34: Pollution and Water Resources says,

> *"Development will only be permitted where it would not be damaging to the environment through air, land, noise or light pollution; where it would preserve or ideally enhance ground and surface water quality; and where existing water resources, sewerage and wastewater treatment infrastructure are adequate to support the proposed development.*
>
> *Proposals for development that are sensitive to the effects of air, 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 be permitted on land affected by contamination where it can be demonstrated, to the satisfaction of the LPA, that the contamination can be satisfactorily remediated so that it is suitable for the proposed end use."*

The Draft Local Plan dated May 2017 Draft policy EN15: Air Quality says,

> *"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 significantly 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 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."*

The Draft Local Plan dated May 2017 Draft policy EN16: Pollution and Water Resources says,

> *"Development will only be permitted where it would not be damaging to the environment through land, noise or light pollution; where it would preserve or ideally enhance ground and surface water quality; and where existing water resources, sewerage and wastewater treatment infrastructure are adequate to support the proposed development.*
>
> *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 can be demonstrated that the contamination can be satisfactorily remediated so that it is suitable for the proposed end use and will not impact on the groundwater environment."*

9.3 Sustainability considerations

9.3.1 Water pollution

9.3.1.1 Existing conditions

The RPS Phase 1 Preliminary Risk Assessment has confirmed that the existing Site is not located within a groundwater Source Protection Zone, and that the Environment Agency's Local River Basin Management Plan classifies groundwater chemical quality beneath the Site as poor quality.

9.3.1.2 Proposed development

The RPS Phase 1 Preliminary Risk Assessment concluded that a Phase 2 Environmental Site Investigation of the Site is completed, and includes the following scope;

- Drilling of a number of boreholes across the site targeting identified potential sources and pollutant linkages;
- Installation of groundwater and gas monitoring wells in selected boreholes;
- Collection of soil and groundwater samples from beneath the site with chemical analysis of these samples for contaminants of concern;
- Ground gas monitoring from wells installed at the site;
- Assessment of ground conditions and generic quantitative risk assessment of soil and groundwater chemical analysis results to determine the potential for the identified potential pollutant linkages to remain active upon redevelopment of the site; and
- Provision of recommendations (where necessary) for remediation/mitigation measures to ensure that any identified potential pollutant linkages are not active upon redevelopment of the site.

9.3.2 Air pollution

9.3.2.1 Existing conditions

As of August 2019, the Site appears to be located within an Air Quality Management Area, with respect to Nitrogen Dioxide levels.

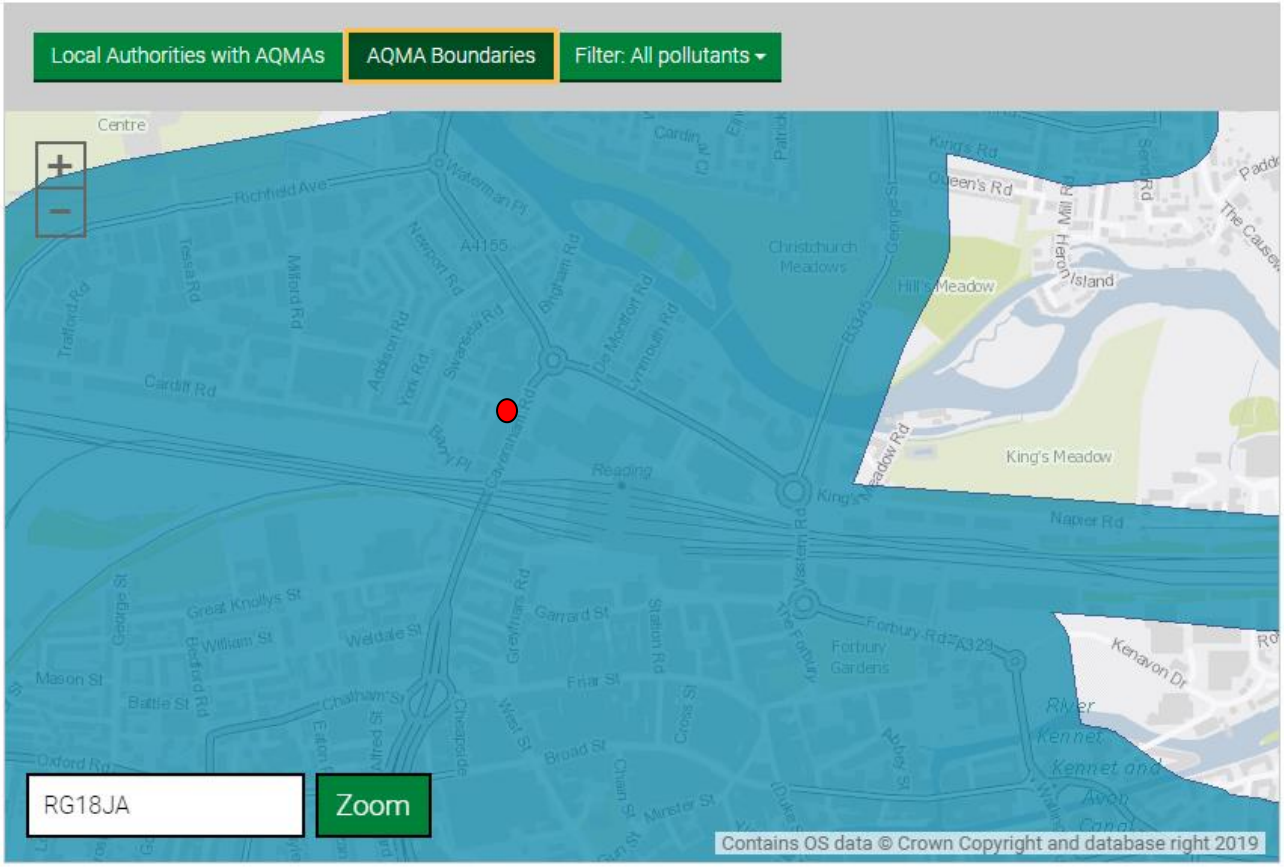


Figure 4: Air Quality Management Areas (Source - https://uk-air.defra.gov.uk/aqma/maps)

9.3.2.2 Proposed development

The HL Energy Strategy (dated 17.10.2019) confirms that ASHP's are currently proposed to be utilised for the heating and hot water for the development. Use of ASHP's does not result in local nitrogen dioxide emissions.

The current BREEAM assessment for the Site also requires the Principal Contractor to manage the Site in an environmentally and socially considerate, responsible and accountable manner. In particular, this requires the Principal Contractor to register the Site with the Considerate Constructors Scheme (CCS) which provides specific guidance and requirements for care about the appearance, respect for the community, protecting the environment, securing everyone's safety and valuing their workforce. The Principal Contractor will be required to achieve the exemplary level of practice within the CCS scheme.

9.3.3 Noise pollution

9.3.3.1 Existing conditions

The existing Site is located on Caversham Road and is already located in a built-up area within Reading. It consists of a 2-storey retail warehouse, service yard and car parking, with 2 no. detached 2.5 storey office buildings. It is therefore expected to be subject to noise pollution from vehicle traffic.

9.3.3.2 Proposed development

The planning noise report, prepared by Waterman Infrastructure & Environment and dated October 2019, states that compliance with building regulation requirements coupled with good acoustic design will allow the development to meet the noise pollution criteria set out in local planning policy. The report is based upon an initial site noise assessment and noise modelling using Cadna-A® software. It finds that once built and operational, there will be negligible noise pollution to nearby residential receptors from the external plant, satisfying BS 4142 guidance and the requirements of Reading Borough Council. This is achieved by setting

plant back from the external façade and locating it in the ground floor undercroft, which allows screening by the building structure. Delivery and servicing to ground floor retail units will have negligible impact.

9.3.4 Light pollution

9.3.4.1 Existing conditions

The existing Site is located on Caversham Road and is already located in a built-up area within Reading. It consists of a 2-storey retail warehouse, service yard and car parking, with 2 no. detached 2.5 storey office buildings. In addition, Caversham Road and Northfields Road contain several street lights, two of which are located directly outside of the Site, one to the north on Northfields Road, and on to the east on Caversham Road. It is therefore expected that the Site is subject to light pollution.

9.3.4.2 Proposed development

Artificial light does much to safeguard and enhance our environment at night; however, where not properly controlled, light pollution can present some physiological and ecological problems. The external lighting strategy should therefore be designed so that it minimises upward lighting, reduces unnecessary light pollution, energy consumption and nuisance to neighbouring properties and animals (such as bats). As part of the current BREEAM Assessment for the Site, the external lighting strategy is being designed in accordance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light which provides limits on the light intensity, light operating hours, the upward light ratio and where the lighting is permitted.

In addition, in accordance with the current BREEAM Assessment, all external lighting (except safety and security lighting) can be automatically switched off between 23:00 and 07.00. And where safety and security lighting is provided and will be used between 23.00 and 07.00, this part of the lighting system will comply with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes. The external light fittings will also be automatically controlled for prevention during daylight hours and presence detection of intermittent pedestrian traffic.

9.4 Conclusion

Investigations into the water, air, noise and light pollution for the development has been carried out, and measures implemented in order to reduce their impact.

As the detailed design progresses the potential impact of the development on the water, air, noise and light pollution, will continue to be considered.

10. BREEAM

10.1 Introduction

BREEAM is the world's leading sustainability assessment method for macroplanning projects, infrastructure and buildings. It recognises and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment.

BREEAM does this through third party certification of the assessment of an asset's environmental, social and economic sustainability performance, using standards developed by BRE. This means BREEAM rated developments are more sustainable environments that enhance the well-being of the people who live and work in them, help protect natural resources and make for more attractive property investments.

The aim of BREEAM is to;

- Encourage continuous performance improvement and innovation by setting and assessing against a broad range of scientifically rigorous requirements that go beyond current regulations and practice.
- Empower those who own, commission, deliver, manage or use buildings, infrastructure or communities to achieve their sustainability aspirations.
- Building confidence and value by provided independent certification that demonstrates the wider benefits to individuals, business, society and the environment.

BREEAM is a holistic approach to sustainability and covers the following categories;

1. Management
2. Health and Wellbeing
3. Energy
4. Transport
5. Water
6. Materials
7. Waste
8. Land Use and Ecology
9. Pollution
10. Innovation

10.2 Policy context

10.2.1 Local planning policy

The Core Strategy adopted January 2015, Policy CS1: Sustainable Construction and Design says all new commercial developments are expected to achieve BREEAM 'Very Good', whilst larger developments of over 10 dwellings or 1000m^2 floor space, should achieve BREEAM 'Excellent'.

The Draft Local Plan dated May 2017 Draft policy CC2: Sustainable Design and Construction says,

> *"All new major non-residential developments are required to meet the most up-to-date BREEAM 'Excellent' standards, where possible; All new minor non-residential developments are required to meet the most up-to-date BREEAM 'Very Good' standard as a minimum"*

10.3 Sustainability considerations

The Reading Borough Council Project Case Officer has confirmed that due to the nature of the development, the retail unit within this scheme is required to achieved BREEAM 'Very Good'.

The BREEAM pre-assessment has been provided in Appendix 3, and it shows that the scheme currently targets a BREEAM 'Very Good' score of 55.80%.

The BREEAM performance summary is provided in Figure 5 below;

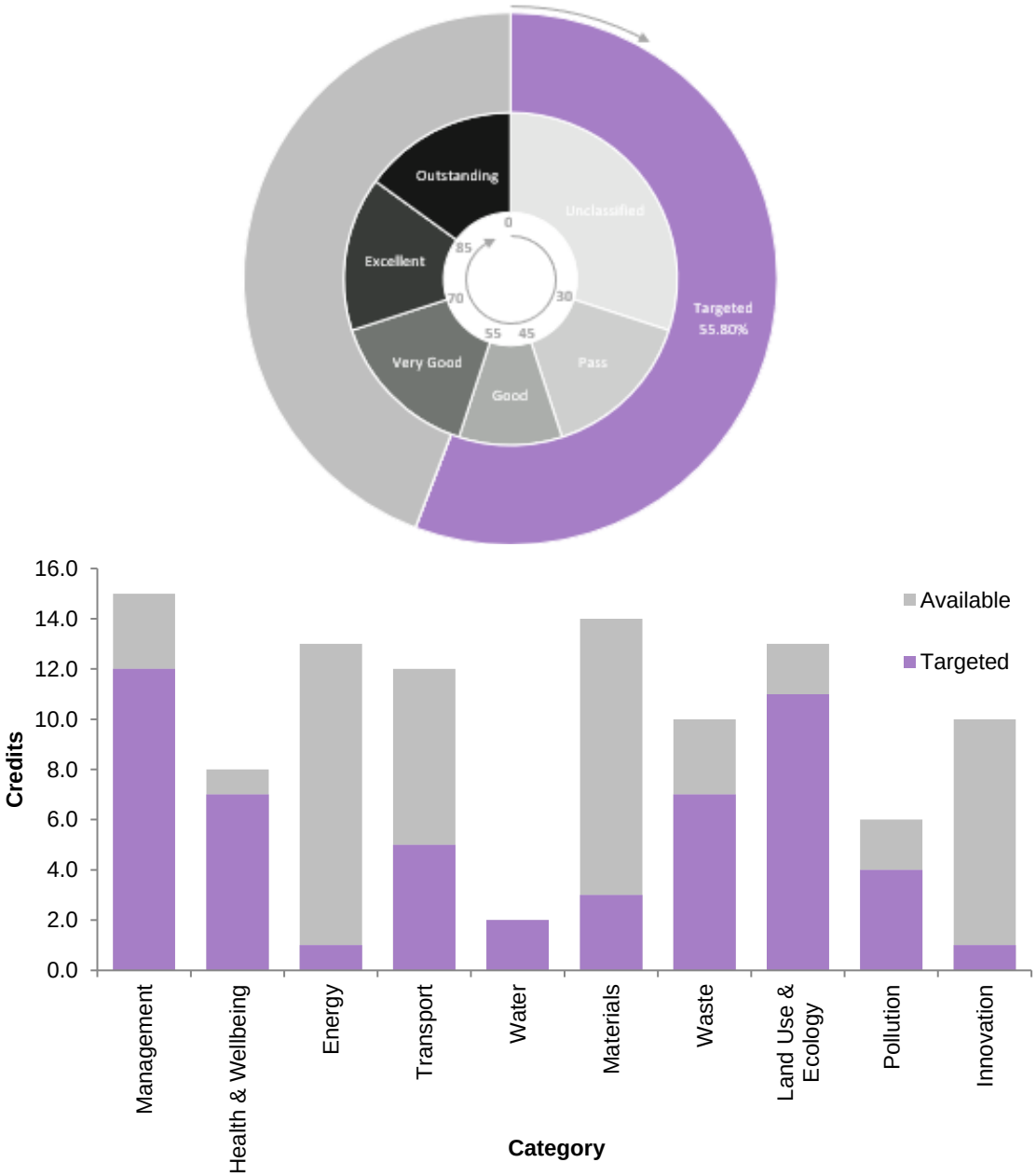


Figure 5: BREEAM Performance Summary

10.4 Conclusion

The scheme currently targets a BREEAM 'Very Good' rating.

11. Energy

Please refer to the Hoare Lea Energy Statement, dated 17.10.2019.

12. Health and wellbeing

12.1 Introduction

It is widely accepted that the environment in which we live and work can have a huge impact on our health, wellbeing, safety and overall comfort.

Visual comfort is an important part of ensuring building occupant health, comfort and wellbeing. In particular, productivity within a building can be increased where glare has been reduced to avoid the associated discomfort and distraction and where lighting controls can be easily accessed and adapted by the occupants themselves. In addition, maximising exposure to natural daylight, and providing users with an external view out and connection to nature can support mental wellbeing.

Research has also shown that extreme temperatures can have an immediate effect on health and wellbeing through increased risk of illness. Effectively controlling and regulating temperature is therefore crucial in maintaining a healthy and comfortable environment. Furthermore, designing the building so that there are a variety of thermal zones and controls can ensure that occupants can have a level of control over their environment.

Crime and the fear of crime also have a major impact on quality of life, and the wellbeing of building occupants. Enabling building occupants to feel safe and secure is therefore essential to successful, sustainable communities. Designing out the risk of crime through careful location of external lighting, security measures and valuable items should therefore provide a benefit to health and wellbeing.

Green space provides benefits not only to the natural environment, but to building occupants. Introducing biophilic design elements to a building supports human interaction with nature which can lead to the promotion of a healthy lifestyle through the promotion of exercise, and subsequently reducing stress levels.

12.2 Policy context

The draft Reading Borough Council Sustainable Design and Construction Supplementary Planning Document (SPD) says that the sustainability statement should consider Health and Wellbeing.

12.3 Sustainability considerations

12.4 Dwellings

The Calford Seaden report on Daylight and Sunlight confirms that;

1) The majority of rooms will meet the BRE recommendations for Average Daylight Factor or will be within a negligible distance.
2) The majority of rooms will meet the BRE recommendations for Daylight Distribution or will be within a negligible distance.

In an urban environment the BRE recognise that achieving the guidance levels for sunlight is rarely possible. Therefore, with the development, which is an urban development, the scheme achieves the results expected.

As the detailed design of the building is completed, it is anticipated that design measures will be incorporated that enhance the controllability of lighting and temperature. In addition, green and private space is expected to be provided to the tenants.

The scheme provides natural surveillance of streets and open spaces between buildings. The residential lobbies will be covered by CCTV services and audio/visual entry system. The car park security gate will have security access systems to avoid any intruders entering.

12.5 Retail unit

Calford Seadon have confirmed in the BREEAM Daylight Assessment letter, dated 23rd September 2019, that 100% of the retail unit will meet the required BREEAM daylighting assessment criteria. This means 100% of the

retail unit will have an Average Daylight Factor of 2%. In addition, at least 80% of the retail unit meets the view of sky criterion, and the room depth criterion has been achieved.

This encourages best practice visual performance by maximising the use of natural daylight and reducing the need for artificial light.

In addition, as part of the existing BREEAM assessment for the scheme, the external lighting strategy will be designed in accordance with set British standards, so that illuminance levels are provided which enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. It is also understood that the appropriate provision of outdoor lighting, can enhance individuals' feelings of security and safety.

The scheme provides natural surveillance of streets and open spaces between buildings. The retail entrance will be covered by CCTV services and audio/visual entry system. The car park security gate will have security access systems to avoid any intruders entering.

As stated above, as the detailed design of the building is completed, it is anticipated that design measures will be incorporated that enhance the controllability of lighting and temperature.

The current BREEAM pre-assessment targets the 'safe and healthy surroundings' credits. These credits aim to encourage the provision of safe access around the site and outdoor space that enhances the wellbeing of building users. It does this by;

- Ensuring safe access to and safe movement around the site.
- Facilitating the activities that can have physical, mental and social benefits for occupants aiding staff retention.
- Adding to the desirability of the building helping to increase its value and appeal to occupants and neighbours.

The first credit requires the external site areas to be designed so that;

- Dedicated and safe cycle paths are provided from the site entrance to any cycle storage and connect to off-site cycle paths where applicable.
- Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:
    - The site entrance to the building entrance
    - Car parks to the building entrance
    - The building to outdoor space
    - Connecting to off-site paths where applicable.
- Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.
- Delivery areas are not accessed through general parking areas and do not cross or share the following:
    - Pedestrian and cyclist paths
    - Outside amenity areas accessible to building users and general public.
- There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.
- Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting

The second credit requires the provision of an external amenity area for the users of the retail unit. This space provides enough amenity for the building users during coffee or lunch breaks to gather, socialise, relax and connect with the natural environment. This space should meet the following requirements;

- Be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky
- Have appropriate seating areas and be non-smoking,
- Be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).

12.6 Conclusion

Calford Seaden have confirmed that appropriate levels of daylight are being provided to the dwellings and retail units.

As the detailed design of the building is completed, temperature and lighting controls will be considered further.

The external lighting strategy will meet the required British Standards to ensure it is appropriate to the use of the building.

The external landscaping will be expanded on further as the design develops, however is expected to meet the BREEAM requirements of Hea 07, 'Safe and healthy surroundings'.

Appendix 1 – Dwellings sustainable design checklist

Energy / CO2

Aim - To conserve energy, in particular carbon dioxide emissions and maximise the use of energy efficiency techniques.

1) How has the development been designed to optimise the use of the energy from the sun and limit heat losses?

An energy strategy has been developed for site using a "Fabric First" approach. Heat losses and gains will be controlled by the optimisation of the fabric of each building, i.e. ensuring appropriate levels of glazing to control winter heat loss and summer heat gain. Reducing the thermal transmittance of the building envelope where appropriate will help to reduce the heating requirement and result in lower energy requirements. The details of the proposed fabric performance are included in the HL Energy Strategy (17.10.2019).

The glazing has been specified to have a G-value of 0.5 which will prevent excessive solar gains.

The building structure will be inherently air tight to minimise air infiltration. Windows and doors will be well fitted to cut draughts and provide a high standard of air tightness. A dedicated air tightness line will be illustrated on drawings through the use of compression seals and a membrane layer.

The building is expected to achieve an air tightness standard of $3m^3/hr/m^2$ at 50Pa as a minimum, which is an improvement on the minimum requirements of 2013 UK Building Regulations Part L2A ($10m^3/hr/m^2$ is allowable under UK Building Regulations).

2) How has the development been designed to optimise natural daylighting, energy efficient lighting and natural ventilation?

The Calford Seaden report on Daylight and Sunlight confirms that;

1) The majority of rooms will meet the BRE recommendations for Average Daylight Factor or will be within a negligible distance.
2) The majority of rooms will meet the BRE recommendations for Daylight Distribution or will be within a negligible distance.

In an urban environment the BRE recognise that achieving the guidance levels for sunlight is rarely possible. Therefore, with the development, which is an urban development, the scheme achieves the results expected.

Energy Efficient LED Lighting is currently included in all apartments.

Due to the location of the development, on a noisy main road, it is considered that natural ventilation is not appropriate for the dwellings.

3) How will design of the building make efficient use of energy? (e.g. use of thermally massive materials, level of insulation, energy efficient white goods and use of green/ brown roofs etc).

The building will use high performance insulating materials and fabric elements to reduce the heating requirement and result in lower energy requirements. The details of the proposed fabric performance are included in the HL Energy Strategy (17.10.2019).

The apartments will use high efficiency mechanical ventilation with heat recovery.

Internal circulation spaces will be heated to minimise heat losses to the interior.

White goods have not yet been specified, however the energy efficiency of these will be considered further as the design develops.

4) Has local energy generation from renewables been considered part of the scheme?

The Energy Strategy for the project includes the provision of Air Source Heat Pumps and a roof mounted PV array. Full details are included in the HL Energy Strategy (17.10.2019).

5) How have cycle storage facilities been considered?

There are 22 two tier bicycle racks in a secure, covered storage area on the ground floor. This provides 44 cycle parking spaces to 44 homes in the development, 1 space per residential apartment. All the cycle parking will be secure and accessible via pin pad-controlled entry points.

There are also 5 Sheffield stands located in an external but covered area of the car park, which will provide an additional 10 spaces for visitors and other users.

The cycle storage locations provide the cyclists with direct access in and out of the building without interference of other residential circulations.

Water

Aim - To improve efficiency in the use of water, conserve water resources and minimise vulnerability to flooding.

6) How will the development incorporate the use of water serving devices to achieve a maximum consumption of 105 litres per person per day?

The detailed design of the development will be completed at a later stage; however, it is anticipated that at this later stage (RIBA Stage 3 and 4) the flow rates will be considered further to enable the 105 l/p/d to be achieved.

7) How will the development incorporate recycling rainwater and reduce the use of potable water?

The RPS FRA and SuDS Strategy, dated September 2019 confirms that the attenuation benefits provided through the use of rainwater harvesting are considered to be limited, and would only be realised when the tanks were not full. Therefore, rainwater harvesting has not been proposed at the site for the attenuation strategy.

8) Has the collection, treatment and re-use of grey water been considered? If so, how will these facilities be incorporated into the development?

As above. This can however be considered further as the design develops.

Materials

Aim - To retain local character and promote the use of materials with a low environmental impact.

9) How will the selected materials help retain local character, ensure long life and ensure a low environmental impact?

The proposal has been adapted from local materials using a lighter tone of brick. The building is also expected to have a more unified façade and a more sympathetic height in relation to uses and scale of neighbouring buildings and the primary road. The design includes regularly spaced windows and long elevations which are reflective of the Site's historical use as a 19th century maltings and which has been lost in the formation of the existing building through extensions and alterations to adapt if for numerous commercial uses since the closure of the maltings in 1900. The regularity adds some coherence and order to the street scene, whilst the set back to the rear of the building adds articulation to the new façade.

The building materials for the proposed scheme are mainly brickwork and metal cladding which are durable and require minimal maintenance.

Surface Water Run-off

Aim - To reduce flooding, pollution and other environmental damage.

10) How has the development considered flooding and pollution?

The Site is at low risk of flooding from the following sources;

- Tidal
- Sewers
- Surface water

- Groundwater
- Other sources (e.g. reservoirs, water mains etc)

The Site is located within Flood Zone 2 in relation to fluival flooding from the river Thames. Mitigation for this is proposed through the following measures;

- All residential accommodation will be located on the first-floor level and above.
- Flood resistance/resilience techniques to be incorporated into the ground floor level up to 38.37m AOD, where feasible.
- All residents and site manager should sign up to the EA's free Flood Warning service.
- A Flood Management Plan should be produced for the residents of the flats and the retail unit occupiers.
- There should be no elevation of external site levels.

It is proposed to incorporate permeable paving, and underground attenuation crates to reduce the surface water discharge rate to 2 l/s. The permeable paving additionally provides water quality benefits, prior to discharge to the Thames Water surface water sewer.

Overall, the RPS FRA and SuDS strategy, dated September 2019, confirms that *'Overall it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation techniques.'*

11) Has the design considered the use of sustainable drainage systems (SUDS) and how will they be incorporated within the development?

The RPS FRA and SuDS Strategy (dated September 2019) confirms that the following SuDS techniques have been considered for the scheme, but have been determined to be not applicable;

- Infiltration SuDs techniques
- Rainwater Harvesting
- Green Roofs
- Swales, Detention Basins and Ponds

The following two measures have been considered applicable;

- Permeable/porous paving – a minimum of 170m^2 would be incorporated.
- Modular underground attenuation tanks – a minimum surface area of 70m^2, with a depth of 1.05m.

Waste

Aim - To minimise the production of waste and maximise re-use and recycling.

12) How will the development minimise waste sent to landfill?

It is anticipated that the Principal Contractor will be required to complete a Site Waste Management Plan for the development, in line with the BREEAM pre-assessment.

A SWMP aims to promote resource efficiency and to prevent illegal waste activities. Resource efficiency includes minimising waste at source and ensuring that clients, designers and principal contractors assess the use, reuse and recycling of materials and products on site and off site. A compliant RMP defines:

1. A target benchmark for resource efficiency, i.e. m^3 of waste per 100m^2 or tonnes of waste per 100m^2
2. Procedures and commitments to minimise non-hazardous waste in line with the target benchmark
3. Procedures to minimise hazardous waste
4. A waste-minimisation target and details of waste minimisation actions to be undertaken
5. Procedures to estimate, monitor, measures and report on hazardous and non-hazardous site waste and demolition waste, where relevant, arising from work carried out by the principal contractor and all subcontractors. Waste data obtained from licensed external waste contractors needs to be reliable and verifiable, e.g. using data from EA/SEPA/EA Wales/NIEA waste return forms or from a PAS402 compliant company

6. Monthly reporting of all construction waste data throughout the project checked against what would be expected based on the stage of the project, invoices, etc., to validate completeness of waste reporting data
7. Procedures to sort, reuse and recycle construction waste into defined waste groups, either on site or through a licensed external contractor
8. Procedures to review and update the plan
9. The name or job title of the individual responsible for implementing the above.

As part of the existing BREEAM Pre-assessment, the scheme will be required to divert 70% (by volume) of non-demolition waste and 80% (by volume) of demolition waste, from landfill.

13) How will the development make the maximum use of construction and demolition waste?

As above, the Principal Contractor is expected to complete a Site Waste Management Plan with the aim to promote resource efficiency and to prevent illegal waste activities.

As part of the existing BREEAM pre-assessment, the scheme will be required to produce less than 7.5m^3 of waste per 100m^2 (GIA). This includes on-site construction, as well as demolition and excavation waste.

14) How will the development make maximum use of re-used and recycled materials?

This will be considered further as the design develops. A pre-demolition audit could be completed for the Site to determine if the principal contractor could utilise any of the existing materials on Site.

15) How will provision be made for the storage and recycling of waste for all users of the site?

The waste management has been developed to meet the Reading borough Waste Management Guidelines.

Pollution

Aim - To minimise damage to the environment through air, ground/surface water, land, noise or light pollution.

16) What measures have been incorporated to ensure that noise and light pollution will be minimised throughout the development?

A copy of the Waterman Planning Noise Assessment, dated October 2019, has been provided. This report concludes that through the incorporation of good acoustic design and selection of appropriate glazing and ventilation, together with building regulation requirements, suitable residential amenity would be provided for the development. In addition, any potential impacts associated with the operation of the development can be controlled to a negligible significance provided careful attention is paid to the building design, plant selection, installation and noise attenuation. Therefore, it is considered that the development would not adversely impact on the existing residential amenity. This is expected to be further reviewed as the design develops.

The existing BREEAM assessment (Appendix 3) for the retail unit requires the external lighting strategy (which will be developed at a later stage) to ensure that it is specified so that;

1) The external lighting strategy has been 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.
2) All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.
3) If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.
4) Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements

This is to ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, thereby reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

17) What measures have been incorporated to reduce nitrogen oxide emissions and reduce the global warming potential of insulants?

ASHPs, which do not produce nitrogen oxide emissions are currently included in the HL Energy Strategy (17.10.2019). The full mechanical and electrical design of the building will be completed at a later date. At this stage, the specification of the ASHP's will be considered, it is anticipated that they will be selected, where appropriate, to incorporate measures that reduce the global warming potential of the insulants.

18) What measures have been incorporated to reduce the release of pollution into the atmosphere?

The full mechanical and electrical design of the building will be completed at a later date. At this stage, it is anticipated that measures, where practical and reasonable, will be specified to reduce the release of pollution into the atmosphere.

Health and Well-being

Aim - To improve the quality of life in homes through good daylighting, improved sound insulation, provision of outdoor space with good accessibility.

19) How has the development been designed to maximise natural lighting, reduce the likelihood of noise complaints, incorporate private outdoor space and ensure the layout of the development can be easily adapted to meet the needs of future occupants?

All apartments have more than one aspect to maximise natural day lighting. Private enclosed winter gardens are also provided to the Caversham Road and Northfield facing apartments to reduce the noise from the busy roads. South facing communal podium gardens are located on the first and fifth floors accessed directly from the main residential stair/lift core.

Management

Aim - To manage the site in an environmentally and socially considerate manner.

20) What measures have been taken to ensure the construction of the site is managed in an environmentally and socially considerate manner, mitigating environmental impacts?

The existing BREEAM Assessment for the scheme (Appendix 3) requires the Principal Contractor for the Site to recognise and encourage construction which is in an environmentally and socially considerate, responsible and accountable manner. The Principal Contractor will be required to;

- Manage the construction site entrance to minimise the impacts (e.g. safety, disruption) arising from vehicles approaching and leaving the development footprint.
- Ensure the development footprint is accessible for delivery vehicles fitted with safety features (e.g. side under run protection) to remove or limit the need for on-street loading or unloading. Where on-street loading is unavoidable, this should be appropriately managed.
- Identify access routes to the development footprint, including for heavy vehicles to minimise traffic disruption and safety risks to others.
- Minimise the risks of air, land and water pollution.
- Minimise the risks of nuisance from vibration, light and noise pollution.
- Ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage.
- Ensure clear and safe access in and around the buildings at the point of handover.
- Provide processes and equipment required to respond to medical emergencies.
- Identify and implement initiatives to promote and maintain the health and wellbeing of all site operatives within the development footprint. This can be via site facilities, site management arrangements, staff policies etc.

- Establish management practices and facilities encouraging equality, fair treatment and respect of all site operatives.
- Provide secure, clean and organised facilities (e.g. changing and storage facilities) for site operatives within the development footprint.
- Minimise risks of the site becoming a focus for antisocial behaviour in the local community (e.g. robust perimeter fencing, CCTV, avoid creating dark corners etc.).
- Aspects of the construction process that might impact the community are communicated regularly, ensuring that nuisance and intrusion are minimised.
- Ensure ongoing training is provided, and up to date, for personnel and visitors (covering items a to l, as appropriate.)
- The principal contractor ensures that site operatives are trained for the tasks they are undertaking (including any site-specific considerations).
- The fleet operators undertake driver training and awareness to promote safety within the development footprint and off site.
- The fleet operators, captures and investigates any road accidents, incidents and near misses and reports them back to the principal contractor. The principal contractor analyses these items.
- All visitor, workforce and community accidents, incidents and near misses are recorded, and action is taken to reduce the likelihood of them reoccurring.
- Processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint.

21) How has the development been designed to ensure people feel safe and secure?

The scheme provides natural surveillance of streets and open spaces between buildings. The retail entrance and residential lobbies will be covered by CCTV services and audio/visual entry system. The car park security gate will have security access systems to avoid any intruders entering. The aim is to avoid creating any natural surveillance spaces and recessed areas which cannot be overlooked.

Ecology

Aim - To retain, protect and enhance wildlife habitats and natural features.

22) How have the wildlife habitats and natural features on and adjacent to the site been considered and how will they be retained, protected and enhanced?

The Middlemarch Environmental ecological desk study identified no European statutory sites within 5 km of the survey area, no UK statutory sites within 2 km and two non-statutory sites within 1 km. The site is not located within 10 km of a statutory site designated for bats. The desk study also provided records of the following species: bats, Mammals, amphibians, reptiles, birds and invertebrates. No features of value were identified on Site. The following recommendations have been provided;

- Biodiversity Enhancement: In accordance with the provision of Chapter 15 of the National Planning Policy Framework (Conserving and Enhancing the Natural Environment) and Local Planning Policy, biodiversity enhancement measures should be incorporated into the landscaping scheme of any proposed development to work towards delivering net gains for biodiversity.
    - Planting of habitats which will be of value to wildlife, such as:
        - native seed/fruit bearing species to provide foraging habitat for mammals and birds;
        - nectar-rich species to attract bees, butterflies and moths;
        - species which attract night flying insects which will be of value to foraging bats;
    - Inclusion of hedgehog passes under any fence lines to allow connectivity between the site and the wider area.
    - Provision of nesting/roosting habitat, such as installation of nest boxes for species such as house sparrow, dense scrub for species such as song thrush, and bat boxes for species such as pipistrelle.
- Terrestrial Mammals: Any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an

outside diameter of greater than 120 mm must be covered at the end of each workday to prevent animals entering/becoming trapped.

Appendix 2 – Retail unit sustainable design checklist

Management

Aim - To recognise and encourage environmentally and socially considerate development.

1) Will guidance for the non-technical building user be provided so they can understand and operate the building efficiently and understand how the design reduces the overall environmental impact of the building and raise environmental awareness?

The provision of a Building User Guide is not currently required as part of the BREEAM pre-assessment as this credit is excluded from 'Shell Only' projects. This is due to the nature of 'Shell Only' buildings, which do not provide any internal systems that any future users would need help understanding.

However, if the 'Shell Only' assessment is altered, as the design progresses, this could be considered further.

2) What consideration has been given to resource use, energy consumption and pollution in terms of the construction site impacts?

The existing BREEAM pre-assessment for the Site requires the Principal Contractor to assign responsibility to an individual for monitoring, recording and reporting energy use, water consumption and transportation data resulting from all on-site construction processes throughout the build programme. As part of this requirement, the Principal Contractor is also required to set targets for the consumption of energy water, and transportation data, and then compare against the final results.

3) Will site investigation and appropriate remedial action be undertaken?

An RPS Phase 1 Preliminary Risk Assessment has been completed for the Site (dated 22/08/2019). This report identified potential pollutant linkages that may be active upon the redevelopment of the Site, which are predominately associated with the historical on site uses.

This report therefore recommended that the potential for the identified pollutant linkages to be active is assessed through a Phase 2 Environmental Site Investigation of the site. The scope of this investigation should include the following:

- Drilling of a number of boreholes across the site targeting identified potential sources and pollutant linkages;
- Installation of groundwater and gas monitoring wells in selected boreholes;
- Collection of soil and groundwater samples from beneath the site with chemical analysis of these samples for contaminants of concern;
- Ground gas monitoring from wells installed at the site;
- Assessment of ground conditions and generic quantitative risk assessment of soil and groundwater chemical analysis results to determine the potential for the identified potential pollutant linkages to remain active upon redevelopment of the site; and
- Provision of recommendations (where necessary) for remediation/mitigation measures to ensure that any identified potential pollutant linkages are not active upon redevelopment of the site.

4) Will the community and stakeholders be involved in the design process encouraging flexibly designed buildings which cater for shared use with the local community?

As the design progresses, consultation with community stakeholders can be considered further.

5) How has the building been designed to reduce the opportunity for and the fear of crime?

The scheme provides natural surveillance of streets and open spaces between buildings. The retail entrance and residential lobbies will be covered by CCTV services and audio/visual entry system. The car park security gate will have security access systems to avoid any intruders entering.

6) What consideration has been given to the maintenance of the building?

All internal and external maintenance in communal areas will be covered by a management company team. Tenants will be responsible for the cleaning of the retail unit. Due to the heights of the buildings, cleaning from the roof level downwards is proposed for the maintenance of facades.

Health and Well-being

Aim - To ensure a good quality amenity level is afforded to occupants of buildings.

7) How has the development been designed to ensure users have sufficient daylight, an external view, adequate and appropriate lighting, ventilation, air quality and drinking water?

Calford Seadon have confirmed in the BREEAM Daylight Assessment letter, dated 23rd September 2019, that 100% of the retail unit will meet the required BREEAM daylighting assessment criteria. This means 100% of the retail unit will have an Average Daylight Factor of 2%. In addition, at least 80% of the retail unit meets the view of sky criterion, and the room depth criterion has been achieved. This encourages best practice visual performance by maximising the use of natural daylight and reducing the need for artificial light.

In addition, the existing BREEAM pre-assessment states that 95% of the floor area has an adequate view out. This means that the window opening to surrounding wall ratio is in accordance with the values in British Standard 8206. In addition, the view is of landscape and buildings rather than just the sky).

Due to the nature of a 'Shell Only' development, where the internal systems are not provided, the design of the lighting, ventilation, air quality and drinking water, has yet to be completed. These should therefore all be considered at a later date.

Energy

Aim - To conserve energy and maximise the use of energy efficiency techniques.

8) How has the building been designed to minimise CO2 emissions associated with their operational energy consumption?

Energy strategy summary: Residential

The strategy has been developed using the 'Be Lean, Clean, and Green' energy hierarchy which utilises a fabric first approach to maximise the reduction in energy through passive design measures.

The following table provides a summary of the energy strategy for the Proposed Development:

No LZC	12.3% betterment achieved against a Part L baseline. High energy efficient building fabric and building services have been utilised to reduce carbon emissions and energy demand through good practice passive and energy efficiency measures.
With ASHP	A further 73.4% betterment is achieved through the use of ASHP. Air source heat pumps are proposed to be installed to provide space heating as well as domestic hot water.
With PV	An 9.4% betterment is achieved through Solar PV. Renewable energy from the proposed PV's is to be implemented in the scheme. It has been estimated that a 100 m^2 of PV would provide 16,300 kWh/year, depending on the efficiency of the PV panel.

Table 4: Energy strategy summary – Residential.

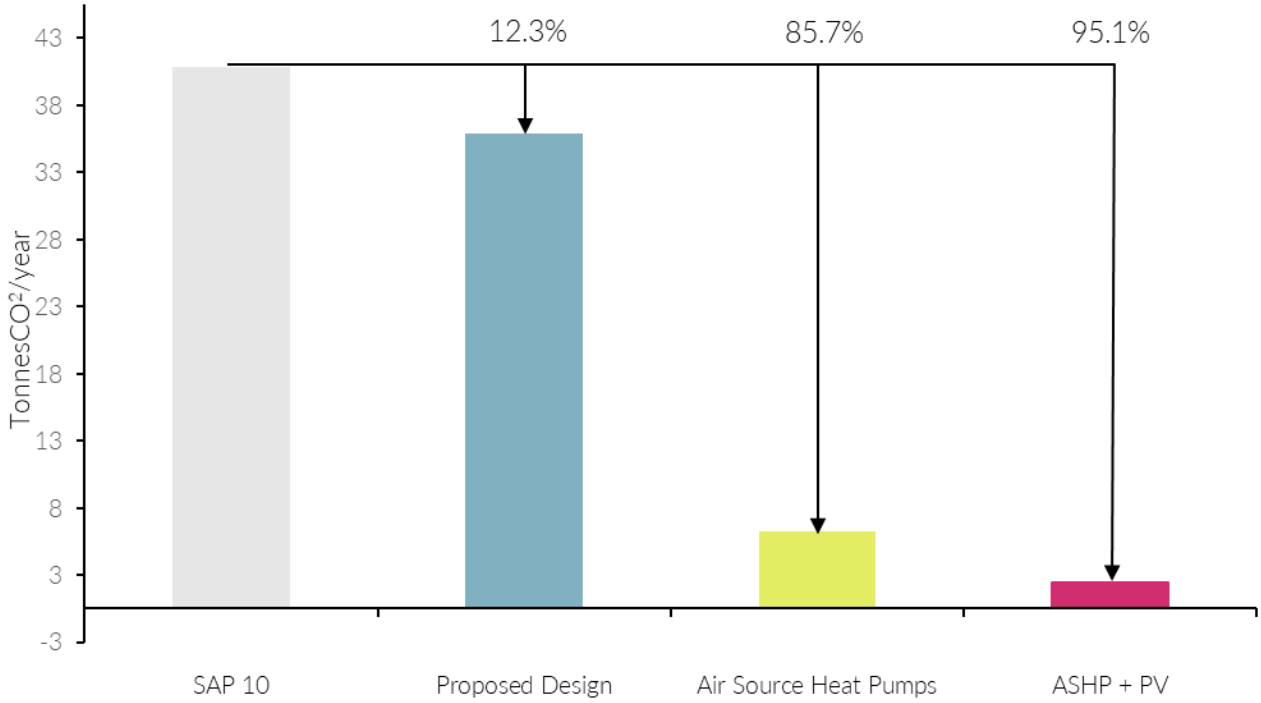


Figure 6: Summary of the estimated carbon reduction by the Proposed Development - Residential:

Results: Residential

Through the measures outlined in the energy strategy, it is anticipated that a 95.1% reduction in CO_2 emissions can be achieved in comparison to a Building Regulations Part L compliant baseline. In line with the Sustainable Design and Construction SPD, an S106 contribution will be provided to offset the remaining tonnes of CO_2 – this is estimated to be £3,510.

Energy strategy summary: Commercial

The commercial unit will be completed as a 'shell only' assessment in lieu of the fit-out details for these areas. Initial simulations based on the inputs provided in Appendix B show that the commercial unit could achieve a Building Emission Rate (BER) of 29.5 $kgCO_2/m^2$ compare to the Notional Building's Target Emission Rate (TER) of 31.6 $kgCO_2/m^2$, leading to a 6% decrease in carbon emissions when compared to a Part L baseline.

Please see the Hoare Lea Energy Strategy, dated 17.10.2019 for full details.

9) How has the development been designed to optimise the use of the energy from the sun, natural daylighting and controlled natural ventilation?

Due to the nature of a 'Shell Only' development, the ventilation strategy has not been completed.

Calford Seadon have confirmed in the BREEAM Daylight Assessment letter, dated 23rd September 2019, that 100% of the retail unit will meet the required BREEAM daylighting assessment criteria. This means 100% of the retail unit will have an Average Daylight Factor of 2%. In addition, at least 80% of the retail unit meets the view of sky criterion, and the room depth criterion has been achieved.

This encourages best practice visual performance by maximising the use of natural daylight and reducing the need for artificial light.

The existing Energy Strategy for the project suggests that Photovoltaic panels could be included within the scheme to maximise the energy from the sun.

10) How will the design of the building make efficient use of energy? (e.g. use of thermally massive materials, levels of insulation and use of green / brown roofs etc).

The detailed design of the building has not yet been completed, however the use of materials and insulation can be considered further at this stage.

11) Have renewable energy sources or decentralised energy been considered for this development and if so, how would they be incorporated within the development?

The existing Energy Strategy for the scheme (dated 17.10.2019) states that air source heat pumps and photovoltaics could be utilised for the development.

Transport

Aim - To reduce the need to travel through appropriately located development.

12) How has the design and layout incorporated measures to reduce the need to travel, especially by car, and promote alternative and sustainable modes of transport such as walking, cycling and the use of public transport?

The Transport Statement for the scheme confirms that;

- The Site has Excellent access to public transport services (as discussed in Section 7.3 of this report).
- The Site links into a good local pedestrian and cyclist infrastructure.
- Due to the proximity of the site to Reading town centre, there is a wide selection of services and amenities available to residents within a reasonable walking distance.
- 16 residential parking spaces ate provided to the Site, including 1 disabled space.
- 44 cycle parking spaces are provided, alongside five Sheffield stands.

13) How have public transport networks been considered in terms of the location of the development and proximity to local amenities?

The Transport Statement for the scheme confirmed that as the Site is located near the centre of Reading, it provides convenient access to a wide range of existing public services and local amenities. Therefore, it is unlikely to result in any adverse impacts on the operation of the local transport network.

Please refer to the Transport Statement for further details.

14) How will the development incorporate the use of water saving devices to achieve a maximum consumption of 5.5 cubic metres per year per person for office developments? (Or the most appropriate

Due to increasing population densities and relatively high levels of water consumption, much of the UK is at risk of water shortages which are likely to increase over time as rainfall patterns vary due to climate change. Reducing water consumption in the UK is, therefore, crucial.

Sub-metering water consumption means that water consumption can be better accounted for. Large water consumers can be identified with the aim of encouraging the reduction in water use where practical. Moreover, changes in consumption can be identified and dealt with as appropriate, thereby minimising risks of systems failures which can have costly and disruptive consequences.

The existing BREEAM pre-assessment for the Site therefore requires the installation of a pulsed water meter on the mains water supply to the building, this is to assist with enabling water saving devices to reduce the water consumption of the building.

Water

Aim - To improve efficiency in the use of water, conserve water resources and minimise vulnerability to flooding.

15) How will the development incorporate the use of water saving devices to achieve a maximum consumption of 5.5 cubic metres per year per person for office developments? (Or the most appropriate benchmark for other types of development).

The detailed design of the development will be completed at a later stage; however, it is anticipated that at this later stage (RIBA Stage 3 and 4) the flow rates will be considered further to enable the 5.5 cubic meters per year per person for office developments to be achieved.

16) Will the development and access to and from it such as roads and paths be located away from areas of potential flooding?

The Site is at low risk of flooding from the following sources;

- Tidal
- Sewers
- Surface water
- Groundwater
- Other sources (e.g. reservoirs, water mains etc)

The Site is located within Flood Zone 2 in relation to fluival flooding from the river Thames. Mitigation for this is proposed through the following measures;

- All residential accommodation will be located on the first-floor level and above.
- Flood resistance/resilience techniques to be incorporated into the ground floor level up to 38.37m AOD, where feasible.
- All residents and site manager should sign up to the EA's free Flood Warning service.
- A Flood Management Plan should be produced for the residents of the flats and the retail unit occupiers.
- There should be no elevation of external site levels.

It is proposed to incorporate permeable paving, and underground attenuation crates to reduce the surface water discharge rate to 2 l/s. The permeable paving additionally provides water quality benefits, prior to discharge to the Thames Water surface water sewer.

Overall, the RPS FRA and SuDS strategy, dated September 2019, confirms that *'Overall it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation techniques.'*

17) How will the development incorporate harvesting and re-use of rainwater?

The RPS FRA and SuDS Strategy, dated September 2019 confirms that the attenuation benefits provided through the use of rainwater harvesting are considered to be limited, and would only be realised when the tanks were not full. Therefore, rainwater harvesting has not been proposed at the site for the attenuation strategy.

Materials

Aim - To retain local character and promote the use of materials with a low environmental impact.

18) How will the selected materials help retain local character, ensure long life and ensure a low environmental impact?

The proposal has been adapted from local materials using a lighter tone of brick. The building is also expected to have a more unified façade and a more sympathetic height in relation to uses and scale of neighbouring buildings and the primary road. The design includes regularly spaced windows and long elevations which are reflective or the Site's historical use as a 19th century maltings and which has been lost in the formation of the existing building through extensions and alterations to adapt if for numerous commercial uses since the closure of the maltings in 1900. The regularity adds come coherence and order to the street scene, whilst the set back to the rear of the building adds articulation to the new façade.

The building materials for the proposed scheme are mainly brickwork and metal cladding which are durable and require minimal maintenance.

19) What consideration has been given to reusing materials in-situ, responsibly sourcing materials and re-using existing structures?

As the existing structures on Site are demolished, a pre-demolition audit could be completed by the demolition contractor to determine whether reuse is feasible and maximise the recovery of materials for subsequent high grade or value applications.

The pre-demolition audit could cover:

1. Identification and quantification of the key materials where present on the project
2. Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy
3. Opportunities for reuse and recycling within the same development
4. Identification of local reprocessors or recyclers for recycling of materials
5. Identification of overall recycling targets where appropriate
6. Identification of reuse targets where appropriate
7. Identification of overall landfill diversion rate for all key materials.

As part of the existing BREEAM pre-assessment for the scheme, the Principal Contractor is required to;

- Source 100% of timber and timber-based products on Site in accordance with the UK Government's Timber Procurement Policy, so that all timber is 'Legal' and 'Sustainable'.
- Source as many products as possible from suppliers with responsible sourcing certification such as ISO 14001 or BES 6001.

Waste

Aim - To minimise the production of waste and maximise re-use and recycling.

20) Has an audit of the materials present on the site been conducted with an assessment of the extent to which materials could be re-used?

At this stage, an audit into the re-use of materials has not been undertaken. This could however be completed by the demolition contractor prior to demolition.

21) How will the development make the maximum use of construction, demolition waste and recycled materials?

It is anticipated that the Principal Contractor will be required to complete a Site Waste Management Plan for the development, in line with the BREEAM pre-assessment.

A SWMP aims to promote resource efficiency and to prevent illegal waste activities. Resource efficiency includes minimising waste at source and ensuring that clients, designers and principal contractors assess the use, reuse and recycling of materials and products on site and off site. A compliant RMP defines:

1. A target benchmark for resource efficiency, i.e. m^3 of waste per $100m^2$ or tonnes of waste per $100m^2$
2. Procedures and commitments to minimise non-hazardous waste in line with the target benchmark
3. Procedures to minimise hazardous waste
4. A waste-minimisation target and details of waste minimisation actions to be undertaken
5. Procedures to estimate, monitor, measures and report on hazardous and non-hazardous site waste and demolition waste, where relevant, arising from work carried out by the principal contractor and all subcontractors. Waste data obtained from licensed external waste contractors needs to be reliable and verifiable, e.g. using data from EA/SEPA/EA Wales/NIEA waste return forms or from a PAS402 compliant company
6. Monthly reporting of all construction waste data throughout the project checked against what would be expected based on the stage of the project, invoices, etc., to validate completeness of waste reporting data
7. Procedures to sort, reuse and recycle construction waste into defined waste groups, either on site or through a licensed external contractor
8. Procedures to review and update the plan
9. The name or job title of the individual responsible for implementing the above.

As part of the existing BREEAM Pre-assessment, the scheme will be required to divert 70% (by volume) of non-demolition waste and 80% (by volume) of demolition waste, from landfill. The scheme will also be required to produce less than 7.5m^3 of waste per 100m^2 (GIA). This includes on-site construction, as well as demolition and excavation waste.

22) How will provision be made for the storage and recycling of waste for all users of the site?

The waste management has been developed to meet the Reading Borough Waste Management Guidelines.

In addition, the existing BREEAM pre-assessment has targeted the operational waste credit, which requires a dedicated space for the segregation and storage of operational recyclable waste to be generated.

Land Use and Ecology

Aim - To retain, protect and enhance wildlife habitats and natural features.

23) How have the wildlife habitats and natural features on and adjacent to the site been considered and how will they be retained, protected and enhanced?

The Middlemarch Environmental ecological desk study identified no European statutory sites within 5 km of the survey area, no UK statutory sites within 2 km and two non-statutory sites within 1 km. The site is not located within 10 km of a statutory site designated for bats. The desk study also provided records of the following species: bats, Mammals, amphibians, reptiles, birds and invertebrates. No features of value were identified on Site. The following recommendations have been provided;

- Biodiversity Enhancement: In accordance with the provision of Chapter 15 of the National Planning Policy Framework (Conserving and Enhancing the Natural Environment) and Local Planning Policy, biodiversity enhancement measures should be incorporated into the landscaping scheme of any proposed development to work towards delivering net gains for biodiversity.
    - Planting of habitats which will be of value to wildlife, such as:
        - native seed/fruit bearing species to provide foraging habitat for mammals and birds;
        - nectar-rich species to attract bees, butterflies and moths;
        - species which attract night flying insects which will be of value to foraging bats;
    - Inclusion of hedgehog passes under any fence lines to allow connectivity between the site and the wider area.
    - Provision of nesting/roosting habitat, such as installation of nest boxes for species such as house sparrow, dense scrub for species such as song thrush, and bat boxes for species such as pipistrelle.
- Terrestrial Mammals: Any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each workday to prevent animals entering/becoming trapped.

24) What consideration has been given to not using previously undeveloped land?

100% of the existing site is located on land which has been previously developed. This therefore means the development would not require land which has been previously undisturbed.

25) What consideration has been given to the removal of contamination from the land?

An RPS Phase 1 Preliminary Risk Assessment has been completed for the Site (dated 22/08/2019). This report identified potential pollutant linkages that may be active upon the redevelopment of the Site, which are predominately associated with the historical on site uses.

This report therefore recommended that the potential for the identified pollutant linkages to be active is assessed through a Phase 2 Environmental Site Investigation of the site. The scope of this investigation should include the following:

- Drilling of a number of boreholes across the site targeting identified potential sources and pollutant linkages;
- Installation of groundwater and gas monitoring wells in selected boreholes;
- Collection of soil and groundwater samples from beneath the site with chemical analysis of these samples for contaminants of concern;
- Ground gas monitoring from wells installed at the site;
- Assessment of ground conditions and generic quantitative risk assessment of soil and groundwater chemical analysis results to determine the potential for the identified potential pollutant linkages to remain active upon redevelopment of the site; and
- Provision of recommendations (where necessary) for remediation/mitigation measures to ensure that any identified potential pollutant linkages are not active upon redevelopment of the site.

Pollution

Aim - To minimise damage to the environment through air, ground/surface water, land, noise or light pollution.

26) What measures have been incorporated to ensure that noise and light pollution plus pollution transported through surface water runoff will be minimised throughout the development?

As part of the BREEAM pre-assessment for the Site, the 'Reduction of night time light pollution' credit has been targeted. This means that the external lighting strategy will be designed in such a way as that it ensures the lighting is concentrated in the appropriate areas and that upward lighting is minimised, thereby reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties. This is further explained in question 27 below.

In addition, the Principal Contractor will be required to;

- Implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.
- Minimise the risks of air, land and water pollution.
- Minimise the risks of nuisance from vibration, light and noise pollution.

27) What measures have been incorporated to ensure that light pollution will be minimised throughout the development?

The external lighting used by buildings can have a detrimental impact on the use and enjoyment of neighbouring properties, and on the mental and physical wellbeing of individuals in them. It also has a significant and often detrimental impact on local wildlife.

The design of lighting installations can reduce the impacts without limiting their functionality and there are a number of appropriate best practice standards for the design and control of such lighting installations that aim to minimise these detrimental impacts.

By limiting light pollution, the impact and energy use of the building may be reduced making it more acceptable to local communities and reducing impacts on local wildlife.

The external lighting design will be completed as part of the future design development (RIBA Stage 3 and 4). However, the existing BREEAM pre-assessment requires the future design to ensure that;

- The external lighting strategy has been 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 (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.
- If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.

- Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.

28) What consideration has been given to reducing refrigerants and minimising nitrogen oxide emissions?

Poor air quality has a detrimental effect on humans, fauna and flora. Gases such as nitrous oxides (NO_x) can react with other gases and environmental factors including sunlight to create substances that have a major impact on health and wellbeing. The resulting substances can be highly detrimental to human health. They can be carcinogenic, affect respiratory function (including asthma and other bronchial complaints), have a sensitising effect for allergy suffers and increase instances of heart disease. Legislation covering the UK sets maximum acceptable limits for measured air pollutants. Under this issue BREEAM seeks to limit emissions from developments in use that affect local air quality.

29) How has the development been sited to minimise the impact of flooding?

The Site is at low risk of flooding from the following sources;

- Tidal
- Sewers
- Surface water
- Groundwater
- Other sources (e.g. reservoirs, water mains etc)

The Site is located within Flood Zone 2 in relation to fluival flooding from the river Thames. Mitigation for this is proposed through the following measures;

- All residential accommodation will be located on the first-floor level and above.
- Flood resistance/resilience techniques to be incorporated into the ground floor level up to 38.37m AOD, where feasible.
- All residents and site manager should sign up to the EA's free Flood Warning service.
- A Flood Management Plan should be produced for the residents of the flats and the retail unit occupiers.
- There should be no elevation of external site levels.

It is proposed to incorporate permeable paving, and underground attenuation crates to reduce the surface water discharge rate to 2 l/s. The permeable paving additionally provides water quality benefits, prior to discharge to the Thames Water surface water sewer.

Overall, the RPS FRA and SuDS strategy, dated September 2019, confirms that *'Overall it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation techniques.'*

30) How has the design considered the use of sustainable drainage systems (SUDS) and how will they be incorporated within the development?

The RPS FRA and SuDS Strategy (dated September 2019) confirms that the following SuDS techniques have been considered for the scheme, but have been determined to be not applicable;

- Infiltration SuDs techniques
- Rainwater Harvesting
- Green Roofs
- Swales, Detention Basins and Ponds

The following two measures have been considered applicable;

- Permeable/porous paving – a minimum of 170m^2 would be incorporated.
- Modular underground attenuation tanks – a minimum surface area of 70m^2, with a depth of 1.05m.

<u>Innovation</u>

Aim - To recognise innovation in the field of sustainability.

31) What consideration has been given to innovative sustainability measures in terms of a procurement strategy, design feature, management process or technological development?

This will continue to be reviewed as the design progresses with the aim of implementing innovative sustainability measures, where practical and cost-effective.

Appendix 3 – BREEAM pre-assessment

HOARE LEA

Cavendish Road. Reading. S2 Estates.

SUSTAINABILITY
BREEAM NEW CONSTRUCTION 2018
PRE-ASSESSMENT REPORT
REVISION 01 – 30 OCTOBER 2019

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	30/10/2019	BREEAM Pre-Assessment	TC	KC	KC

This document has been prepared for S2 Estates only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

Project number: 2323420
Document reference: REP-2323420-4-TC-20191030-BREEAM 2018 PRE ASSESSMENT-Rev01

BREEAM Audit box

BRE registration number	TBC
Licensed assessor	Taylor Cook
Assessor support	Jack Tinsley
BREEAM scheme	BREEAM New Construction
BREEAM scheme version	2018
Assessment stage	Pre-Assessment Stage
Technical manual version	3.0
Tier code (internal use only)	Tier 3

BREEAM Credit filtering box

Building type and sub-group	Retail – Shop or Shopping Centre
Building floor area	c.240m^2
Designed to be untreated?	No
Building services (heating)	N/A – Shell Only
Building services (cooling)	N/A – Shell Only
Commercial cold storage systems	N/A – Shell Only
Transportation systems	N/A – Shell Only
Laboratory (type, area and size)	N/A – Shell Only
Fume cupboards / containment devices	N/A – Shell Only
Unregulated water uses	Yes
External areas?	Yes
Statutory requirements impacting outdoor space?	No
Unregulated energy load	No
Post occupancy ENE01 credits targeted?	No

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1. Executive summary

This report provides an indicative BREEAM 2018 New Construction pre-assessment for the proposed 71 – 73 Cavendish Road project in Reading.

The development falls under the BREEAM New Construction 2018, Retail category and a Shell Only pre-assessment has been conducted. The proposed development is targeting a BREEAM 'Very Good' rating as a minimum. This has been confirmed by the Reading Planning Case Officer.

The current anticipated baseline score is 55.80%, equivalent to a BREEAM 'Very Good' rating, with a difference between the minimum required score for a BREEAM 'Very Good' rating of 55.00%% of 0.80%.

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

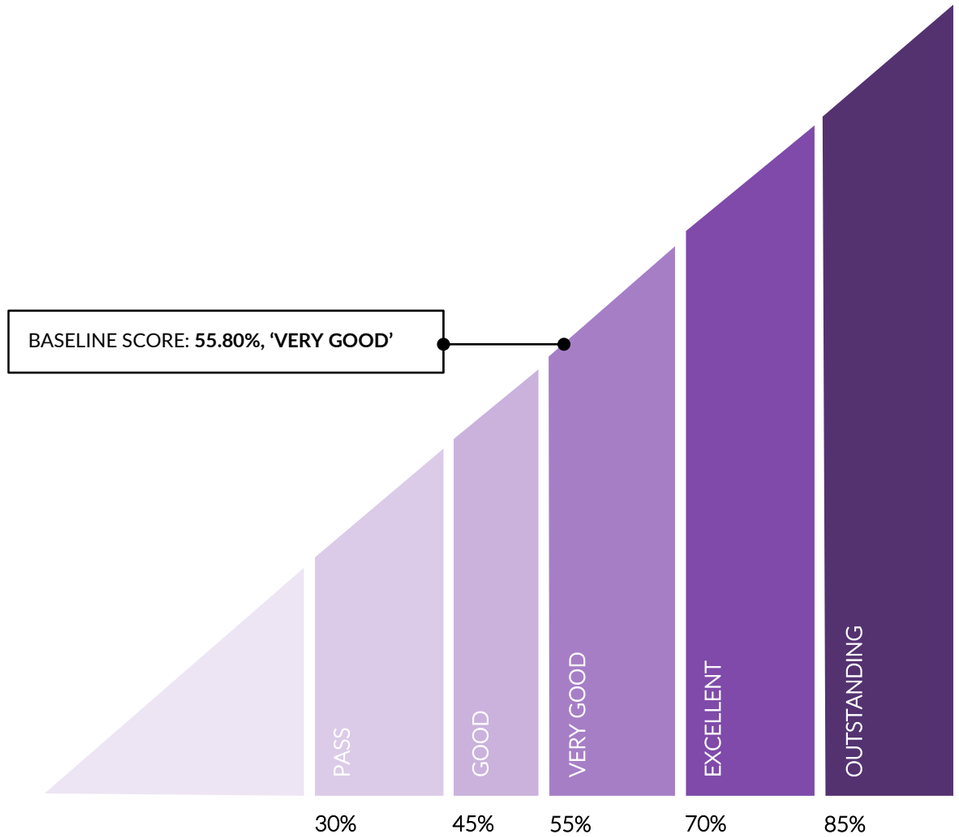


Figure 1: BREEAM 2018 Scale and Anticipated Performance Scores.

2. BREEAM Pre-Assessment

2.1 Introduction

This report relates to the proposed Cavendish Road development. It is recommended the building should be registered under the BREEAM New Construction 2018 scheme and assessed using the Retail criteria. The building is currently considered to be most suitable to be assessed using a 'Shell Only' assessment. The assessment will be targeting a BREEAM 'Very Good' rating as a minimum.

2.2 Initial Pre-Assessment

This pre-assessment has been carried out independently by a qualified BREEAM assessor. The credit requirements were issued to all relevant members of the design team. Each member of the design team was expected to review their BREEAM requirements and provide advice and guidance, where necessary, on the achievability of the BREEAM credit. These comments were all collated by the BREEAM assessor and input into this BREEAM Pre-Assessment.

This report therefore sets out a route to achieving the target 'Very Good' rating and highlights the design team members responsible for each credit issue.

As the design progresses, each member of the design team is expected to provide feedback regarding credits under their responsibility, identifying any relevant issues.

The following predicted score has been calculated based upon the above;

- 55.80% 'Baseline 'Very Good' Rating

All mandatory and minimum standards for the BREEAM 'Very Good' rating have been included within the assessment strategy for the target baseline score.

Refer to Appendix B for detailed credit requirements.

In addition, the BREEAM manual can be found at;

https://www.breeam.com/NC2018/

2.3 Project Team Members

Discipline	Organisation
Client / Developer	S2 Estates
Ecologist	Middlemarch Environmental
Architect	JTP
Civils / Structural Consultant	RPS
Transport Consultant	Mayer Brown
Air Quality Consultant	RPS
Flood Risk/SUDS	RPS
Noise and Vibration Consultant	Waterman
Daylight and Sunlight	Calfordseaden
Energy Consultant	Hoare Lea
Contaminated Land Consultant	RPS
Planning Consultant	QUOD

Table 1: Project Team Members.

3. Summary Score Sheet

The summary table below highlights the list of targeted credits for the current BREEAM 2018 pre-assessment. Mandatory credits to achieve a 'Very Good' rating and above are highlighted by (M_v).

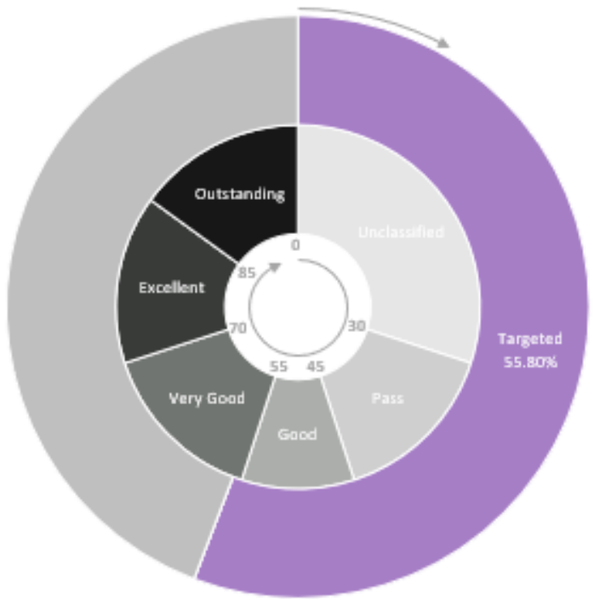
Table 2: BREEAM Target Summary.

Category	Issue	Credits	
		Available	Targeted
Management	Man 01: Project brief and design	4	3
	Man 02: Lifecycle cost and service life planning	4	2
	Man 03: Responsible construction practices	6	6
	Man 04: Commissioning and handover	1	1
Health & Wellbeing	Hea 01: Visual comfort	4	4
	Hea 05: Acoustic performance	1	1
	Hea 06: Security	1	0
	Hea 07 Safe and healthy surroundings	2	2
Energy	Ene 01: Reduction of energy use and carbon emissions	9	0
	Ene 03: External lighting	1	1
	Ene 04: Low carbon design	3	0
Transport	Tra 01: Transport assessment and travel plan	2	2
	Tra 02: Sustainable transport measures	10	3
Water	Wat 02: Water monitoring (M_v)	1	1
	Wat 03: Water leak detection	1	1
Materials	Mat 01: Environmental impacts from construction products - Building life cycle assessment	7	0
	Mat 02: Environmental impacts from construction products	1	0
	Mat 03: Responsible sourcing of construction products (M_v)	4	2
	Mat 05: Designing for durability and resilience	1	1
	Mat 06: Material efficiency	1	0
Waste	Wst 01: Construction waste management	5	3
	Wst 02: Use of recycled and sustainably sourced aggregates	1	0
	Wst 03: Operational waste	1	1
	Wst 05: Adaptation to climate change	1	1
	Wst 06: Design for disassembly and adaptability	2	2
Land Use and Ecology	LE 01: Site Selection	2	2
	LE 02: Identifying and understanding the risks and opportunities for the project	2	2
	LE 03: Managing negative impacts on ecology	3	3
	LE 04: Change and enhancement of ecological value	4	4
	LE 05: Long term ecology management and maintenance	2	0
Pollution	Pol 03: Flood and surface water management	5	3
	Pol 04: Reduction of night time light pollution	1	1
Innovation	Inn 01: Approved innovation and exemplary level credits	10	1
Total	Targeted weighted score rating: 55.80%, BREEAM 'Very Good'		

4. Conclusion

Based upon an initial review of the comments provided by the design team, it is anticipated that the 71-73 Cavendish Road project could achieve a score of 55.80%, equivalent to a BREEAM 'Very Good' rating.

Figure 2 outlines the Proposed Development scores in each category. It also outlines where potential credits could be targeted to increase the assessment score and rating.



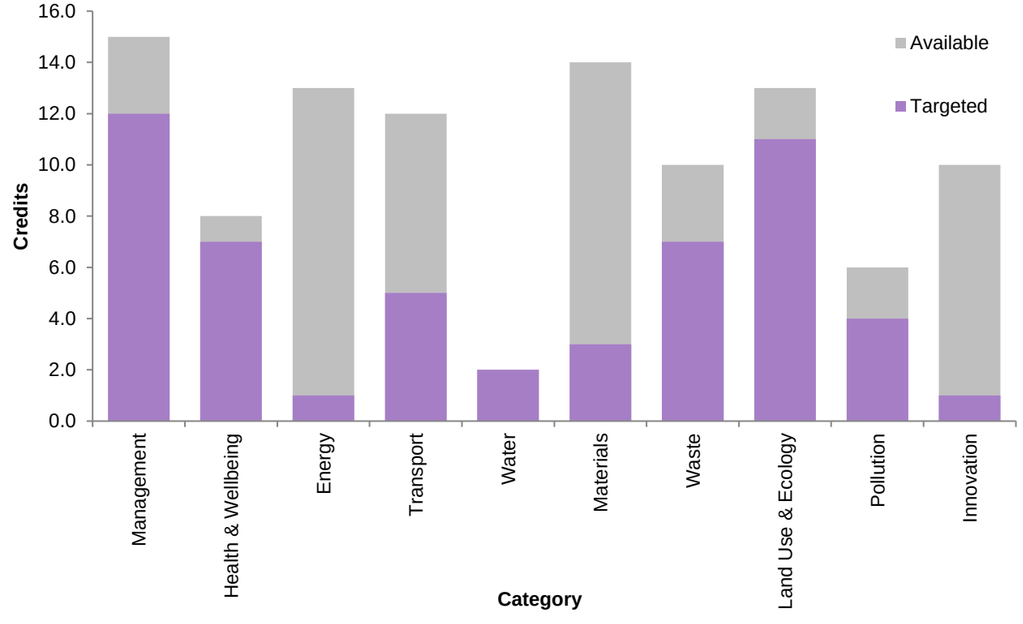


Figure 2: BREEAM Performance Summary and Targeted Credits.

5. Appendix A: Early Action Credits

5.1 Project brief stage

Under the BREEAM, there are a number of credits that are time critical and require early action by the design team in order for the credits to be achieved. For these credits, the actions required prior to end of RIBA Stages 1 and 2; and the members of the design team responsible for these are listed below:

Credit Issues	RIBA Stage 1 Actions	Owner
Man 01 Project brief and design	– First credit: Stakeholder consultation: By the end of Stage 1 – definition and engagement of key stakeholders (incl. team member with significant construction experience) and their roles and responsibilities. – Third Credit: Sustainability champion to be appointed to facilitate the setting and achievement of BREEAM performance targets for the project by Stage 2.	Project Manager BREEAM AP
Mat 06 Material efficiency	Consult with relevant design team members to identify and implement measures for efficient use of materials throughout all key stages. Suggested actions include: – Provide details outlining activities relating to material efficiency. – Provide drawings or building integrated model (BIM), calculations showing reduction of material use through design. – Collate meeting notes, construction programme, and responsibilities schedule (indicating parties consulted).	Planning Consultant
LE 04 Enhancing site ecology	The ecologist must be appointed by RIBA Stage 1 to carry out initial surveys, and subsequently provide recommendations in a report at RIBA Stage 2.	Ecologist
LE 05 Long term impact on biodiversity		

Table 3: BREEAM 2018 Early Action Credits (RIBA Stage 1)

5.2 Concept design stage

Credit Issues	RIBA Stages 2 Actions	Owner
Man 01 Project brief and design	– First credit: Develop roles, responsibilities and contributions schedule detailing relevant roles throughout the project. – Second credit: Stakeholder consultation by completion of Concept Design. – Advisory professional: BREEAM performance targets to be formally agreed between the client and design/project team no later than Concept Design stage (RIBA Stage 2).	Planning Consultant Client BREEAM AP
Man 02: Life cycle costing and service life planning	– An elemental level Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during RIBA Work Stage 2.	Cost Consultant
Hea 06 Security	– Appoint Suitability Qualified Security Specialist (SQSS) to conduct a Security Needs Assessment (SNA).	Architect SQSS
Ene 04 Low carbon design	– Carry out a passive design analysis and a renewable energy systems feasibility study.	MEP Sustainability Consultant
Mat 01 Environmental impacts from construction products - Building life cycle assessment	– Conduct outline design LCA assessment and options appraisal. This LCA must be submitted to BRE Global prior to planning application submission.	Architect Civil and structural engineer Cost Consultant
Mat 03 Responsible sourcing of materials	– Development and use a project sustainable procurement plan for the project.	Project manager Sustainability consultant
Mat 06 Material efficiency	– Set targets and report on opportunities and methods to optimise the use of materials. Develop and record the implementation of material efficiency.	Architect Structural Engineer Civil engineer
Wst01 Construction waste management	– Carry out (where relevant) a pre-demolition audit.	Demolition contractor Client
Wst 05 Adaptation to climate change	– Conduct a climate change adaption strategy appraisal for structural and fabric resistance.	Architect + Structural Engineer
Wst 06 Design for disassembly and adaptability	– Undertake a building-specific disassembly assessment and functional adaptation strategy study. – Subsequently incorporate adaption measures into the design where practical and cost effective at RIBA Stage 4.	Architect Structural Engineer
LE 02 Identifying and understanding the risks and opportunities for the project	– The project team is required to liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites.	Ecologist Project manager
LE 03 Managing negative impacts on ecology	– Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief.	Ecologist Project manager

Table 4: BREEAM 2018 Early Action Credits (RIBA Stage 2)

6. Appendix B: Detailed Credit Assessment

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
Management					
Man 01 Project brief and design	First credit - Stakeholder consultation (project delivery): Where evidence provided demonstrated that from RIBA stage 2 (design brief) or equivalent the client, building occupier, design team and contractor have met and are involved in contributing to the decision-making process for the project. As a minimum this includes meeting to identify and define their roles, responsibilities and contributions during each key phase. Consideration of contributions must meet specified minimum requirements The project team demonstrates how the project delivery stakeholder contributions and consultation process outcomes influence the following: – Initial Project Brief – Project Execution Plan – Communication Strategy – Concept Design	1	1	This credit has been targeted but requires the completion of the Man 01 Stage 2 template.	Project Manager
	Second credit - Stakeholder consultation (interested parties): Where evidence provided demonstrates that prior to the completion of the Concept Design stage, all relevant interested party stakeholders have been consulted by the design team and this covers the minimum consultation content (including but not limited to functionality, impacts on local community, inclusive and accessible design). The impact this consultation has had on the Project Brief and Concept Design must be demonstrated and consultation feedback has been given to all relevant parties by the developed design stage. A design workshop is undertaken that focuses on operational energy.	1	0	It is our understanding that this has not been completed at this stage.	-
	Pre-requisite The project team, early in the design process formally agrees BREEAM targets for the project. Third credit – BREEAM AP (concept design): Where evidence provided demonstrates that a BREEAM AP has been appointed to facilitate the setting and achievement of BREEAM performance target(s) for the project and evidence shows that the designed BREEAM performance target(s) has been contractually agreed and demonstrably achieved by project design. The BREEAM AP appointment must be separate to the appointed assessor.	1	1	This credit has been targeted.	BREEAM AP
	Fourth credit – BREEAM AP (developed design): Where evidence provided demonstrates that the Third credit is achieved and a BREEAM AP is appointed to monitor progress against the agreed BREEAM performance target(s). This is done by attending key project/design team meetings during the developed design and reporting to the client throughout the process.	1	1	This credit has been targeted.	BREEAM AP
Man 02 Life cycle impacts	First and second credit - Elemental life cycle cost (LCC): Where evidence provided demonstrates that an elemental Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during Process Stage 2 (concept design/RIBA Stage 2) or equivalent. The LCC analysis shows an outline LCC plan for the project, appraising a range of options based on multiple cash flow scenarios e.g. 20, 30, 50, or 60 years and a fabric and servicing strategy for the project outlining services component and fit-out options.	2	0	It is our understanding that this has not been completed at Stage 2.	LCC Consultant
	Third credit - Component level LCC option appraisal: Where evidence provided demonstrates that a component level LCC plan has been developed by end of Process Stage 4 (RIBA Stage 4) including the following component types: – Envelope: e.g. cladding, windows, and/or roofing	1	1	This credit has been targeted.	LCC Consultant

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
	– Services: e.g. heat source cooling source, and/or controls – Finishes: e.g. walls, floors and/or ceilings – External spaces Demonstrate using appropriate examples provided by the design team, how the component level LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.				
	Fourth credit - Capital cost reporting: Where evidence provided demonstrates reporting of the capital cost for the building in pounds per square metre (£/m^2) via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section.	1	1	This credit has been targeted.	Cost Consultant
Man 03 (M_e) (M_o) Responsible construction practices Mandatory: – One credit (responsible construction management) for Excellent – Two credits (responsible construction management) for Outstanding	Pre-requisite All timber and timber-based products used on the project is 'legally' harvested and traded timber First credit - Environmental management: Evidence which demonstrates that the principle contractor operates an environmental management system (EMS) covering main operations e.g. third party certified to ISO 14001/EMAS or equivalent standard or have a structure that is in compliance with BS 8555-2003 and has reached stage 4 of implemented stage. Evidence that the principal contractor implements best practice pollution policies and procedures on-site in accordance with Pollution Prevention Guidelines, PPG6. It is understood this document has been withdrawn, however BRE identify this still constitutes best practice.	1	1	This credit has been targeted.	Principal Contractor
	Pre-requisite The client and contractor formally agree and demonstrate performance targets. Second credit – BREEAM AP (site): Evidence which demonstrates that a BREEAM AP is appointed to monitor the project to ensure ongoing compliance with relevant sustainability performance/process criteria. The defined BREEAM performance target forms a requirement of the principal contractor's contract and to achieve this credit in final post construction phase of assessment, the BREEAM-related performance target must be demonstrably achieved by the project.	1	1	This credit has been targeted.	Principal Contractor

	Third and fourth credit – Responsible construction management:
	
	Using the BREEAM checklist - up to two credits:
	Appoint a dedicated person to be responsible for monitoring and reporting on activities against risk evaluation documents collected.
	
	The principal contractor evaluates the risks (on-site and off-site), plans and implements actions to minimise the identified risks, covering the following, where appropriate:
	– Vehicle movement on and near site
	  – Management of construction site entrance (M)
	  – Ensure development footprint is accessible for delivery vehicles with safety features (eg. Side under run protection)
	  – Identify access routes to the development footprint, including for heavy vehicles to minimise the safety risks and disruption to others.
	– Pollution management
	  – Minimise the risks of air, land and water pollution. (M)
	  – Minimise the risks of nuisance from vibration, light and noise pollution.
	– Tidiness
	  – Practices ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage. (M)
		2	2	These credits have been targeted.	Principal Contractor

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		

	– Ensure clear and safe access in and around the buildings at the point of handover. (M)
	– Health and wellbeing
	  – Provide processes and equipment required to respond to medical emergencies. (M)
	  – The principal contractor identifies and implements initiatives to promote and maintain the health and wellbeing of all site operatives within the development footprint. This can be via site facilities, site management arrangements, staff policies etc.
	  – Establish management practices and facilities encouraging equality, fair treatment and respect of all site operatives. (M)
	  – Provide secure, clean and organised facilities (e.g. changing and storage facilities) for site operatives within the development footprint.
	– Security processes
	  – Minimise risks of the site becoming a focus for antisocial behaviour in the local community (e.g. robust perimeter fencing, CCTV, avoid creating dark corners etc.).
	– Training, awareness and feedback
	  – Aspects of the construction process that might impact the community are communicated regularly, ensuring that nuisance and intrusion are minimised.
	  – Ensure ongoing training is provided, and up to date, for personnel and visitors. (M)
	  – The principal contractor ensures that site operatives are trained for the tasks they are undertaking. (M)
	  – The fleet operators undertake driver training and awareness to promote safety within the development footprint and off site.
	– Monitoring and reporting
	  – The fleet operators, captures and investigates any road accidents, incidents and near misses and reports them back to the principal contractor. The principal contractor analyses these items.
	  – All visitor, workforce and community accidents, incidents and near misses are recorded, and action is taken to reduce the likelihood of them reoccurring. (M)
	  – Processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint.
	
	One credit is achieved for meeting the requirements for all mandatory sections, identified by (M)
	Two credits are achieved for meeting the requirements for all mandatory and six additional requirements
	An additional exemplar level credit is available for achieving all requirements within Table 4.1 (identified above)				

	Exemplary credit - Responsible construction practices: An additional exemplary level credit is available for achieving all requirements within Table 4.1 (identified above)	1	1	This credit has been targeted.	Principal Contractor
	Fifth and sixth credit - Monitoring of construction-site impacts: Where evidence provided demonstrates the responsibility has been assigned to an individual for monitoring, recording and reporting energy use, water consumption and transport data from all on-site construction processes throughout the build programme.	2	2	These credits have been targeted.	Principal Contractor
Man 04 (M_v), (M_e), (M_o) Commissioning and handover	Third credit - Testing and inspecting building fabric: Where credit 1 is achieved and evidence provided demonstrates that the integrity of the building fabric is quality assured through compliant post construction testing and inspection. Any defects identified in the **thermographic survey** or airtightness testing reports are rectified prior to building handover and close out.	1	1	This credit has been targeted.	Principal Contractor
Health and Wellbeing					

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
Hea 01 Visual comfort	Second and third credits – Average daylighting: – Where evidence provided demonstrates that the relevant building areas meet good practice daylighting criteria as outlined below, in addition to room depth criterion, daylight uniformity or annual illuminance levels. Education buildings – Pre-schools, schools, occupied spaces: two credits 2.0%, 80% area	2	2	Calford Seadon have confirmed both credits can be targeted.	Daylighting Consultant
	Fourth credit - View out: Where evidence provided demonstrates that 95% of floor areas in relevant building areas are within 8m of a wall which has a window or permanent opening that provides an adequate view out. The window/opening must be ≥20% of the surrounding wall area.	1	1	This credit has been targeted.	Architect
	Fifth credit - Lighting levels and controls: – For external areas, lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas Lighting of roads and public amenity areas, Code of Practice for the design of road lighting, BSI, 2013 and BS EN 12464-2:2014 light and lighting - Lighting of work places - Part 2: Outdoor work places.	1	1	This credit has been targeted.	M&E Consultant
Hea 05 Acoustic performance	Indoor Ambient Noise Levels Achieve the indoor ambient noise level standards set out within Section 1 of BB93 for all room types. A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the ANC Good Practice Guide, Acoustic testing of schools.	1	1	This credit has been targeted.	Acoustician
Hea 06 Security	One credit - Security of site and building: Where evidence provided demonstrates that a suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment during or prior to Concept Design (RIBA Stage 2). The recommendations from the SQSS must be implemented into the design.	1	0	It is our understanding this has not been completed at Stage 2.	Architect / Security Consultant
	Exemplary level criteria A compliant risk-based security rating scheme has been used e.g. SABRE. The performance against the scheme has been confirmed by independent assessment and verification.	1	0	As above.	Architect / Security Consultant

Hea 07
Safe and healthy surroundings
	First credit - Safe access:
	Where external site areas form part of the assessed development the following apply:
	– Dedicated and safe cycle paths are provided from the site entrance to any cycle storage and connect to offsite cycle paths where applicable.
	– Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:
	  – The site entrance to the building entrance,
	  – Car parks (where present) to the building entrance
	  – The building to outdoor space
	  – Connecting to off-site paths where applicable.
	– Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.
	
	Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply:
	– Delivery areas are not accessed through general parking areas and do not cross or share the following:
	  – pedestrian and cyclist paths
	  – outside amenity areas accessible to building users and general public.
		2	2	Both credits have been targeted.	Architect

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted</th></tr>
<tr><td></td><td>– There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.
– Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.

Second credit - Outside space
There is an outside space providing building users with an external amenity area.

The space must be of an appropriate size to provide enough amenity for the predicted number of building users during coffee or lunch breaks to gather, socialise, relax and connect with the natural environment. The space is predominantly intended for building staff but can be used by other building users where relevant and beneficial to the building users.
The outside space must:
– Be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky
– Have appropriate seating areas and be non-smoking,
– Be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Energy</td></tr>
<tr><td>Ene 01 (M_e) (M_o)
Reduction of carbon emissions
Mandatory:
– Four credits for Excellent
– Six credits (energy performance) and 4 credits (energy modelling and reporting) for Outstanding</td><td>Up to nine credits:
Where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO_2 emissions.
The number of credits achieved is determined by comparing the Energy Performance Ratio for New Construction (EPR_{NC}) with the benchmarks in the table below.
<table>
<tr><th colspan="2"></th><th colspan="2">Minimum Standards</th></tr>
<tr><th>BREEAM credits</th><th>EPR_{NC}</th><th>Rating</th><th>Minimum Requirements</th></tr>
<tr><td>1</td><td>0.1</td><td rowspan="3">-</td><td rowspan="3">Requires a performance improvement progressively better than the relevant national building regulations compliant standard</td></tr>
<tr><td>2</td><td>0.2</td></tr>
<tr><td>3</td><td>0.3</td></tr>
<tr><td>4</td><td>0.4</td><td rowspan="2">Excellent</td><td rowspan="2">Requires 4 credits to be achieved (equivalent to an EPR_{NC} of at least 0.4).</td></tr>
<tr><td>5</td><td>0.5</td></tr>
<tr><td>6</td><td>0.6</td><td rowspan="4">Outstanding</td><td rowspan="4">Requires 6 credits to be achieved (equivalent to an EPR_{NC} of at least 0.6) and 4 credits for Energy modelling and reporting.</td></tr>
<tr><td>7</td><td>0.7</td></tr>
<tr><td>8</td><td>0.8</td></tr>
<tr><td>9</td><td>0.9</td></tr>
</table></td><td>9</td><td>0</td><td>The Energy Strategy enables 0 credits to be targeted.</td><td>Energy Consultant</td></tr>
<tr><td>Ene 03
External lighting</td><td>One credit:
Where evidence provided demonstrates that the external lighting has an average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit watt and that all external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.</td><td>1</td><td>1</td><td>This credit has been targeted.</td><td>M&E Consultant</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
Ene 04 Low carbon design	First credit - Passive design analysis: Where the first credit of Hea 04 (Thermal comfort) is achieved and the project team carries out an analysis of the design to identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services, and that these solutions are implemented meaningfully into the design.	1	0	It is our understanding these have not been completed at Stage 2.	Energy Consultant
	Second credit - Free cooling: Where the first credit is achieved, the passive design analysis includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions. Free cooling solutions might include night time cooling, ground coupled air cooling or surface water cooling (for example); i.e. does not use active cooling.	1	0	It is our understanding these have not been completed at Stage 2.	Energy Consultant
	Third credit - Low zero carbon feasibility study: Where evidence provided demonstrates that a feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2) by an energy specialist to establish the most appropriate recognised local (on- or near-site) low or zero carbon energy source(s) for the development. A local LZC technology/ies has been specified for the building in line with the recommendations of this feasibility study and this method of supply results in a meaningful reduction in regulated CO_2 emissions.	1	0	It is our understanding these have not been completed at Stage 2.	Energy Consultant
Transport					
Tra 01 Transport assessment and travel plan	Two credits: – Where evidence provided demonstrates that a travel plan has been developed as part of the feasibility and design stages which considers all types of travel relevant to the building type and users. – The travel plan must be structured to the needs of the particular site and takes into consideration the findings of a site-specific transport survey. – The travel plan must include a package of measures that have been used to steer the design of the development in order to meet the travel plan objectives and minimise car-based travel patterns. The travel plan must be demonstrated in action post construction.	2	2	The Transport Statement was completed at Stage 2. These credits may require the competition of a Travel Plan at a later stage.	Transport Consultant
Tra 01 Transport assessment and travel plan	Ten credits Features included to achieve a Tra02 points score. Credits are achieved based on the site's Accessibility Index and the features provided.	10	3	The Transport Statement was completed at Stage 2. These credits may require the competition of a Travel Plan at a later stage.	Transport Consultant

Points	Points	Points	Credits
AI < 25	25 ≤ AI < 40 (urban centres)	AI of ≥ 40 (metropolitan centre locations)	
1	1		1
2		1	2
3	2		3
4		2	4
5	3		5
6	4	3	6
7	5		7
8	6	5	8
9	7	6	9

Issue	Credit Requirements	Credits Available	Credits Targeted	Comments / Actions	Responsible Team Member

10	8	7	10

Sustainability Transport Measures:

Public transport measures	Points
Public transport measures	
– The existing AI calculated in Tra 01 achieves the following: – ≥ 4 for prison or MOD sites, rural location sensitive buildings, and other building group 3 – ≥ 8 for all other building type	1
– Demonstrate an increase over the existing Accessibility Index through negotiation with local bus, train or tram companies to increase the frequency of the local service provision for the development;	2
– Demonstrate an increase over the existing Accessibility Index. This could be through provision of a diverted bus route, a new or enhanced bus stop, or other similar solutions.	3
– Provide a dedicated service, such as a bus route or service	3
– Provide a public transport information system in a publicly accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities.	1
Private transport measures	
– Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development.	1
– Set up a car sharing group or facility to facilitate and encourage building users to car share. – Raise awareness of the sharing scheme with marketing and communication materials. – Provide priority spaces for car sharers for at least 5% of the total car parking capacity for the development. – Locate priority parking spaces nearest the development entrance used by the sharing scheme participants.	1
Active travel measures	
– During preparation of the brief, the design team consults with the local authority (LA) on the state of the local cycling network and public accessible pedestrian routes, to focus on whichever the LA deems most relevant to the project, and how to improve it. – Agree and implement one proposition chosen with the local authority. The proposition supported by the development is additional to existing local plans and has a significant impact on the local cycling network or on pedestrian routes open to the public	2
– Install compliant cycle storage spaces to meet the minimum levels set out the BREEAM criteria	1

Issue	Credit Requirements		Credits		Comments / Actions	Responsible Team Member
			Available	Targeted		

	– Option 7 has been achieved.
	– Provide at least two compliant cyclists' facilities for the building users, (including pupils where appropriate to the building type):
	  – Showers
	  – Changing facilities
	  – Lockers
	  – Drying spaces.
		1				

	Existing amenities: – At least three existing accessible amenities are present, see Table 7.6 on page 179, where relevant for a Building Group.	1				
	Enhanced amenities: – Ensure a minimum of one new accessible amenity is provided.	2				
	Ensure more than one new accessible amenity, in accordance with Table 7.6 within the BREEAM criteria for the relevant Building Group, is provided.	3				
	Alternative transport measures					
	Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan. Submit these for review by BRE.	1 - 3				
Water						
Wat 02 (M), (M_e), (M_o) Water monitoring Mandatory: Criterion 1 only for Good and above.	One credit: – Where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.		1	1	This credit has been targeted.	M&E Consultant
Wat 03 Water leak detection	First credit - Leak detection system: – Where evidence provided demonstrates that a leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is provided.		1	1	This credit has been targeted.	M&E Consultant
Materials						
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)	One - six credits: LCA superstructure Up to six credits are available for development of a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or a Compliant LCA tool during concept design stage. – Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options throughout the design development, using a building LCA tool that is recognised by BREEAM – Submit to BRE at concept design stage prior to planning submission. – Submit updated LCA assessment to BRE at technical design stage. One credit LCA substructure Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping).		7	0	It is our understanding this was not completed at Stage 2.	LCC Consultant

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted</th></tr>
<tr><td></td><td>Exemplary level criteria
One credit – Core building services options appraisal during concept design
Carry out building LCA options appraisal of at least 3 significantly different core building services design options, using a building LCA tool that is recognised by BREEAM

One credit – LCA and LCC alignment
– Achieve Elemental LCC plan and Component Level LCC options appraisal credits include design options appraised as part of the LCA within the Elemental and Component LCC models.
Integrate the aligned LCA and LCC options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document including the relevant cost information from the ‘elemental LCC plan’ and ‘Component level LCC option appraisal’.</td><td>2</td><td>0</td><td>It is our understanding this was not completed at Stage 2.</td><td>LCC Consultant</td></tr>
<tr><td>Mat 02
Environmental Product Declarations (EPD)</td><td>One credit:
Where evidence provided demonstrates the designs features construction products with EPD that achieve a total EPD points score of at least 20, according to the BRE calculation methodology.</td><td>1</td><td>0</td><td>This credit is not currently targeted.</td><td>Principal Contractor</td></tr>
<tr><td rowspan="3">Mat 03 (M), (M_e), (M_o)
Responsible sourcing of construction products
Mandatory:
Criterion 1 sustainable timber sourcing for all ratings</td><td>Pre-requisite
All timber and timber-based products used on the project are ‘legally harvested and traded timber’

First credit: Enabling sustainable procurement
Where evidence provided demonstrates that a sustainability procurement plan is in place at by the concept design stage and is used by the design team to guide specification towards sustainable construction products.</td><td>1</td><td>0</td><td>The pre-requisite has been targeted.

The credit is not currently targeted as the plan has not been completed at Stage 2.</td><td>Principal Contractor</td></tr>
<tr><td>Up to three credits:
Where evidence provided demonstrates the available responsible sourcing of materials (RSM) can be awarded where the applicable building materials are responsibility sourced in accordance with the BREEAM methodology.
<table>
<tr><th>RSM credits</th><th>% of available RSM points achieved</th><th>MAT03 Scope</th></tr>
<tr><td>1</td><td>≥ 10%</td><td>Superstructure</td></tr>
<tr><td>2</td><td>≥ 20%</td><td rowspan="2">As above, plus
– Internal finishes
– Substructure and hard landscaping</td></tr>
<tr><td>3</td><td>≥ 30%</td></tr>
</table></td><td>3</td><td>2</td><td>Two credits have been targeted.</td><td>Principal Contractor</td></tr>
<tr><td>Exemplary credit:
Where evidence provided demonstrates that at least 50% of the available RSM points are achieved. Scope also includes core building services.</td><td>1</td><td>0</td><td>The exemplary level credit has not been targeted.</td><td>Principal Contractor</td></tr>
<tr><td>Mat 05
Designing for durability and resilience</td><td>One credit:
PART A: Protecting vulnerable parts of the building from damage
– Protection measures are incorporated into the building's design and construction to reduce damage to the building’s fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against:
– Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.).
– Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.</td><td>1</td><td>1</td><td>This credit has been targeted.</td><td>Architect</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
	– External building fabric damage by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building façade and where delivery areas or routes are within 2 metres of the façade, i.e. specifying bollards or protection rails. – Potential malicious damage to building materials and finishes, in public and common areas where appropriate. PART B: Protecting exposed parts of the building from material degradation – Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: – The element or product achieving an appropriate quality or durability standard or design guide OR – A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors. – Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design. Design the roof and façade to prevent water damage, ingress and detrimental ponding.				
Mat 06 Material efficiency	One credit: At the preparation and brief and concept design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages – Preparation and brief – Concept design – Developed design – Technical design – Construction Develop and record the implementation of material efficiency – Developed design – Technical design – Construction	1	0	It is our understanding that this was not completed at Stage 1.	-
Waste					
Wst 01 (M_0) Construction waste management Mandatory: One credit for Outstanding	One credit - Pre-demolition audit Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of Pre-demolition audit scope: – Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works – Guide the design, consider materials for reuse and set targets for waste management – Engage all contractors in the process of maximising high grade reuse and recycling opportunities – Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets. Three credits - Construction resource efficiency:	4	2	Two credits are targeted for the construction resource efficiency. The pre-demolition audit has not been completed at Stage 2.	Principal Contractor

<table>
<tr><th>Issue</th><th>Credit Requirements</th><th colspan="2">Credits</th><th>Comments / Actions</th><th>Responsible Team Member</th></tr>
<tr><th></th><th></th><th>Available</th><th>Targeted</th><th></th><th></th></tr>
<tr><td></td><td>– Where a Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to on-site construction and dedicated off-site manufacture or fabrication.
– In addition, evidence provided demonstrates that non-hazardous construction waste (excluding demolition and excavation waste) generated by the building's design and construction meets or exceeds the following resource efficiency benchmarks:
<table>
<tr><th>BREEAM Credits</th><th colspan="2">Amount of waste generated per 100m^2 (gross internal floor area)</th></tr>
<tr><th></th><th>m^3</th><th></th></tr>
<tr><td>One credit</td><td>≤ 13.3</td><td>≤ 11.1</td></tr>
<tr><td>Two credits</td><td>≤ 7.5</td><td>≤ 6.5</td></tr>
<tr><td>Three credits</td><td>≤ 3.4</td><td>≤ 3.2</td></tr>
<tr><td>Exemplary level</td><td>≤ 1.6</td><td>≤ 1.9</td></tr>
</table></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Fifth credit - Diversion of resources from landfill:
Sort waste materials into separate key waste groups, either on-site or through a licensed contractor for recovery.

Where evidence provided demonstrates that the following percentages of non-hazardous construction and demolition waste (where applicable) generated by the project have been diverted from landfill:
<table>
<tr><th>BREEAM credits</th><th>Type of Waste</th><th>Volume</th><th>Tonnage</th></tr>
<tr><td rowspan="3">One credit</td><td>Non-demolition</td><td>70%</td><td>80%</td></tr>
<tr><td>Demolition</td><td>80%</td><td>90%</td></tr>
<tr><td>Excavation</td><td>N/A</td><td>N/A</td></tr>
<tr><td rowspan="3">Exemplary level</td><td>Non-demolition</td><td>85%</td><td>90%</td></tr>
<tr><td>Demolition</td><td>85%</td><td>95%</td></tr>
<tr><td>Excavation</td><td>95%</td><td>95%</td></tr>
</table></td><td>1</td><td>1</td><td>One credit targeted.</td><td>Principal Contractor</td></tr>
<tr><td>Wst 02
Use of recycled and sustainably sourced aggregates</td><td>Pre-requisite
If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Wst01 requirements.

One credit: Project sustainable aggregate points
Where evidence provided identifies amounts of aggregate used for the project, the types of aggregate, its source (location) and the transport type. This information is used to calculate the Sustainable Aggregate points score. Credits are scored as follows:</td><td>1</td><td>0</td><td>This credit has not been targeted.</td><td>Principal Contractor</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
	Project Sustainable Aggregate Credits: 1 — Project Sustainable Aggregate points: 3.5–6.0 1 exemplary performance credit — > 6.0 The calculation is based on the following aggregate uses: – Engineered fill – Concrete coarse aggregate – Concrete fine aggregate – Asphalt aggregate – Granular bedding for pipes – Granular bedding for hard landscape products – Hydraulically bound materials				
Wst 03 (M_e) (M_o) Operational waste Mandatory: One credit for Excellent and above	One credit: Where evidence provided demonstrates that there is dedicated space(s) to cater for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. The dedicated space(s) must be: – Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams – Accessible to building occupants / facilities operators for the deposit of materials and collections by waste management contractors – Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates. – The specified/installed operational waste facilities are compliant with the relevant NHS guidelines for that part of the UK. Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, e.g. large amounts of packaging or compostable waste generated by the building's use and operation, the following facilities must be provided as part of its waste management strategy: – Static waste compactor(s) or baler(s); situated in a service area or dedicated waste management space. – Vessel(s) for composting suitable organic waste resulting from the building's daily operation and use OR adequate space(s) for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility. – Where organic waste is to be stored/ composted on site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes.	1	1	This credit has been targeted.	Architect
Wst 05 Adaptation to climate change	One credit - Structural and fabric resilience: Where evidence provided demonstrates that a climate change adaptation strategy appraisal for structural and fabric resilience has been conducted by the end of Concept design (RIBA Stage 2) covering hazard identification and assessment, risk estimation, evaluation and management. Appraisal to identify & evaluate impact on the building over its life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts ID hazards taking into account the following: structural stability, robustness, weather proofing and detailing, material durability, health and safety of occupants, impact on building contents and business continuity	1	1	This credit has been targeted. It requires the completion of the Wst 05: Adaption to Climate Change template at Stage 2.	Structural Consultant
Wst 06	One credit - Design for disassembly and functional adaptability - recommendations	1	1	This credit has been targeted. It requires the completion of the Wst 06: Design for	Architect

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
Design for disassembly and adaptability	Where evidence provided demonstrates that the design team conducts a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios. Recommendations are required to be developed at the concept design stage.			disassembly and functional adaptability template at Stage 2.	
	One credit - Disassembly and functional adaptability – implementation Provide an update, during Technical Design, on: – How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. – Changes to the recommendations and solutions during the development of the Technical Design. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	1	1	This credit has been targeted.	Architect
Land Use and Ecology					
LE 01 Site selection	First credit - Previously occupied land: Where evidence is provided to demonstrate that at least 75% of the proposed development's footprint is on an area of land which has previously been developed for use by industrial, commercial or domestic purposes in the last 50 years.	1	1	This credit has been targeted.	Architect
	Second credit - Contaminated land: Where evidence provided demonstrates that the site is significantly contaminated as confirmed by a contaminated land specialist's site investigation, risk assessment and appraisal. The client or principal contractor must confirm that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan.	1	1	The RPS Phase 1 Preliminary Risk Assessment confirms that this credit can be targeted. Any remediation recommendations provided in the Phase 2 report, should be completed.	Contaminated Land Professional
LE 02 Identifying and understanding the risks and opportunities for the project	Pre-requisite - Assessment route selection An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist. The client or contractor confirms compliance will be and is monitored against all relevant UK and EU or international legislation relating to the ecology of the site. Up to two credits Depending on the route for compliance taken the following number of credits are available. [illustration not transcribed: see table below] Survey and evaluation Route 1 Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment Route 2 – An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions. – Prior to the completion of the preparation and brief, an appropriate level of survey and evaluation: – For sites where complex ecological systems are likely to be present) has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish:	2	2	Middlemarch Environmental have confirmed 2 credits could be targeted.	Ecologist

	Project team member route (Route 1)	Ecologist route (Route 2
Survey and evaluation	1 credit	1 credit
Determining the ecological outcomes for the site		1 credit

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted</th></tr>
<tr><td></td><td>– Current and potential ecological value and condition of the site, and related areas within the zone of influence.
– Direct and indirect risks to current ecological value
– Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence.
– Data are collated and shared with project team to inform the site preparation, design or construction works.

Determining the ecological outcomes for the site (Routes 1 and 2)
– Survey and evaluation criteria (criteria 3–6 above) relevant to the chosen route have been achieved.
– During Concept Design, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites (appropriate to the scale and type of development) for the project.
– When determining the ecological outcome for the site, this must involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. This must be done in accordance with the following hierarchy of action:
– avoidance
– protection
– reduction or limitation of negative impacts
– on site compensation and,
– enhancement, considering the capacity and feasibility within the site, or where viable, off-site.
Following this the optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>LE 03
Managing negative impacts on ecology</td><td>Pre-requisite – Identification and understanding the risks and opportunities for the site
– The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site

– LE02 has been achieved

<table><tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist Route (Route 2)</th></tr><tr><td>Planning, liaison and implementation</td><td>1 credit</td><td>1 credit</td></tr><tr><td>Managing negative impacts of the project (limitation or compensation)</td><td>1 credit</td><td>1 or 2 credits</td></tr></table>
One credit – Planning, liaison, implementation and data
– Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief.
– Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs.
– The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected

Up to two credits – Managing negative impacts of the project
Route 1 (one credit)
Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net impact has resulted.</td><td>3</td><td>3</td><td>Middlemarch Environmental have confirmed 3 credits could be targeted.</td><td>Ecologist</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted</th></tr>
<tr><td></td><td>Route 2 (up to two credits)
Negative impacts from site preparation and construction works have been managed according to the hierarchy:

For sites where complex ecological systems are likely to be present) and either:
– No overall loss of ecological value has occurred (2 credits) OR,

– The loss of ecological value has been limited as far as possible (1 credit)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>LE 04
Change and enhancement of ecological value</td><td>Pre-requisite - Identifying and understanding the risks and opportunities for the project
– LE 03 has been achieved. Including the following, specific to the aims of this issue:
– Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes
– Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs.

– The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.

<table>
<tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist route (Route 2)</th></tr>
<tr><td>Liaison, implementation and data</td><td>N/A</td><td>1 credit</td></tr>
<tr><td>Enhancement of ecology</td><td>1 credit</td><td>up to 3 credits</td></tr>
</table>

Route 1
One credit - Enhancement of ecology
– The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions and measures based on recommendations from recognised ‘local’ ecological expertise, specialist input and guidance to inform the adoption of locally relevant ecological solutions and measures which enhance the site.
– Data collated is provided to the local environmental records centres nearest to, or relevant for, the site.

Route 2
One credit - Liaison, implementation and data collation
– The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented the solutions and measures selected in a way that enhances ecological value in the following order:
– On site, and where this is not feasible,
– Off site within the zone of influence.

Up to three credits - Enhancement of ecology
Credits are awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in either GN 35 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues – Route 1 or GN 36 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues.</td><td>4</td><td>4</td><td>Middlemarch Environmental have confirmed 4 credits could be targeted.</td><td>Ecologist</td></tr>
<tr><td>LE 05
Long term ecology management and maintenance</td><td>Pre-requisite - Roles and responsibilities, implementation, statutory obligations
– The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.
– Where pursued, LE 04 has been achieved, including the following specific aims of this issue:</td><td>2</td><td>0</td><td>Middlemarch Environmental have provided a fee proposal to complete these works, should they be required.</td><td>Ecologist / Project Manager</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
	– Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes. – Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs. Up to two credits are available depending on the route selected. One credit - Planning, liaison, data, monitoring and review management and maintenance				

	Project team member route (Route 1)	Ecologist route (Route 2)
Liaison, monitoring implementation and evolving management and maintenance solutions	1 credit	1 credit
Landscape and habitat management plan		1 credit

One credit - Planning, liaison, data, monitoring and review management and maintenance

- The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to:
  - monitor and review implementation and the effectiveness
  - develop and review management and maintenance solutions, actions or measures.
- In support of the above and to help ensure their continued relevance over the period of the project the following should be considered:
  - Monitoring and reporting of on the ecological outcomes for site implemented at the design and construction stage
  - Monitoring and reporting of outcomes and successes from the project
  - Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site)
  - Maintaining the ecological value of the site and its relationship or connection to its zone of influence
  - Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02).
  - Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04.
- As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site.

One credit - Landscape and ecology management plan (or similar) development

- Landscape and ecology management plan, or similar, is developed in accordance with BS 42020:2013(210) covering as a minimum the first five years after project completion and includes:
  - Actions and responsibilities, prior to handover, to give to relevant individuals
  - The ecological value and condition of the site over the development life.
  - Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework
  - Identification and guidance s to trigger appropriate remedial actions to address previously unforeseen impacts

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
	– Clearly defined and allocated roles and responsibilities. – The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site.				
Pollution					
Pol 03 Surface water run off	Pre-requisite An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Part 1: Flood resilience (Up to Two credits) Two credits - Low flood risk: A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration. These sources include: – Fluvial (rivers) – Tidal – Surface water: sheet run-off from adjacent land (urban or rural) – Groundwater: most common in low-lying areas underlain by permeable rock (aquifers) – Sewers: combined, foul or surface water sewers – Reservoirs, canals and other artificial sources One credit - Medium/high flood risk: Where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium or high annual probability of flooding AND the ground level of the building, car parking and access is at least 600mm above the design flood level of the flood zone for the site's location OR the final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017	2	1	The drainage consultant has confirmed (06.09.2019) that Part 1 may be achievable post-construction, when the flood resilience and resistance techniques included can be verified.	Drainage Consultant
	Part 2: Surface water run-off Pre-requisite: Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site. First credit: Drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events, including allowance for climate change. Additionally, relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SUDs are in place. Second credit: Where evidence provided demonstrates that the consultant has confirmed that there is no risk of flooding of property in the event of a local drainage system failure, AND EITHER – The post development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development, including an allowance for climate change.	2	2	The drainage consultant has confirmed (06/09/2019) that 2 credits can be targeted here.	Drainage Consultant

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		

	– Any additional predicted volume of run-off for the 100-year 6-hour event must be prevented from leaving the site by using infiltration or other Surface Drainage System (SUDs) techniques
	
	OR (only where criterion no. 9 or 10 for this credit cannot be achieved)
	
	– Justification from the Appropriate Consultant indicating why the above criteria cannot be achieved i.e. where infiltration or other SUDS techniques are not technically viable options.
	– The post development peak rate of run-off is reduced to a limiting discharge. The limiting discharge is defined as the highest flow rate from the following options:
	  – The pre-development one-year peak flow rate
	  – The mean annual flow rate (Qbar)
	  – 2L/s/ha.				

	Part 3: Minimising watercourse pollution One credit: Where evidence provided demonstrates that the following water course pollution prevention measures are covered: – Appropriate Consultant confirms that there will be no discharge from the developed site for rainfall up to 5mm. – Specification of Sustainable Drainage Systems (SUDs) or source control systems such as permeable surfaces or infiltration trenches – Specification of oil/petrol separators (or equivalent system) in surface water drainage systems, where there is a high risk of contamination or spillage of substances – Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system – All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SUDS manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site. – A comprehensive and up-to-date drainage plan of the site will be made available for the building/site occupiers. – Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SUDS must be in place. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance	1	0	This credit is not currently targeted.	Drainage Consultant
Pol 04 Reduction in night time light pollution	One credit: Where evidence provided demonstrates that the lighting system has been designed in accordance with the following requirements: – The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILE Guidance notes for the reduction of obtrusive light, 2011. – All external lighting (except for safety and security lighting) can be automatically switched off between 2300hrs and 0700hrs. This can be achieved by providing a timer for all external lighting set to the appropriate hours. – If safety or security lighting is provided and will be used between 2300hrs and 0700hrs, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILE's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 2300 or earlier. – Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements.	1	1	This credit is currently targeted.	M&E Consultant
Innovation					

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted		
Exemplary credits summary	Exemplary credits Up to a maximum of ten credits are available: Where the building demonstrates exemplary performance by meeting defined exemplary level performance criteria in one or more of following BREEAM assessment issues: – Man 03 Responsible construction practices – Hea 01 Visual comfort – Hea 02 Indoor air quality – Ene 01 Reduction of energy use and carbon emissions – Wat 01 Water consumption – Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA) – Mat 03 Responsible sourcing of construction products – Wst 01 Construction waste management – Wst 02 Use of recycled and sustainably sourced aggregates – Wst 05 Adaptation to climate change One innovation credit can be awarded for each individual BREEAM issue exemplary performance level complied with. Approved Innovations One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an Approved Innovation application form.	10	1	The Man 03 Responsible Construction Practices Exemplary measure has been targeted.	Principal Contractor

7. Appendix C: Credit Weightings BREEAM 2018

The weightings for the associated credits depending on the assessment route are shown in Table D1 below.

Section	Section Weighting			No. of credits available	Value of Each Credit
	Fully-fitted	Shell only	Shell and core	Shell Only	
Management	11.0%	12.0%	11.0%	15	0.80%
Health and Wellbeing	14.0%	7.0%	8.0%	8	0.87%
Energy	16.0%	9.5%	14.0%	13	0.73%
Transport	10.0%	14.5%	11.5.0%	12	1.20%
Water	7.0%	2.0%	7.0%	2	1.00%
Materials	15.0%	22.0%	17.5%	14	1.57%
Waste	6.0%	8.0%	7.0%	10	0.80%
Land Use and Ecology	13.0%	19.0%	15.0%	13	1.46%
Pollution	8.0%	6.0%	9.0%	6	1.00%
Innovation	10.0%	10.0%	10.0%	10	1.00%

Table D1: BREEAM Credit Weightings

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