CIRCULAR ECONOMY STATEMENT

Ringers Road

Produced by XCO2 for Ringers Road Properties Ltd

April 2023

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	01	02	03			
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EXECUTIVE SUMMARY

This section provides a non-technical summary of the circular economy approach and commitments for the proposed Ringers Road scheme in the London Borough of Bromley.

DESCRIPTION OF THE DEVELOPMENT

The proposed description of development is as follows:

The site is located between Ringers Road and Ethelbert Road in Bromley and includes the demolition of existing buildings and construction of a mixed-use development comprising residential units, ancillary residents' facilities (including co-working space) and commercial floor space (Use Class E) across two blocks, along with associated hard and soft landscaping, amenity spaces, cycle and refuse storage.

Figure 1: Proposed Development

CIRCULAR ECONOMY PRINCIPLES

This report is structured around the six Circular Economy (CE) principles, which are outlined in the Greater London Authority's Guidance on Circular Economy Statements (2022). These principles should be a fundamental part of the design process and are as follows:

1. Building in Layers;
2. Designing out Waste;
3. Designing for Longevity;
4. Designing for Adaptability or Flexibility;
5. Designing for Disassembly; and,
6. Using Systems, Elements or Materials that can be Reused or Recycled.

In addition, the CE design approaches which have been adopted for the proposed development are also outlined. The adopted design approaches directly support the implementation of the six aforementioned CE principles.

CIRCULAR ECONOMY TEMPLATE

This report should be read in conjunction with the attached Circular Economy Spreadsheet which includes the following information:

- Circular Economy Design Approaches
- Circular Economy Design Principles by Building Layer
- Bill of Materials
- Recycling and Waste Reporting Table
- A Summary of Circular Economy Targets

IMPLEMENTATION APPROACH

This report will be reviewed throughout all project stages, alongside the following corresponding reports from planning stage:

- Energy & Sustainability Statement
- Overheating Assessment
- Whole Life Carbon Assessment
- Demolition and Construction Management Plan
- Design Servicing Plan
- Waste Management Strategy
- Daylight, Sunlight and Overshadowing Assessment

Due to the early stage of the development, we will be seeking to implement the following via planning condition:

- Pre-redevelopment audit
- Pre-demolition audit
- Site Waste Management Plan
- Cut & Fill calculations

The applicant is committed to reporting progress against each of the CE commitments set out in this document at post-completion stage.

INTRODUCTION

This section introduces the key principles that a circular built environment should adopt. It provides a brief description of the development, summarises the process followed to produce this document, and outlines the CE aspirations for the proposed development.

This report has been produced to address Policy D3 'Optimising site capacity through the design led approach' and Policy SI7 'Reducing waste and supporting the Circular Economy', within the London Plan; as well as Policy 112 'Planning for Sustainable Waste Management, Policy 123 'Sustainable Design and Construction' and Policy 124 'Carbon Dioxide Reduction, Decentralised Energy Networks and Renewable Energy' in Chapter 7 of the London Borough of Bromley Local Plan. A full review of the relevant planning policy framework can be found within Appendix A.

CIRCULAR ECONOMY PRINCIPLES

> *Transitioning to a circular economy offers significant opportunities for meeting the needs of a growing population and reducing the adverse impacts on the environment, by re-thinking the way that we design our homes and buildings and consume resources.*[1]

A CE is a new economic model that stands in opposition to the current linear economy. Within a linear economy, materials are mined, manufactured, used and thrown away. A CE seeks to keep resources in use and retain their value (Figure 2: Linear, recycling, and circular economic models (Circular Flanders)).

The built environment sector is the largest user of materials and generator of waste in the economy. In London alone the sector accounts for 54% of waste and consumes 400 million tonnes of material each year. There are clear environmental benefits to adopting a CE approach in the building environment, including sending less waste to landfill and reducing the use of virgin materials. In addition, there are numerous social and economic benefits.

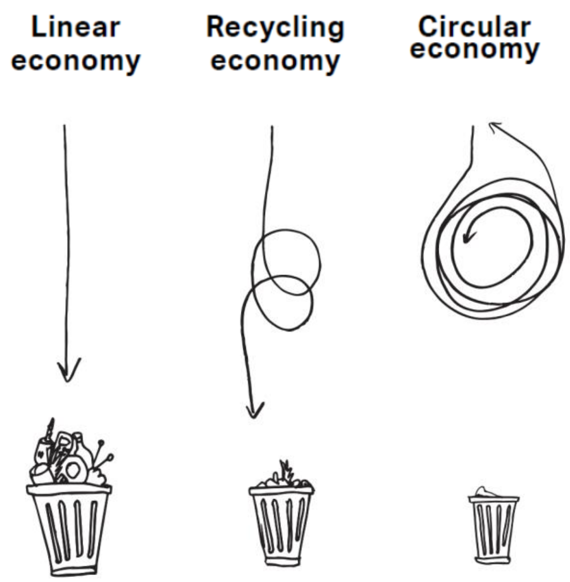

Figure 2: Linear, recycling, and circular economic models (Circular Flanders)

By implementing CE principles developers can protect their business against the rising costs of materials and waste disposal.

> *LWARB estimates that if circular economy principles are successfully adopted it could contribute between £3 billion and 3% billion in growth for London by 2036 and create as many as 12,000 new jobs.*[1]

[1] 'Design for a Circular Economy: Primer' (Greater London Authority)

This report is structured in accordance with the following core guiding principles and commitments, as identified in the GLA's 'Circular Economy Statement: Guidance':

1. **Building in Layers**: Ensuring that different parts of the building are accessible and can be maintained and replaced where necessary.
2. **Designing Out Waste**: Ensuring that waste reduction is planned in from project inception to completion, including consideration of standardised components, modular build, and reuse of secondary products and materials.
3. **Designing for Longevity**
4. **Designing for Adaptability or Flexibility**
5. **Designing for Disassembly**
6. **Using Systems, Elements or Materials that can be Reused and Recycled**

These core CE principles are compared against current practice in Figure 3 below:

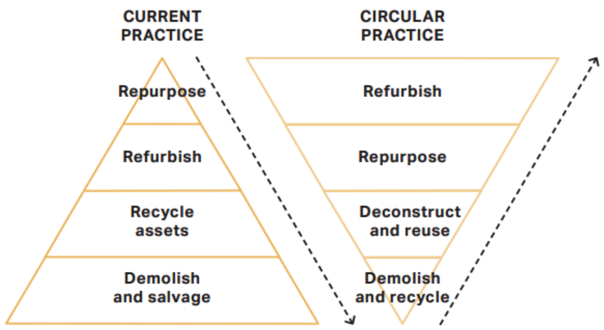

Figure 3: Current practice compared to circular practice (GLA)

DESCRIPTION OF THE DEVELOPMENT

The proposed description of development for the application is as follows:

The site is located between Ringers Road and Ethelbert Road in Bromley and includes the demolition of existing buildings and construction of a mixed-use development comprising residential units, ancillary residents' facilities (including co-working space) and commercial floor space (Use Class E) across two blocks, along with associated hard and soft landscaping, amenity spaces, cycle and refuse storage

Table 1: Proposed areas

Use	GIA (sqm)
Total Residential Space	5,752
Total Private Amenity Space	656.1
Total Commercial Space	413
Total Ancillary	2,177.9
Total	**8999**

METHOD STATEMENT

A CE workshop was held where CE principles and aspirations specific to the development were discussed.

Further workshops will be held at the next design stages to monitor the project's progress in reaching the goals summarised in the 'Circular Economy Aspirations' section of this report.

As per GLA policy, the report will be reviewed in full and updated if required at post completion stage.

SUPPLEMENTARY DOCUMENTS

This report should be read in conjunction with following reports, which have been submitted as part of this planning application:

- Energy & Sustainability Statement;
- Overheating Assessment;
- Sustainability Design & Construction Statement;
- Whole Life Carbon Assessment;
- Demolition and Construction Management Plan <To be completed post planning>;
- Waste Management Strategy (including refuse and recycling strategy) <To be completed post planning>;
- Site Waste Management Plan <To be completed post planning>;
- Flood Risk Assessment and Sustainable Drainage Strategy;
- Delivery and Servicing Management Plan;
- Daylight, Sunlight and Overshadowing Assessment; and,

As outlined in these reports, the development has been designed in line with the relevant sustainability policies with the London Plan and the London Borough of Bromley Local Plan. This reflects the client and design team's aspirations in delivering a sustainable development of high quality.

Additionally, this report should be read in conjunction with the attached Circular Economy Spreadsheet which includes the following information:

- Circular Economy Design Approaches;
- Circular Economy Design Principles by Building Layer;
- Bill of Materials;
- Recycling and Waste Reporting Table; and,
- A Summary of Circular Economy Targets.

CIRCULAR ECONOMY ASPIRATIONS

The project team for the proposed development interpret CE in the following way:

- Source materials responsibly;
- Design for durability and resilience;
- Implement measures to optimise material use;
- Carry out a pre-demolition waste audit;
- Implement waste minimisation targets during; demolition and construction;
- Ensure there is sufficient space for storage and segregation of operational waste; and,
- Design a flexible and adaptable building.

1. BUILDING IN LAYERS

Principle 1 outlines the importance of ensuring different parts of the building are accessible and can be maintained and replaced where necessary.

Where possible and feasible, an approach of 'building in layers' will be followed. This is the approach where building elements and components, with different lifecycles and lifespans, form independent layers; thus, creating a building made up of multiple independent layers. The reason is for these independent layers to be accessible and removable, whilst simultaneously maintaining their value. This approach will also support the principle of reuse and recycling. A building in layers approach will ensure that layers with shorter lifespans can be replaced without causing damage to layers with longer lifespans. Figure 4 provides an outline of the different building layers and their indicative lifespans.

To support reuse and recycling, the different layers should be independent, accessible, and removable. This is particularly important for layers that require more frequent replacement, such as building services and internal fit-outs.

An approach of building in layers is proposed for the Ringers Road development, with differing CE approaches proposed for each layer depending on its function and expected lifespan.

In evidence of this, the following sections of the report refer to the individual building layers when outlining the proposed CE approaches.

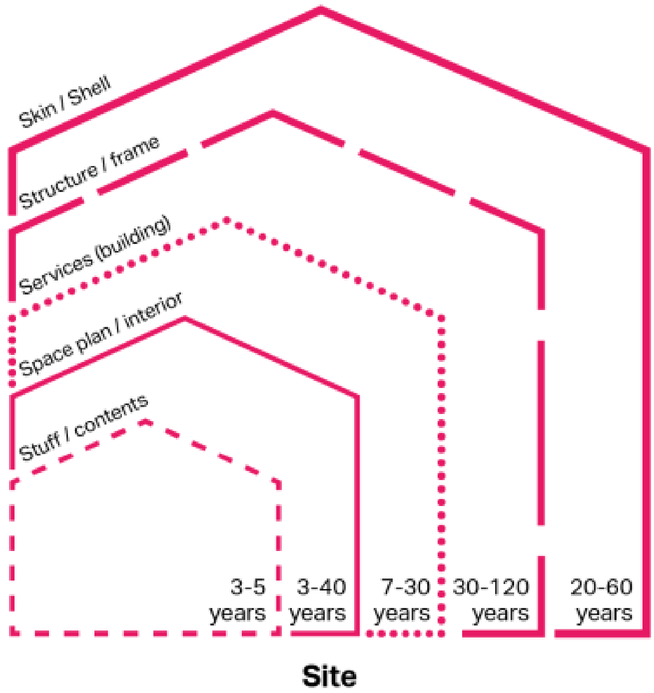

Figure 4: Building Layers. Source: GLA Circular Economy Statement Guidance (Illustrative Lifespans)

A summary of the building layers has been provided below[2]:

- **Site**: The site works comprises the external works, earth works and landscaping.
- **Skin/Shell e.g., Façade**: This layer includes the façade, as well as other exterior surfaces such as the roof, siding, sheathing and windows.
- **Superstructure**: This comprises the load bearing elements above the plinth and includes the roof-supporting structure. Insulation and services may be embedded in the superstructure.
- **Services**: This includes plumbing, heating, cooling, ventilation, and electrics.
- **Space**: Comprises elements that can be changed without changing the structure, services, or skin; including the layout, internal walls and partitions, ceilings, floors, surface finishes, fixtures, doors and fitted furniture.
- **Stuff/Contents**: This is essentially anything that could fall if the building was turned upside down.
- **Construction Materials**: Temporary installations/ works, materials, packaging, and equipment.

[2] Greater London Authority. (2022). London Plan Guidance: Circular Economy Statements. Available At: https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg.pdf

2. DESIGNING OUT WASTE

Principle 2 requires that waste production is planned in from project inception all the way through to completion. It is an important principle because it requires the consideration of measures such as standardised components, modular build and reuse of secondary products and materials.

A range of measures have been proposed to minimise the quantities of materials used within each layer.

BS EN 15978 and RICS PS set out stages in the life of a typical project, described as life-cycle modules:

- Module A1-A5: Product sourcing and construction stage
- Module B1-B7: Use stage
- Module C1-C14: End of life stage
- Module D: Benefits and loads beyond the system boundary

Each stage addresses the principles of using resources efficiently throughout the lifecycle of a construction project. The aim is to plan as far in advance as possible, and to use available materials as efficiently as possible, in order to minimise the resources used in construction.

Table 2 is focuses on the product sourcing and construction stage (Module A1 – A5). Following this, Table 3 focuses on the use stage (Module B1 – B7) and Table 4 on the end-of life stage (C1-C4). Finally, benefits and loads beyond the system boundary are considered in Table 5.

Table 2: Strategies Proposed to Minimise the Quantities of Materials Over the Product Sourcing and Construction Stage (Module A1 – A5)

Building Layer	Module A1-A5 – Product Sourcing and Construction Stage
Site	**Minimising the Quantities of Other Resources Used** The proposed development is to be built on previously developed land, therefore, helping to optimise London's limited resources and preserve green space.
	Minimising the Quantities of Materials Used The current site comprises an early 20th century building functioning as multiple retail units. A pre-demolition waste audit will be carried out prior to commencement of demolition works; however, preliminary site surveys have indicated that some 'residual value' can be recovered from the existing site and materials. According to the Design & Access Statement Addendum prepared by Assael Architecture, 'the decorative upper floors of the existing building positively contribute to the townscape character of Bromley, and the chamfered corner forms one of many prominent elevations facing the High Street. The existing building on the site dates to the early 2Oth century and above the ground floor retail units, period decoration and architectural features adorn the facade including; solider course banding, cast window reveals and distinctive parapet details. The details will be cleaned and retained, bar the windows which will be upgraded and replaced with grey windows, to match the upper floors'. The existing building façades facing High Street and Ethelbert Road will, therefore, be retained, bar the windows, eliminating high amounts of demolition waste and decreasing the virgin resource use of the development. A strategy of demolition will exist for all parts of the structure that will not be retained and a strategy of recycling will be pursued. It may not be feasible to reuse demolition waste on-site (due to site constraints); however crushed aggregate from previous projects can be brought to site and reused, thereby reducing the quantity of new aggregate that needs to be procured. Some demolition materials could be retained to form the pile matting, which can subsequently be incorporated into the substructure. The project team will aim to maximise recovery, reuse, and recycling of demolition waste. <A Pre-demolition waste audit will be carried out following appointment of a demolition contractor.>
	Designing out demolition waste At least 95% of demolition waste will be recycled/reused following the various demolition protocols and waste hierarchy. Where practicable, demolition waste will be reused on site, for example there is the potential for demolished building materials to be reused as hardcore. If it is not feasible to use demolition waste on-site (due to site constraints), crushed aggregate from previous projects can be brought to site and reused; thereby reducing the quantity of new aggregate that needs to be procured. <A Pre-demolition waste audit will be carried out following appointment of a demolition contractor.>
	Managing Demolition Waste Where materials cannot be recycled or re-used on site, the demolition contractor will refer to the London Waste Map to consider opportunities for using local sites to manage materials and waste. Following their appointment, the demolition contractor will contact local waste facilities to ensure that local landfill has capacity to receive any construction or demolition waste that cannot be recycled. Prior to commencement of demolition and excavation, a pre-demolition audit will be undertaken to identify the likely waste arisings. This will identify the possibility for activating recovery methods for the different materials present. The Principal Contractor will include information on the pre-demolition audit in the final SWMP and this is expected to cover: • Identification of the key refurbishment / demolition materials; • Potential applications and any related issues for the reuse and recycling of the key demolition materials in accordance with the waste hierarchy. <A pre-demolition waste audit & Site Waste Management Plan will be carried out following appointment of a main contractor.>
Substructure	**Minimising the Quantities of Materials Used** The use of an efficient form factor within the design and lowering the building weight, shall help reduce the use of materials in the foundations and basement (particularly concrete and reinforcement steel). As less shall be required as part of their structural design.

Building Layer	Module A1-A5 – Product Sourcing and Construction Stage
	Further to the above, all formwork shall be reusable and made of timber.
	Designing out excavation waste At least 95% of waste from excavation works associated with construction of foundations will be diverted from landfill and put to beneficial use. For example, topsoil will be given special attention due to its high value.
	Managing Excavation Waste Opportunities will be sought for the excavation waste to be used on site, in other local construction projects or other beneficial uses such as quarry restoration; these options should be prioritised above sending waste to landfill.
	Opportunities to explore Minimise concrete grade.
Superstructure	**Minimising the Quantities of Materials Used** The proposed scheme has been designed to utilise materials in an efficient manner. Material efficiency measures seek to optimise the use of materials within the building design, procurement, construction, maintenance, and end of life stages of the development. Ultimately this approach will help to reduce the quantities of new materials used. It is advised that this approach is considered at each stage of the project. In line with LB Bromley comments, the design of the proposed development has been scaled down from 16 to 12 storeys and the west-facing upper storey massing has been scaled down to reduce the impact of the building on the neighbouring conservation area. This will result in lesser demand for resources and reduce the overall carbon footprint of the development. Building elements have been selected to minimise environmental impact. At present, a range of measures are proposed to minimise resource requirements associated with the superstructure/shell/skin of the buildings proposed and reduce the quantity of new material brought to site including, but not limited to: • Standard window sizing with few different window types proposed across facades • Lightweight internal wall construction • Efficient building form • Common repeating details • Optimising column spacing A full review of the materials specified for the development will be undertaken during the detailed design stage.
	Specifying & sourcing responsibly & sustainably If hazardous waste materials are identified, a specific Hazardous Waste Management Plan will be developed, ensuring that it is minimised. All hazardous waste will be dealt with in accordance with relevant policy and guidance. An Asbestos Risk Register and Control of Substances Hazardous to Health (COSHH) report will also be prepared. To meet the GLA's requirements, a minimum 20% of the building material elements are to be comprised of recycled or reused content. Separating reused and recycled targets is encouraged and promoted. This will require the main contractor to develop and adopt a Sustainable Procurement Plan which will guide specification towards sustainable construction products. This must guide procurement throughout the project and include the following: • Identification of risks and opportunities against a broad range of social, environmental, and economic issues. • Aims, objectives and targets to guide sustainable procurement activities. • A strategic assessment of sustainably sourced materials available locally and nationally. • A policy to procure materials locally where possible. • Procedures to check and verify that the sustainable procurement plan is being implemented and adhered to (for example setting out measurement criteria, methodology and performance indicators to assess progress and demonstrate success). As outlined in the Sustainability Statement, 100% of the timber used will be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of Forestry Certification (PEFC) source.

<table>
<tr><th>Building Layer</th><th>Module A1-A5 – Product Sourcing and Construction Stage</th></tr>
<tr><td rowspan="2"></td><td>The main contractor should prioritise products which hold a responsible sourcing certification (EMS/ISO14001) for the key process as per minimum; this will ensure economic, social, and environmentally responsible practices are implemented throughout construction products supply chain. As such, there will be a preference to source materials locally where feasible. Other materials will be sourced in accordance with the following guidance:
• 100% concrete will be BES 6001 certified (Responsible Sourcing of Construction Products).
• Other major construction materials will be certified under an Environmental Management System (EMS) such as ISO 14001.
The main contractor will be encouraged to source materials from manufacturers holding EPD certificates, thus further precision can be gained when carrying out Whole Life Carbon (WLC) Assessments.</td></tr>
<tr><td>Opportunities to explore
• Specifying lower carbon concrete through utilisation of cement replacements, recycled aggregate and minimising transportation.
• During Stage 3, the specification of lower carbon options for concrete mix will be explored.
• Maximising the reuse of demolition waste on site.</td></tr>
<tr><td>Shell/skin</td><td>As per Superstructure
Minimising the Quantities of Other Resources Used
A ‘fabric first’ approach has been considered to reduce the energy demand and CO2 emissions, with all elements targeting an improvement upon the Part L 2021 minimum standards using SAP10 carbon factors. One of the objectives for the building façade for the proposed scheme is to achieve the optimum balance between providing natural daylighting benefits to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands. For further information please refer to accompanying Daylight, Sunlight and Overshadowing Assessment and the Energy Statement provided by XCO2.</td></tr>
<tr><td rowspan="2">Services</td><td>Minimising the Quantities of Other Resources Used
Building services have been reduced as far as possible by implementing a ‘fabric first’ approach. A Lean Design Option appraisal can be found in the accompanying Energy Statement provided by XCO2.</td></tr>
<tr><td>Minimising the Quantities of Materials Used
The Energy Strategy which has been carried out in line the GLA’s Energy Hierarchy will establish the most appropriate energy sources for the development.</td></tr>
<tr><td>Space</td><td>Minimising the Quantities of Materials Used
Measures are proposed to mitigate the impacts associated with the interior layout including:
• Standardised residential units</td></tr>
<tr><td>Stuff</td><td>Not in scope of works</td></tr>
<tr><td>Construction</td><td>Minimising the Quantities of Other Resources Used
The contractor is to set targets for energy and water used on site and ensure measures are put in place to minimise consumption of these resources, including through:
• Use of alternatives to diesel / petrol powered equipment where possible
• The incorporation of sources of renewable energy, to offset the use of main utilities
• Selection and specification of energy efficient plant and equipment wherever viable
• Implementation of staff-based initiatives such as turning off plant and equipment when not in use, both onsite and within site offices
In addition, the transport of materials to site and transport of waste materials from site will be monitored and reported.
Use of temporary site accommodation will be minimised as far as possible.</td></tr>
</table>

Building Layer	Module A1-A5 – Product Sourcing and Construction Stage
	Minimising the Quantities of Materials Used Measures will be taken by the main contractor to reduce the amount of packaging used and to coordinate deliveries. This will include agreements with material suppliers to reduce the amount of packaging, to use reusable packaging or to participate in a packaging take-back scheme (e.g. bricks delivered on recycled pallets) and the implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which would increase the risk of their damage and disposal as waste. In addition, particular attention will be paid to material quantity requirements, to avoid over-ordering and generation of waste materials.
	Designing out construction waste A Site Waste Management Plan (SWMP) will be provided following appointment of a main contractor. Construction waste will be separated into recyclable waste streams before removal from site for reuse or disposal. In general, the following measures will be investigated to facilitate the minimisation of waste generation: • Agreements with material suppliers to reduce the amount of packaging, to use reusable packaging or to participate in a packaging take-back scheme; • Colour coded and signposted skips to promote waste segregation and reduce the risk of cross contamination; • Sorting containers held on site for each trade, with all site waste to be collected by a licensed waste carrier; • Waste management monitoring and recording as part of the site's 'Smart Waste' obligations; • Attention to material quantity requirements, to avoid over-ordering and generation of waste materials; • Re-use of materials during demolition wherever feasible; • Segregation of waste at source where practical; and, • Identification of opportunities for potential re-use of materials off-site where materials cannot be recycled or re-used on site. <A Site Waste Management Plan will be carried out following appointment of a main contractor.>
	Managing Construction waste At least 95% of construction waste will be recycled (i.e. diverted from landfill). In accordance with government targets, the demolition and construction contractor will be required to maximise the proportion of recycled The main contractor shall monitor these this target throughout construction works as well as implementing the Site Waste Management Plan/Construction Management Plan to manage/reduce construction waste. The disposal of all waste or other materials removed from the site will be in accordance with the requirements of the Environment Agency (EA), Control of Pollution Act 1974 (COPA), Environment Act 1995, Special Waste Regulations 1996, and the Duty of Care Regulations 2003. Where materials cannot be recycled or re-used on site, the contractor will aim to identify opportunities for potential re-use of materials off-site. Although the vast majority of construction and demolition waste will be recycled, some waste will be sent to landfill. Once appointed, the demolition contractor will contact local waste facilities to ensure local landfill has capacity to receive any construction or demolition waste that will not be recycled. The Principal Contractor is responsible for ensuring the SWMP is reviewed and updated accordingly at regular intervals, and as necessary throughout the construction phase. The Principal Contractor will provide a monthly report to the Client on the progress of the Waste Management Strategy. <A Site Waste Management Plan will be carried out following appointment of a main contractor.>
	Opportunities to Explore Minimising temporary works requirements through construction methodology
Summary	To meet GLA requirements: • >95% of demolition waste to be recycled • >95% excavation waste to be recycled • >95% of construction waste to be recycled • >20% recycled or reused content of building material elements Measures to contribute to these reductions in waste to landfill include:

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Building Layer	Module A1-A5 – Product Sourcing and Construction Stage
	• Retaining & restoring existing building • Where practicable, demolition waste will be reused on site, with potential for demolished building materials to be reused • Material efficiency measures will be used to reduce the quantity of new materials procured including re-use of materials wherever feasible, segregation of waste at source where practical and re-use and recycling of materials off-site, where re-use on-site is not practical (e.g., through use of an offsite waste segregation facility and re-sale for direct re-use or re-processing). • Sourcing materials with EMS/BES certificates • Prioritising products having EPDs certificates • Separating the targets for reused and recycled contents of materials • Assumed 20% GGBS replacement • Monitoring energy and water use during construction • Monitoring transport of materials to and from site
Challenges	To be reviewed and updated at the next project stage once a contractor has been appointed. Limited availability of manufacturers with certificates.
Counter actions	To be reviewed and updated at the next project stage once a contractor has been appointed.
Plan to prove and quantify	Sustainable Procurement Plan Measuring responsible souring – copies of EMS/BES etc certificates Monitoring of construction site impacts Environmental impacts from construction products – copies of EPD certificates Pre-demolition report Demolition and Construction Management Plan Site Waste Management Plan Whole Life Cycle Assessment Daylight, Sunlight and Overshadowing Assessment Architectural Stage 2/3 information Structural Stage 2/3 information MEP Stage 2/3 information

Table 3: Strategies Proposed to Minimise the Quantities of Resources Using During Usage (Module B1 - B7)

Building Layer	Module B1 – B7 – Use Stage
Site	N/A
Substructure	N/A
Superstructure	N/A
Shell/skin	As outlined in the accompanying Energy Statement, the proposed development aims to reduce the energy demand by implementing the GLA Energy Hierarchy (be lean- use less energy, be clean- supply energy efficiently, be green- use renewable energy and be seen-monitoring)
Services	The proposed development will be fitted with water efficient fixtures and fittings, with water meters provided to enable the monitoring of water consumption. The development shall be designed to achieve mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption) in line with Policy SI 5 Water Infrastructure of the London Plan 2021. Building service systems with a significant water demand will have additional water monitoring equipment fitted to them. A leak detection system will be employed on the main water supply The design team will identify all unregulated water demands that could be realistically mitigated or reduced. Through either good practice design or specification, a meaningful reduction in the total water demand of the building will be made. As noted previously, where possible, and the complexity and scale of the project must be considered here,

Building Layer	Module B1 – B7 – Use Stage
	building elements and components with different lifespans will form independent layers. This will ensure those layers with shorter lifespans can be replaced without damage to layers which have longer lifespans. This will include the following principal layers: • Structure: Foundation and load-bearing elements • Skin: Exterior surfaces • Services • Space: The interior layout • Stuff: Furnishings and carpets In addition, a plant replacement strategy will be developed to ensure that building services equipment can be replaced when required (at end of life) without damage to building fabric or structure. A BUG will include information on the building and its environmental strategy, e.g. energy, water or waste efficiency policy or strategy, and how users should engage with and deliver the policy or strategy.
Space	Where possible, internal partitions will be removable without destructing the building's structure.
Stuff	**Managing Municipal Waste** The project has been designed to allow occupiers to achieve the required 65% recycling rate for municipal waste. Separate on-site waste areas will be provided for the proposed development: • Is designed with adequate, flexible, and easily accessible storage space • Supports the separate collection of dry recyclables (e.g. – paper, mixed plastics, metals, glass etc.) • Supports the separate collection of food waste The operational waste will be managed in accordance with the waste hierarchy. The principal contractor will follow the 'Mayor's Business Waste Management Strategy' in order to reduce the amount of waste generated. A Building User Guide shall be provided, which will include information on how, when and where building occupiers should store and deposit recyclables and dispose of waste and promote recycling.
Construction	N/A
Summary	To meet the GLA >65% recycling of municipal rate target, the following measures will be adopted: • Non-technical Building User Guide • Building operational energy and water to be sub metered as appropriate
Challenges	To be reviewed and updated at the next project stage once a contractor has been appointed.
Counter actions	To be reviewed and updated at the next project stage once a contractor has been appointed.
Plan to prove and quantify	Building User Guide Operational energy and water targets will be implemented Contractor to appoint nominated individual to monitor construction energy and water use Plant Replacement Strategy Operational Waste Management Plan /Strategy Delivery and Servicing Management Plan

Table 4: Strategies Proposed to Minimise Waste at the End of Life Stage (Module C1 – C4)

Building Layer	Module C1-C4 – End Of Life Stage
Site	N/A
Substructure **Superstructure** **Shell/skin**	The proposed development has been designed for repurpose and independent replacement of individual elements, due to their design life periods, as the majority of building elements have a service life < 60 years and will be replaced at least once over the building's 60-year lifespan. An approach of 'building in layers' is proposed to ensure that layers with shorter lifespans can be replaced without

Building Layer	Module C1-C4 – End Of Life Stage
Services	damage to layers which have longer life spans. The following principles will be implemented in order to ensure materials can be recovered in as high a value state as possible at end of life: • Durability • Design for Disassembly • Material Passports • Layer Independence • Standardisation
Space	
Stuff	
Construction	N/A
Summary	The building's structure has been designed with an indicative design life of over 60 years (based on current British Standards). However, it is anticipated that the building's lifespan will greatly exceed 60 years.
Challenges	To be reviewed and updated at the next project stage once a contractor has been appointed.
Counter actions	To be reviewed and updated at the next project stage once a contractor has been appointed.
Plan to prove and quantify	Whole Life Carbon Assessment

Table 5: Consideration of Benefits and Loads Beyond the System Boundary for the Proposed Development

Building Layer	Module D - Benefits And Loads Beyond The System Boundary
Site	N/A
Substructure	There is no scope for exporting energy from the site. Regarding secondary materials, secondary fuels or Secondary products resulting from reuse, recycling and energy recovery that take place beyond the system boundary for both products and buildings are addressed in the Whole life Carbon assessment. It is important to highlight the potential role of 'Material Passports'. Material Passports (MP) are (digital) sets of data describing defined characteristics of materials and components in products and systems that give them value of present use, recovery, and reuse[3]. Material passports are generally agreed to include some or all of the following categories of material and product information types: • Physical, chemical, and biological Properties • Material health (including VOC content) • Unique product and system identifiers • Design and production information • Transportation and logistics • Construction methods • Use and operate phase • Disassembly and reversibility methods • Reuse and recycling information The Applicant and design team fully support the concept of material passports. However, at the time of writing there is no standardised methodology for implementing materials passports, although work is currently being done in this field. The possibility of utilising material passports will be investigated further at the next design stage; it may, for example, be possible to capture and store information about key building elements, to facilitate future reuse at end of life. This will depend largely on whether BIM will be implemented from Stage 4 onwards and whether an as-built model will be a key deliverable for the main contractor. This has not yet been determined by the client.
Superstructure	
Shell/skin	
Services	
Space	
Stuff	

[3] 'Materials Passports – Best Practice', 2019, Heinrich and Lang

Building Layer	Module D - Benefits And Loads Beyond The System Boundary
	It is widely agreed that BIM is required in order to be able to implement materials passports, due to the data management processes needed to ensure this information is stored correctly and in a usable format.
Construction	N/A
Summary	The WLC makes it possible to quantify the reuse, recovery and recycling potential of a building or product.
Challenges	To be reviewed and updated at the next project stage once a contractor has been appointed.
Counter actions	To be reviewed and updated at the next project stage once a contractor has been appointed.
Plan to prove and quantify	Whole Life Carbon Assessment

3. DESIGNING FOR LONGEVITY

This section outlines strategies that will be employed in line with Principle 3, Designing for Longevity.

Designing for longevity is focused on design to avoid a premature end of life for all components through consideration of maintenance and durability.

Table 6 overleaf outlines strategies that will be employed in line with the principle of designing for longevity. It also outlines the proposed with relation to designing for longevity across the different building layers (where applicable).

Table 6 : Proposed Approaches to Designing for Longevity Across Building Layers

Building Layer	Design For Longevity
Site	A systematic risk assessment will be carried out to identify and evaluate the impact of climate change on structural and fabric resilience. The following SuDS options have been considered for the site: • Rainwater reuse • Green/Blue roofs • Tanked Systems • Permeable Paving For further information, please refer to the SuDS & Foul Water Drainage Strategy Report for the proposed development site.
Substructure	The proposed scheme has been designed to adapt to and mitigate the effects of climate change, specifically in terms of overheating and flood risks. To mitigate the effects of climate change and resulting overheating risks, the development has followed the cooling hierarchy principles as a means of reducing the amount of solar and internal gains as a first step to maintaining comfortable internal temperatures. Please refer to the Overheating Assessment and the Energy Statement for further detail. The exposed parts of the building will be protected from material degradation.
Superstructure	
Shell/skin	
Services	A plant replacement strategy will be developed to ensure that building services equipment can be replaced when required (at end of life) without damage to building fabric or structure. Plant will be located either externally (e.g. condenser units) or within the ground floor plant room. The plant room will be accessible. It will be possible to disassemble larger items of plant - for example the water tank, which will be installed in sections.
Space	The surface materials shall be designed durable and easy to maintain. Vulnerable parts of the building shall be protected from accidental or malicious damage, thus expanding material lifespan, and reducing replacement.
Stuff	Not in scope of works
Construction	N/A
Summary	The building will be designed to avoid a premature end of life for all components. Specifying durable material finishes Designing for climate change scenarios
Challenges	To be reviewed and updated at the next project stage once a contractor has been appointed.
Counter actions	To be reviewed and updated at the next project stage once a contractor has been appointed.
Plan to prove and quantify	Implementing Overheating, Flood Risk Assessment Drainage Strategy recommendations Plant Replacement Strategy

4. DESIGNING FOR ADAPTABILITY OR FLEXIBILITY

This section outlines strategies that will be employed in line with Principle 4, Designing for Adaptability or Flexibility.

Designing for Adaptability is defined as “a building that has been designed with thought of how it might be easily altered to prolong its life, for instance by altering, addy or removing building elements, to suit new uses or occupancy patterns.”

Designing for Flexibility is defined as “a building that has been designed to allow easy rearrangement of its internal fit-out and arrangement to suit the changing needs of occupant”[4].

The terms are often used interchangeably, however, adaptability refers more to structural changes, whilst flexibility often relates to floor plates. Table 7 outlines the different approaches proposed for designing for adaptability or flexibility, across each building layer.

[4] Greater London Authority. (2022). London Plan Guidance: Circular Economy Statements. Available At: https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg.pdf

Table 7 : Proposed Approaches to Designing for Adaptability or Flexibility Across Building Layers

<table>
<tr><th>Building Layer</th><th>Design For Adaptability Or Flexibility</th></tr>
<tr><td>Site</td><td>N/A</td></tr>
<tr><td>Substructure</td><td>N/A</td></tr>
<tr><td>Superstructure</td><td rowspan="2">From the outset the proposed scheme has been designed to serve multiple purposes; considering functional adaptability throughout the design stages.
The design will review measures that relate to functional adaptability such as:
• Feasibility of building containing multiple or alternative building uses;
• Accessibility and plant replacement;
• Versatility to accommodate changes in working practices;
• Adaptability to future climate scenarios / to future proof building occupants needs;
• Changes in use / convertibility of internal spaces; and,
• Refurbishment potential.</td></tr>
<tr><td>Shell/skin</td></tr>
<tr><td>Services</td><td>It will be possible to remove and replace major items of plant without needed to demolish sections of wall or floor. Local services will be adaptable to a range of uses.</td></tr>
<tr><td>Space</td><td>Recommendations or solutions based on the study will aim to enable and facilitate disassembly and functional adaptation are to be developed.</td></tr>
<tr><td>Stuff</td><td>Not in scope of works</td></tr>
<tr><td>Construction</td><td>CE measures will be reviewed during construction to ensure that recommendations are implemented.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Summary</td><td>The building will be designed to be adaptable to multiple uses.</td></tr>
<tr><td>Challenges</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Counter actions</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Plan to prove and quantify</td><td>Plant Replacement Strategy</td></tr>
</table>

5. DESIGNING FOR DISASSEMBLY

This section outlines strategies that will be employed in line with Principle 5, Designing for Disassembly

Designing for Disassembly is defined as "[designing a building] to allow the building and its components to be taken apart with minimal damage to facilitate reuse or recycling"[5]. Therefore, meaning that if the building has been designed for disassembly, it should be possible to replace any component of a building.

Ease of disassembly is facilitated by principles allowing the building or parts of the building to be disassembled at the end of its life, or to be renovated rather than demolished, with individual components being used for other purposes. Table 8 outlines the different approaches proposed to design for disassembly across the different building layers.

[5] Greater London Authority. (2022). London Plan Guidance: Circular Economy Statements. Available At: https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg.pdf

Table 8: Proposed Approaches to Designing for Disassembly Across Building Layers

<table>
<tr><th>Building Layer</th><th>Design For Disassembly</th></tr>
<tr><td>Site</td><td></td></tr>
<tr><td>Substructure</td><td rowspan="4">As the majority of building elements have a service life <60 years, the proposed development has been designed to enable the replacement of individual elements based on their design life periods, therefore meaning that some could be replaced at least once over the building’s 60-year lifespan.
As noted previously (Building in Layers), an approach of ‘building in layers’ is proposed to ensure that layers with shorter lifespans can be replaced without damage to layers which have longer life spans.
Modularity allows elements to be slotted together or taken apart to promote disassembly. The feasibility of inclusion of modular elements will be evaluated post planning.
Local services will be adaptable to a range of uses. Components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. Building Information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction. Exposed and reversible connections will be utilised where possible to facilitate disassembly and ensure materials can be recovered in a high value state.
RC frames should be kept within the operational phase of the building life cycle for as long as possible. The information regarding the construction of the building shall be easily communicable for future building professionals to aid future redevelopments that maximise the repurposing of the building with minimal demolition.
Components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. Building Information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction.</td></tr>
<tr><td>Superstructure</td></tr>
<tr><td>Shell/skin</td></tr>
<tr><td>Services</td></tr>
<tr><td>Space</td><td>The key challenge to implementing design for disassembly and reuse relates to specific requirements for the fit out. This will be considered and addressed as the project progresses. The ease of disassembly and the functional adaptation potential of different design scenarios will be explored by the end of Concept Design. Recommendations will be made, and solutions developed based on the study carried out during Concept Design, that will aim to enable and facilitate disassembly.</td></tr>
<tr><td>Stuff</td><td>Not in scope of works</td></tr>
<tr><td>Construction</td><td>N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Summary</td><td>The building will be designed to allow for disassembly.</td></tr>
<tr><td>Challenges</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Counter actions</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Plan to prove and quantify</td><td>Wst 06 Design for Disassembly and Adaptability Study</td></tr>
</table>

6. USING SYSTEMS, ELEMENTS OR MATERIALS THAT CAN BE REUSED OR RECYCLED

This section outlines strategies that will be employed in line with Principle 6, Using systems, elements or materials that can be reused and recycled

This final principle supports the application of the waste hierarchy at the end of the building'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. As in the previous section (Designing Out Waste), the role of material passports is an important consideration here.

Table 9 outlines the strategies proposed to promote the use of reusable or recyclable systems, elements, or materials across each building layer.

Table 9: Strategies Proposed to Promote the Use of Reusable or Recyclable Systems, Elements or Materials

<table>
<tr><th>Building Layer</th><th>Using Systems, Elements Or Materials That Can Be Reused Or Recycled</th></tr>
<tr><td>Site</td><td>N/A</td></tr>
<tr><td>Substructure</td><td>Standard-size materials will be used where possible as these help to facilitate reuse.
If a hand- set brick system is selected as the preferred construction method, bricks can be reused at the end of the buildings lifespan. The reinforced concrete frame however will not be appropriate for re-use.</td></tr>
<tr><td>Superstructure</td><td rowspan="3">Building Information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction. Exposed and reversible connections will be utilised where possible to facilitate disassembly and ensure materials can be recovered in a high value state. Standard types of connections will be used as these can be separated and reused more easily.</td></tr>
<tr><td>Shell/skin</td></tr>
<tr><td>Services</td></tr>
<tr><td>Space</td><td>The key challenge to implementing design for disassembly and reuse relates to specific requirements for the fit out. This will be considered and addressed as the project progresses. The ease of disassembly and the functional adaptation potential of different design scenarios will be explored by the end of Concept Design. Recommendations will be made, and solutions developed based on the study carried out during Concept Design, that aim to enable and facilitate disassembly.</td></tr>
<tr><td>Stuff</td><td>Components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. Building Information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction.</td></tr>
<tr><td>Construction</td><td>CE measures will be reviewed during construction to ensure that recommendations are implemented.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Summary</td><td>The building will be designed using systems, elements or materials that can be reused or recycled where possible.</td></tr>
<tr><td>Challenges</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Counter actions</td><td>To be reviewed and updated at the next project stage once a contractor has been appointed.</td></tr>
<tr><td>Plan to prove and quantify</td><td>Whole Life Carbon Assessment
Wst 06 Design for Disassembly and Adaptability Study
End of Life Strategy</td></tr>
</table>

CIRCULAR ECONOMY DESIGN APPROACHES

The CE design approach supports the implementation of the 6 CE principles.

Decision trees contained within the Circular Economy Guidance document sets out a hierarchy of CE design approaches for developments, there is specific design approaches set out for sites with buildings already on site.

It should be noted that CE design approaches are not mutually exclusive and that multiple approaches are expected to be adopted for each project. Different design approaches will be required for different building layers, for example.

This section begins by determining the design approaches adopted for this development, before focusing on how these will be adhered to and how they will support the delivery of the six CE principles and, in particular, the following:

- Designing for Longevity
- Designing for Adaptability or Flexibility
- Designing for Disassembly

APPROACH FOR EXISTING STRUCTURES/ BUILDINGS

The CE design approach for the existing structures on site has been guided by the decision tree shown in Figure 5. As noted earlier in this section, CE design approaches are not mutually exclusive and multiple approaches are expected to be adopted for each project. In this case, the existing building consists of a (see Table 10).

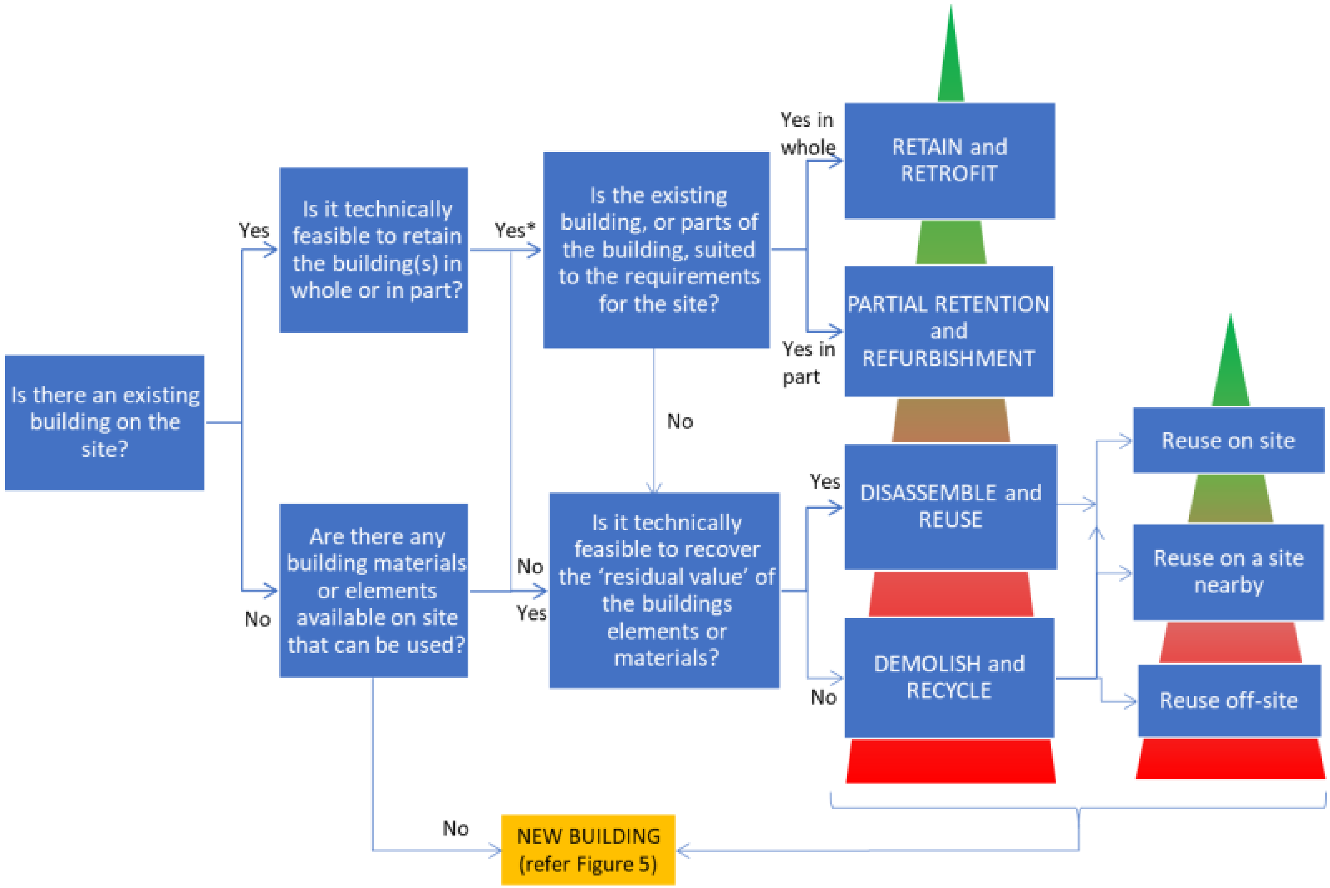

Figure 5: Circular Economy Decision Tree (GLA Circular Economy Statement)

Table 10: Circular Economy Design Approach for the Existing Site at Ringers Road Bromley

Circular Economy Adopted Design Approach: Existing Site	
Building	Single storey early 20th century building functioning as multiple retail units
Design Approach	Partial Retention and Refurbishment
Strategic Response	The current Ringers Road Bromley site comprises a single storey early 20th century building. This building 'contributes positively to the townscape character of Bromley', and will therefore be retained, bar the windows, which will be replaced to match the rest of the new build. The additional storeys for the proposed development will be constructed on top of the existing single storey build, eliminating high amounts of demolition waste and decreasing the virgin resource use of the development. A pre-demolition waste audit will be carried out prior to commencement of demolition works; however, it is likely that there will be little demolition waste produced, and a strategy of demolition and recycling will be pursued for the existing windows and the remainder of the building. To ensure that any potential risks are minimised, whilst maximising recovery, reuse and recycling, a range of measures will be implemented including, but not limited to: • Colour coding and signposting of skips to reduce the risk of cross contamination. • Covering of skips to prevent dust and debris blowing about the site and immediate environment. • The sealing and secure storage of all potentially hazardous materials when not in use. • Advanced building surveys prior to commencement of the soft strip works including an asbestos and hazardous materials survey, in accordance with the Hazardous Waste Regulations and the Control of Asbestos Regulations. It should be noted that due to site constraints, it may not be possible to crush demolition waste on-site. The proposed development will include a basement which in part will utilise the existing basement thus reducing the excavation works. In order to minimise the impact of these works, reuse and recycling will be maximised, with measures to ensure no topsoil is sent to landfill.

APPROACH FOR ALL NEW ELEMENTS OVER THE LIFETIME OF THE DEVELOPMENT

The adopted design approach to CE for the new structure on site has been guided by the decision tree shown in Figure 6.

The adopted design approaches directly support the implementation of the six CE principles.

Further detail on how the proposed design approaches support the implementation of the six CE principles, and in particular the below principles, is outlined in the relevant sub-sections below.

- Designing for Longevity
- Designing for Adaptability or Flexibility
- Designing for Disassembly

Table 11 outlines the design approaches proposed for the different building uses, alongside an explanation of why each approach has been adopted.

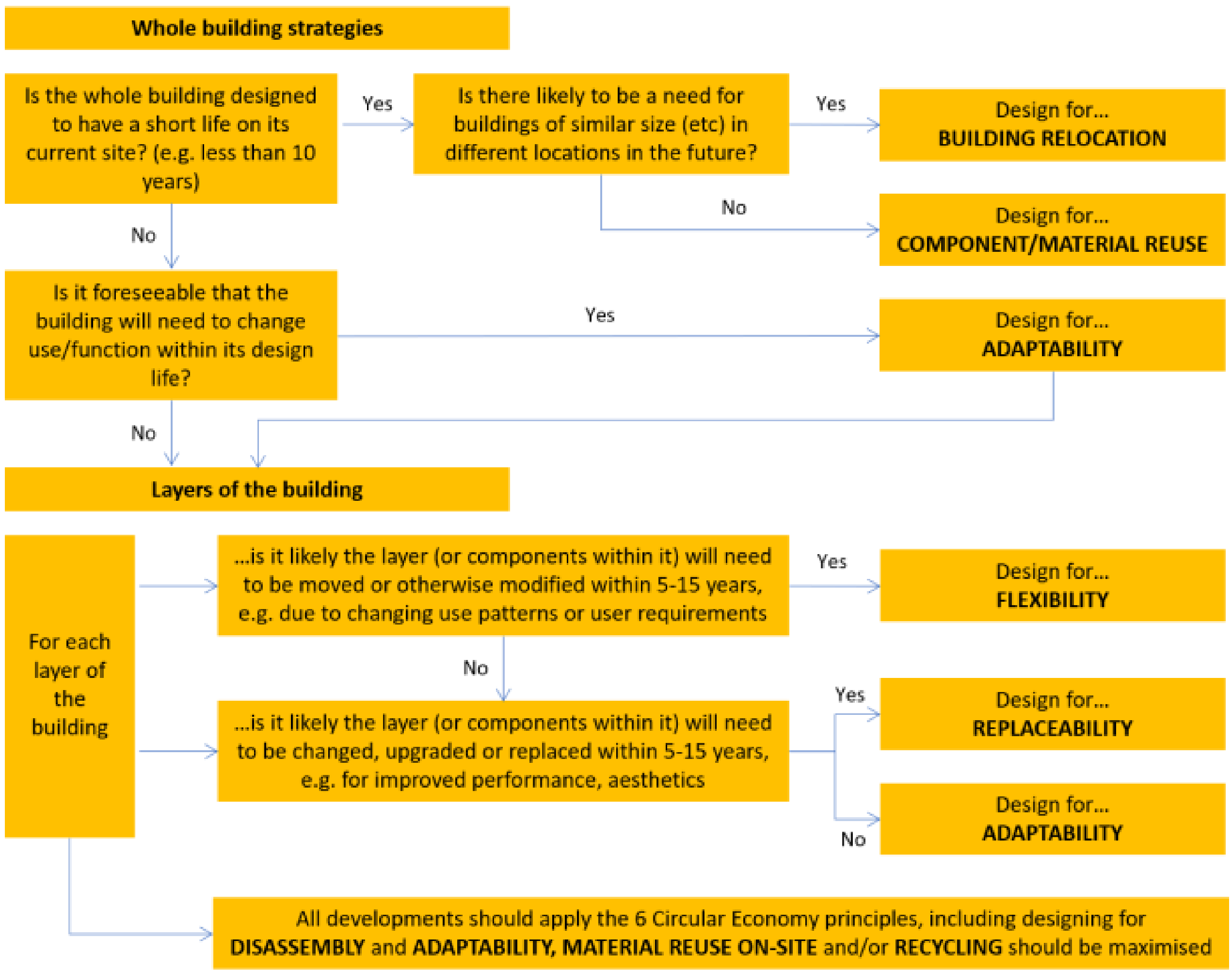

Figure 6: Decision Tree for Design Approaches for New Buildings, Infrastructure and Layers Over Lifetime of Development

Table 11: Circular Economy Design Approach for the New Development at Ringers Road Bromley

<table>
<tr><th colspan="3">Circular Economy Adopted Design Approach: New Development</th></tr>
<tr><td colspan="2">Building</td><td>Residential development with commercial floorspace at ground floor level</td></tr>
<tr><td colspan="2">Adopted Design Approach for Whole Building</td><td>Disassembly and Adaptability, Material Reuse On-Site and/or Recycling shall be maximised</td></tr>
<tr><td rowspan="5">Adopted Design Approach for Layers</td><td>Skin/Shell</td><td>Design for Adaptability</td></tr>
<tr><td>Structure/Frame</td><td>Design for Adaptability</td></tr>
<tr><td>Services (Building)</td><td>Design for Replaceability</td></tr>
<tr><td>Space Plan/Interior</td><td>Design for Replaceability</td></tr>
<tr><td>Stuff/Contents</td><td>Design for Replaceability</td></tr>
<tr><td colspan="2">Explanation/ Supporting narrative</td><td>The building has been designed with a long lifespan; therefore, ‘Design for Relocation’ and ‘Component/Material Reuse is not as relevant to this project.
It is unlikely that the residential portion of the development will change use patterns and/or user requirements within a timeframe of 5- 15 years. However, within 5 – 15 years certain layers of the building may require changing or upgrading to allow for improved performance/ aesthetics. This will not be a requirement for all layers therefore, depending on the layer a strategy of ‘design for Replaceability’ or ‘Design for Adaptability’ will be adopted.
The building design will consider all six CE principles and, as part of this, will be designed to facilitate disassembly at end of life.</td></tr>
</table>

PLANS FOR IMPLEMENTATION

This section provides details how the short- and medium-term targets and commitments will be implemented, monitored, and reported.

The plan outlined in Table 12 explains how short- and medium-term commitments will be implemented, monitored, and reported. The applicant will produce a post completion report documenting actual performance against these targeted. Where possible, information has been provided on meeting longer-term targets; however, it is acknowledged that the majority of these will depend on collaboration with building occupiers/tenants. At present (pre-planning stage) no tenants have been identified; more information will be provided on implementing the longer-term targets at the next stage.

Table 12: Circular Economy Commitments: Implementation Plan

Commitments/Targets	Action	Responsible party	Anticipated implementation date
At least 95% of all demolition waste will be reused, repurposed and/or recycled.	• Complete a pre-demolition waste audit to determine estimated quantities of concrete waste arisings. • Contact local waste processing facilities to ensure that they have capacity to accept the estimated demolition waste. • Put procedures in place for segregating and storing demolition waste prior to collection by a licenced waste contractor.	Demolition contractor	Prior to demolition works
At least 95% of all excavation waste will be diverted from landfill and put to beneficial use.	Complete cut and fill calculations and an Excavated Materials Options Assessment. Put in procedures in place for ensuring 95% of excavation waste is put to beneficial use.	Contractor (below grounds work)	Prior to excavation.
At least 95% of construction waste will be reused, returned to supplier for recycling and/or recycled.	Put procedures in place for segregating and storing construction waste prior to collection by a licenced waste contractor.	Contractor	Prior to commencement of Stage 5.
Adequate facilities will be provided to enable 65% of municipal waste to be recycled or composted by 2030.	Review design of bin stores to ensure they meet the following criteria: • Accessible to building users • Adequately sized for anticipated waste volumes • Clearly signed to assist with segregating and storing recyclable, compostable and general/landfill waste streams	Architect	Stage 3
	Develop process for monitoring waste performance once the development is operational.	Client, tenant(s) & waste contractor	Post-planning once tenants are identified.
	Explore measures such as consolidated, smart logistics and community-led waste minimisation schemes for operational waste.	Client, architect, tenant(s) & waste contractor	Post-planning once tenants are identified.

Commitments/Targets	Action	Responsible party	Anticipated implementation date
	Support tenants with their own waste management policies and procedures to ensure the required recycling/composting targets are met by 2030.	Client & tenant(s)	Post-planning once tenants are identified.
ABOVE AND BEYOND STANDARD PRACTICE COMMITMENTS AND TARGETS			
The building will utilise an efficient form to minimise quantities of new materials. Material efficiency measures will optimise the use of materials within building design, procurement, construction, maintenance, and end of life; and ultimately reduce the quantities of new materials used.	Review and update Material Efficiency statement and implementation plan at RIBA Stage 3.	Architect / Sustainability Consultant	Post-planning but prior to commencement of Stage 3.
	Review and update Material Efficiency statement and implementation plan at RIBA Stage 4.	Architect / Sustainability Consultant	Prior to commencement of Stage 4.
	Review and update Material Efficiency statement at Stage 5.	Contractor	Prior to commencement of Stage 5.
Reusing demolition waste on site	Complete a pre-demolition waste audit to determine estimated quantities of reusable/recyclable materials	Demolition contractor	Prior to demolition works
The scheme utilises brownfield land.	No action required.		
The scheme will use the GLA's energy hierarchy to minimise operational energy use and has been designed to minimise water consumption.	Review energy modelling post-planning and ensure targets are being met.	Energy specialist	Post-planning, prior to completion of Stage 3.
	Review specification of water consuming equipment in the development to ensure GLA water use targets are being met.	Architect	Prior to final specification of sanitaryware.
The contractor will be required to set targets for energy and water used during construction and put in place measures to minimise consumption of these resources.	Assign responsibility to an individual for monitoring, recording, and reporting energy use, water consumption and transportation data resulting from all on-site construction processes throughout the build-programme.	Contractor	Prior to commencement of construction works.
	Set targets/KPIs for construction site energy use, water consumption and transport of materials and waste.	Contractor	Prior to commencement of construction works.
100% of timber FSC or PEFC certified; 100% concrete BES 6001 certified; where possible steel sourced from suppliers rated under the CARES Sustainable Constructional Steel Scheme; other major construction materials certified under an Environmental Management System (EMS) such as ISO 14001.	Produce Sustainable Procurement Plan outlining key material suppliers and corresponding responsible sourcing certifications.	Contractor	Prior to commencement of construction works.

Commitments/Targets	Action	Responsible party	Anticipated implementation date
Environmental Product Declaration (EPD)	Manufacturers with EPD certificates will be prioritised.	Contractor	Prior to commencement of construction works.
Building structure has been designed to facilitate a range of uses.	Review structural design at Stage 3 to ensure that adaptability of space is maintained.	Architect & Structural Engineer	Prior to completion of Stage 3.
A systematic risk assessment will be carried out to identify and evaluate the impact of climate change on structural and fabric resilience.	Review structural design at Stage 2 to ensure that climate change resilience of the structure and fabric has been accounted for.	Architect & Structural Engineer	Prior to completion of Stage 3.
The building has been designed to facilitate major refurbishment without compromising the structural design. Vulnerable parts of the building will be protected using durable finishes, raised curbs and bollards.	Review structural design at Stage 2 to ensure that vulnerable parts of the building shall be protected and refurbishment can be undertaken without compromising the structural design.	Architect & Structural Engineer	Prior to completion of Stage 3.
It will be possible to remove and replace all major items of plant without needed to demolish sections of wall or floor. Local services will be adaptable to a range of uses.	Review plant replacement strategy at RIBA Stage 3 to ensure all recommendations are being implemented.	Architect, Structural Engineer & MEP	Prior to completion of Stage 3.
The structural design will allow for reconfiguration of the internal environment to accommodate changes in working practices and business models.	Review design of superstructure and internal layouts to ensure that adaptability of space is maintained.	Architect & Structural Engineer	Prior to completion of Stage 3.
End of Life Strategy			

Commitments/Targets	Action	Responsible party	Anticipated implementation date
A Site Waste Management Plan (SWMP).	Review and update the Site Waste Management Plan / Resource Management Plan to ensure the following actions are carried out: • A target benchmark for resource efficiency • Procedures and commitments to minimise non-hazardous waste in line with the target benchmark • Procedures to minimise hazardous waste • A waste-minimisation target and details of waste minimisation actions to be undertaken • Procedures to estimate, monitor, measure and report on hazardous and non-hazardous site waste and demolition waste, where relevant, arising from work carried out by the principal contractor and all subcontractors • Monthly reporting of all construction waste data throughout the project checked against what would be expected based on the stage of the project, invoices, etc., to validate completeness of waste reporting data • Procedures to sort, reuse and recycle construction waste into defined waste groups, either on site or through a licensed external contractor • Procedures to review and update the plan • The name or job title of the individual responsible for implementing the above	Contractor	Prior to commencement of construction works (Stage 5).
The principle contractor will follow the UK Government's 'Waste Management Plan for England 2021', the 'Mayor's Municipal Waste Management Strategy - Rethinking Rubbish in London, and the 'Mayor's Business Waste Management Strategy' in order to reduce the amount of waste generated.	Set targets for maximum allowable construction waste and set procedures for achieving the minimum recycling rates set out for demolition, excavation, and demolition waste.	Contractor	Prior to commencement of construction works (Stage 5).
Promote operational waste recycling	Produce non-technical Building User Guide and inform on how to operate the building efficiently with the original design intent.	Contractor	Prior to commencement of Stage 6.
Providing support on how to use the building in the most energy efficient way			

APPENDIX A: POLICY FRAMEWORK

REGIONAL PLANNING POLICY (LONDON PLAN 2021)

The new London Plan has introduced several new policy requirements that consider circular economy principles.

Policy D3 'Optimising site capacity through the design led approach' and Policy SI7 'Reducing waste and supporting the Circular Economy' set clear policy objectives to:

- Create high quality buildings that consider practicality of use, flexibility, safety and building lifespan;
- Encourage the use of appropriate construction methods and robust materials;
- Take into account the principles of the circular economy and aim for high sustainability standards;
- Ensure that products and materials are retained at their highest value for as long as possible;
- Improve resource efficiency;
- Minimise waste (both during construction and building operation); and
- Meet or exceed the following targets:
    - Zero biodegradable/recyclable waste to landfill by 2026;
    - Municipal waste recycling target of 65% by 2030;
    - Reuse/recycling or recovery of 95% of construction and demolition waste;
    - The beneficial use of at least 95 per cent of excavation waste.

Policy SI7 requires developments that are referrable to the Mayor of London to submit a Circular Economy Statement as part of a planning application; it states:

Referrable 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.*

Policy SI7 encourages London boroughs to set their own lower local thresholds for Circular Economy Statements.

Circular Economy Statements must adhere to the minimum content requirements stated in 'Circular Economy Statement: Guidance Pre-Consultation Draft' in order to be considered 'compliant'.

Circular Economy Statements will be checked for:

- Completeness
- Technical validity
- Level of ambition

Furthermore, Policy SI7 states that referable applications must demonstrate how performance of the Circular Economy Statement will be monitored and reported, including confirmation of:

- What actually happened;
- How this is different from what was planned;
- What differed and what the key learnings were.

LOCAL PLANNING POLICY (BROMLEY LOCAL PLAN)

Bromley's Local Plan was adopted by the council in 2019, has a number of policies that consider Circular Economy Principles:

Policy 112: Planning for Sustainable Waste Management

The Council will support sustainable waste management by:

- Implementing the waste hierarchy in its approach to future waste management
- Allocating the strategic waste management sites of Waldo Road, Churchfields and Cookham Road and safeguarding them for waste uses only.
- Working in collaboration with the London Boroughs of Bexley, Greenwich, Southwark, Lewisham and City of London to make optimum use of waste management capacity in the south east London sub region.
- Meeting the London Plan waste apportionment targets.

Bromley will require Site Waste Management Plans for all major development proposals to reduce waste on site and manage remaining waste sustainably.

New waste management facilities will be and extensions and/ or alterations to existing waste management facilities must demonstrate that they will not undermine the local waste planning strategy and help the Borough move up the waste hierarchy. This is addressed in more detail in the Development Management Policies document.

The council has also prepared a Development Management Development Plan Document (DPD) which sets out planning policies to help determine which developments are granted planning permission in Haringey. It was adopted by the council on the 24 July 2017.

Policy 123: Sustainable Design and Construction

A. All applications for development should demonstrate how the principles of sustainable design and construction have been taken into account alongside the principles set out in the general design policy. The London Plan sets out the general principles of sustainable design and construction which should be integrated from the start of a development project:
    a. Minimise carbon dioxide emissions
    b. Avoid internal overheating and contributing to the heat island effect
    c. Use of natural resources, including water, efficiently
    d. Minimise pollution (including air, noise and run-off)
    e. Minimise the generation of waste and maximising reuse and recycling
    f. Avoid impacts from natural hazards including flooding
    g. Ensure developments are comfortable and secure for users
    h. Secure sustainable procurement of materials
    i. Promote and protect biodiversity and green infrastructure, including space for food growing where appropriate
B. Applications for major development should include information about how each of the principles have been addressed in a stand-alone sustainability statement or within other appropriate documentation. Evidence supplied with non-major developments should be proportionate to the scale of development.

Policy 124: Carbon Dioxide Reduction, Decentralised Energy

A. Major developments should aim to reduce their carbon dioxide emissions in accordance with the levels set out in the London Plan. Planning applications for major development should include evidence of how the energy requirements and carbon dioxide emissions of proposed developments have been assessed and propose a clear reduction strategy in line with the energy hierarchy. Information submitted should be sufficient to demonstrate how the relevant London Plan policies have been addressed and how the strategy can be fully implemented without additional permissions.
B. Major development proposals should investigate the potential for connecting to an existing decentralised heat or energy network or developing a new site-wide network and the potential for renewable energy should be assessed as part of the design of the

development to ensure successful integration.

C. The carbon dioxide reduction target should be met on site unless it can be demonstrated that it is not feasible. Any shortfall may be met through an identified project off-site or through a payment in lieu to a local carbon off-setting scheme.

D. Applications for major developments should be accompanied by information which demonstrates how the relevant London Plan policies (5.2 to 5.9) will be met. An energy assessment is required with both outline and full applications and should be based on the GLA's 'Energy Planning' guidance.

E. Strategies for carbon dioxide reduction should follow the energy hierarchy:
    a. Be lean: use less energy, reduce demand;
    b. Be clean: supply energy efficiently;
    c. Be green: use renewable energy.

UK GREEN BUILDING COUNCIL GUIDANCE

Although not planning policy, it is useful to consider the UK Green Building Council's (UKGBC) report on circular economy: 'Circular Economy Guidance for Construction Clients: How to Practically Apply Circular Economy Principles at the Project Brief Stage'. This sets out the following principles, which complement the regional and local planning policies:

- Reuse
    - Reuse the existing asset
    - Recover materials and products on site or from another site
    - Share materials or products for onward reuse
- Design buildings for optimisation
    - Design for longevity
    - Design for flexibility
    - Design for adaptability
    - Design for assembly, disassembly, and recoverability
- Standardisation or modularisation
- Servitisation and leasing
- Design and construct responsibly
    - Use low impact new materials
    - Use recycled content or secondary material
    - Design out waste
    - Reduce construction impacts

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