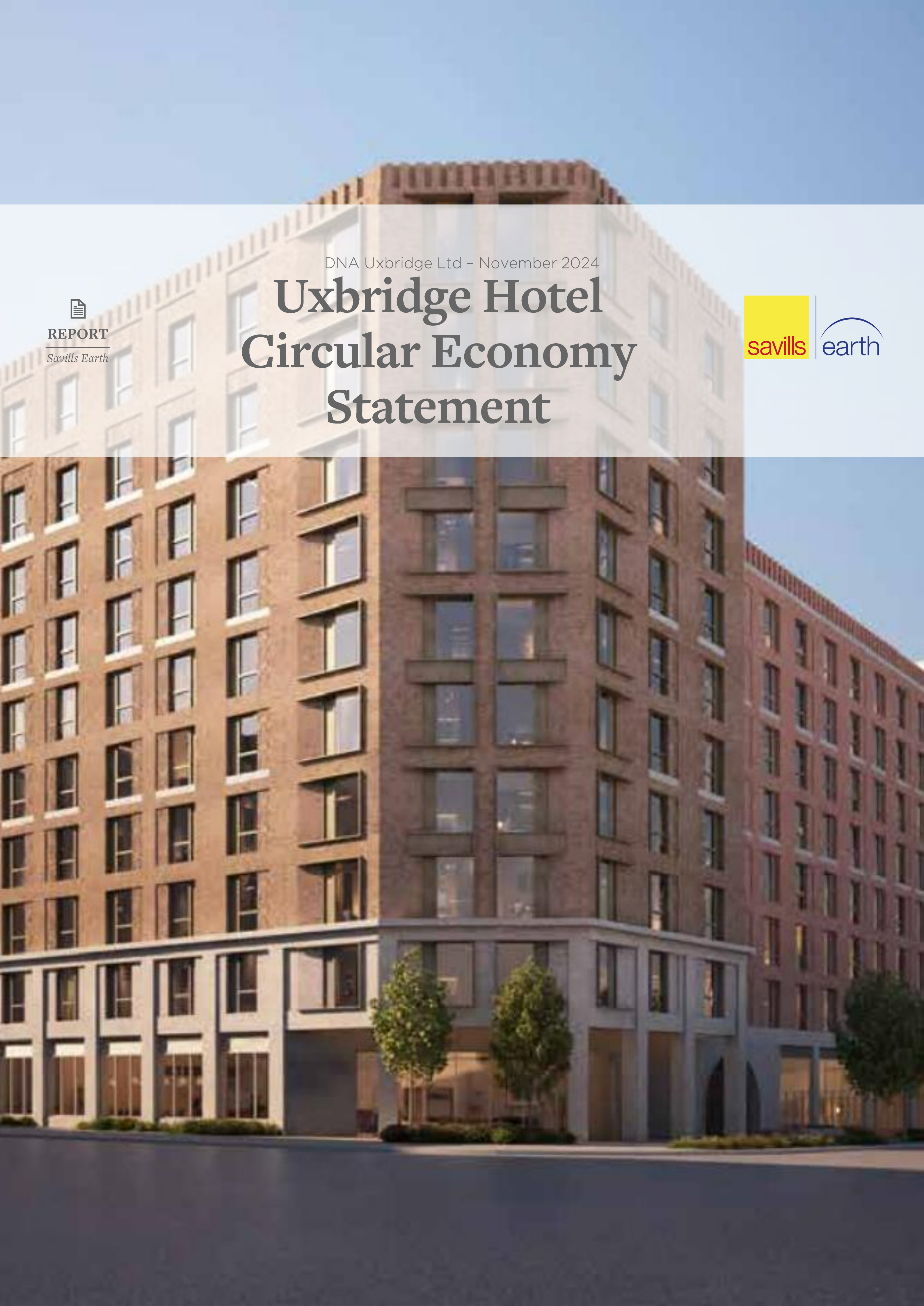
DNA Uxbridge Ltd – November 2024

Uxbridge Hotel Circular Economy Statement

REPORT

Savills Earth

savills earth



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Document revision

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01. Executive summary

This Circular Economy Statement has been prepared by Savills Earth to support the Full Planning Application submitted to the London Borough Hillingdon in March 2023 for the development at, 148-154 High Street, Uxbridge, UB8 1JY (hereafter referred to as 'the Site').

The proposed development comprises Hotel (Class C1), Co-Living (Class Sui Generis) and replacement Commercial Floorspace (Class E). Alongside these uses, the proposed development will provide a new publicly accessible pocket park, alongside other public realm improvements, basement car parking and associated infrastructure. The scheme has been developed in line with the six circular economy principles and will focus on designing for disassembly and adaptability, maximising material reuse on-site and/or recycling.

Along with other sustainability aspects like whole life carbon, an early collaborative approach to circularity thinking considered the core circular economy principles applied to design, construction and operation. This is reflected in the Circular Economy Statement (CES) previously submitted as part of the hybrid planning application, which this CES describes in further detail, in line with GLA guidance.

The definition of targets and options for reducing waste and material use is set out in the approach below. Design workshops will be undertaken during the detailed design stages to review, test, refine and integrate these principles. Wherever possible, the team will endeavour to go beyond GLA guidance's minimum circular economy targets.

Minimise material quantities

The proposal adopts a design approach that focuses on material resource efficiency – a leaner concept with less material demand will also reduce the amount of waste produced in the construction process, without compromising the design concept.

For waste reduction, measures to minimise excavation, simplify and standardise materials and components of choice, and dimensional coordination have all been considered.

The massing, scale, urban form and layout of the Uxbridge mixed use development proposal responds to its immediate neighbouring context as well as the broader context along Uxbridge High Street, considering upcoming development. The materiality of the new blocks responds to the existing character of the townscape, with an improved appearance through the creation of views through an active retail high street.

Minimise fuels, land & water

The Uxbridge mixed use development will be designed for energy and water efficiency in operation. Construction processes will prioritise fuel and water conservation, including delivery and storage logistics, for example. The proposed scheme will be built upon a previously developed site which will minimise disruption to the existing landscape and optimise the use of London's limited resources. In addition to that, the scheme will endeavour to reuse and recycle building materials and components from the existing buildings, mostly off site, as detailed in the Pre-demolition audit (found in Appendix 3).

Specifying & sourcing materials

This involves designers and contractors collaborating for optimum results and includes references to green sourcing guides like Greenspec and Green Guide. Specification priority will be given to locally sourced, high recycled content materials and products with EPDs.

The choice of materials and colour for the Uxbridge mixed use development is arranged in a way that unifies the facades through design and composition, whilst enabling each building to develop its own character and function as a stand-alone piece of architecture. The co-living block facades employ a primarily brick texture with the hotel using composite cladding with textural variation.

Design for longevity, adaptability/flexibility and reusability

The strategic approach GLA decision tree directed attention towards designing for adaptability and longevity for this regeneration development.

Key exposed building elements have been designed to limit degradation from environmental factors such as solar radiation, wind and temperature variations. A disassembly guide will be produced to indicate how the deconstruction and recoverability of materials could be maximised at the end of their life.

Very durable materials have been chosen to optimise the lifespan of the building and mitigate against the need to replace materials. The structural frame will be designed for a design life of 50 years. The design also offers flexibility for future adaptation, such as resizing or reconfiguring apartment layouts and being able to accommodate additional M&E kit, if required.

Non-load bearing internal partitions allow the internal layout to be modified in line with needs changes, as demonstrated within the 'adaptability' section within the Design & Access Statement.

Recoverability

In a circular economy, the value of products, materials and resources is maintained in the economy for as long as possible, while waste generation is minimised. An end-of-life strategy has been included in this report, assessing the percentage of materials that can be recovered or returned.

Design out waste

Implementing the 'building in layers' approach, the design objective for the elements with longer life cycles (more than 25 years) is to design for longevity, adaptability and flexibility. Building layers with shorter life expectancy (less than 25 years) will be designed for ease of maintenance, reuse and recoverability. The plant will be made accessible for replaceability and maintenance.

Manage waste sustainably and at the highest value

Guided by the waste hierarchy and in association with the waste capacity report, the site waste management plan and operational waste management strategy ensure optimum management and auditing of demolition, construction and municipal waste.

The operational waste strategy has been developed in line with the London Plan, the London Borough of Hillingdon requirements and the waste hierarchy to be both efficient and convenient.

Both the co-living waste stores have been designed to minimise the number of collections per week through the rotation of eurobins. Along with this, the management staff will manage, monitor and record the use of recycling, waste and food containers. When poor recycling is noted, information will be circulated to all occupiers to be made aware of what materials can be recycled. Whilst the operator of the hotel is not yet confirmed, it is anticipated that they will have daily servicing as part of their logistics management.

Waste provisions for the various areas of the building will meet the minimum requirement to have at least three waste streams: general waste, dry recycling and food waste/composting. Clear communication with the end user will be key to facilitate recycling during operation. This will be in the form of non-technical building user manuals, as well as enforced by dedicated property management personnel.

Supporting information, such as the Design & Access Statement and the Planning Statement, note that waste will be collected and managed in accordance with all relevant legislation and guidance. It is anticipated that operational waste will mainly comprise household and recyclable materials. The proposed commercial uses are not considered to give rise to unusual volumes of waste. Further information can be found within the Design and Access Statement prepared by CGL Architects.

Next Steps

The design team will continue to optimise the design and make informed material specification decisions in order to further reduce the whole life carbon emissions and increase circularity within the Uxbridge mixed use development.

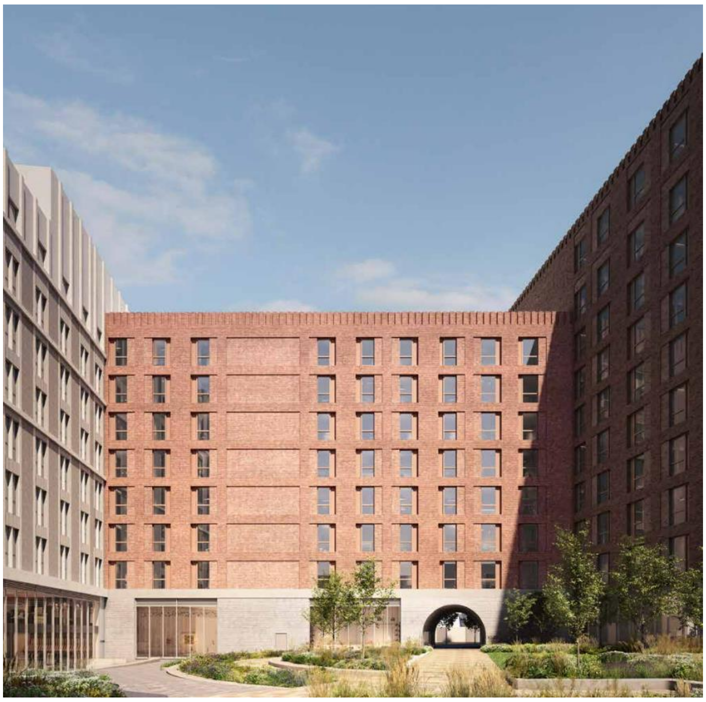
It is also accepted that a Post-Construction Circular Economy Statement will be conditioned, where a Post-Construction Circular Economy Statement is to be submitted to the GLA prior to the occupation of each building/phase.

02. Introduction

This Circular Economy Statement has been prepared by Savills Earth to support the Full Planning Application submitted to the London Borough Hillingdon in March 2023 for the development at, 148-154 High Street, Uxbridge, UB8 1JY (hereafter referred to as 'the Site').

The proposed development comprises Hotel (Class C1), Co-Living (Class Sui Generis) and replacement Commercial Floorspace (Class E). Alongside these uses, the proposed development will provide a new publicly accessible pocket park, alongside other public realm improvements, basement car parking and associated infrastructure. The scheme has been developed in line with the six circular economy principles and will focus on designing for disassembly and adaptability, maximising material reuse on-site and/or recycling.

This CES should be read in conjunction with other supporting documents submitted with the planning application, including the Whole Life-Cycle Carbon Assessment by Ridge, the Planning Statement prepared by Savills and the Design and Access Statement prepared by CGL Architects which explain the proposed development in more detail and relate it to the surrounding context and planning policy framework for the Site.



The Site

The 0.38ha site occupies a key urban centre location within Uxbridge Town Centre at the start of the pedestrian High Street. The site has three distinct boundary conditions at the end of an island block- High Street, Belmont Road and Bakers Road. A pedestrian right-of-way - Cock's Yard - runs along the south side of t

The Site currently comprises office floorspace and primarily retail accommodation with an abundance of retail units let to various well-known brands. The site is centred around a ground floor central service yard, which contains a private basement car parking underneath.

Across Uxbridge High Street and to the Site's immediate west, there is a large indoor shopping centre known as 'the Pavilions'. This building comprises commercial uses on the ground floor with two 5-storey residential tower blocks,

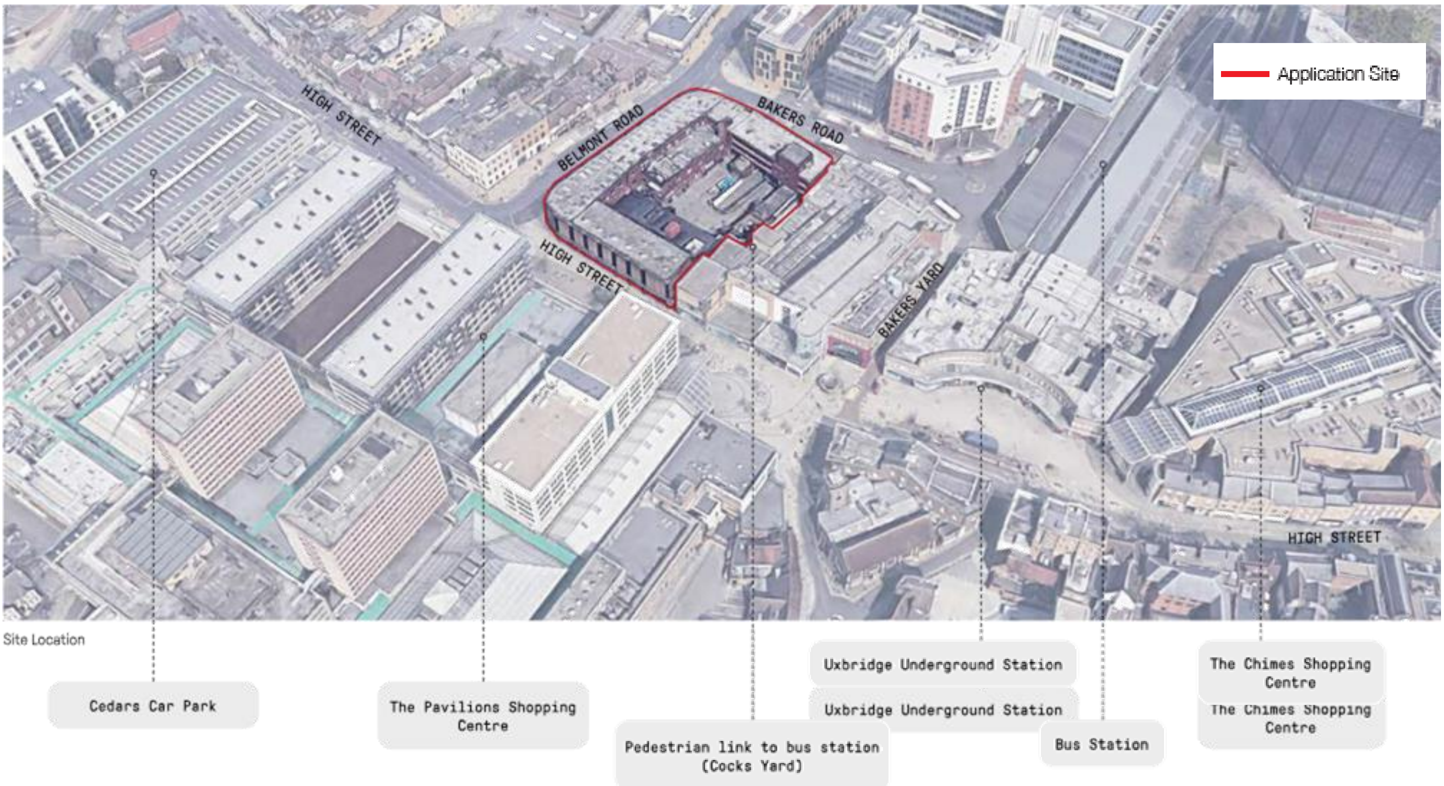
namely Armstrong House and Middlesex House extending above. To the east of the Site, along Belmont Road is Senator Court, modern office accommodation, and to the south-east of the Site exists a 9-storey hotel. These can be seen in the aerial view below.

Description of the proposed development

The Application seeks full planning permission for:

"Demolition of the existing buildings and comprehensive redevelopment of the site to provide a mixed use development comprising hotel (Class C1), co-living (Class Sui Generis) and replacement commercial floorspace (Class E) alongside public realm improvements, including a new pocket park, basement parking and associated infrastructure."

The proposed design adequately responds to the distinct boundary conditions encountered adjacent to the site. The architecture has been designed to address each elevation, providing a sensitive and appropriate scale and relationships with each street. The largest mass allocated to the co-living faces Bakers Road, where the tallest buildings ranging between 5 and 9 storeys are located. The High Street has the most prominent public realm with buildings heights ranging from 4 to 8 storeys – massing allocated to



Site Location

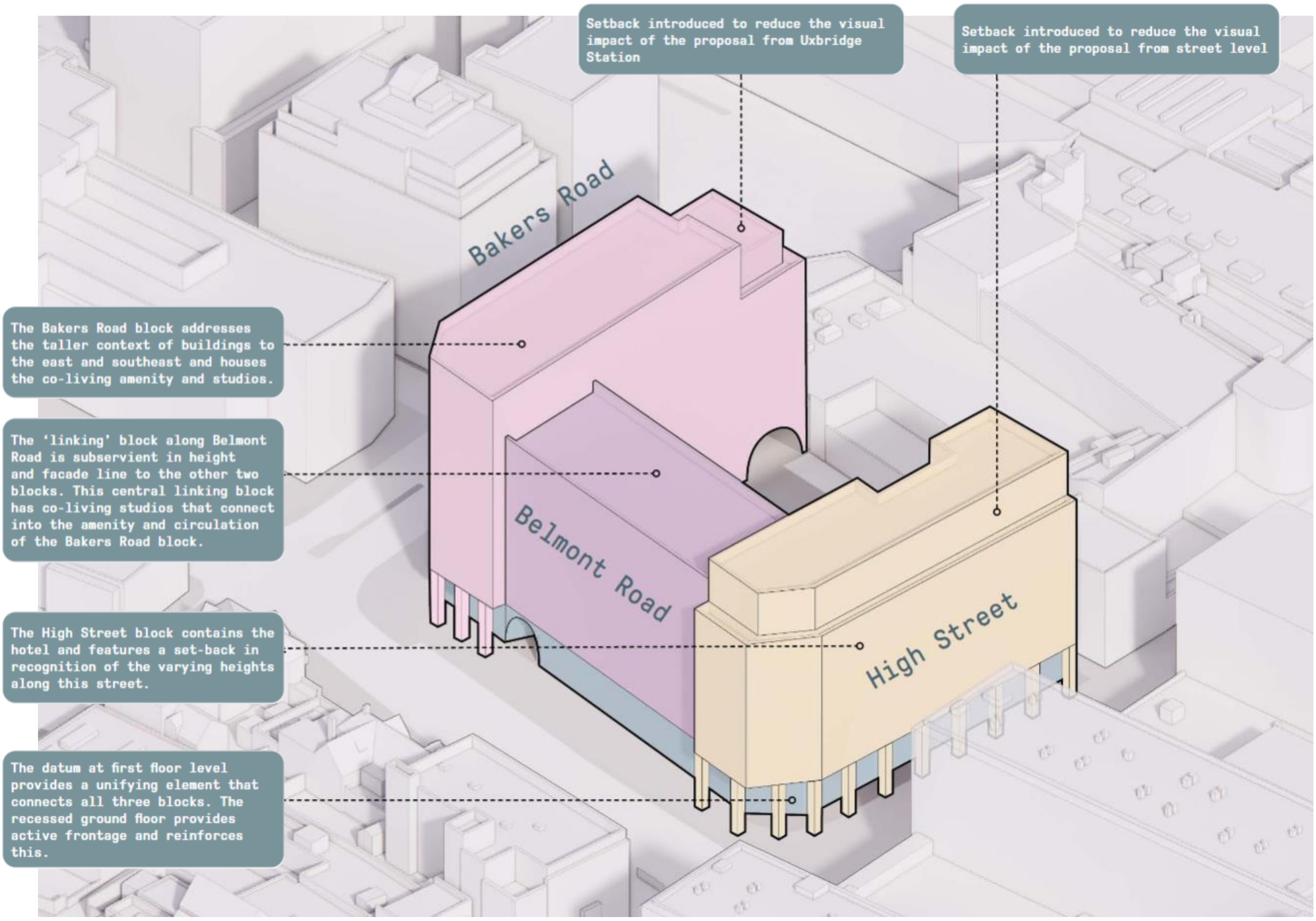
the hotel acknowledges the contextual height nearby while improving on the existing colonnade by adding double height retail frontage. Across the street, on Belmont Road, the buildings are much smaller, hence the adjacent proposed mass is lowered in response.

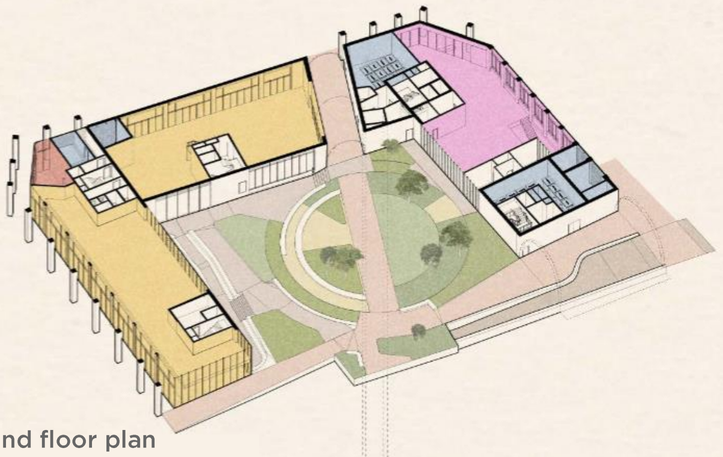
The massing approach has developed the building into three blocks that have their own programme, massing and elevational approach:

- The block fronting Bakers Road houses the co-living entrance, studio accommodation and co-living amenity.
- The block fronting The High Street houses the hotel block sat above the largest retail units.
- The block fronting Belmont Road houses co-living studio accommodation above retail units, acting as a linking block between Belmont Road and the High Street.

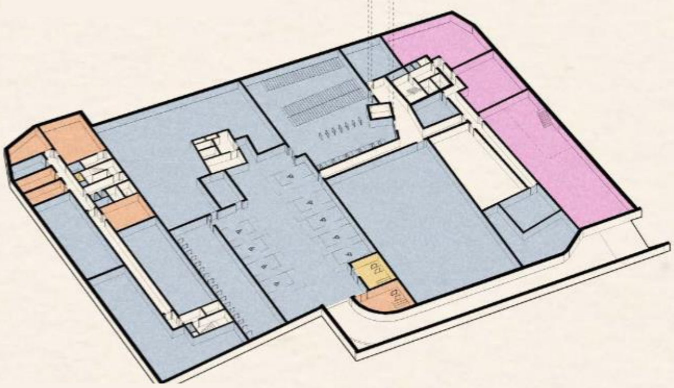
The building uses are predominantly grouped into their relevant blocks to provide efficient spaces for occupation. The ground floor uses a combination of a central public courtyard and active frontages to all three streets to provide a common connection.

The following page provides a few floorplans to further convey scale and massing of the scheme. For full details, please refer to the DAS.



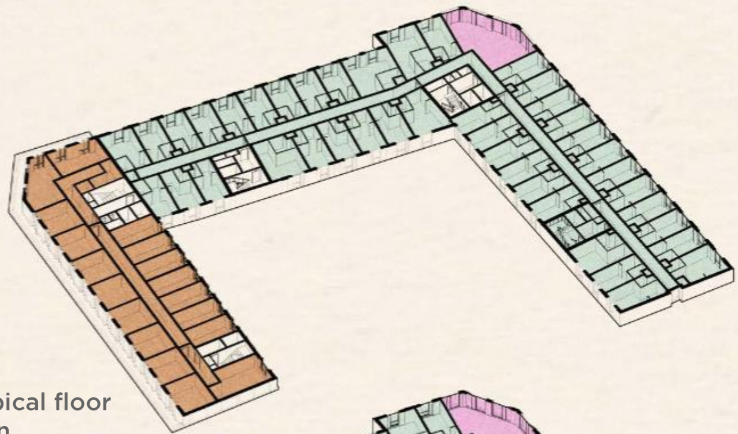


Ground floor plan

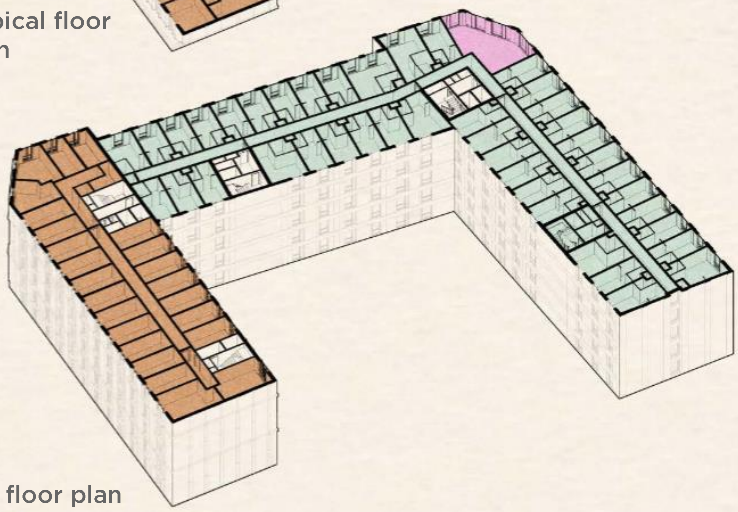


Basement plan

- Public Realm
- Retail
- Hotel Entrance
- Co-living Amenity



Typical floor plan



7th floor plan

- Hotel Rooms
- Co-living
- Co-Living Amenity

Structure and purpose of this report

This CES has been prepared to detail the circular economy strategic approach adopted by the proposed development and to give an overview of the interventions that will be applied to ensure circular economy principles are embedded within the design of the scheme over its lifetime. The CES report headlines will provide a framework for the project team to operate consistently within circular economy guidelines set out by the GLA and the London Borough of Hillingdon

The following sections of this CES provide the following:

- Strategic Approach
- Key Circular Economy Commitments
- Implementation Strategy
- End of Life Strategy
- Appendices

Policy Framework

The London Plan sets out the spatial development strategy for Greater London. It is the overall strategic plan for London, defining an integrated economic, environmental, transport and social framework for how London will develop over the next 20 - 25 years. The London Plan includes the following policies in relation to the Circular Economy.

<u>SI 7 Reducing waste and supporting the circular economy</u>

Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by the Mayor, waste planning authorities and industry working in collaboration to:

- Promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible
- Encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
- Ensure that there is zero biodegradable or recyclable waste to landfill by 2026
- Meet or exceed the municipal waste recycling target of 65 per cent by 2030
- Meet or exceed the targets for each of the following waste and material streams:
  i. Construction and demolition – 95 per cent
  ii. Excavation – 95 per cent beneficial use
- Design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.

Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted, to demonstrate:

- How all materials arising from demolition and remediation works will be re-used and/or recycled
- How the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life
- Opportunities for managing as much waste as possible on site
- Adequate and easily accessible storage space and collection systems to support recycling and re-use
- How much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
- How performance will be monitored and reported.

Hillingdon Local Plan Part 1 – Strategic Policies (2012)

The Local Plan Part 1 sets out the overall level and broad locations of growth up to 2026. It comprises a spatial vision and strategy, strategic objectives, core policies and a monitoring and implementation framework with clear objectives for achieving delivery. These policies are supported by more detailed policies and allocations set out in the Local Plan Part 2.

- Policy BE1 (Built Environment) - all new developments should maximise the opportunities for all new homes to contribute to tackling and adapting to climate change and reducing emissions of local air quality pollutants.
- Policy EM1 (Climate Change Adaptation and Mitigation) – includes a series of requirements for development, including the promotion of low carbon and renewable technologies.
- Policy EM11 (Sustainable Waste Management) The Council will require all new development to address waste management at all stages of a development's life from design and construction through to the end use and activity on site.

Hillingdon Local Plan Part 2- Development Management Policies (2020)

The Local Plan Part 2 comprises Development Management Policies, Site Allocations and Designations and the Policies Map. It delivers the detail of the strategic policies set out in the Local Plan Part 1.

- Policy DMEI 2 (Reducing Carbon Emissions) – all developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.
- Policy DMIN 4 (Re-use and Recycling of Aggregate) - The Council will promote the recycling of construction, demolition and excavation waste.

Hillingdon encourages all developments to submit a CES, following a 3-step approach: submit a draft CES at pre-application, submit a detailed CES at planning application and submit an updated CES at post-construction, upon commencement of RIBA Stage 6. The GLA circular economy template spreadsheet should accompany each submission to demonstrate and quantify the impact of circularity principles in the design.

The CES will therefore be based on the GLA's guidance document for Circular Economy Statements issued in March 2022, which interprets the policies set out above and describes what Circular Economy Statements should include.

03. Strategic approach

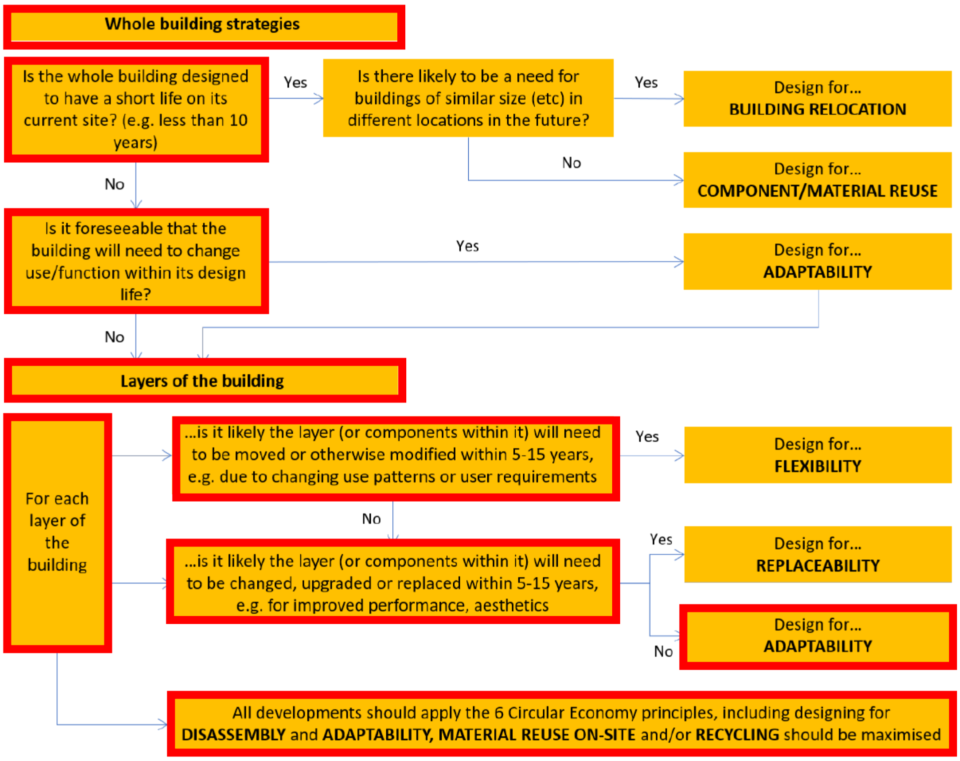
Along with other sustainability aspects like whole life carbon, a collaborative approach to circularity thinking considered the core circular economy principles applied to design, construction and operation.

The strategic approach GLA decision tree, as shown on the right, directed attention towards designing for adaptability and longevity for this mixed-use development. The design will facilitate adaptability to extend the proposed building's life, whilst also allowing for eventual deconstruction and reconstruction to allow components and materials to be salvaged for reuse or recycling.

The existing building on the plot will be demolished to allow for the construction of a new mixed use development, since it was found unsuitable to reuse. The floor to ceiling heights are low for the intended use, the ground floor would have a split level, and the facades are approaching their end-of-life and internal levels are poor from the tinted glazing and decorative precast cladding units blocking daylight and views out. A more detailed summary of the existing site's opportunities can be found on the next page.

As it is not technically feasible to retain the existing building on site, some residual value of the building elements and materials will be recovered – a detailed pre-demolition audit has been carried out to determine the principal demolition materials and the recommended waste management routes of these demolition products.

The strategic approach is to design the proposed scheme for adaptability, whilst incorporating the six circular economy principles.



Strategic approach decision tree for new buildings

Existing site opportunities

The existing building on-site is estimated to have been built between 50-60 years ago. The Pre-Redevelopment Audit highlights that the site is poorly utilised, and the existing accommodation is of poor quality and unproductive. Therefore, it is proposed that the suspended floors and roof are to be demolished, with the basement retained and refurbished to facilitate the construction of the accommodation above.

Generally, the façades would be described as tired and of their time. Poorly insulated glazed units, a mix of masonry units peppered with poorly executed repairs, and large "decorative" precast concrete cladding units in front of dark tinted glass contributing to poor light levels and little visual amenity internally and a challenging "brutalist" façade externally.

The existing floor structures are comparatively deep, with what might be expected in a purpose built block; the ground to first floor height is significantly greater, at approximately 5 metres, than would typically be required. If retained, alongside new structures, these factors combined will require split levels across a floor plate significantly impeding horizontal circulation of people and services. The existing structural layout is therefore geometrically incompatible with the desired new arrangement of accommodation both on plan and in elevation.

In attempt to maximise retention of existing structures, or part of, the proposal will largely retain the perimeter retaining wall, with the basement slab modified for new foundations and where increased head-height is required. Modifications to the basement slab will require local repairs to the retaining wall.

Wherever possible, building elements, original materials and components will be reused to maximise their lifespan. Existing concrete from the hardscapes can be crushed and reused as piling mat/hardcore for the proposed development.

The Pre-Redevelopment Audit concludes that replacement structures would use no more materials than retention and modification – the foundations and columns would need to be entirely new and the ramped structures at ground floor would need to be replaced.

A pre-demolition audit has been carried out to audit the waste streams arising from the strip out and demolition works and identify a waste hierarchy of prevention, reuse, recycle, recover and dispose. Waste routes will be defined when demolition contractors are awarded the contract for site works. After this, routes will be determined from an approved list of waste carriers.

Elevations onto Bakers Road & The High Street

Proposed design considerations

<u>Building in Layers</u>

The proposed scheme design has been broken down into building layers to design out waste, optimise material use and keeping building elements/materials in use after the end of their life cycle. Please refer to the summary of strategies in Table 2.

The design objective for the elements with longer life cycle (more than 25 years) is to design for longevity, adaptability and flexibility. The concrete frame ensures longevity and can be adapted for any future uses. Building layers with shorter life expectancy (less than 25 years) are being designed for ease of maintenance, reuse and recoverability. The plant will be made accessible for replaceability and maintenance.

Subject to the new use of the site it may be possible to retain some elements of the car park walls, however complete re-use is unlikely. The nature of the construction eliminates large scale re-use of any components. The majority of the material forming the structures will be recycled with the two largest waste streams being identified as concrete and brick and steel.

Other waste types can be carried on site or off site at transfer stations which allow a greater proportion of recovered materials than on site sorting. In addition, it is proposed that sending single mixed loads rather than several smaller loads of different waste streams can reduced the carbon footprint of associated transportation.

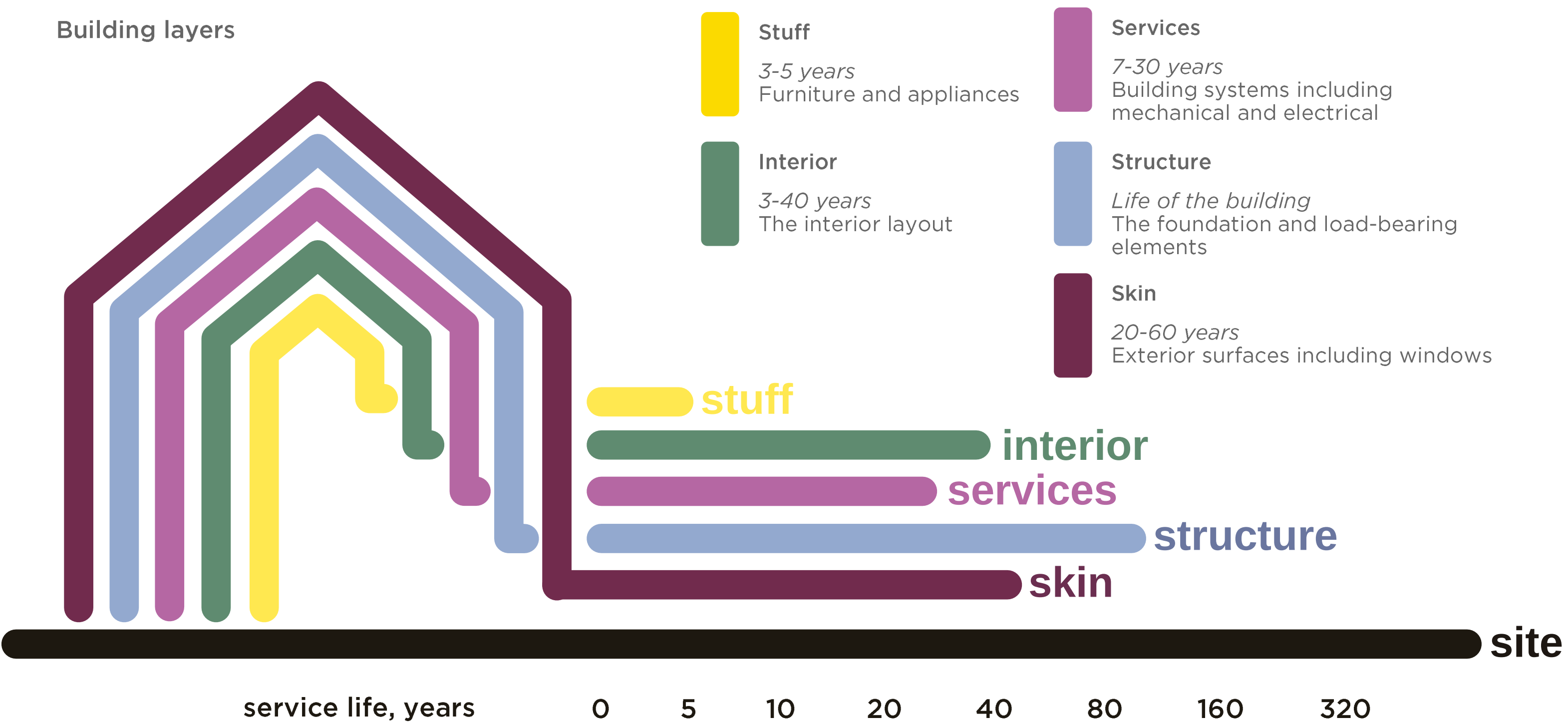
The project team is supportive of the transition from a linear approach to a circular one, led by the GLA's core principles. The Applicant's aspirations is for a scheme characterised by an efficient and economical design, with emphasis on the integration of engineering and architectural principles to deliver a simple, elegant, and budget-compliant solution. The aim is to create efficiencies at every level from the foundations, through the structure, cladding, services, internal layouts and finishes.

The applicant's strategic principles and objectives include a sustainable legacy to future occupiers and to build on lessons learnt from earlier projects to improve environmental credentials.

<u>Design Optimisation</u>

Passive design studies have been undertaken to identify the most suitable passive and energy-efficient design approach for the scheme. Superstructure design has been optimised, through the selection of post-tensioned concrete for elements, such as the

Building layers



upper floors slabs, walls and columns. These result in a considerable reduction in the building weight and translates to a significant carbon saving when compared to reinforced concrete. Recycled content has been maximised where practically possible. GGBS content is proposed as a cement replacement to reduce the use of virgin cement. Further interventions for the reduction of embodied carbon are being investigated by the architects and the main contractor. With some of the interventions, there are supply chain limitations, for example, recycled aluminium. These challenges and opportunities will be explored further at the time of procurement.

Demolition and Construction waste

The embodied carbon associated with demolition has been calculated based on a standard assumption of 50kgCO2e/m^2 to the GIA of the existing areas being demolished. As the total floor area to be demolished is around 7,010m^2, the embodied carbon associated with this would be circa 350,500kgCO2e.

Construction waste arising from the proposed development will be minimised in line with the relevant planning requirements.

A pre-demolition audit has been undertaken for the site quantifies the estimated volume of waste generation and identifies opportunities for maximising reuse and the recovery of materials in alignment with the waste hierarchy. The current building is unsuitable for reuse, however, there is potential to minimise waste through the recovery of materials.

The Resource Management Plan, to be produced in the next design stage, will outline the strategy to maximise opportunities for reusing and recycling construction waste, while monthly monitoring will ensure that subcontractors are engaged in the process. The following opportunities for reducing construction waste have been identified:

- Waste will be segregated on-site to assist with the recycling rate;
- Just in time material deliveries to avoid stockpiling on site and reduce the risk of damage; and
- Supplier take-back schemes will be utilised.

Operational Waste

The refuse strategy has been developed with consideration to the Hillingdon Local Plan 2012-2026 and West London Waste Plan as well as the West London Boroughs goal to meet the London Plan and the GLAs guidance.

Both the co-living waste stores have been designed to minimise the number of collections per week through the rotation of eurobins. Along with this, the management staff will manage, monitor and record the use of recycling, waste and food containers. When poor recycling is noted, information will be circulated to all occupiers to be made aware of what materials can be recycled. Whilst the operator of the hotel is not yet confirmed, it is anticipated that they will have daily servicing as part of their logistics management.

Waste provisions for the various areas of the building will meet the minimum requirement to have at least three waste streams: general waste, dry recycling and food waste/composting. Clear communication with the end user will be key to facilitate recycling during operation. This will be in the form of non-technical building user manuals, as well as enforced by dedicated property management personnel refuse pick-up points are located on Belmont Road as well as on Bakers Road, with a managed system for corralling refuse containers to the pick-up locations.

Table 1: Circular economy strategic approach – existing buildings

Circular Economy Design Approach	Phase / Building / Area / Layer	Strategic Response
Retain and Retrofit	Existing buildings	The existing building, estimated to be 50–60 years old, is underutilised and features low-quality, unproductive spaces, as highlighted by the Pre-Redevelopment Audit. The proposal recommends demolishing the suspended floors and roof while retaining and refurbishing the basement for new accommodation. The dated façade, with its poorly insulated glazing, weathered masonry, and brutalist cladding, offers poor light and visual amenity, and the building's structural design—with deep floor slabs and excessive ceiling height on the first floor—hinders efficient circulation and is incompatible with the intended new layout. Whilst possible, the retention of some superstructure elements would be cost prohibitive, deliver an inferior development and would be ultimately self-defeating. Having poured, time, money, and resources into this hybrid structure it would be totally inflexible to possible changes of use for the accommodation in the future. Far better to create a new flexible structure, that is adaptable for future changes of use and need. The new development aims to transform the street-scape through the new mixed-use proposal, including active retail and co-living frontages as well greatly improving and increasing the retail provision.
Partial Retention and Refurbishment	Existing buildings	As the existing building is not being maintained, there will be no proposed repurpose or reconstruction. As explained above, individual materials or building elements may be reused off-site, pending further investigative work in the next design stage.
Disassemble and Reuse	Existing buildings	Wherever possible, disassembly will be prioritised over demolition so that building elements, original materials and components can be reused to maximise their lifespan. The Pre-Demolition audit has identified a minimal possibility of re-use of materials.
Demolish and Recycle	Existing buildings	The Pre-Demolition audit has assessed the waste type and quantities that can be recycled and identified that 100% of concrete can be crushed into Recycled Concrete Aggregate (RCA) on/off site. 100% of Steel and Mixed metals to be placed in the scrap metal re-processing industry. 100% of glass can be melted and created into new windows or other glass products and for this, would be sent off site for recycling. For other waste types streaming and sorting will be carried on-site and off-site transfer stations. Modern technologies allow transfer stations to recover a greater proportion of materials than simple sorting.

Table 2: Circular economy strategic approach – new buildings

Circular Economy Design Approach	Phase / Building / Area / Layer	Strategic Response
Building relocation	Proposed buildings	The proposed development is of significant scale and is not intended for relocation during its lifetime. The proposed structures have been designed with its urban planning, wider community and infra-structure context in mind, and therefore no reason is anticipated to justify relocation.
Component or material reuse	Internal partitions Building systems Existing concrete Structure Skin Interiors	The scheme has been designed with flexibility and adaptability to accommodate future changes and reuse of components. Internal partitions are not load-bearing and therefore demountable, building systems are interchangeable, and adaptable floor layouts enable easy reconfiguration and reuse of components as needs evolve over time. Some of the concrete from the existing site could be used for piling mat, while others will be recycled off-site. The design will facilitate disassembly at its end of life to encourage material reuse. The team will also look into the possibility of using material passports to enable easy identification and retrieval of reusable materials within the structure, skin and interiors during deconstruction or renovation activities. The Whole Life-cycle Carbon Assessment prepared by Ridge estimated that 21.42% of building materials will be comprised of recycled/reused content (by value).
Adaptability	Structure Interiors	The proposed grid structure will allow for spaces to easily reconfigured to accommodate different layouts, ensuring a possible change to apartment sizes and unit mixes in the future. The internal partitions in the residential levels not load-bearing, allowing for more flexible arrangements of interior spaces. The proposed HVAC systems should be easily expanded or modified to meet changing occupancy or usage requirements.
Flexibility	Internal layout Utilities infrastructure	As detailed above, proposed spaces can be reconfigured to suit different purposes or adapt to changing needs, and non-load-bearing internal partitions can be altered to create flexible rooms and spaces that can be easily expanded or reduced as needed. The proposed amenity, offices and retail spaces are also flexible and adaptable to evolve with changing use requirements. Utility infrastructure will be designed with flexibility in mind, allowing for the easy replacement or upgrade, including potential future connection to a local district heating network.
Replaceability	Standardised components Skin Services	Widely available, standardised building components and materials will be prioritised to ensure that replacements can be easily sourced from various suppliers. HVAC systems will be easily accessible and rooftop plant can be removable by cranes. Utility infrastructure will be designed with flexibility in mind, allowing for the easy replacement or upgrade, including potential future connection to a local district heating network.

Table 2: Circular economy strategic approach – new buildings

Circular Economy Design Approach	Phase / Building / Area / Layer	Strategic Response
Disassembly	Structure Skin Interiors	The design is likely to feature prefabricated components that are manufactured off-site and assembled on-site, enabling easier disassembly during future renovations or demolitions. The scheme will use bolted connections instead of welded or adhesive fixed connections where possible, as bolts can be easily removed, allowing for disassembly without damage to materials. A labelling system could be investigated to mark components, connections, and materials with information about their specifications and assembly/disassembly instructions. Materials that are recyclable will be prioritised, and these can be separated easily during the eventual disassembly process.
Longevity	Structure Skin All building layers	Focus on high-quality, durable materials that can withstand environmental conditions, wear and tear, and aging over an extended period. Use finishes and coatings that protect materials from weathering, corrosion, and other environmental factors. A regular and proactive maintenance program should be implemented to address potential issues before they become major problems. Flexible and adaptable design features will be incorporated to allow for future changes in use or renovations, supporting adaptive reuse rather than complete redevelopment. Structural elements will be designed for longevity, surpassing the 60 year life cycle assessed in this report.

04. Circular economy commitments

Circular economy design principles by building layer

Designing out waste	Module A – Product sourcing and construction stage
Site	Prioritise disassembly of existing buildings where possible. The Pre-Demolition audit quantifies and identifies the materials that can be reused/recycled, as well as their routes. For the construction of the proposed buildings, the Site Waste Management Plan (SWMP) that accompanies the CES states that waste on site will be minimised through the adoption of the waste hierarchy wherever possible to re-use, recycle waste generated on site other than final disposal. A ground level processing area will be created where we separate all waste streams. Further segregation of the waste streams on site will reduce lorry movements and allow potential for further re-cycling. The following waste minimisation practices will be adopted: • Decrease the need for temporary work • Crushing inert waste onsite and using for backfill • Just in time delivery of materials to prevent spoilage • Ordering the correct materials and correct quantities - in bulk if appropriate • Recording material delivered onsite and dispatched • Where possible packaging would be kept on until the last moment, material suppliers will be asked to collect packaging for reuses 99.4% of non-hazardous demolition waste will be diverted from landfill.
Substructure	Minimise new excavation as the basement level is planned to be partially retained. Excavation waste will be used on site where possible. Standard foundation methodologies have been designed to minimise material waste. Quantities of required materials have been accurately calculated to avoid over-ordering and waste materials. Salvage and reuse materials from the demolition of existing substructures in new construction projects, as detailed in the Pre-Demolition audit, recycling materials like concrete or steel will be used for use as aggregates or for scrap metal re-processes.

Circular economy design principles by building layer

Designing out waste	Module A – Product sourcing and construction stage
Superstructure	The proposed design includes for efficient floorplans throughout the scheme to optimise material usage. The proposal will investigate and prioritise the offsite manufacture of the external and internal component parts, thus reducing waste and time to construct. Salvage and reuse materials, such as lumber, bricks, or metal framing, for other construction projects.
Shell/Skin	Off-site construction/ modular components will be investigated to reduce waste on site, including balustrades, windows and doors. Recycle exterior cladding materials, such as bricks, stones, or metal panels, in other projects. GRC cladding panels are specified for the façade and these require minimal maintenance, reducing the need for frequent cleaning, repainting, and repairs. This not only saves time and money but also reduces the amount of energy and resources required to maintain the building's facade. Furthermore, GRC cladding panels are resistant to moisture, fire, and UV radiation, making them a durable and long-lasting option for sustainable building design. Recycle materials like glass, insulation, or metal for use in new products. Supplier take back schemes will be used where possible.
Services	A high thermal performing, and airtight facade will reduce energy demand, eliminates unnecessary components and processes in MEP systems. Design MEP systems with modular components to reduce the need for custom fabrication and enable efficient disassembly and reassembly, minimising waste generation during installation and future modifications. The material specification for the pipes, ducts and chambers have undergone a carbon impact assessment to determine the most appropriate specification to reduce embodied carbon on the design. Salvage and reuse mechanical, electrical, and plumbing equipment, such as pipes, fixtures, or HVAC systems, in other projects. Recycle metals and electronic components for resource recovery.
Space	Spaces have been designed to maximise their utility and reduce the need for excess square footage. Riser space has been coordinated to minimise spatial wastage and disruption to internal layouts.
Stuff	Just in time deliveries will be used to reduce waste created by improper storage and weather damage. Salvage and reuse interior fixtures, furniture, or finishes in other projects. Provide adequate and organised recycling within the building to encourage responsible disposal of unwanted items. Circular economy principles will be encouraged with incoming residents and occupiers.

Designing out waste	Module A – Product sourcing and construction stage
Construction stuff	As detailed within the SWMP, all waste will be segregated into different waste streams using skips or containers for both hazardous and non-hazardous use. It is encouraged that suppliers and sub-contractors offer a take-back and collection services for material and packaging. Suppliers and sub-contractors will make sure all packaging is in accordance with Packaging Waste Regulations. If any non-compliancy is found or there is an unnecessary amount of packaging, supplier and sub-contractors will take back the packaging at their own expense.
Summary	The design team will endeavour to minimise waste generation, optimise resource usage, and promote sustainable practices throughout the lifecycle of the project. 99.4% of non-hazardous demolition waste will be diverted from landfill.
Challenges	All opportunities for reducing materials may not have been fully explored at this or future stages. Supplier takeback schemes still an immature market for certain materials in the UK. Access to appropriate recycling facilities and waste disposal sites, especially for specialised materials, may be limited in certain areas. Managing the logistics and transportation of construction waste to recycling facilities can be challenging due to the volume and weight of materials.
Who and when	Structural engineer, demolition contractor and main contractor during design and construction stages
Plan to prove and quantify	The implementation of standard impact avoidance measures will reduce waste from construction activities, which can be secured through the DCEMP. In line with practices, targets and monitoring procedures described within the SWMP, the main contractor will be required to develop a Resource Management Plan to estimate anticipated construction waste and identify opportunities for minimising waste generation. The Resource Management Plan will also identify opportunities for maximising material recover in line with the waste hierarchy. Contractor will keep waste records to ensure targets are achieved. Regular monitoring and evaluation can help track progress and identify areas for improvement.

Designing out waste	Module B – In-use stage
Site	The landscape design will prioritise planting that require minimal maintenance and water usage. The scheme has also considered co-ordinated sustainable urban drainage measures, as well as specification of efficient fittings, to significantly reduce water consumption. The scheme will target 69.9% of municipal waste to be recycled, while this increases to 83.8% for the hotel and retail waste.
Substructure	N/A
Superstructure	The design proposal has considered adaptability and flexibility to accommodate future changes in occupancy or use without the need for major renovations or demolition. The use of high-quality, durable materials that can withstand frequent reconfiguration supports the building's long-term adaptability. Interior partitions are designed to be non-load-bearing and movable, so spaces can be redefined without impacting the building's structural integrity.
Shell/Skin	High insulation levels and air tightness will ensure energy efficiency and reduce heating and cooling waste. Passive design strategies have been/will be explored to maximise natural light and ventilation, reducing the need for artificial lighting and air conditioning.
Services	Highly energy efficient services to aim to provide a 59% reduction over Part L. It is estimated that a 25% reduction in existing water usage can be achieved through the specification of efficient fittings. The co-ordinated surface water strategy for the detailed application has been developed in response to the Draft London Plan SUDs hierarchy and includes extensive water recycling and storage features to achieve greenfield runoff rates.
Space	The building uses are predominantly grouped into their relevant blocks to provide efficient spaces for occupation. Multifunctional spaces have been incorporated into the design. Co-living offers a more extensive array of spaces and facilities to residents. Smart meters will be installed so residents can monitor their energy and water usage.
Stuff	Refuse stores provide separation for general waste, recycling and organic materials collection. The communal kitchens will have separate bins for waste, recycling and food waste. This will be regularly collected by building management and transported to the communal storage areas.
Construction stuff	Contractor will segregate and monitor waste generated during construction.

Designing out waste	Module B – In-use stage
Summary	Minimising the quantities of other resources used (energy, water, land) Supporting information notes that waste will be collected and managed in accordance with all relevant legislation and guidance, and it is anticipated that operational waste will mainly comprise household and recyclable materials. The proposed commercial uses are not considered to give rise to unusual volumes of waste.
Challenges	Successful waste management relies on collaboration among multiple stakeholders, including building managers, waste management providers, businesses, and residents.
Who and when	Waste consultant as well as contractor
Plan to prove and quantify	The application is supported by a Site Waste Management Plan and an Operational Waste Strategy is detailed within the DAS. Non-technical building user manuals will be developed and will include incentives for encouraging dedicated property management personnel to track and manage waste management to meet the above targets. Waste provisions for the various areas of the building will have at least three waste streams: general waste, dry recycling and food waste/composting.

Designing out waste	Module C – End-of-life stage
Site	The waste hierarchy will be followed for all aspects : Reuse in-situ> Reuse on site> Reuse off-site> Recycling> Other recovery (with energy recovery)> Disposal Implement deconstruction and demolition plans that prioritise salvageable materials.
Substructure	The concrete frame substructure specified for the scheme can be recyclable in the future and repurposed. Design foundations and footings for easy disassembly and reuse. A Whole Life Carbon Assessment has been undertaken by Ridge, detailing a holistic view to reducing embodied and operational carbon emissions.
Superstructure	The concrete frame superstructure specified for the scheme can be recyclable in the future and repurposed. Design of a flexible structural elements that is adaptable for changes and future need. A Whole Life Carbon Assessment has been undertaken by Ridge, detailing a holistic view to reducing embodied and operational carbon emissions, including the percentage recycled materials specified for the scheme.
Shell/Skin	Façade elements should be able to be reused, such as brickwork, GRC panels and window frames. The façade finishes have been designed for durability and longevity to reduce the need for replacement.
Services	Mechanical, electrical, and plumbing systems have been designed with components that can be easily removed and recycled. Equipment and fixtures were specified with a focus on longevity and recyclability.
Space	Interior spaces have been designed with flexibility in mind to accommodate future changes in use or occupancy. Interior finishes will prioritise materials that are easy to remove and recycle.
Stuff	Encourage residents to donate or recycle unwanted belongings during move-out. Provide resources and facilities for residents to properly dispose of electronic waste, furniture, and other large items. Collaborate with local organisations or charities to facilitate the reuse of household items.

Designing out waste	Module C – End-of-life stage
Construction stuff	Partner with waste management companies to ensure proper sorting and disposal of construction waste. Prioritise the reuse of surplus materials in future projects or donate them to community organisations. Implement deconstruction techniques that preserve the integrity of materials for potential reuse.
Summary	An end-of-life strategy should be carried out at Post-Construction to detail measures for maximum disassembly, reuse and recycling.
Challenges	Lack on continuity of strategies planned at post-construction and measures taken at the end of life.
Who and when	Demolition contractor and Sustainability Consultant during proposed development's end of life
Plan to prove and quantify	Post-Construction Circular Economy to further detail the end-of-life strategy, which will be submitted no later than 3 months post-construction.

Designing out waste	Module D – Benefits and Loads Beyond the System Boundary
Site	The scheme is located on previously developed land with no impact on virgin land. The site is well located, in close proximity to amenities, including major transport infra-structure hubs, reducing the site's transportation-related emissions. The proposed green infrastructure and SuDS, will assist in managing stormwater effectively.
Substructure	Pile foundations will minimise excavation need and material use. The existing basement will be partially retained minimising excavation required.
Superstructure	A Whole Life Carbon Assessment has been undertaken using a holistic view to reducing embodied and operational carbon emissions, whilst maximising the circularity. The design has incorporated flexibility to allow for future modifications or additions without significant demolition or waste generation.
Shell/Skin	High performing fabric and material specifications, such as insulation and glazing, will minimise heating and cooling loads. Façade materials have been chosen for their durability and ease of maintenance to extend the lifespan of the building envelope.
Services	Highly energy-efficient HVAC systems and lighting will minimise operational energy use.
Space	Flexible and adaptable interior spaces have been proposed to accommodate changing needs over time. Spaces have been designed to maximise their utility and reduce the need for excess square footage to eliminate excess material.
Stuff	Durable and long-lasting materials shall be specified for interior finishes and furnishings to reduce the need for frequent replacements. Design for disassembly to facilitate easier recycling or reuse of building components at the end of their lifespan. Encourage residents to prioritise experiences over material possessions to reduce overall consumption.
Construction stuff	As mentioned earlier and detailed withing the SWMP, construction waste will be minimised by optimising material use and recycling or repurposing surplus materials. Construction methods that minimise disruption to the surrounding environment and reduce energy consumption during construction will be prioritised.
Summary	Circularity strategy to communicate all the potential impacts and benefits from the reuse, recycling and recovery of materials at the end of their lifetime
Challenges	Lack on continuity of strategies planned at post-construction and measures taken at the end of life
Who and when	Demolition contractor and Sustainability Consultant during proposed development's end of life
Plan to prove and quantify	Post-Construction Circular Economy to further detail circularity strategy

Designing for longevity	
Site	The proposed scheme has been designed to serve its purpose successfully way beyond the 60-year life cycle
Substructure	The concrete structural design will be difficult to design for disassembly, so will prioritise designing for longevity, efficient design and maximising the use of cement replacement. Proper drainage systems will be implemented to prevent water damage, prolonging the lifespan of the substructure.
Superstructure	Materials specified for durability and longevity, such as the proposed concrete frame structure. Ensure proper insulation and moisture control measures to prevent deterioration and mould growth. Design for flexibility and adaptability to accommodate future changes or renovations without compromising structural integrity.
Shell/Skin	Materials will be specified to ensure they are durable and weather-resistant and low-maintenance to protect the building envelope from the elements. Regularly inspect and maintain the exterior to address any signs of deterioration promptly.
Services	Install high-quality MEP systems to minimise the risk of leaks, failures, and costly repairs. Incorporate smart technology and energy management systems, such as BMS, to optimise resource usage and prolong the lifespan of service components. Plan for easy access and maintenance of service infrastructure to facilitate repairs and upgrades as needed.
Space	Design flexible and adaptable interior spaces that can accommodate changing needs and preferences over time. Consider universal design principles to ensure accessibility for residents of all ages and abilities.
Stuff	Circular economy principles will be encouraged with incoming residents and occupiers. Specify high-quality furniture and appliances that are built to last and can withstand regular use.
Construction stuff	Highly skilled contractors and tradespeople who adhere to high-quality construction standards and practices will be employed. Appropriate construction techniques and quality control measures will be implemented to ensure the longevity of the building structure and components.
Summary	The design has been developed keeping in mind long term use of the building and how it can adapt to the changing needs in the future

Designing for longevity	
Challenges	Regular maintenance, periodic inspections, and proactive management practices are essential for ensuring the continued longevity and performance of the building over time.
Who and when	All parties during concept design and technical design stages
Plan to prove and quantify	Implement a proactive maintenance program to monitor building performance and address issues before they escalate. Track key performance indicators such as energy efficiency, indoor air quality, and structural stability over time. Document maintenance activities, repairs, and replacements to assess the effectiveness of design decisions and inform future improvements.

Designing for adaptability or flexibility	
Site	Glazing ratios and massing have been designed to optimise energy efficiency and occupant comfort over time. Landscaping and outdoors spaces have been designed with future flexibility in mind, as these can be reconfigured or repurposed as needs change.
Substructure	Flexible utility connections and access points to accommodate future changes to MEP systems have been incorporated, such as the possibility of connection to a local district heating network in the future.
Superstructure	Structural systems can allow for easy reconfiguration of interior spaces without compromising structural integrity. Specified building materials can be easily modified or adapted to accommodate future renovations or expansions.
Shell/Skin	Selected exterior cladding materials and systems can be easily replaced or upgraded without significant structural modifications. Waterproofing detailing, profiling, drainage details, fixings and general geometry will be thoroughly assessed.
Services	Install flexible piping and conduit systems that allow for easy rerouting or expansion of plumbing, electrical, and HVAC systems. Specify modular or plug-and-play components for mechanical and electrical equipment to facilitate future upgrades or replacements.
Space	Design multi-functional spaces and flexible living areas that can serve multiple functions and adapt to changing lifestyle needs. Provide ample storage space and built-in cabinetry that can be customised as storage needs change over time.
Stuff	Encourage residents to prioritise quality over quantity when furnishing and decorating their homes. Specify durable and timeless finishes and furnishings that can easily be integrated into different design schemes or room configurations. Circular economy principles will be encouraged with incoming residents and occupiers.
Construction stuff	Temporary structures, such as construction site offices or worker accommodations, to be designed with modular components to enable easy disassembly and reassembly, promoting reusability in future projects. Utilise reusable formwork systems, such as metal or plastic formwork, reducing waste generated during the concrete casting process. Opt for rental equipment instead of purchasing new machinery or tools to provide flexibility and reduce the need for long-term storage.

Designing for adaptability or flexibility	
Summary	The scheme's design has considered adaptability and flexibility at each level of design and construction, to create a scheme that can evolve and grow with the changing needs and preferences of its occupants over time.
Challenges	Incorporating adaptability features during the initial design and construction phases may require additional upfront costs. Some adaptable design features may have environmental implications or require additional resources, offsetting their sustainability benefits.
Who and when	All parties during concept design and technical design stages
Plan to prove and quantify	Post Occupancy Evaluation surveys could collect feedback from building occupants regarding their satisfaction with the adaptability and flexibility of the space, assessing how well the building design meets their evolving needs and preferences. Use occupant feedback to identify areas for improvement and inform future design decisions.

Designing for disassembly	
Site	The site's location and connectivity allows for easy access and egress of construction equipment and materials, facilitating both assembly and disassembly processes.
Substructure	The concrete structural design will be difficult to design for disassembly, so will prioritise designing for longevity, efficient design and maximising the use of cement replacement.
Superstructure	The concrete structural design will be difficult to design for disassembly, so will prioritise designing for longevity, efficient design and maximising the use of cement replacement.
Shell/Skin	Investigate the viability of using lime-based mortar to allow brickwork to be disassembled. Cladding elements such as composite cladding panels allow for easier disassembly Avoid adhesives or irreversible attachment methods that can make disassembly more challenging.
Services	Servicing design allows for disassembly of part or the whole M&E system, with modular components that can be easily disconnected and removed.
Space	Investigate the use of demountable partitions instead of fixed walls to allow for flexibility in space allocation. Prioritise the specification of modular components to allow for easy disassembly and reassembly, promoting reusability and adaptability, and also to enable future expansions or modifications without major disruptions.
Stuff	Provide storage solutions for storing disassembled components or materials for future use or recycling. Circular economy principles will be encouraged with incoming residents.
Construction stuff	Document construction details and material specifications to aid in future disassembly and salvage efforts. Circular economy principles will be a fundamental criteria in the contractor's tender
Summary	By considering disassembly at all building layers, the scheme can be more easily adapted, relocated, or recycled at the end of their lifespan, reducing environmental impact and promoting resource efficiency.
Challenges	Lack on continuity of strategies planned at post-construction and measures taken at the end of life
Who and when	All parties during concept design and technical design stages
Plan to prove and quantify	Calculate the potential environmental impact and cost savings associated with on-site disassembly versus off-site demolition. Assess the potential salvage value of materials and building components for reuse or recycling.

Using systems, elements or materials that can be re-used and recycled	
Site	A target benchmark for resource efficiency will be specified and adhered to by the Site Project manager, as detailed within the SWMP. Construction practices that protect natural habitats during site preparation will be implemented.
Substructure	Use of 50% GGBS cement replacement for substructure elements, such as the piles, pile caps and capping beam. The concrete design can be recycled for future use.
Superstructure	Use of 30% GGBS in the upper floor slabs and 50% GGBS in the walls and columns. The concrete design can be recycled for future use. Use recycled steel or aluminium for beams, columns, and other load-bearing components.
Shell/Skin	Brickwork and window frames can be reused. Investigate the viability of insulation materials made from recycled or renewable sources, such as recycled glass, denim, or cellulose.
Services	MEP equipment to be sent for disassembly for recycling parts and components. Plumbing fixtures and piping to be made from recycled metals or plastic composites.
Space	Investigate flooring materials made from recycled content, such as carpet tiles with recyclable backing or reclaimed wood. Use low-VOC paints and finishes to improve indoor air quality and facilitate future renovations without harmful off-gassing.
Stuff	Recycling and reuse strategies will form part of the Home User Guide. Encourage residents to adopt sustainable consumption habits and provide resources for recycling and repurposing unwanted belongings.
Construction stuff	Source construction materials and products from manufacturers with established recycling programs or take-back initiatives. Circular economy principles will be a fundamental criteria in the contractor's tender.
Summary	The potential for reuse and recycling will be considered on all material choices and specifications.
Challenges	Lack on continuity of strategies planned at post-construction and measures taken at the end of life.
Who and when	All parties during concept design and technical design stages.
Plan to prove and quantify	A Sustainable Procurement Plan will be developed and will be reviewed with contractor during pre- construction supply chain engagement. Keep detailed records of all materials used in the construction, including their recycled content, certifications (such as FSC for wood products), and sustainability attributes. Use tools such as Environmental Product Declarations (EPDs) or Material Safety Data Sheets (MSDS) to provide quantitative data on the environmental impacts and recyclability of materials.

Reporting forms

A Bill of Materials is located in Appendix 1, and an estimated circularity by material can be found in the table below.

In addition to this, a Site Waste Management Plan and an Operational Waste Management Plan will be produced to inform the recycling and waste management processes. A Waste & Recycling Reporting Form (as per GLA's guidance for Circular Economy Statements) could not be completed at this stage, as the demolition or main contractors have not yet been appointed.

A Whole Life Carbon (WLC) Assessment has been carried out in line with the new London Plan Policy SI2 for the proposed development (please refer to separate report). The OneClick LCA tool was used for the assessment and the values below were also obtained from the analysis.

The below circularity figures are based on the preliminary assessment carried out using OneClick LCA, which will continue to be monitored and refined in the next design stages.

Estimated circularity by key material type – output from OneClick LCA

Result category	Total kg	Virgin %	Materials Recovered %	Disposal %	Downcycling and use as energy %	Recycling and reuse as material %	Materials returned %	Circularity %
Concrete	30,178,606.34	94.59	5.41		100.0		50.0	27.71
Metal	1,756,097.79	16.54	83.46			100.0	100.0	91.73
Bricks and ceramics	968,296.6	100.0	0		100.0		50.0	25.0
Gypsum-based	862,634.8	86.93	13.07	16.49	12.4	71.11	77.31	45.19
Insulation	321,660.85	68.81	31.19	53.76	46.24		23.12	27.16
Glass	175,000	100	0			100	100	50
Wood and biogenic	745,835.04	0	108.88		100.0		50.0	79.43
Earth masses and asphalt	6,731,033.06	99.91	0.09	93.78	5.78	0.44	3.33	1.71
Other materials	764,172.78	93.25	6.75	59.55	12.44	28.01	34.23	20.49

Circular economy narrative

Minimise material quantities

The proposal adopts a design approach that focuses on material resource efficiency – a leaner concept with less material demand will also reduce the amount of waste produced in the construction process, without compromising the design concept.

For waste reduction, measures to minimise of excavation, simplify and standardise materials and components of choice, and dimensional coordination have all been considered.

The massing, scale, urban form and layout of the Uxbridge mixed use development proposal responds to its immediate neighbouring context as well as broader context along Uxbridge High Street, considering upcoming development. The materiality of the new blocks respond to the existing character of the townscape, with an improved appearance through the creation of views through an active retail high street.

Minimise fuels, land & water

The Uxbridge mixed use development will be designed for energy and water efficiency in operation. Construction processes will prioritise fuel and water conservation, including delivery and storage logistics, for example. The proposed scheme will be built upon a previously developed site which will minimise disruption to the existing landscape and optimise use of London's limited resources. In addition to that, the scheme will endeavour to reuse and recycle building materials and components from the existing buildings, mostly off site, as detailed in the Pre-demolition audit (found in Appendix 3).

Specifying & sourcing materials

This involves designers and contractors collaborating for optimum results and includes reference to green sourcing guides like Greenspec and Green Guide. Specification priority will be given to locally sourced, high recycled content materials and products with EPDs.

The choice of materials and colour for the Uxbridge mixed use development is arranged in a way that unified the facades through design and composition, whilst enabling each building to develop its own character and function as a stand-alone piece of architecture. The co-living block facades employ a primarily brick texture with the hotel using composite cladding with textural variation.

Design for longevity, adaptability / flexibility and reusability

The strategic approach GLA decision tree directed attention towards designing for adaptability and longevity for this regeneration development.

Key exposed building elements have been designed to limit degradation from environmental factors such as solar radiation, wind and temperature variations. A disassembly guide will be produced to indicate how deconstruction and recoverability of materials could be maximised at the end of their life.

Very durable materials have been chosen to optimise the lifespan of the building and mitigate against the need to replace materials. The structural frame will be designed for a design life of 50 years. The design also offers flexibility for future adaptation, such as resizing or reconfiguring apartment layouts and being able to accommodate additional M&E kit, if required.

Non-load bearing internal partitions allow the internal layout to be modified in line with needs changes, as demonstrated within the 'adaptability' section within the Design & Access Statement.

Recoverability

In a circular economy, the value of products, materials and resources is maintained in the economy for as long as possible, while waste generation is minimised. An end-of-life strategy has been included in this report, assessing the percentage of materials that can be recovered or returned.

Design out waste

Implementing the 'building in layers' approach, the design objective for the elements with longer life cycles (more than 25 years) is to design for longevity, adaptability and flexibility. Building layers with shorter life expectancy (less than 25 years) will be designed for ease of maintenance, reuse and recoverability. The plant will be made accessible for replaceability and maintenance.

<u>Manage waste sustainably and at the highest value</u>

Guided by the waste hierarchy and in association with the waste capacity report, the site waste management plan and operational waste management strategy ensure optimum management and auditing of demolition, construction and municipal waste.

The operational waste strategy has been developed in line with the London Plan, the London Borough of Hillingdon requirements and the waste hierarchy to be both efficient and convenient.

Both the co-living waste stores have been designed to minimise the number of collections per week through rotation of eurobins. Along with this, the management staff will manage, monitor and record the use of recycling, waste and food containers. When poor recycling is noted, information will be circulated to all occupiers to be made aware of what materials can be recycled. Whilst the operator of the hotel is not yet confirmed, it is anticipated that they will have daily servicing as part of their logistics management.

Waste provisions for the various areas of the building will meet the minimum requirement to have at least three waste streams: general waste, dry recycling and food waste/composting. Clear communication with the end user will be key to facilitate recycling during operation. This will be in the form of non-technical building user manuals, as well as enforced by dedicated property management personnel.

Supporting information, such as the Design & Access Statement and the Planning Statement, note that waste will be collected and managed in accordance with all relevant legislation and guidance, and it is anticipated that operational waste will mainly comprise household and recyclable materials. The proposed commercial uses are not considered to give rise to unusual volumes of waste. Further information can be found within the Design and Access Statement prepared by CGL Architects.

05. Circular economy targets

Circular economy targets for existing and new development	Policy Requirement	Target Aiming For (%)	Policy Met?	Explanation (How will performance against this metric be secured through design, implementation and monitoring?)
Demolition waste materials (non-hazardous)	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	100%	Exceeds Policy	As described within the SWMP, the segregation of different waste streams for recycling will be carried out during demolition, focussing on circular economy principles to reduce, reuse and recycle wherever possible. Latest estimates by the demolition contractor is that 100% will be diverted from landfill.
Excavation waste materials	Minimum of 95% diverted from landfill for beneficial reuse.	100%	Exceeds Policy	The scheme will aim for zero avoidable waste. As the proposed scheme will involve very little excavation, given the basement retention, we will ensure that contractors are able to achieve 100% diversion from landfill for any excavation waste materials that may arise
Construction waste materials	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	99.4%	Exceeds Policy	The SWMP pre-works forecast located on page 42 of Appendix 3 estimates that 99.4% of non-hazardous demolition waste will be diverted. The amount of construction waste listed on the Recycling and Waste Reporting table was estimated based on the targeted BREEAM credits under Wst 01, in line with the pre-assessment carried out by Ridge.
Municipal waste	Minimum 65% recycling rate by 2030.	69.9%	Exceeds Policy	As detailed within table 4.1 on page 16 of the OWMP (Appendix 4) states that 69.9% of municipal waste will be recycled, while this increases to 83.8% for the hotel and retail waste.
Recycled content	Minimum 20% of the building material elements to be comprised of recycled or reused content.	21%	Exceeds Policy	The Whole Life-cycle Carbon Assessment prepared by Ridge estimated that 21.25% of building materials will be comprised of recycled/reused content.
Additional requirements	**Policy Requirement**	**Please acknowledge acceptance for a planning condition**		**Please set out an indicative timescale and responsible party for the provision of this information**
Post-Construction Report	A CE Statement is required at post-construction (i.e. upon commencement of RIBA Stage 6 and prior to the building being handed over, if applicable. Generally, it would be expected that the assessment would be received no more than three months post-construction)	It is accepted that the Post Construction Reporting will be conditioned		The Sustainability Consultants will submit the Post-Construction CES no later than 3 months post-construction.

06. Implementation strategy

Post-planning at detailed stage design

A Site Waste and Resource Management Plan (SWMP/RMP) has been prepared and will be further detailed by the appointed contractor including procedures and commitments to sort and divert waste from landfill, through either;

- Reusing the material on site (in-situ or for new applications)
- Reusing the material on other sites
- Salvaging or reclaiming the material for reuse
- Returning material to the supplier via a 'take-back' scheme
- Recovery of the material from site by an approved waste management contractor and recycled or sent for energy recovery.

Waste materials will be sorted into separate key waste groups, such as bricks, concrete, insulation, packaging, timber, electricals, plastics, glass, etc., according to the waste streams generated by the scope of the works either onsite or offsite through a licensed contractor for recovery.

Further details to the SWMP will be produced by the construction contractors and will include the target benchmark for resource efficiency. It should also cover the following:

- Procedures and commitments for minimising non-hazardous waste in line with the benchmark
- Procedures for minimising hazardous waste
- Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
- Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on site or through a licensed external contractor
- The name or job title of the individual responsible for implementing the above

The plan should be in line with guidance provided by DEFRA, Building Research Establishment (BRE) and Waste & Resources Action Programme (WRAP). Where materials cannot be reused or recycled on-site, the contractor will identify opportunities for potential reuse off-site. Material and waste generated through construction will be stored safely and efficiently, either for reuse on site or removal. Any materials to be reclaimed / reused will be done so in accordance with the WRAP protocol.

The waste reports and records will be reviewed and audited periodically by an appointed Sustainability Champion on site.

Construction

The appointed Construction Contractor will take appropriate measures on site to further reduce the environmental impact of the construction. They will adopt the following:

- The contractor will register with the Considerate Constructors Scheme and aim to attain a high score in all categories
- Energy-efficient equipment, services and construction methods will be adopted to reduce energy consumption.
- Water use will be minimised during operation, installation and construction processes
- Energy including fuel and water use will be recorded on site during the construction process
- Measures will be put in place to mitigate the potential for pollution from the Site to land, air or water including noise and dust
- The main contractor will operate as per the guidelines set by ISO 14001 Environmental Management System (or an equivalent standard) and encourage the same throughout the supply chain
- Strategic planning will be done in advance to minimise transport to and from the Site to reduce greenhouse gas emissions
- The carbon footprint of material transportation should be recorded through Key Performance Indicator (KPI) sheet provided by the Sustainability Consultant.

In line with the BREEAM targeted credits under Wst 01, the construction Contractor will also be required to:

- Provide a compliant Resource Management Plan, targeting non-hazardous waste to be less than 13.3 m3 or 11.1 tonnes per $100m^2$ GIFA; and
- Ensure that at least 70% (by volume) of non-hazardous waste generated by the project is diverted from landfill and that 80% (by tonnage) on non-hazardous waste demolition waste generated by the project is diverted from landfill.

A sustainable procurement plan will be produced to ensure the sustainability requirements are captured within the material specification.

Within the inclusion of performance requirements, any deviation from the design that will impact material quantities will need to be approved by the relevant design consultant.

Post-completion

Following project completion, an update to the Detailed Circular Economy Statement will be prepared by the sustainability consultant. This updated statement will detail progress against the targets and commitments, reporting on the outcomes and lessons learned.

Targets will be set during detailed design stages and the Post Completion report will be collated from data obtained during demolition and construction works with the final reporting occurring within three months of handover of the development. The report will be submitted to ce&wastestratement@london.gov.uk as well as the London Borough of Hillingdon within 3 months of completion.

Next Steps

The design team will continue to optimise the design and make informed material specifications decisions in order to further reduce the whole life carbon emissions and increase circularity within the Uxbridge Hotel development.

07. End of life strategy

The final circular economy principle is focusing on the end of the development's lifetime. Using systems, elements or materials that can be reused and recycled will ultimately help in ensuring that waste is avoided, or at least reduced.

A Digital Building Information Model (BIM) will be developed to house all essential information about the building's materials, structural components, and sustainability features. The BIM serves as a central, accessible digital resource, enabling future stakeholders to understand the building's design and maintenance needs across its life cycle. By documenting recyclable materials, reusable components, and dismantling guidance, the BIM will facilitate efficient decision-making for repairs, upgrades, and eventual deconstruction, ensuring the building's sustainability goals are maintained.

In addition to the BIM, an end-of-life manual will be created to provide clear, accessible instructions on the building's sustainable design elements, material reuse options, and deconstruction processes. This manual will act as a practical guide, detailing proper recycling and disposal methods to minimise environmental impact when the building reaches the end of its functional life. Easy-to-follow guidelines within this manual will empower future owners and operators to make sustainable choices aligned with the original design intent.

To promote sustainable use throughout the building's occupancy, training materials and occupant guides will be developed. These resources will educate occupants on the building's sustainable features, such as waste recycling programs, energy-efficient systems, and green spaces, along with instructions on proper usage. By informing occupants about these systems, the guides support day-to-day sustainable practices and help preserve the building's design goals throughout its operational life.

Substructure and superstructure

The concrete frame ensures longevity and can be adapted for any future uses as the grid sizes have been optimised for flexibility of use in the future.

There is limited opportunity for high-value reuse from the proposed construction type. However, the majority of the building materials, components and products can be recycled at the end of their useful life, and this is summarised below.

The proposal's flexible design will allow for future changes in use to accommodate different apartment typologies and potential change of use from the hotel to student accommodation, for example. Materials such as concrete and steel can be recovered at end-of-life for reuse and/or recycling.

Unlike the existing structural form, the new structure is robust and will permit future interventions to be considered without the need for demolition.

Façade

Materials such as bricks, glass, steel and other metals can be recovered, reused and/or recycled.

Standardised design and mechanical fixings will be preferred where possible to enable disassembly.

Interior fit-out

The specification of durable and demountable interior fit-out will allow for components and materials to be recovered and reused. Alternatively, the option to share reusable materials with other buildings through web-based material/building components platforms can also be explored.

Building services

The proposed building services will be designed and maintained to prolong their expected service life. The risers have been designed to allow for prefabrication off site and therefore support disassembly. Ease of access will allow building services to be replaced without major disruptions to the buildings.

Building circularity score

One Click LCA Building Circularity tool was used to estimate opportunities for the materials at end of life. The results are based on inputs used for the whole life carbon analysis (see separate WLC Assessment). The material quantities and specification inputs are in alignment with the those prepared by the cost consultant.

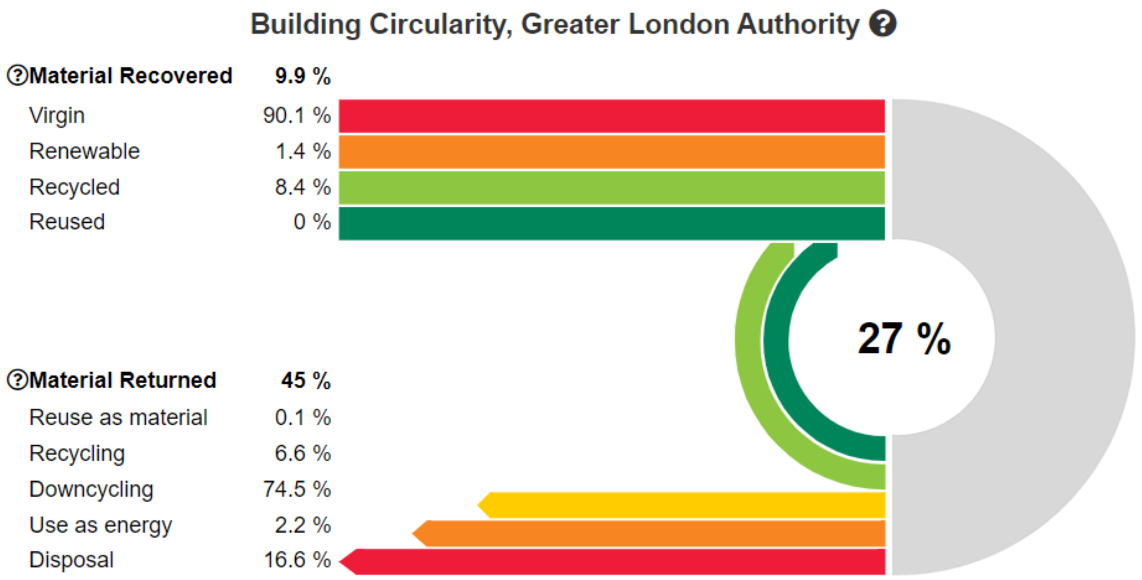
It is impossible to predict construction processes, reusable, and recycled value in 60(+) years, however, based on current practices and industry benchmarks applied by the OneClick tool, an estimation is produced by the tool and can be seen in the diagram on the following page.

This building's circularity is evaluated in terms of the mass of the recovered building material as compared to virgin material likely to be used in the building construction and the percentage of the material that can be returned to building construction at the end of life of the building.

Materials recovered (9.9%) represent the use of circular materials in the project. It is the mass-based share of recycled, reused or renewable materials of the total materials used.

Materials returned (45%) represents the end-of-life handling of materials that were used in the project. It is the mass-based share of materials that are either recycled or reused as material, added with 50% of the materials that are either downcycled (with value loss, such as reuse of concrete aggregates) or used as energy (such as wood or plastic products) incineration.

The Building Circularity score, (in this case the 27%) which is shown in the middle, is the average from the materials recovered added up to the materials returned (i.e. (9.9%+45%)/2).



OneClick LCA Building Circularity tool results