

Kenavon Drive, Reading

Sustainability Statement Addendum

May 2019



Berkeley Homes (Western) Ltd
Kenavon Drive

Sustainability Statement for Kenavon Drive



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1 Introduction

MLM Consulting Engineers Ltd Sustainability Group have been appointed by Berkeley Homes (Western) Ltd to prepare a Sustainability Statement in support of a planning application for the proposed re-development of Kenavon Drive in Reading (the 'proposed development').

The proposed site currently consists of two large commercial retail stores which will be demolished to provide 795 new build residential units along with commercial units, associated landscaping and ancillary works.

The purpose of this report is to assess the sustainability performance of the proposed development against relevant local, regional and national policy requirements and demonstrate how these are addressed through the implementation of appropriate design and construction practices.

The following planning policy and construction guidance documentation has been considered in detail in the preparation of this Sustainability Statement:

- The National Planning Policy Framework, Department of Communities and Local Government (CLG), 2012;
- Reading Borough Local Development Framework Core Strategy with Alteration (Reading Borough Council, 2015);
- Sites and Detailed Policies Document (Reading Borough Council, 2012);
- Revised Sustainable Design and Construction Supplementary Planning Document (Reading Borough Council, 2011).

This Sustainability Statement has been prepared using information included in a number of documents that either form part of or are submitted in support of the planning application for the proposed development. The sustainability measures described herein have been developed in consultation with members of the project's design and consultant team.

This report takes into account the special character of the proposed development and defines the broad approach that will be implemented in order for the development to meet the required policy criteria. The specific details and assumptions set out within this Sustainability Statement will be tested and reviewed throughout the detailed design, build and operational phases of the proposed development.

The remainder of this document is structured as follows:

- Section 2 provides an overview of the site's context and the Proposed Development;
- Section 3 outlines the planning policy context;
- Section 4 sets out the assessment methodology;
- Section 5 presents the sustainability assessment and details the sustainability features of the Proposed Development;
- Section 6 presents the conclusions.

2 Overview of the Project

The proposed site is located in central Reading. The Site comprises an irregular shaped plot of approximately 2.74 ha, situated to the south of Kenavon Drive. It is occupied by two large commercial retail stores, a Toy's R Us in the east of the Site and a Homebase in the west with associated asphalt car parks forming the remainder of the Site. The Site is bound to the north by Kenavon Drive with further retail units beyond. To the west by Forbury Road and HM Prison Reading and to the south by a line of mature trees and the River Kennet. Residential apartments are located to the east of the Site.

Historic maps from 1879 indicate that the site was occupied by a Biscuit Factory and this continued until 1979. By 1990 the site had been partially redeveloped with a single rectangular retail building in the east of the site. By 1995 a second large rectangular building was present in the western area of the site. No further significant changes are noted. The buildings are to be completely demolished and the existing foundations removed.

The proposed development is to comprise a number of residential buildings of varying height, providing a total in the range of 795 units. The buildings are arranged in three separate blocks namely West, Middle and East. The buildings comprise the outer perimeter of each block with an enclosed amenity podium space at first floor level. This space will be accessible by the residents and will consist of hard and soft landscaping. The podium houses a car park on ground floor for the residents, which in instances extends under the buildings. There is a localised semi-basement area where the Energy Centre is located in the Middle block which is lowered circa 800mm into the ground to provide sufficient clear height for the required plant. On ground floor there is also provision of plant areas including a substation in each of the blocks.

3 Planning Policy Context

Rising international and national aspirations on sustainability have led to the strengthening of national planning policies and building control processes that contribute to the Government's long-term commitment to support sustainable development. To ensure compliance with relevant sustainability and wider targets and requirements, the following key policies and documents have been reviewed within the context of the proposed development.

3.1 National Planning Policy Framework (CLG, 2012)

The National Planning Policy Framework, 2012, sets out the Government's planning policies for England and how these are expected to be applied. It must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions. The document presents a series of policies that constitute the Government's view of what sustainable development in England means in practice for the planning system. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development. Policies in Local Plans should follow the approach of the presumption in favour of sustainable development so that it is clear that development which is sustainable can be approved without delay.

3.2 Local Planning Policy

3.2.1 Reading Borough Local Development Framework Core Strategy with Alteration (Reading Borough Council, 2015)

The Core Strategy sets out the key elements of the planning framework for the area. It comprises a spatial vision and strategic objectives for the area; a spatial strategy; core policies related to the implementation of the strategy; and a monitoring and implementation framework with clear objectives for achieving delivery.

The planning system has a key role in implementing the Government's Strategy for Sustainable Development. The strategy revolves around 5 guiding principles:

- Living within environmental limits;
- Ensuring a strong, healthy and just society;
- Achieving a sustainable economy;
- Promoting good governance;
- Using sound science responsibly.

Four priority areas for action are identified in the Strategy:

- Sustainable consumption and production;
- Climate change;
- Natural resource protection;
- Sustainable communities.

Implementation of the Core Strategy along with its vision and objectives will be supported by a set of strategic level policies. These policies will be supplemented by more detailed development control policies set out in a Development Control Policies Document that will form part of the Reading Borough Local Development Framework.

Specifically, *Policy CS1: Sustainable Construction and Design* states that proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

3.2.2 Sites and Detailed Policies Document (Reading Borough Council, 2012)

The Sites and Detailed Policies Document (SDPD) is one of the documents that make up Reading's

Local Development Framework (LDF). The LDF is a collection of documents that, together, guide development and spatial change in Reading and give a basis for making decisions on planning applications. The LDF is the 'spatial arm' of Reading's Sustainable Community Strategy, in that it includes those elements that affect the physical form of Reading. The purpose of this document is to provide the detailed planning policies and identify the specific development sites and designations necessary to deliver the Core Strategy.

Specifically DM1 Adaptation to Climate Change states 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, 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.

Specifically, *DM2 Decentralised Energy* states that developments of the sizes set out below shall demonstrate how consideration has been given to securing energy for the development from a decentralised energy source, including CHP.

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

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

3.2.3 Revised Sustainable Design and Construction Supplementary Planning Document (Reading Borough Council, 2011)

This supplementary planning document (SPD) aims to promote high standards of Sustainable Design and Construction, providing detail on how to comply with development plan policies set out in the Reading Borough Local Development Framework Core Strategy (2008). This document also brings together relevant national guidance. It provides practical advice on the forms of sustainable design and construction plus waste minimisation that will meet these policy requirements and how these policy requirements are applied at the local level through policy CS1: Sustainable Construction and Design and CS2: Waste Minimisation of the adopted Core Strategy.

Core Strategy Policy CS1 sets out an overarching strategy in relation to climate change, energy efficiency, energy conservation measures, inclusion of renewable energy sources, reduction in carbon emissions, and inclusion of appropriate flood minimisation measures in new development, including the construction of new building and the redevelopment and refurbishment of existing building stock. This SPD provides an opportunity to clarify and interpret the Core Strategy policy in the context of the continuing evolution of advice and best practice.

Recent changes to the Building Regulations mean that the requirement in policy CS1 to 'off-set at least 20% of predicted carbon dioxide emissions' has now been superseded for both residential and non-residential developments. All other parts of policy CS1 are still relevant. For this reason, the requirement to off-set at least 20% of predicted carbon dioxide emissions from the estimated energy usage of the completed and occupied development in adopted policy CS1 is not mentioned further in the SPD.

The Communities and Local Government Building Regulations 2010 Circular Letter of 28 September 2010 Circular also sets out how carbon reductions will be achieved for both new homes and new non-domestic buildings. It sets out that the target emission rate for carbon dioxide will achieve an additional improvement of 25% relative to 2006 standards.³ These changes were brought into effect through Part L1A Building Regulations in October 2010 and are reflected in the building regulations.

To comply with the relevant policies and standards on energy, a combination of measures including energy efficiency measures, energy conservation measures, and inclusion of renewable energy sources / low carbon sources should be considered.

A submission for a formal planning application requires the following documents in order to comply with the relevant requirements of policy CS1: Sustainable Construction and Design, of the Core Strategy:

- A Pre-assessment estimator incorporating a 3% buffer or for minor development, provision of other appropriate information to provide confidence to the LPA that policy CS1 requirements can be achieved.
- Sustainability Statement for all major development - Sustainability Statements typically require the developer to take consideration of all aspects of development form which can contribute to securing high standards of sustainable development. In Reading the requirements of the Sustainability Statements should follow the sustainability checklists at Appendix 5.
- Energy Statement⁶ for all major development - The Energy Statement demonstrates how the energy related aspects of the proposed development actually meets the requirements of policy CS1 and the building regulations. The Energy Statement provides the specification for meeting the required energy targets including a calculation of the carbon emissions for a development. The Energy Statement should explain how the carbon dioxide reductions will be achieved and importantly, which renewable energy technologies/ low carbon energy sources have been considered and dismissed, clearly explaining the reasons for this.

4 Assessment Methodology

This Sustainability Statement has been structured around the Reading Borough Council's sustainable development aims and objectives, and demonstrates the sustainability features included into the Proposed Development.

Specifically, the Proposed Development has been assessed against the following topics, as these are listed in Reading Borough Council's Revised Sustainable Design and Construction SPD Sustainability Checklist in Appendix 5:

- Management;
- Health and Well-being;
- Energy/Carbon Dioxide Emissions;
- Transport;
- Water;
- Materials;
- Waste;
- Land Use and Ecology; and
- Pollution.

The following sections detail the sustainability credentials of the Proposed Development, against the above topics.

The sustainability measures described in this Sustainability Statement were developed in consultation with members of the project team.

5 Sustainability Assessment

5.1 Management

The Principal Contractor will comply with the 'Considerate Contractors Scheme' ensuring that the Site is managed significantly beyond best practice. Requirements for environmental control, based on good working practice, such as careful programming, resource conservation, adhering to health and safety regulations and quality procedures would be incorporated.

The principal contractor will be required to monitor and/or adopt at least four of the Construction Site Impacts listed below:

- Monitor, report and set targets for CO₂ production or energy use arising from site activities;
- Monitor and report CO₂ emissions or energy use arising from commercial transport to and from site;
- Monitor, report and set targets for water consumption from site activities;
- Adopt best practice policies in respect of air (dust) pollution arising from site activities;
- Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site;
- 80% of site timber is reclaimed, reused or responsibly sourced.

Mitigation measures to minimise water (ground and surface) pollution occurring on the Site during construction activities will be implemented by the Principal Contractor in compliance with the requirements of the Considerate Contractor Scheme.

It is expected that an Environmental Management Plan (EMP) will be developed and will include roles and responsibilities, detail on control measures and activities to be undertaken to minimise environmental impact, and monitoring and record-keeping requirements. It is intended that the EMP will be periodically reviewed and regular environmental audits of its implementation will be undertaken during the construction phase of the Proposed Development.

A public exhibition was held for the proposed development where members of the design and client team attended both days to describe the scheme to the public, answer any questions and receive verbal feedback. Members of the public were encouraged to fill out a feedback forms and engage with the scheme. The feedback, both verbal and written, was generally very positive and the proposed development was commended for its approach, character and design of the masterplan and buildings, open space offer, revitalisation of the waterside, provision of more homes, public space and facilities.

A follow up consultation event was conducted by the design and client team where an updated newsletter was sent out to 1,650 addresses in and around Reading as well as to local political representatives and groups. This newsletter included more information about how the scheme has evolved. The freephone information line, email and website were all identified as part of the newsletter. The website was also updated with the new information. The event displayed more information about the materials and finishes relating to the buildings, as well as a model.

Where possible the client and design team have taken aboard the feedback from these consultations and have modified the design to align with the comments. For example reducing the height of the key building to accord with Reading Borough Council's Tall Building Policy.

In addition, the team presented the design to Design South East's Design Review Panel who toured the site and the local vicinity and then provided critique and feedback on the proposals and their general quality and suitability. The general feedback was extremely positive and supported the approach to the site in terms of urban design, massing, architecture and landscape. Further to their feedback more design work has been undertaken to address some of the issues including most significantly the removal of the tower and reduction in size of the arrival square.

The safety and wellbeing of the occupants of the scheme is a priority in the development of the design. The aim was to create a safe and enjoyable new public and private space. Advisory meetings have been conducted with the Crime Prevention & Design Advisor at Thames Valley Police where it was highlighted that prevention principles are incorporated in to the design and layout. The suggestions from the meetings have been integrated in the design or were already part of the design. These include the following:

- Active frontage, that gives a spontaneous overlooking of the public space.
- A clear separation between amenity private space open exclusively to the resident of the building of the block and amenity space open to the public. Again the private amenity space is overlooked by the residents.
- Core segregation, the access to one core will give you access only to that block and it is not connected to another.
- Access will be controlled at front door point and at the entrance via the car park.
- Access to the undercroft car park will be controlled via an automatic gate.
- Bins store and cycle store will be accessible only by the residents.
- Post will be delivered via a secured lobby or through the individual front door.
- Street and square will have street lighting and no dark areas will be created.
- Retractable bollard will be located at the entrance of the pedestrian areas, River Square and Palmers Street, to control the vehicular access.

A dedicated site specific guidance for the non-technical building user will be prepared. The purpose of this guide is to help building users access, understand and operate the building efficiently and in a manner in keeping with the original design intent. The guide will be written in plain English and will provide easily accessible and understandable information relevant to the residents, non-technical facilities management team/building manager and other building users, e.g. visitors/community users.

Post-handover aftercare will be provided to the building owner/occupants during the first year of occupation to ensure the building operates and adapts, where relevant, in accordance with the design intent and operational demands.

5.2 Health and Well-being

Getting good daylight penetration into apartments is key in delivering high quality units that support wellbeing. Given the nature of the masterplan, with blocks that face to all four cardinal points, it is impossible to completely avoid north facing units without introducing numerous additional cores however the design has been developed to reduce the number down to the minimum possible. Where north facing units are unavoidable one bed single aspect units are proposed to reduce the impact on the daylight and views.

The daylight and sunlight assessments shows that over 90% of the analysed rooms in the most constrained positions met or improved upon BRE target values for their respective usages. The Proposed Development has been designed to allow good levels of daylight to penetrate into the proposed units and distribute throughout the rooms efficiently.

All flats have full height windows to take advantage of views and sunlight, some of which will include Juliet balconies. The vast majority of units are to feature balconies to provide private amenity space and have high quality views or favourable aspect.

Shared garden spaces have been proposed at podium level of all three blocks to supplement private amenity space and provide places for residents to enjoy and come together. These spaces have been carefully conceived and would be fully enclosed and protected on all four sides. Private amenity will be supplemented by the public spaces proposed at ground level in the form of the Arrival Space, the linear park on Palmer Street and the Riverside Square. These will include informal children's play space and stepped visual access to the Kennet alongside the site.

Fixed internal and external lighting shall be by energy efficient light fittings and lamps controls. Lighting within apartments shall generally be controlled via manual on/off wall switches. The lighting installation shall be designed to provide a quality of light incorporating a balance between surface colours and textures, visual interest, light colour, uniformity and non-uniformity of light patterns. Lighting shall be designed to suit specific tasks or controlled to provide variable levels for multiple tasks in areas where this is appropriate.

The lighting scheme shall include all exterior spaces identified in the scope which require artificial lighting for visual tasks. These include, but are not limited to circulation routes and amenity areas. The lighting shall cover car parks, walkways and roads, entrances, particular development features and security requirements, etc. Movement sensor controls shall be employed to particularly vulnerable areas i.e. vehicle and pedestrian entrances. Car park lighting shall be provided with the first luminaires at entrance photocell controlled and the rest on presence detection.

The ventilation system to the majority of the apartments shall be MEV ventilation unit located within the apartment's ceiling void. Air shall be extracted from all wet rooms within the apartment i.e. bathroom, en-suite and kitchen and from the utility cupboard to minimise overheating to the apartment during the summer, via extract air valves mounted within the ceiling. Humidistat sensors shall be provided in addition to the light switch operation in accordance with NHBC Requirements.

The ventilation system to the apartments on the North facade shall be MVHR ventilation unit located within the apartment's Utility Services cupboard. Each MVHR shall draw fresh air from an air intake grille located within the external façade and supply air to all habitable rooms within the apartment i.e. bedrooms and lounge areas, via supply air valves mounted within the ceiling. Summertime bypass shall be provided. Summer purge provision shall be provided to reduce internal temperatures. Purge ventilation shall be provided via openable windows/doors.

The Air Quality assessment has found that during operation the effects associated with the production of NO₂ and PM₁₀ from operational traffic, CHP plant and boilers will be negligible and not significant.

A Stage 2 Acoustic Assessment has been undertaken to advise on acoustic design issues associated with the construction of a new residential development at Kenavon Drive in Reading, in respect of the site's suitability for residential development and the likely noise impacts arising from the proposed development on existing residential properties. The assessment has found that although existing sound conditions are expected to be a constraint to the residential development of this site, acoustic solutions are available which should allow, in combination with careful design, compliant dwellings.

The external building fabric has been carefully designed to ensure that the recommended internal noise levels are achieved. A noise assessment and site suitability assessment confirms that the Proposed Development will not generate likely significant noise or vibration impacts during either construction or operation.

5.3 Energy/Carbon Dioxide Emissions

The Energy Statement for the Proposed Development (Energy Statement, March 2019, MLM) is structured in accordance with Reading Borough Council's Energy Hierarchy. Emphasis has been placed on maximising energy demand reduction for the building and reducing carbon emissions.

The energy consumption figures for the proposed residential part of the development are based on SAP modelling data produced under Building Regulations Part L1A 2013 compliant software. The energy consumption figures, for the proposed communal parts of the scheme are based on SBEM modelling data produced under Building Regulations Part L2A 2013 compliant Software.

In line with the requirements of the national, regional and local planning policies, ADL of the Building Regulations and current best practice, the following energy strategy was proposed:

- The incorporation of energy efficiency and passive design measures ('Be Lean'), which could bring savings in regulated CO₂ emissions of approximately 7.22% over the baseline. The key passive design and energy efficiency measures integrated in the Proposed Development will include:
 - Improved U-values of the thermal elements (wall, floor and roof) and controlled fittings (windows) compliant with the Building Regulations Part L1A 2013 and Part L2A 2013 requirements for residential and commercial developments respectively;
 - Careful design and construction monitoring to create a reasonably air tight building;
 - Mitigating the cold bridges and eliminate the potential for surface condensation;
 - Improved Specific Fan Power (SFP) for Mechanical Ventilation with Heat recovery for the dwellings facing Kenavon Drive and Watlington Street. All remaining dwellings will be fitted with Centralised Mechanical extract Ventilation;
 - Improved Specific Fan Power (SFP) for the WC's in each commercial unit;
 - Low energy lighting including LED technology lighting systems where viable;
 - CHP and gas fired boiler from the energy centre for space heating and hot water generation for residential development;
 - Split system to each commercial unit for space heating and cooling;
 - Instantaneous electric point of use water heaters for each commercial unit for domestic hot water;
 - Gas fired boiler for domestic hot water for cafes/restaurant.
- The potential for connection to an existing communal heating network was also investigated and was not considered viable at this time as no heating network exists nearby. However the plant room of the proposed development will be designed to ensure that enough space is available when a district heating system will be available. It is possible to incorporate CHP (energy centre) into the scheme to meet the Hierarchy of providing 'clean' energy. The electricity generated will be harnessed directly by the development for its space heating and domestic hot water demands and even process heating. The CHP (only applicable to the residential part of the development) will be sized to deliver 60% of the annual energy demand of the development. All the dwellings will be connected to the heat network created as part of the development. The inclusion of the CHP will provide approximately 23.10% reduction in CO₂ emissions against the 'Be Lean' stage. Regarding the commercial units, it has been identified that the head load profile the units will not be suitable to connect to a CHP system as the space heating and domestic hot water will be low.
- The installation of on-site renewable technologies, such as Air Source Heat Pumps, have been identified as feasible for the commercial units. Air source heat pumps can be connected in series and thus provide a heating system, modules only work as and when demand requires thus providing excellent efficiencies. The commercial unit will have its own system to reduce the number of units needed in order to serve this development and associated space. The incorporation of the air source heat pump ('Be Green') will allow the development to achieve an overall carbon savings of 32.45% against Building Regulations Part L 2013.

The energy hierarchy indicates a projected carbon reduction of 32.45% will be achieved by efficient building design and construction with the use of renewable energy generation and implementation of combined heat and power unit. This is in line with the requirements of the Building Regulations (2013) and the Local Authority Strategy.

5.4 Transport

A transport assessment has been undertaken for the proposed development ('Stage 3 Transport Report', PBA, December 2016). The site is located within less than 10 minute walking distance to Reading Town Centre and Reading Station. A high quantity of local amenities and facilities are situated within walking distance. The site is also very well connected to the town centre cycle network, which allows to travel between the site and mostly every part of Reading by bicycle. In addition, the site is within 400 metres of several bus stops and within 10 min walk to the town centre bus interchange. Therefore, the site is very easy to access by sustainable means.

The assessment has found that the proposed development does not have a material impact on the local highway network as for weekday peak increase are minimal and the flows at weekends will be substantially lower. Due to the location of the site close to the Station and Town Centre it is a highly sustainable site and as such can support a high level of car free provision with major employment, transport, retail hubs in any walking distance.

Residential vehicle parking has been located at ground floor level in the three podia areas, one of each parcel. Each of the car parks area is going to be accessed from one point, via automatic gates with a combined entrance and exit. The car parks will provide a safe and clean environment for the resident and are connected to each of the cores with a direct entrance controlled by a fob or key code access. Due to the high connectivity of the site, the vicinity to the train station and the new bus route that is going to run in Kenavon Drive, the number of resident parking spaces is limited. Visitors parking and some spaces for the commercial on site have been integrated in the public realm around the site.

Cycling will be encouraged through the provision of new parking facilities, as well as through the travel plan. The local authority requirement for cycle parking spaces have been provided in a combination of designated secure store rooms at ground floor and a Brompton style scheme provision. The cycle stores provided are two for each podium and can be accessed from the core of each building via the car park. Links to Palmer Street and Huntley Street are provided by access corridors in the West and the East podium. To increase the efficiency of the storage space the proposal is to use a two-tier cycle storage solution. The Brompton Style Scheme will provide part of the flats, generally the one bedroom, with a Brompton style bicycle at the moment of purchase. The bicycle is to be stored within the flat therefore reducing the number of spaces required in the communal cycle storage. Cycle parking spaces will also be provided for the users and staff of the commercial provision.

The majority of the site layout will provide suitable access for servicing, refuse and emergency vehicles. In addition the main entrance will also accommodate an articulated vehicle to service the convenience (food) store at the front of the development. A specific turning head has been provided for this vehicle in front of the building, this will also be used for refuse collection and other smaller delivery vehicles as such all servicing for the site is off road and contained with the site. At the end of the main access route prior to the bollards which lead to the large HGV turning area, in a smaller turning area for transit/box vans.

5.5 Water

The design of the Proposed Development will aim to minimise internal potable water consumption to a rate of 105 litres or less per person per day, if feasible for the residential dwellings and a 35% improvement over BREEAM baseline water consumption levels for the commercial units. This will be achieved through the specification of low-flow sanitary fittings such as WC flushes, taps and showers.

Water meters will be specified that provide a visible display of mains potable water consumption to occupants will be provided in each residence. Implementation of these measures could provide significant reductions in the water use from the proposed development and will reduce the short-term impact on water supply resources in the area.

A system of above ground rain water drainage shall be provided throughout the development. Generally all rain water pipes shall be distributed internally within the building envelope or externally where collecting balcony surface water drainage.

5.6 Materials

The selection and application of the materials comprising the proposed development will respect the scale and setting of the surroundings. On that basis, the materials will be suitable and robust, with durable long-life properties. Suitable durability and protection measures or design features/solutions will be incorporated to prevent damage to the vulnerable parts or exposed elements of the building and surrounding streetscape, therefore minimising the frequency of replacement and maximising materials optimisation.

Reading has a strong heritage as a brick making town and hence brick has been considered as the appropriate material for the development and for residential homes, with properties of longevity, durability and humanity.

Wherever feasible, materials employed in key building elements (roof, external walls, internal walls, etc.) and hard landscaping will be selected in line with the Green Guide to Specification with a low environmental impact (including embodied carbon) over the full life cycle of the building. In addition, the contractor will opt for products with Environmental Product Declaration.

The proposal will aim at sourcing materials from responsible sources, for example through suppliers who participate in responsible sourcing schemes such as the BRE BES 6001:2008 Responsible Sourcing Standard. Where timber products are used, they will be obtained from sustainable sources, either Forest Stewardship Council or Programme for the Enforcement of Forestry Certification approved sources.

All thermal insulation products used in the building (i.e. external walls, ground floor, roof and building services insulation which includes any insulation required for any water pipes and storage systems) will have a low embodied impact relative to their thermal properties, as determined by the Green Guide to Specification ratings. Furthermore, where feasible, thermal insulation products used in the building will be responsibly sourced.

5.7 Waste

The proposed development will provide easily accessible waste and recycling facilities during the construction and operational phases. Within all of the blocks refuse store rooms will be located adjacent to the main stair and lift core, they will be mechanically ventilated. The refuse stores that are not directly accessed from the road will be managed with bins collected with a tow tractor and moved to the designated collection point on day of collection. Each of the stores will be equipped with floor drains for regular cleaning. It was agreed with the local authority that an additional a Wheelie bin will be provided for electrical products and collected by the Council when required.

Commercial refuse and recycling has been assumed to be completely privately managed by the retail units and the refuse storage to be within the retail space. Only in Block E1 where that cannot be served by the front a bin collection area has been created with access from the podium car park.

A Site Waste Management Plan (SWMP) will be developed for the proposed scheme to identify the types and quantities of waste produced during every stage of demolition and construction. The SWMP will be produced before on-site works begin and will look into the opportunities to minimise and reduce waste generation, such as:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take back scheme;
- Implementation of a 'just in time' material delivery system to avoid materials being stockpiled on-site for long periods of time, increasing the risk of their damage and disposal as waste;
- Attention to material quantity requirements to avoid over ordering and generation of wasted materials;

- Reuse of materials on-site wherever feasible,
- Segregation of waste at source where practical; and
- Reuse and recycling of materials off-site where reuse on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct reuse or reprocessing).

Where possible, materials needed for the construction process will be obtained firstly from re-use and recycling schemes before seeking fresh material.

Throughout the design and construction phases of the proposed development emphasis will be on pre-assembly and pre-fabrication of elements, wherever practicable, to minimise on-site waste and improve quality.

Once the proposed development is operational, recycling and composting opportunities will be maximised for the good management of waste through the provision of sufficient internal and external space. Specifically a dedicated external area will be provided located towards the front of the site to evade any noise generated from the frequency of use of this area and its servicing as well as the requirements of the serving operator to pick up the materials.

5.8 Land Use and Ecology

The site is located in central Reading and is occupied by two large commercial retail stores, a Toy's R Us in the east of the Site and a Homebase in the west with associated asphalt car parks forming the remainder of the Site. Historic maps from 1879 indicate that the site was occupied by a Biscuit Factory and this continued until 1979. By 1990 the site had been partially redeveloped with a single rectangular retail building in the east of the site. By 1995 a second large rectangular building was present in the western area of the site. No further significant changes are noted.

The buildings are to be completely demolished and the existing foundations removed and the proposed re-development is to comprise a number of residential buildings of varying height, providing a total in the range of 765 units. Therefore, in line with the Reading's Sustainable Design and Construction SPG, the Proposed Development will be delivered 100% on previously developed land aiming to optimise the scale and density of the site, considering the local context, and making efficient use of Reading's limited land.

The site has potential to enhance the neighbourhood and create new public spaces within walking distance of the city centre. The arrival space layout creates a green, sheltered and legible space that accommodates pedestrians, cyclists and vehicle in an integrated street arrangement. A direct pedestrian access is created from the road crossing, via steps into the space. Huntley Street route evokes the pedestrian dominated streets of the biscuit factory to create a public realm route that is equitable between pedestrians, cyclists and vehicles. Low planting provides a green defensible buffer zone between footways and the residential frontage of the properties that line the street. The route gives clear views to the spaces at each end and in particular the fountains in the riverside square. Towards the river the majority of the existing trees are retained, helping screen the proposed development. Planting is also incorporated into the street to enhance ecology and to soften the street environment as it approaches the river edge.

The main feature of Palmer street is a central, linear shared garden providing seating, play opportunities and planting. The residences on each side access their property from the street and each home has a front garden, approximately 2 metres wide with the boundary defined by a railing and hedge. A footpath is provided on each side of the street, providing direct access to the front gardens and front doors. The middle of the street is green in character with a series of linked garden rooms divided by plant beds, some of which may be used for community gardening. The linear gardens will be a playable space allowing children to play throughout the space. Some garden rooms will contain natural play items such as features to climb and balance; others will have seating, or tables and chairs for outdoor dining, games and working.

Significant amenity space is created by large podium gardens on each of the three blocks. These will contain both private patios for flats opening onto the podiums and communal space for all residents within the block to use. It is proposed that all vegetation that lies within 4 metres of the proposed buildings footprint be removed. This is to ensure sufficient access when constructing the buildings. This will include most of the London Planes along the riverside. In addition a number of trees along Kenavon Drive are to be removed because they are of poor quality or form.

At ground level the public realm areas provide shared amenity space and ground floor homes have small terraces facing onto the streets providing private amenity space. At podium level the flats have private patios facing onto large shared gardens.

The aim of the planting is to create a sheltered, green and attractive place for people to live and visit, whilst maximising the potential for wildlife benefit. The scheme aims to retain existing trees of value where possible. This is achieved along Kenavon Drive where a number of Red Oak are retained Jopling Mews where boundary trees are retained and along the riverside where three Plane trees are retained. The planting proposals have been developed with input from both the local authority landscape officer and the ecology consultant.

5.9 Pollution

Sufficient external lighting shall be provided for a safe environment whilst limiting light pollution and minimising lighting ingress to the surroundings. External lighting systems shall incorporate lamps having an efficacy of at least 70 lumens per circuit watt fitted with both time controls and daylight level photocell controls. The system shall achieve safe environments for people, traffic and the development; and minimises light pollution and ensures light levels are kept within the limits as required by BS 5489 Code of practice for the design of road lighting and nuisance to the adjacent neighbourhood shall be avoided.

All thermal insulation products used in the building (i.e. external walls, ground floor, roof and building services insulation which includes any insulation required for any water pipes and storage systems) will have a low embodied impact relative to their thermal properties, as determined by the Green Guide to Specification ratings. Insulation materials for the residential element of the Proposed Development will be selected to have a Global Warming Potential of less than five, to ensure products are not selected which will cause depletion of the ozone.

The proposed Site is currently almost entirely covered by hard standing and the existing surface run-off drains to the River Kennett and Thames Water surface water sewer in Kenavon Drive with little or no stream attenuation. The proposed Site is partially within Flood Zone 2 (medium risk) and partially within Flood Zone 1 (low risk) but the site has been deemed appropriate for development that is largely residential in nature, providing that a site level Flood Risk Assessment (FRA) is prepared as part of any application. The nearest surface watercourse to the proposed Site is the River Kennet which flows within a sheet piled channel along the southern boundary of the Application Site. The flow is towards the east.

Recommended climate change allowances within the NPPF were updated in February 2016. Peter Brett Associates (PBA) has obtained and reviewed the existing EA models of the River Kennet and River Thames near the site. The allowances of 35% and 70%, recommended for residential uses within Flood Zone 3 in the Thames basin, have been simulated as a conservative assessment. The model results confirm that the proposed Site is unaffected. In all 1:100yr simulations including new climate change allowances, the flood level at the site is less than 37.50 m AOD. The levels on the proposed Site are all entirely above this level, with minimum ground levels being above 38.0 m AOD. This puts the proposed Site outside of Flood Zone 3 with a minimum freeboard of 0.5 m above the 1% AEP flood level including climate change.

The proposed Site can therefore be considered to be safe from flooding throughout its lifetime (50- 100 years) and dry access can be maintained during an extreme fluvial flood event, up to the 1% AEP flood level including climate change with a minimum freeboard of 0.50 m. This is consistent with EA guidance which requires a minimum finished floor level 300mm above the 1% AEP flood level, including climate change and therefore no further flood mitigation is considered necessary.

The Proposed Development will employ a Sustainable urban Drainage System (SuDS) to substantially reduce run-off from the current brownfield rate. These measures are likely to include permeable paving, podium attenuation, cellular storage, bio-retention and green – brown roofs. This will provide a significant improvement over both the existing rate and water quality of run-off from the Application Site. The SUDS system will use linked (tanked) systems to prevent infiltration into the ground and mobilisation of contaminants. Oil interceptors, catch pits, and gullies will be utilised where appropriate to provide additional pollution control.

It is therefore concluded that the proposed Site is not at significant risk of flooding and that the proposed drainage system will result in a reduction to the risk of flooding off-site. As a result, no significant impact on flood risk and drainage is anticipated as a result of the Proposed Development.

6 Conclusion

This Sustainability Statement assesses the proposed development against relevant sustainability standards as well as sustainability policies aims and objectives. The key beneficial impacts of the scheme in relation to sustainability can be summarised as follows:

- Use of previously built-on land;
- Provision of buildings visually integrated in the surroundings;
- Good practice environmental design, including good daylight and acoustics;
- Substantial carbon reduction in comparison with the baseline is predicted. This will be achieved by efficient building design and construction with the use of passive design measures and specification of renewable technologies such as air source heat pumps;
- Provision of water efficient sanitary ware;
- Minimisation of impact on biodiversity and provision of ecological enhancements ;
- Maximisation of recycling and implementation of the best practicable environmental options for non-recyclable residual waste;
- Provision of a Site that is accessible to all, including the disabled and promotes pedestrian and bicycle access;
- Adherence to sustainable construction site management practices including:
 - Sourcing timber from reclaimed, reused or responsible sources;
 - Developing and implementing a Site Waste Management Plan (SWMP);
 - Reducing environmental impacts of the construction site.

The sustainability strategy described in this report sets out the proposed measures and commitments that have been and will continue to be incorporated into the design development process, the construction and operation of the buildings in order to optimise its environmental performance and result to a scheme that can be designed, constructed and operated in a sustainable way.



T +44 20 7422 7800
A 3rd Floor Eldon House
2 Eldon Street
London, EC2M 7LS

www.mlmgroupp.com