19 Charterhouse Street - Detailed Circular Economy Statement

SWECO

Contents

Rev	Date	Reason for Issue	Prepared	Reviewed	Approved
P03	09.04.2025	Issued for Planning	RC	MP	MP

Executive Summary

This Detailed Circular Economy Statement (CES) has been undertaken by Sweco UK on behalf of Farrview Limited (the Applicant) for 19 Charterhouse Street (the Proposed Development), London, EC1N 6RA. The Proposed Development has been designed to ensure a balanced distribution of mass, which includes a multi-storey, standalone building featuring an office entrance lobby and retail units, including affordable jewellery workspace on the ground floor and lower ground floor. The building also offers commercial workspaces on Levels 01-09, complemented by a landscaped rooftop terrace designed for tenant use.

The Detailed CES has been undertaken in accordance with GLA London Plan Guidance (LPG) Circular Economy Statements (March 2022) with the supporting GLA – Circular Economy Statement Template provided in Appendix A. This document outlines the strategy for the Existing and Proposed Development in line with the GLA Decision Trees for each respectively.

The key circular highlights for the Proposed Development centre around a retention and renew approach to reduce the generation of waste and conserve existing materials. New materials for the Proposed Development will be subject to review to maximise the recycled content and secondary materials during the next design stages.

90%

Specifically with regards to demolition waste – Reuse and Recycling will be prioritised over Recovery and Landfill waste destinations.

95%

The Proposed Development will ensure each stage has a high level of reuse and recycling where the targeted rates for diversion from landfill are reported when available.

20%

The Proposed Development is targeting recycled content rates for the new materials ensuring secondary are chosen above virgin materials.

95%

It is anticipated that the proposed materials for the Development will have a high anticipated useful end of life.

Introduction

1.1 The Proposed Development

Existing Development Description

The building has a hard and defensive appearance, with small, high-cilled windows, dark metal panel cladding, concrete columns, and has a distinctive rounded corner feature which faces southeast.

The building currently comprises a dual use of office and educational use, with the latter reverting to office use on the departure of the London College of Accountancy (LCA).

Proposed Development Description

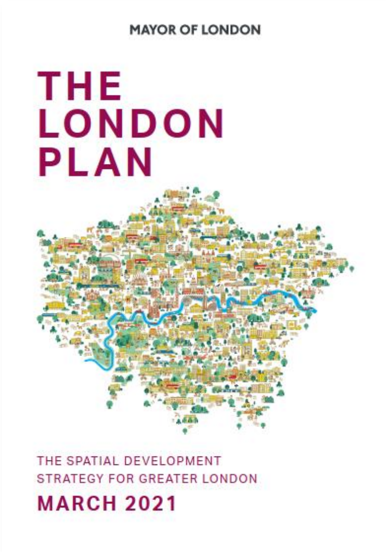
Remodelling, refurbishment and extension of the existing building to provide Use Class E (commercial, retail/restaurant and jewellery workspace), landscaped amenity terraces, balconies, relocated entrances, commuter facilities, on-site loading bay and plant; and other associated works.

Proposed Use Class	Proposed GIA (sq m)
Office	12,016
Retail	310
Jewellery Workspace	520
TOTAL	**12,846**

1.2 Circularity Drivers for the Built Environment

The London Plan (March 2021)

The London Plan is a spatial development strategy setting out an economic, environmental, transport and social framework for the development of London to 2036.



Policy SI 7 Reducing waste and supporting the circular economy

A 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:

1) 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
2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026
4) meet or exceed the municipal waste recycling target of 65 per cent by 2030
5) meet or exceed the targets for each of the following waste and material streams:
a) construction and demolition – 95 per cent reuse/recycling/recovery
b) excavation – 95 per cent beneficial use
6) 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.

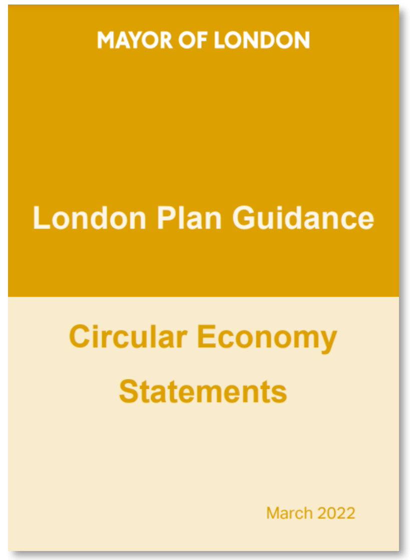
B Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted, to demonstrate:

1) how all materials arising from demolition and remediation works will be re-used and/or recycled
2) 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
3) opportunities for managing as much waste as possible on site
4) adequate and easily accessible storage space and collection systems to support recycling and re-use
5) how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
6) how performance will be monitored and reported.

C Development Plans that apply circular economy principles and set local lower thresholds for the application of Circular Economy Statements for development proposals are supported.

GLA Circular Economy Statement Guidance

The adoption of the published London Plan (March 2022) requires a supporting Circular Economy Statement to respond to Policy SI7 'Reducing waste and supporting the Circular Economy'.



"Referable application" 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.*

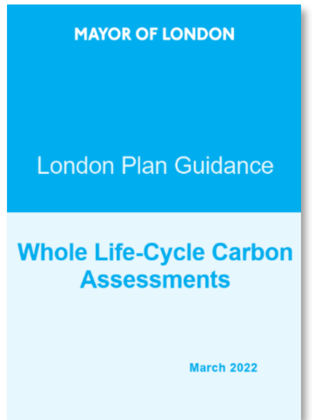
The circular economy statement guidance released by the Mayor of London provides the necessary strategic approach to accompany planning applications. The key aims of the circular economy statement are as follows:

- Consider strategies to facilitate the transition towards a circular built environment;
- Report against numerical targets that will facilitate monitoring of waste and recycling; and
- Recognise opportunities to benefit from great efficiencies that can help to save resources, materials and money.

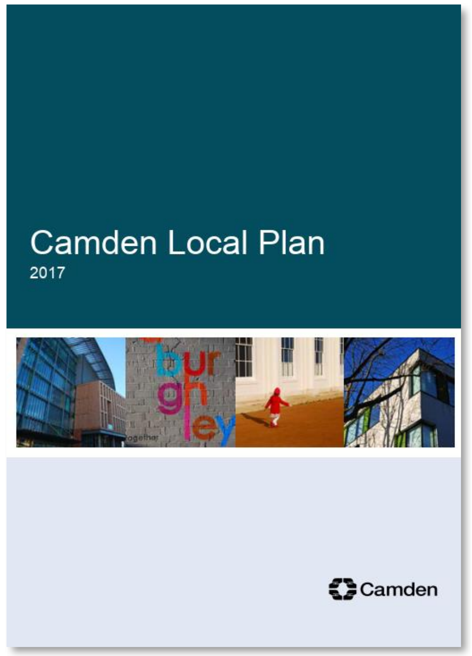
The guidance document provides core principles to promote a regenerative and restorative whole systems approach where key performance targets can be set against each.

GLA Whole Life-Cycle Carbon Assessments Guidance

The London Plan requires a Whole Life-Cycle Carbon Assessment for referable schemes to support Policy SI 2 F and encourages it for non-referable developments. This assessment evaluates a building's carbon emissions throughout its entire lifecycle. There is a strong connection between the Circular Economy (CE) and Whole Life-Cycle Carbon (WLC) assessments, which should be addressed by: using the same Bill of Materials for both assessments, ensuring CE outcomes lower WLC emissions or provide additional benefits (module D), incorporating end-of-life scenarios from the CE statement into the WLC assessment, informing design decisions with insights from both studies, and cross-referencing relevant documents in the planning application.



Camden Local Plan (Adopted 2017)



Policy CC1 Climate change mitigation

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

We will:

e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and

f. expect all developments to optimise resource efficiency.

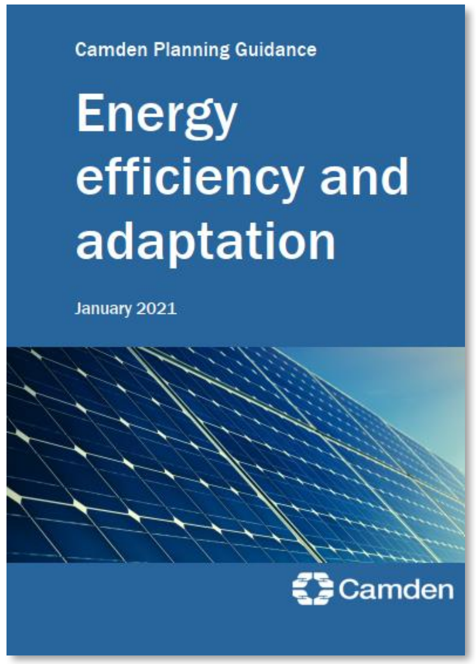
Policy CC5 Waste

The Council will seek to make Camden a low waste borough.

We will:

- a. *aim to reduce the amount of waste produced in the borough and increase recycling and the reuse of materials to meet the London Plan targets of 50% of household waste recycled/composted by 2020 and aspiring to achieve 60% by 2031;*
- b. *deal with North London's waste by working with our partner boroughs in North London to produce a Waste Plan, which will ensure that sufficient land is allocated to manage the amount of waste apportioned to the area in the London Plan;*
- c. *safeguard Camden's existing waste site at Regis Road unless a suitable compensatory waste site is provided that replaces the maximum throughput achievable at the existing site; and*
- d. *make sure that developments include facilities for the storage and collection of waste and recycling.*

CPG – Energy and Efficiency and Adaptation (2021)



The Camden planning guidance on energy efficiency and adaptation, particularly in Section 9 regarding reuse and optimising resource efficiency, emphasises the importance of sustainable development practices. This section encourages the reuse of existing buildings and materials to minimise waste and reduce the environmental impact associated with new construction. It promotes strategies that focus on maximising resource efficiency throughout the lifecycle of a project, including design, construction, and operation.

Key aspects of this guidance include:

Building Reuse: Encouraging the adaptation of existing structures rather than complete demolition, which can preserve historical value and minimise resource consumption.

Material Efficiency: Advocating for the use of local, sustainable materials and the recycling of materials from demolished or refurbished buildings to reduce the demand for new resources.

Design for Longevity: Promoting designs that enhance the durability and adaptability of buildings, allowing them to meet changing needs over time without requiring significant alterations.

Waste Reduction: Implementing waste management plans during construction to reduce landfill contributions, including strategies for recycling and reusing materials on-site.

Lifecycle Approach: Considering the entire lifecycle of materials and energy use, from extraction and production through to end-of-life disposal, to optimise overall resource efficiency.

Collaboration and Community Engagement: Encouraging collaboration among stakeholders, including architects, builders, and the community, to identify opportunities for resource optimisation and reuse.

Draft New Camden Local Plan

Policy CC1 - Responding to the climate emergency

A. The Council will prioritise the provision of measures to mitigate and adapt to climate change and require all development in Camden to respond to the climate emergency by:

ii. Prioritising and enabling the repurposing and re-use of existing buildings over demolition;

iii. Following circular economy principles, minimising waste and increasing re-use;

iv. Reducing whole life carbon emissions, by taking a whole life carbon approach, considering both embodied carbon and operational carbon;

Policy CC2 - Repurposing, Refurbishment and Re-use of Existing Buildings

A. The Council will seek to ensure that the repurposing, refurbishment and re-use of existing building/s is prioritised over demolition.

B. Where sites include existing building/s, applicants will be required to undertake a condition and feasibility assessment, to understand the re-use potential of the existing buildings and explore the best use of the site. This should be undertaken at the earliest opportunity, as part of the design process.

C. Taking into account the findings of the condition and feasibility assessment, applicants will be required to demonstrate that alternative development options (such as refit, re-use, refurbish, substantial refurbishment and extension) have been fully explored.

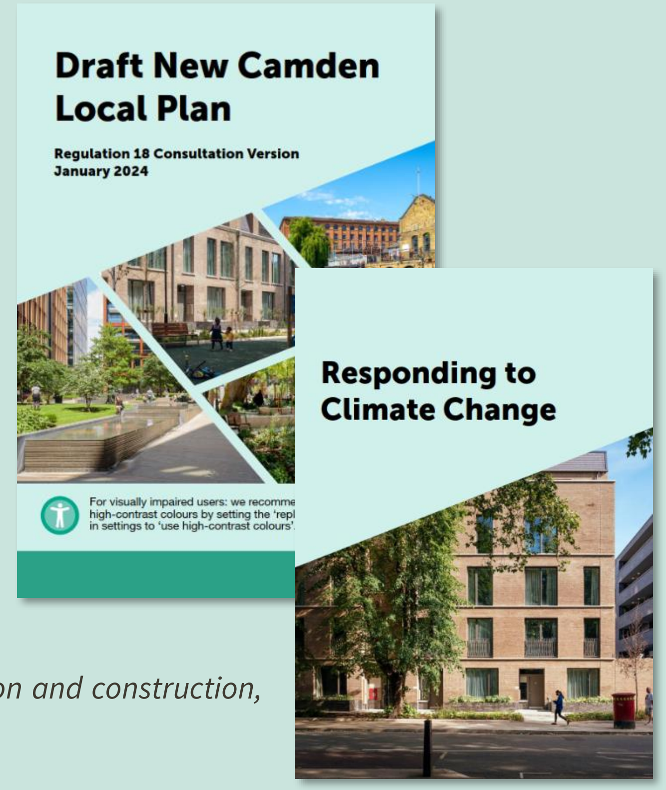
D. Applicants should discuss the findings of the condition and feasibility assessment and the assessment of alternative development options (as set out in criteria B and C above) with the Council, at the earliest opportunity, before progressing the design of any scheme.

E. The Council will only permit proposals that involve the partial or substantial demolition of existing building/s, where it can be demonstrated to the Council's satisfaction that:

i. The applicant has comprehensively explored a range of alternative development options, informed by the condition and feasibility assessment, prior to considering full or partial demolition.

ii. The proposal constitutes the best use of the site, when considered against alternative options involving the retention, repurposing, refurbishment and/or re-use of the existing building/s.

F. Where it is demonstrated to the Council's satisfaction that the partial or full demolition of existing building/s is justified, the applicant will be required to submit a pre-demolition audit. This should demonstrate that the re-use of materials has been explored on site; identify all materials within the building and document how they will be managed; show how building material waste will be minimised; and demonstrate that circular economy principles have been applied in accordance with Policy CC3 Circular Economy and Reduction of Waste.



Policy CC3 - Circular economy and reduction of waste

A. The Council will seek to ensure that developments minimise waste, use resources efficiently, and are designed to facilitate easy maintenance and adaptability of use.

The Council will:

i. Require all developments to optimise resource efficiency by:

- *a. Reducing waste through the application of the waste hierarchy (Prevention, Preparing for reuse, Recycling, Other recovery, Disposal);*
- *b. Reducing energy and water use during demolition and construction, whilst effectively mitigating air quality impacts;*
- *c. Minimising the amount of materials required;*
- *d. Using materials with low embodied carbon content; and*
- *e. Enabling low energy and water demands once the building is in use.*

ii. Require all developments to be designed for:

- *a. easy maintenance and renovation;*
- *b. flexibility and adaptation; and*
- *c. longer life and facilitating deconstruction for future re-use.*

iii. Require applicants to submit a Sustainability Statement with all applications documenting how the requirements set out in criteria (i) and (ii) have been met.

iv. Require new build major applications, or major applications which involve substantial demolition and rebuild, to submit a Circular Economy (CE) Statement, following GLA guidance. The following details must be included in the CE Statement:

- *a. an accurate record of all the materials used in the building's construction;*
- *b. the proportion of materials and elements reused on-site;*
- *c. materials reused from other sites;*
- *d. recycled materials;*
- *e. new materials by mass and material intensity (kg per m2); and*
- *f. a calculation of the development's overall 'material circularity'.*

v. Require applicants needing to submit a Circular Economy Statement (as set out in criteria (iv) above) to explore opportunities to use the site, or other local sites, for the temporary storage of re-usable materials, during the construction phase, to enable other developments coming forward in the locality to use those materials.

vi. Safeguard Camden's existing waste site at Regis Road unless a suitable compensatory waste site is provided that replaces the maximum throughput achievable at the existing site.

1.3 Implementation

Project Team

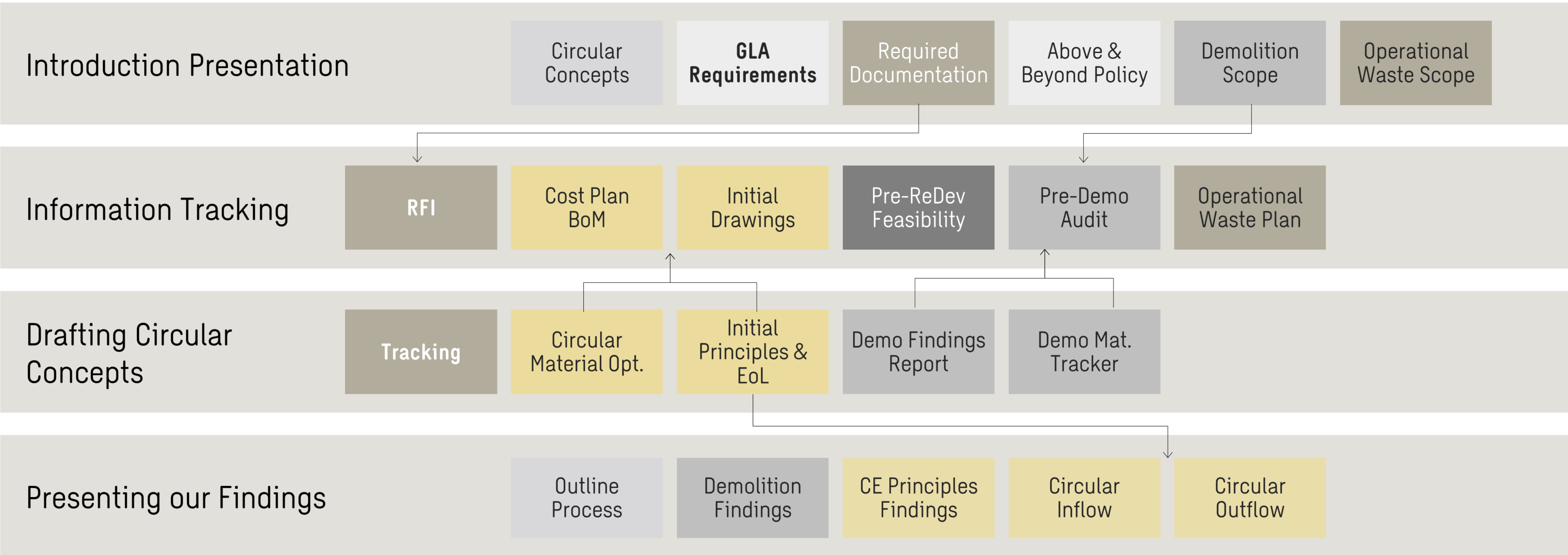
Client	**Farrview Limited**
Architect	**DSDHA**
Structures	**DMAG**
MEP	**Sweco**
Façade	**Sweco**
Sustainability	**Sweco**

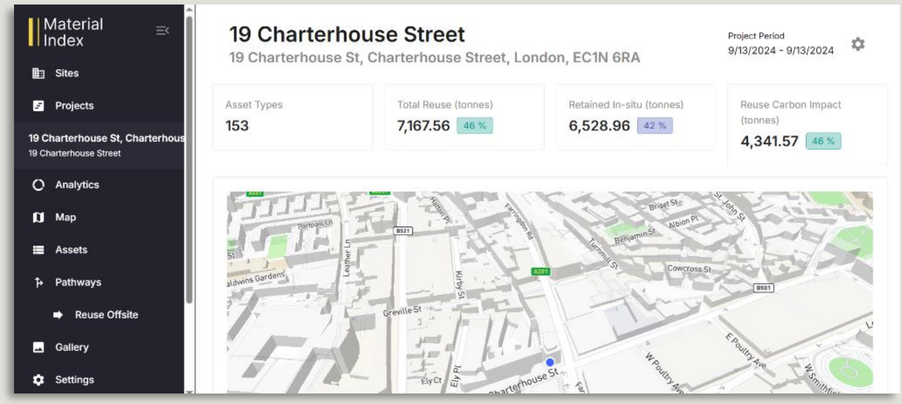
In order to ensure that a Circular Economy Strategy is in place during the early design stages of the development, an implementation strategy has been put together to monitor the methodology and practices by the team. Short and medium term targets and commitments will be reported on throughout each stage with long term targets reported as key milestones and aspirations.

To ensure the team are able to set realistic targets for the development, an initial workshop was undertaken on the 17th June 2024 to provide an introduction to circular economy in the built environment and how this aligns with current policies.

In the circular analysis, the first step is establishing a starting point or initial assumption that will be used to guide the analysis. These initial assumptions could be a set of data with the purpose of setting a starting point to provide a reference for the analysis, which can be used to evaluate the results and conclusions of the analysis. Without the initial assumptions, the analysis may lack direction and coherence, making it difficult to draw meaningful conclusions. This initial analysis was carried out based on the design at a level of detail that of Stage 2. The circular KPIs are typically set during RIBA Stage 2 of the design where concept information is available. At this stage circular concepts are incorporated into the design to prepare for the procurement and technical design process at a later stage. This report provides circular assumptions based on the current design to be developed further as the Proposed Development design progresses. Information regarding the materials and form will be provided with more accuracy during Stages 3 and 4 of the design.

During the later stages of the design, disassembly principles will be fully integrated, and the procurement process will begin. We will liaise with the Contractor and track the waste destinations for reporting. Once at this stage, additional workshops will be logged with the team for monitoring of our approach and commitments.





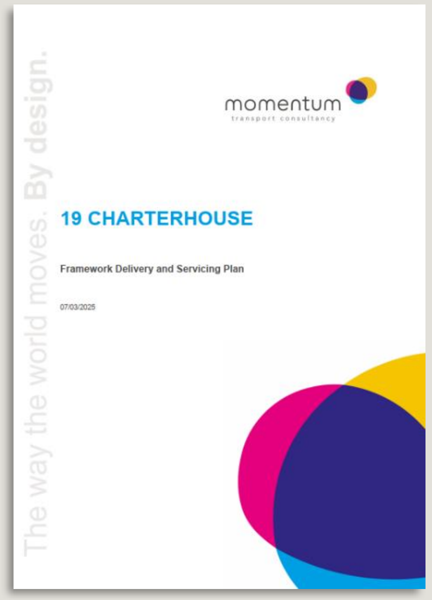
Material Index Pre-Demolition Audit Report

DSDHA Design and Access Statement

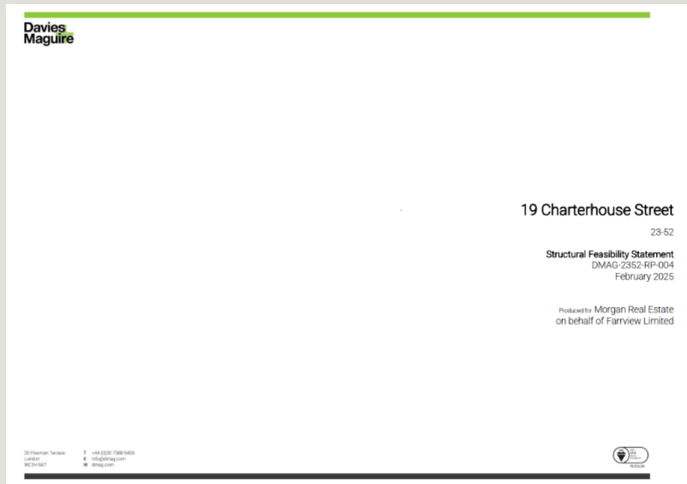
Sweco Stage 2 Engineering Services Brief

Supporting Reports

Sweco Stage 2 Façade Assessment



Momentum Delivery and Servicing Plan



DMAG Structural Feasibility Statement

The Existing Development

2

2.1 Approach and Methodology for the Existing Development

During the earliest stages of the project, the design team were engaged to highlight the requirements for the existing site and the process to be undertaken guided by the GLA Decision tree for existing buildings (see right).

The GLA decision tree for existing buildings is a framework designed to support developers and stakeholders in making informed decisions regarding the sustainability and circularity of existing buildings.

This decision tree involves several steps that guide design teams through assessing the current state of a building and determining the best approaches to enhance its circularity. Here's a general overview of the process:

Assess Current Building Status: The first step involves evaluating the existing building's condition, including its structural integrity, materials used, and potential for re-use.

Identify Opportunities for Reuse: Users are guided to explore options for reusing existing materials and components in renovations or new developments, which is a key principle of the circular economy.

Evaluate Waste Management Strategies: The decision tree encourages consideration of waste reduction strategies during demolition and construction phases, promoting recycling and responsible disposal of materials.

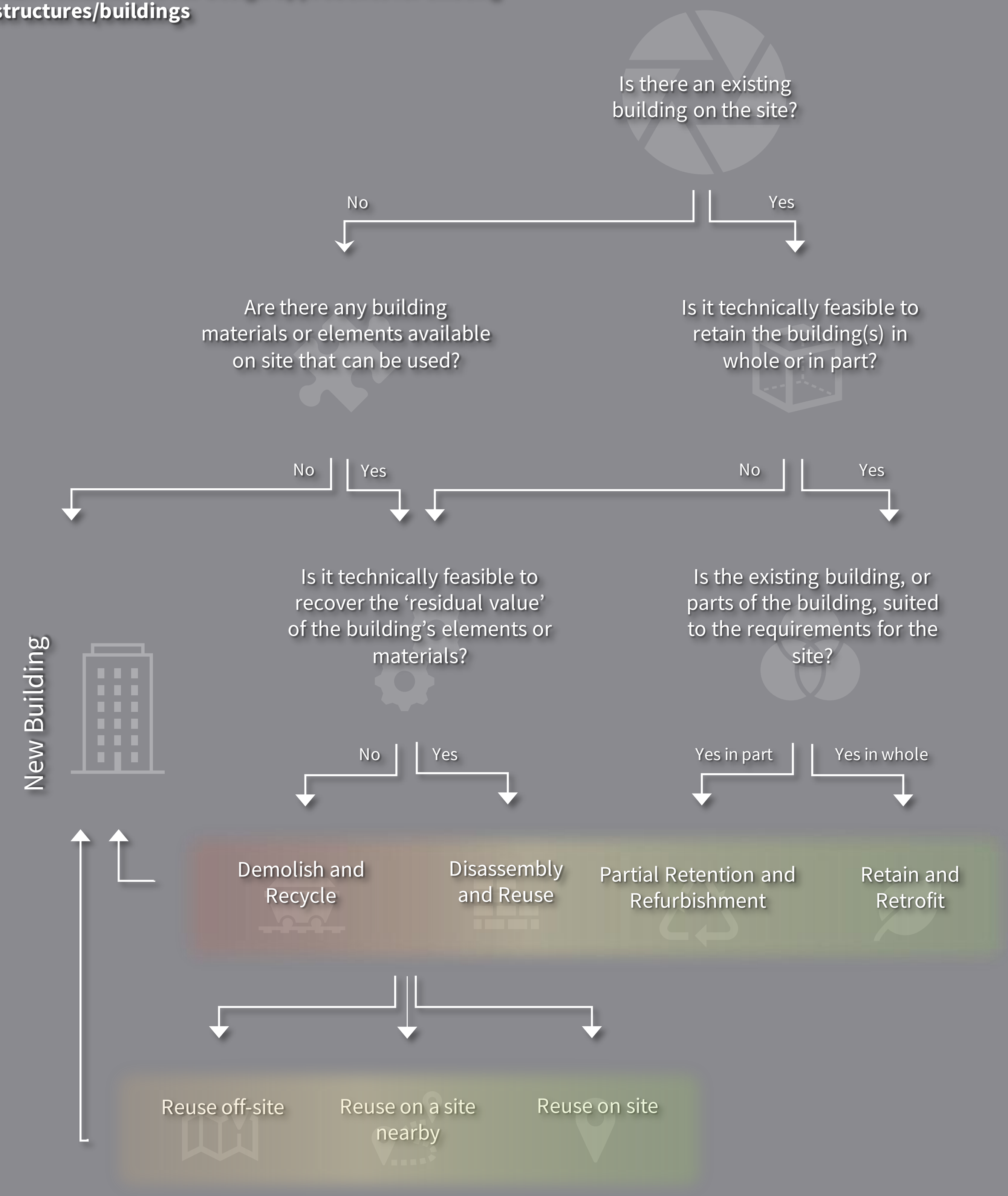
By following the GLA Decision tree the most suitable route to circularity is a Partial Retention and Refurbishment and Disassembly and Reuse and Strategy. This approach will prioritise the retention and reuse of materials prior to recycling for the existing development. The intention is to retain a significant proportion of the structure while investigating the high value pathways for the materials to be extracted.

The Sweco team outlined the documents required for demolition to maximise reuse, recovery, and recycling. The Detailed Materials & Reuse Audit Scope was then issued to the team to ensure all existing materials in the development can be quantified.

Material Index was brought on board to complete the Pre-Demolition Audit, summary outlined in Section 2.2.

By using the Pre-Demolition Audit results, each material was categorised and assessed for reusability, recoverability, and recyclability.

GLA Decision tree for design approaches for existing structures/buildings



2.2 Pre-Demolition Audit Summary

As highlighted in Section 2.1, Material Index has conducted a comprehensive Pre-Demolition Audit for all materials associated with the 19 Charterhouse Street development. This extensive audit has led to the categorisation of materials into four distinct groups: Retain, Reuse On-Site, Reuse Off-Site, and Recycle Off-Site. The estimated waste destinations for all materials on-site are illustrated in Figure 2-2, with the total amount of materials reaching 15,553 tons.

A significant portion of the materials, comprising 42% or 6,529 tons, is designated for retention. This high retention rate plays a crucial role in preventing unnecessary demolition, reducing transport needs, and minimising waste generation. The retained materials primarily consist of structural components, which account for 92% of the total weight of materials on site, as shown in Figure 2-3. Notably, 45% of these structural components will remain in situ, while the remaining 54% is sent for off-site recycling with reuse accounting for less than 1%.

Opportunities for material reuse have been categorised into on-site and off-site destinations, amounting to 639 tons, or just over 4% of the total materials available. During the strip-out and demolition phases, the paths for material reuse will be closely monitored to optimise the repurposing of existing materials. The subsequent section, Material Reuse Opportunities, provides a detailed overview of items identified for reuse and discusses their feasibility.

Lastly, the recycling of materials off-site accounts for 54% of the total, equating to 8,386 tons of materials. This recycling is typically necessary when materials have reached the end of their life cycle or when there is no viable method to extract them without incurring damage to the development. Importantly, these materials will be directed away from landfills and instead recycled. The upcoming section, Material Recycling Opportunities, further delves into the specifics of the materials designated for recycling and evaluates their feasibility.

Due to the live online Platform delivered by Material Index, it is important to acknowledge that the figures presented in Section 2 reflect the status at the time of this submission. As the design, strip-out, and demolition processes progress, these figures will be regularly reviewed and updated to accurately reflect any changes in waste destinations. Nevertheless, the overarching targets for diverting waste from landfill will remain consistent throughout these updates. This dynamic approach ensures that the project stays aligned with sustainability goals while adapting to real-time developments.

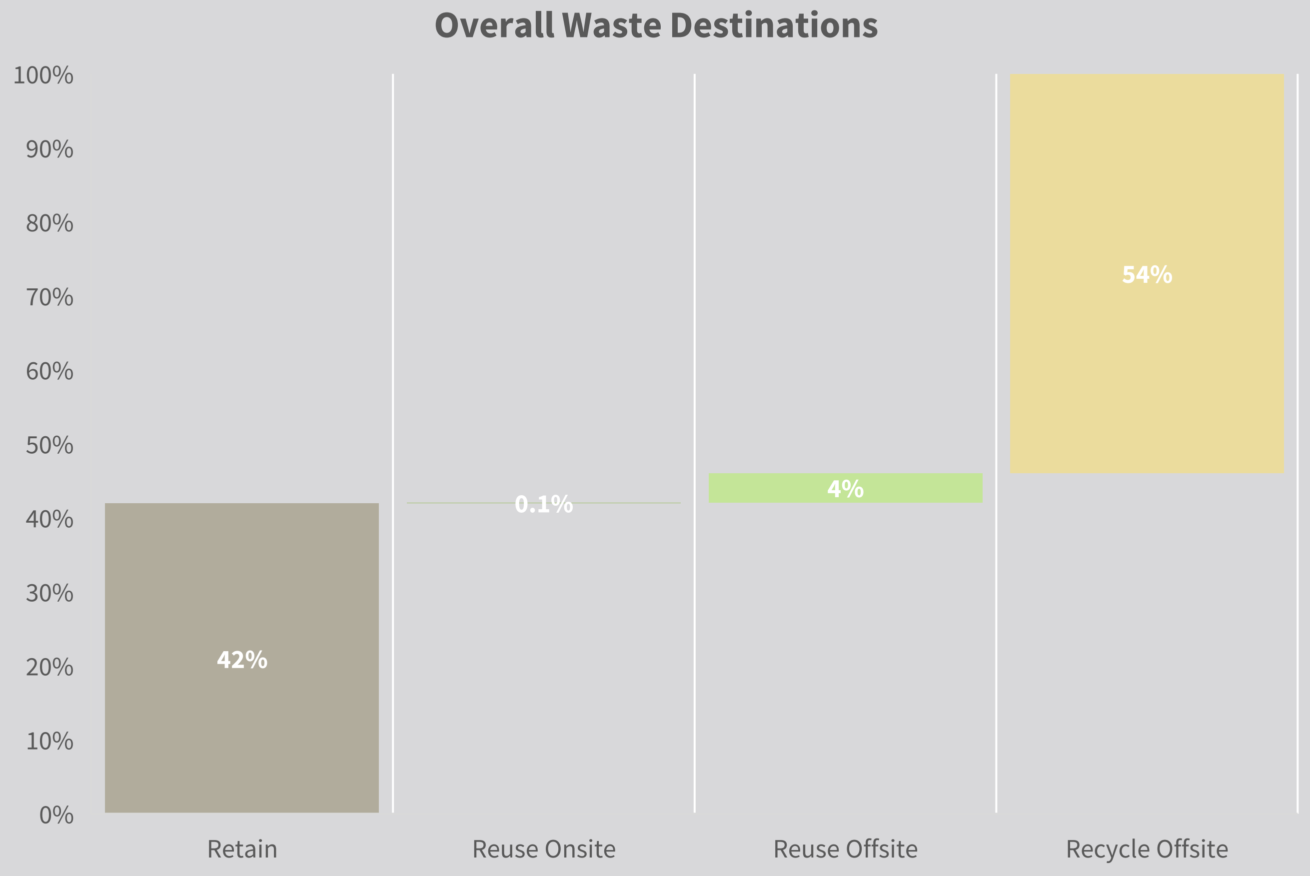


Figure 2-2 Overall waste destinations for all materials by weight (t)

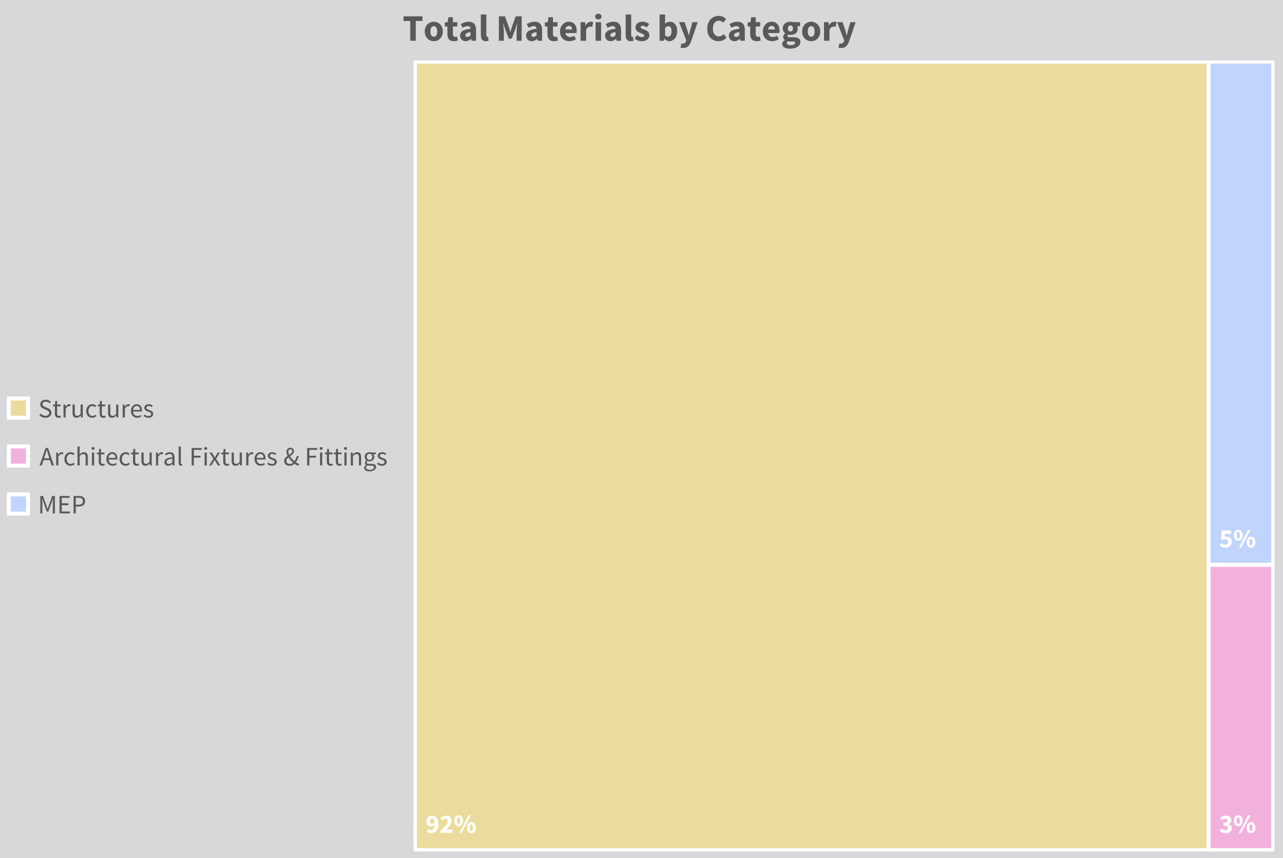


Figure 2-3 Total materials by category by weight (t)

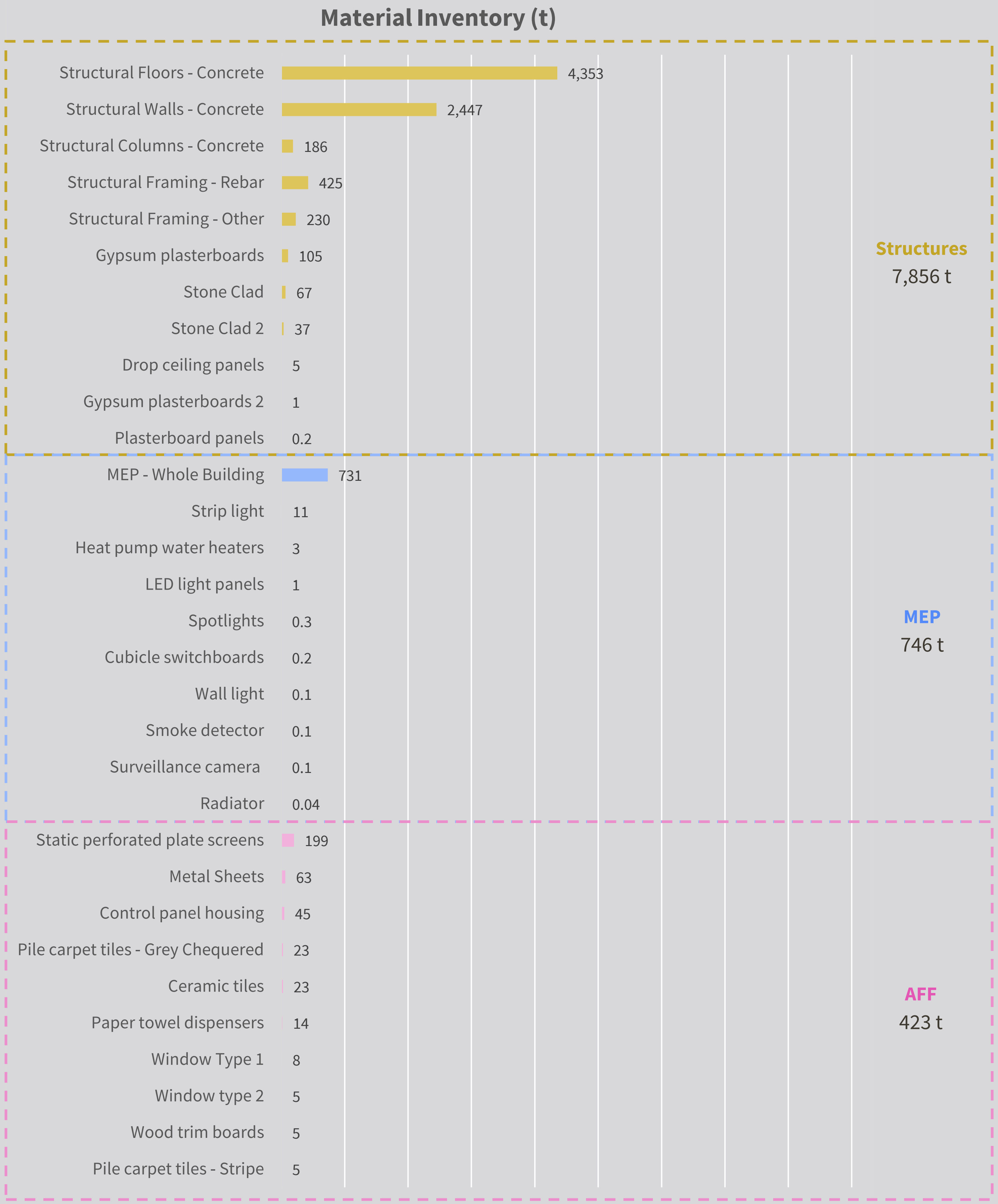


Figure 2-4 Condensed material inventory by weight (t)

Review of the Material Inventory

Figure 2-4 presents a summarised material inventory of the components found within the existing development, as identified in the Pre-Demolition Audit conducted by Material Index. Given the extensive number of materials assessed, only a select group has been highlighted here. The selected items include:

- All identified Structural materials
- The top 10 materials within the Architectural Fixtures and Fittings (AFF) category
- The top 10 materials within the Mechanical, Electrical, and Plumbing (MEP) category

It is important to note that materials designated for retention are not included in this list, as they are not classified as waste that will be removed from the existing development for storage or other purposes.

Structures contribute the most substantial amount at 7,856 tons, indicating that the structural elements significantly impact the overall waste generated. Most of the materials in this category consist primarily of concrete, owing to the concrete frame and floor slabs present in the building. Following this, the Alternative Finishes (AFF) category accounts for 746 tons of waste, which is considerably lower than that of the structural components. Lastly, the Mechanical, Electrical, and Plumbing (MEP) systems contribute 423 tons to the overall waste total. This distribution highlights the dominance of structural waste while also acknowledging the presence of waste from alternative finishes and MEP systems in the overall waste management assessment.

Material Reuse Opportunities

Material Index has identified a substantial quantity of materials from the existing building that are deemed suitable for reuse on and off site.

Given the extensive range of materials recognised for both on-site and off-site reuse, a selection of the top 25 items has been highlighted in Figure 2-5. Below is an overview of the feasibility and process for reusing the largest materials by weight:

- **Stone Cladding:** There is a large quantity of the external stone cladding that has been identified for both on-site and off-site reuse. The cladding could be creatively repurposed to enhance the architectural design by carefully removing the stone for its reapplication in the Proposed Development. Additionally, the stone cladding can be utilised to create feature walls in both interior and exterior spaces, enhancing the visual appeal of entryways, living areas, or outdoor patios. Furthermore, it can be repurposed into raised garden beds or planters, where the natural look of the stone complements landscaping designs. If the stone cladding is in usable pieces, it can also serve as paving stones for the roof space. This should be investigated in the next stages.
- **Static Perforated Plate Screens:** These refer to ceiling tiles located throughout the office floor plate. Where these are in good condition, they could be incorporated into the ceiling in an off site project. The tiles should be able to be removed carefully without damage, so it is likely that a large quantity can be recovered.
- **MEP – Whole Building:** An MEP condition survey should be undertaken to review all systems for potential reuse off-site. Where systems are deemed not suitable for reuse, the value could be recovered through recycling.
- **Metal Sheets:** These refer to external cladding sheets below windows on the external façade of the existing building. The panels have been identified for reuse off-site to be applied on other construction projects. The cladding sheets could be repurposed for interior applications, such as feature walls or ceilings, adding a modern industrial look to office spaces, lobbies, or conference rooms. In addition, the metal cladding can also find a second life in landscaping projects, functioning as garden screens, planters, or decorative fencing.
- **Carpet Tiles:** There are significant quantities of office carpet flooring available for reuse off-site. The carpets vary in colour and appear generally in good quality, standard size, and commonly used in office settings. Currently, these carpets are designated for off-site reuse. To facilitate this, options for off-site storage should be considered.

Figure 2-5 Top 25 materials by weight identified by Material Index as having potential for reuse on and off site

Material Recycling Opportunities

As shown in Figure 2-2, 54% of the total materials on site have been designated for recycling. This is largely due to the concrete elements in the development. Figure 2-6 provides a comprehensive overview of these materials, some of which overlap with those identified for reuse. In some cases, this overlap accounts for potential damage that might occur during the removal process. The below addresses potential recycling routes for the materials outlined in Figure 2-6:

- **Concrete -Structural Elements:** The options for recycling concrete are somewhat limited, primarily involving the process of crushing the material to create secondary aggregates. This approach, while straightforward, plays a crucial role in diverting concrete waste from landfills. By repurposing crushed concrete as aggregates, it can be effectively reused in various construction projects, thereby reducing the demand for new raw materials. Furthermore, using recycled aggregates can enhance the performance of new concrete by providing added strength and durability.
- **MEP Systems:** Most components of MEP systems are typically composed of metals and plastics. Once these metals are separated, they can be recycled and transformed into new metal products, thereby extending their lifecycle. This process allows for valuable resources to be reintegrated back into production. On the other hand, recycling plastics presents more challenges, as it requires careful assessment to determine the type of plastic and the appropriate recycling methods. Different plastics have varying properties and recycling capabilities, so it is essential to identify them accurately. To maximise recycling potential, it's advisable to explore take-back schemes offered by manufacturers for various MEP kits. These programs can facilitate the proper disposal and recycling of components, ensuring that materials are effectively recovered and reused. By actively participating in such initiatives, stakeholders can significantly enhance the sustainability of MEP systems and promote responsible waste management practices.
- **Windows:** The windows can be disassembled to separate various components, including glass, frames, and hardware. The glass is then crushed into small pieces, which can be melted down and reformed into new glass products. The aluminium frames can be melted down and recycled into new aluminium products.
- **Ceramic Tiles:** Once removed from the existing building, the ceramic tiles can be recycled in various ways. One prevalent method involves crushing the tiles into smaller fragments, which can then serve as aggregate in new concrete mixes or be used as a base material for paving and landscaping.

Figure 2-6 Materials by weight identified by Material Index as having potential for recycling off site

The Proposed Development

3

3.1 Approach and Methodology for the Proposed Development

From the outset circular thinking has been a part of the concept design to set strong aspirations for sustainability and retention for the existing development. The key drivers for the circular buildings are outlined in Section 1.2 along with the GLA Decision tree for new buildings for the design approach (see right).

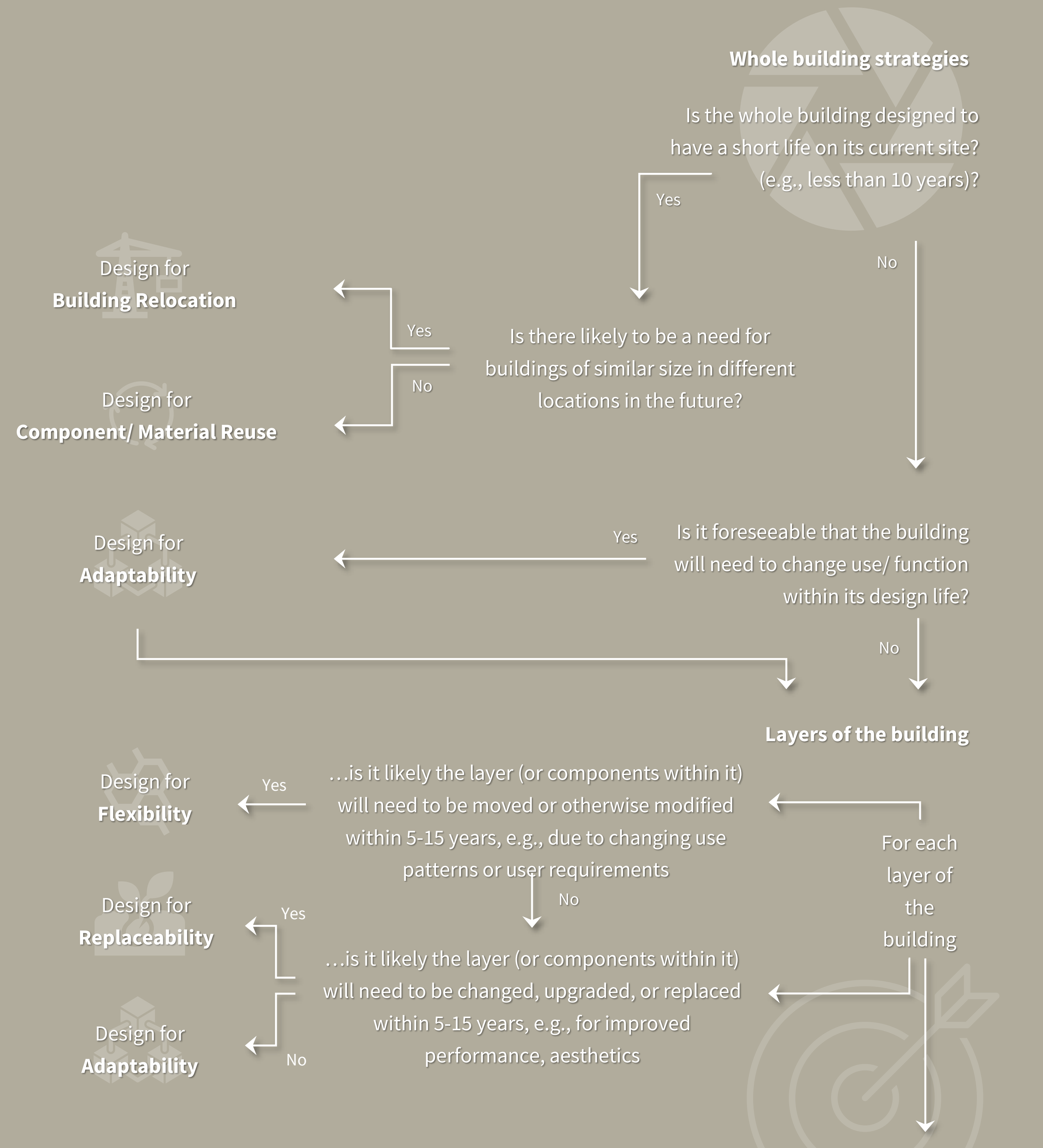
The new Proposed Development has used the GLA Decision tree for design approaches for new buildings, infrastructure, and layers over the lifetime of development (see right) to determine the most suitable route for assessing the circular principles presented. Where the building design life assumed for the Whole Life Carbon Assessment is 60 years with potential for a change in use or function, the six circular economy principles are applied to the Proposed Development.

Feasibility design documentation produced covering the materials and quantities associated with the proposed development are provided to initiate the base circular analysis. The base analysis for the development assumes all materials procured are from virgin sources with all materials to landfill at the end of life. It should be noted due to the pre-Stage 2 information informing the analysis the results will evolve as the design progresses.

Using these assumptions, we can anticipate the true building circular inflow and outflow and the circular performance indicators as outlined in Section 4. At this stage the targets are only indicative of the building's circular performance and a clearer picture will be provided at later design stages.

The development is therefore designed with the six circular economy principles in mind with each set out for the relevant layers in Section 3.2.

GLA Decision tree for design approaches for new buildings, infrastructure, and layers over the lifetime of development



All developments should apply the six Circular Economy Principles, including designing for **disassembly** and **adaptability, material reuse on-site** and/or **recycling** should be maximised.

3.2 Circular Design Principles

The Circular Economy Principles as defined in the GLA Circular Economy Guidance:

- The Building in Layers – ensuring that distinct parts of the building are accessible and can be maintained and replaced where necessary
- Designing for Longevity
- Designing for Adaptability
- Designing for Flexibility
- Designing for Disassembly
- Designing for Recoverability and Reusability
- Designing Out Waste

The Building in Layers

The building shearing layers concept is a useful framework for understanding how buildings adapt and evolve over time. It acknowledges that different components of a building have different lifespans and thus require different approaches to design, maintenance, and upgrades. The building layers as shown in Figure 3-1 are defined below:

Site: This layer is subject to the previous use and can range from greenfield to brownfield depending on historic data.

Skin: This layer includes the exterior of the building, including the windows, doors, and cladding. It protects the building from the elements, such as wind and rain, and helps to regulate temperature and humidity inside the building.

Structure: This layer includes the walls, floors, and roof of the building. It provides the framework for the building and is responsible for supporting the weight of everything inside it. The structure is typically made of wood, steel, or concrete.

Services: This layer includes the mechanical and electrical systems of the building, such as heating, ventilation, and air conditioning (HVAC), plumbing, and electrical wiring. These systems are essential for the comfort and safety of the occupants and require regular maintenance and upkeep.

Space Plan - The interior layout—where walls, ceilings, floors, and doors are placed. These can change more frequently, particularly in commercial buildings, to accommodate different tenants or different uses.

Stuff: This layer includes everything inside the building, such as furniture, appliances, and equipment. While not directly related to the building's stability, the contents can affect its functionality and overall aesthetic appeal.

Due to the scope of the build, the building layer 'Stuff' has been excluded from the circular analysis.

The Circular Economy Principles Overview

Designing for Longevity

Creating enduring structures and spaces within the built environment entails designing with sustainability, resilience, and adaptability in mind to ensure their lasting relevance and utility. Significant consideration has been given to ensure its enduring presence, relevance, and functionality over an extended period. This involves strategic planning and design choices that collectively aim to achieve sustainability, adaptability, and resilience

Designing for Flexibility and Adaptability

The design has a strong emphasis on flexibility and adaptability, aiming to create a space that can adapt to changing needs and functions over time. This approach ensures that the building can accommodate various uses and activities, potentially extending its lifespan and enhancing its overall sustainability. By incorporating flexible design principles, the structure is set to remain relevant and useful, even as user requirements or technologies evolve. Essential to this concept are adaptable layouts, movable partitions, modular components, and infrastructure that can support different configurations and technological upgrades. The goal is to deliver a versatile and resilient environment, reducing the need for extensive renovations or new construction as demands shift, thus contributing to a more sustainable built environment.

Designing for Disassembly

By incorporating disassembly strategies, the development aims to minimise environmental impact by extending the lifecycle of building materials and reducing the need for new resources. The design focuses on creating a development that can be easily taken apart at the end of its useful life. This design philosophy prioritises the future recyclability and reusability of building components, promoting a circular economy and reducing waste.

Designing for Recoverability and Reusability

The design aims to prioritise recoverability and reusability, meaning that it is meticulously planned to ensure that, at the end of its initial service life, the building's components can be recovered and repurposed. This sustainable approach is integral to the building's concept, with a focus on facilitating future adaptation, renovation, or deconstruction with minimal waste and environmental impact. Key considerations include the use of modular elements, durable and recyclable materials, and construction methods that allow for easy disassembly. The intent is to create a structure that is not only efficient and functional for its present use but also responsible and flexible in terms of its long-term footprint.

Designing Out Waste

The concept of minimising waste is integrated into every aspect of the building design in the proposed development. This approach encompasses the entire lifespan of the building to include for any existing structures on site. The development incorporates lean building design to optimise efficiency, reduce waste, and enhance value in the construction process. Drawing inspiration from the principles of lean manufacturing, this design philosophy focuses on streamlining operations, improving quality, and delivering better performance. In addition, there is an equal emphasis on addressing waste that may be generated during the building's operational life.

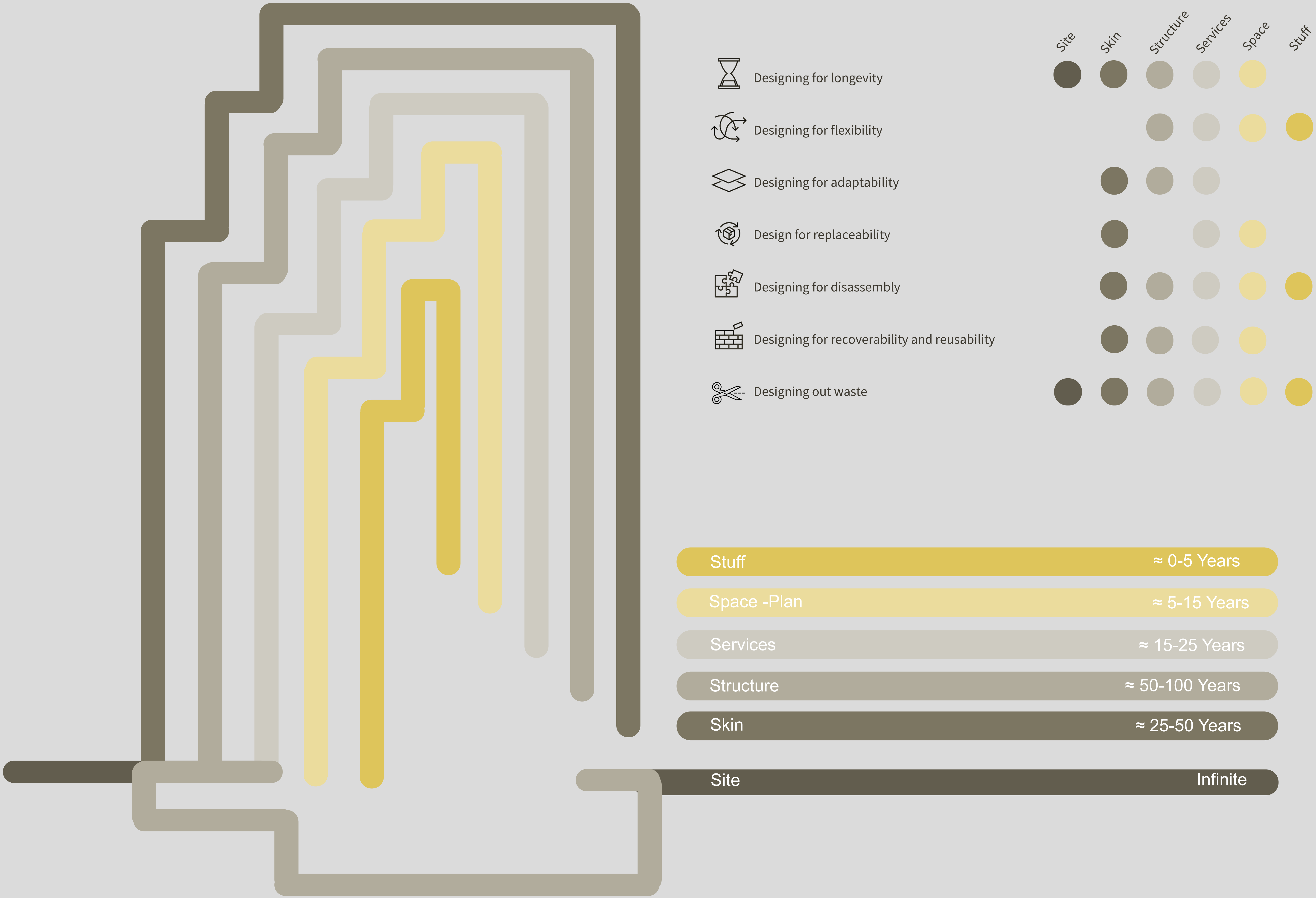


Figure 3-1 The Building Shearing Layers for 19 Charterhouse Street

19 Charterhouse Street – Circular Narrative

Skin

The design of the façade features hand-set stone for the solid walls supported by a steel framework, complemented by infill curtain walling for the windows and infill panels. For the additional floors proposed a unitised curtain walling system that will be directly affixed to the lightweight steel structure is being considered.

Base: Office Entrance - Materials: Rusticated stone or concrete with a natural look can be paired with a polished column base that seamlessly meets the ground, offering both durability and simplified maintenance.

Middle: Farringdon Road - Middle Facade: The design incorporates a double-height element at the base to align with the urban scale. As the terrain descends on Saffron Hill, the building maintains the tide line datum, ensuring a consistent relationship between the base and the urban landscape. The proposal will feature strong, resilient textures to enhance character, utilising material finishes that provide detail and sophistication to the base. The approach focuses on a timeless design for the base, middle, and top using robust and long-lasting materials.

Top: The design incorporates a double-height element at the base to align with the urban scale. As the terrain descends on Saffron Hill, the building maintains the tide line datum, ensuring a consistent relationship between the base and the urban landscape. The proposal will feature strong, resilient textures to enhance character, utilising material finishes that provide detail and sophistication to the base. The approach focuses on a timeless design for the base, middle, and top using robust and long-lasting materials.

Figure 3-2 DSDHA Axonometric Bay Section - Overview

Terraces: The terraces at the upper levels offer opportunities for planting and engagement with the materials of the upper floors. The sculpted precast columns connect with the terraces, featuring inset metal curtain walling panels. The terraces are designed with lush landscaping and straight balustrades for an inviting atmosphere.

Designing for Longevity

The selection of rusticated stone or concrete with a natural appearance, paired with a polished column base, indicates a strong emphasis on both durability and a timeless aesthetic appeal. Rusticated stone and concrete are not only visually appealing but are also known for their resilience against weathering, erosion, and other environmental factors. This inherent durability means they are less susceptible to damage over time, leading to fewer instances of wear and tear.

By choosing materials that can withstand the test of time, the design minimises the need for frequent replacements, which in turn reduces the associated costs and resource consumption required for upkeep. This focus on longevity helps ensure that the facade remains functional and visually appealing for many years, ultimately supporting sustainable practices by lowering the lifecycle impact.

Additionally, the polished column base does not just enhance the aesthetic qualities of the design; it also contributes to the overall structural integrity of the facade. Its robustness ensures that the lower sections of the building can endure heavier loads and resist impacts, which further supports the longevity of the facade.

Designing for Flexibility and Adaptability

The introduction of a unitised curtain walling system for the additional floors demonstrates a significant degree of adaptability within the facade design. This type of system is composed of pre-fabricated units that can be quickly and efficiently installed, allowing for a streamlined construction process. Importantly, the modular nature of the unitised curtain walling means that it can easily be reconfigured to accommodate changes in layout or usage, whether due to evolving functional requirements, tenant needs, or shifts in urban dynamics.

Moreover, the incorporation of terraces at the upper levels adds another layer of adaptability to the facade. These terraces create opportunities for greenery and planting, which not only contribute to biodiversity but also enable the building to respond to the community's aesthetic preferences and environmental considerations. The terraces facilitate interaction between the occupants and the natural elements, inviting a sense of connection to the outdoors.

This dual approach of using a unitised system alongside accessible terraces enhances the overall flexibility of the facade, allowing it to evolve over time in response to changing needs and preferences. It promotes a dynamic architectural expression that can adapt to future trends while still maintaining a cohesive visual identity.

Designing for Disassembly, Recoverability, and Reusability

The implementation of a unitised curtain walling system significantly enhances the ease of disassembly compared to traditional construction methods. This advantage is critical for future renovations, upgrades, or modifications, as it allows individual components to be systematically removed and reused without causing damage to the underlying structural framework. The modular design of the system is specifically engineered to facilitate this process, ensuring that elements can be taken apart with minimal effort and without compromising the integrity of the overall building. By adopting this approach, the structure not only supports efficient future renovations but also aligns with sustainable building practices by reducing construction waste and the need for new materials.

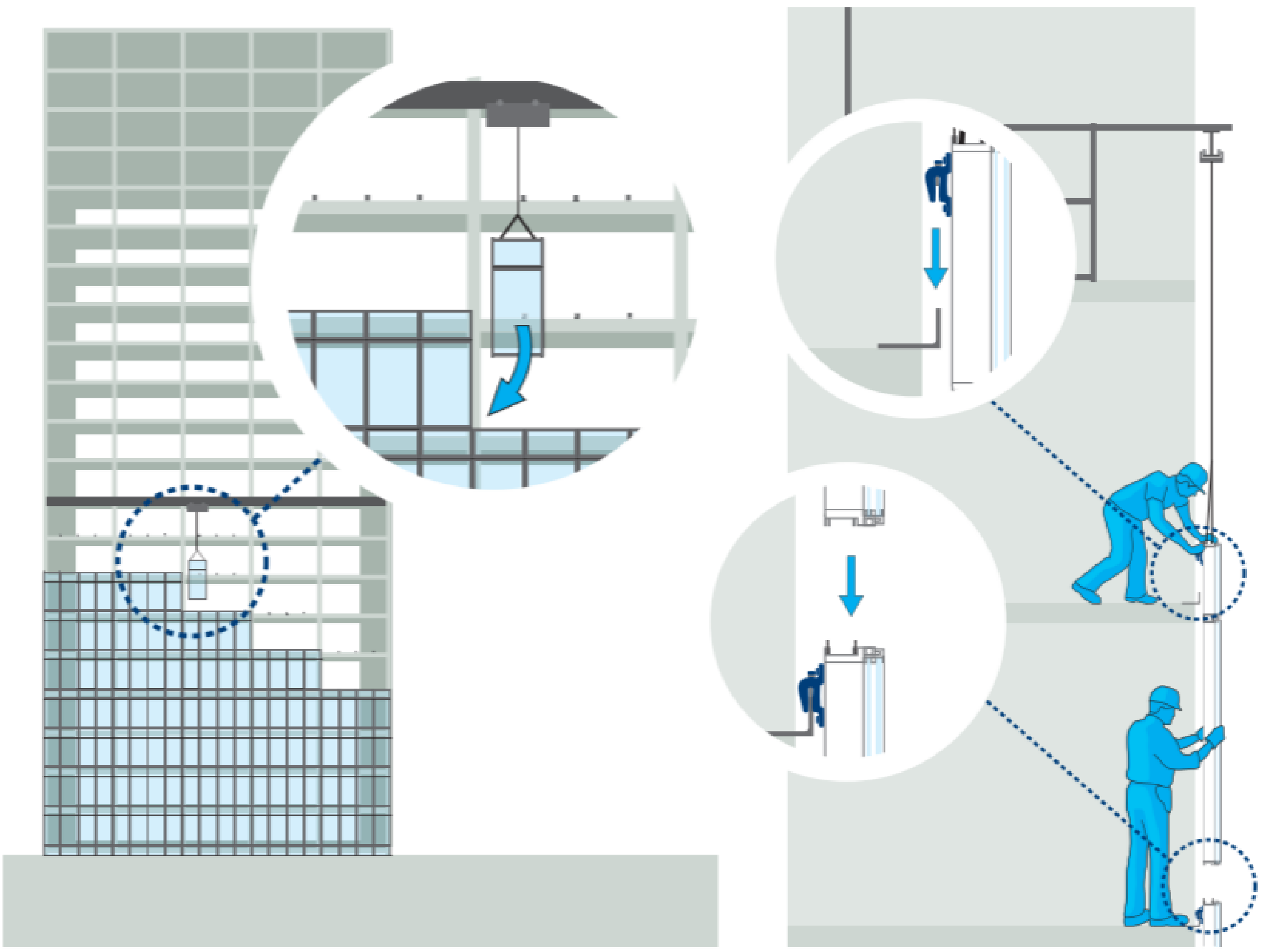


Figure 3-3 Sweco Unitised curtain wall (UCW) option Modularisation and installation method (Courtesy: Reynaers)

The selection of materials such as precast columns and metal curtain walling panels further enhances the potential for recoverability and reusability within the facade design. These materials are typically designed for easy removal, allowing them to be repurposed or recycled at the end of their life cycle. This characteristic is essential in promoting a circular economy, as it minimises waste and promotes the efficient use of resources. By prioritising materials that come with established recovery processes, the design strategy reinforces the commitment to sustainability.

Designing Out Waste

The proposal's emphasis on incorporating robust textures and thoughtfully selected material finishes not only adds visual character but also plays a crucial role in minimising excess material usage, thereby advancing the principle of designing out waste. By prioritising high-quality, durable materials that require less frequent replacement or repair, the design inherently reduces the volume of waste generated over the building's lifecycle.

Moreover, the use of pre-manufactured elements, such as the unitised curtain walling system, significantly enhances the efficiency of material utilisation. This approach allows for precision fabrication in controlled environments, which can lead to optimised material use and minimal offcuts during construction. As a result, the potential for construction waste is drastically reduced, contributing to a more sustainable building process.

Substructure & Superstructure

The Proposed Development involves the removal of the existing reinforced concrete partial 6th floor plant level of the building, to be replaced by four new floors. The new structure will utilise a lighter steel frame construction, featuring pre-cast hollow core slabs. Additionally, the existing columns will be extended to the new roof level to minimise beam spans and decrease the weight of the steel.

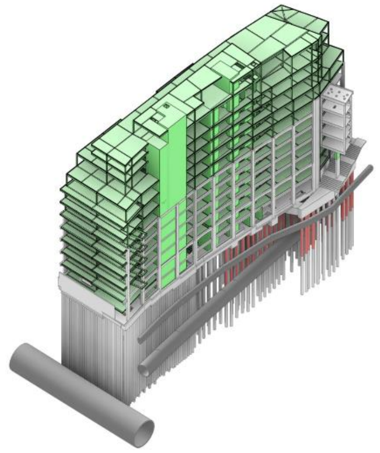


Figure 3-4 DMAG Proposed Structure

Designing for Longevity

The Proposed Development's focus on robust design, including the use of key elements and ties, directly contributes to longevity within the framework of the circular economy. By ensuring that structural components are designed to withstand potential stresses and prevent failure, the lifespan of the building is extended. This longevity reduces the need for frequent repairs and replacements, aligning with circular economy principles that prioritise resource efficiency and waste reduction.

Moreover, the use of durable materials like steel and the integration of existing structural elements into the new design promote the re-use of resources, minimising the consumption of new materials. This approach supports sustainability by lowering the environmental impact associated with construction and demolition processes.

By designing for longevity, the scheme not only enhances the building's resilience but also contributes to a circular economy by fostering a mindset of valuing materials and structures over their lifecycle, encouraging maintenance, adaptive reuse, and resource recovery at the end of the building's life.

Designing for Flexibility and Adaptability

The transition from three cores to two central cores represents a significant improvement in the building's layout, enhancing its flexibility and adaptability in line with circular economy principles. By demolishing the existing north, central, and south cores and introducing a new central core, the design promotes a more efficient distribution of building services and access throughout the structure.

This streamlined approach not only optimises spatial efficiency but also allows for greater adaptability in responding to changing tenant needs and future modifications. With fewer cores, there is more available floor space that can be easily reconfigured for various uses, accommodating diverse functions over time. This flexibility is crucial where the ability to repurpose and adapt buildings can extend their lifecycle and reduce resource consumption.

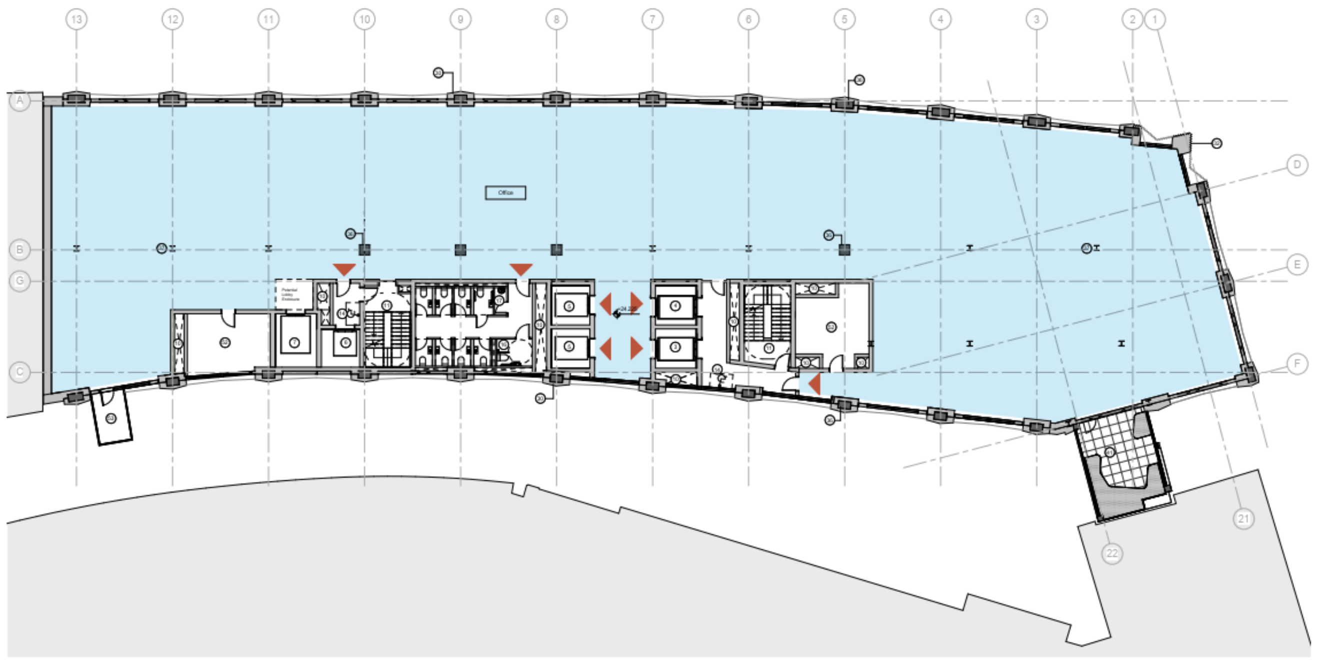


Figure 3-5 DSDHA Typical Office Core & Floor

Designing for Disassembly, Recoverability, and Reusability

The proposed design of the new structure, featuring a steel frame in conjunction with 200mm thick reinforced concrete hollow core precast planks, presents notable benefits in terms of disassembly, recoverability, and reusability.

The implementation of a steel frame enables easier disassembly compared to traditional concrete structures. Steel components can be detached and reconfigured with relative ease, facilitating future modifications or complete redevelopments while minimising waste generation. This adaptability is in line with circular economy principles, as it extends the lifespan of materials and decreases reliance on new resources.

In addition, the reinforced concrete hollow core planks are engineered for both strength and lightweight efficiency. Their modular design allows for removal and reuse in new construction projects, significantly reducing material waste. The ability to recover these planks for future developments promotes a more sustainable building approach, conserving valuable resources in the process.

Lastly, the overall design supports a systematic disassembly strategy, where components can be identified, catalogued, and either repurposed or recycled at the end of their lifecycle. This potential for recoverability and reusability not only enhances the building's sustainability but also contributes to wider efforts aimed at reducing environmental impact and encouraging resource efficiency within the framework of the circular economy.

Designing Out Waste

The proposed design aims to significantly reduce waste by maintaining the existing foundations and piles without any alterations. By choosing to reuse these foundational elements, the project minimises the need for new materials and the waste typically associated with excavation and disposal of old foundations. This approach not only conserves resources but also reduces the environmental impact associated with manufacturing new materials and the transportation required for new foundation installation.

Moreover, reusing existing foundations contributes to a more efficient construction process, as it eliminates the time and labour involved in creating new foundations. This strategy aligns with the principles of designing out waste, ensuring that materials are utilised to their fullest potential while minimising both construction waste and the overall carbon footprint of the project. By prioritising the reuse of existing structures, the design fosters sustainability and supports the circular economy by extending the lifecycle of materials and reducing the need for new resource extraction.

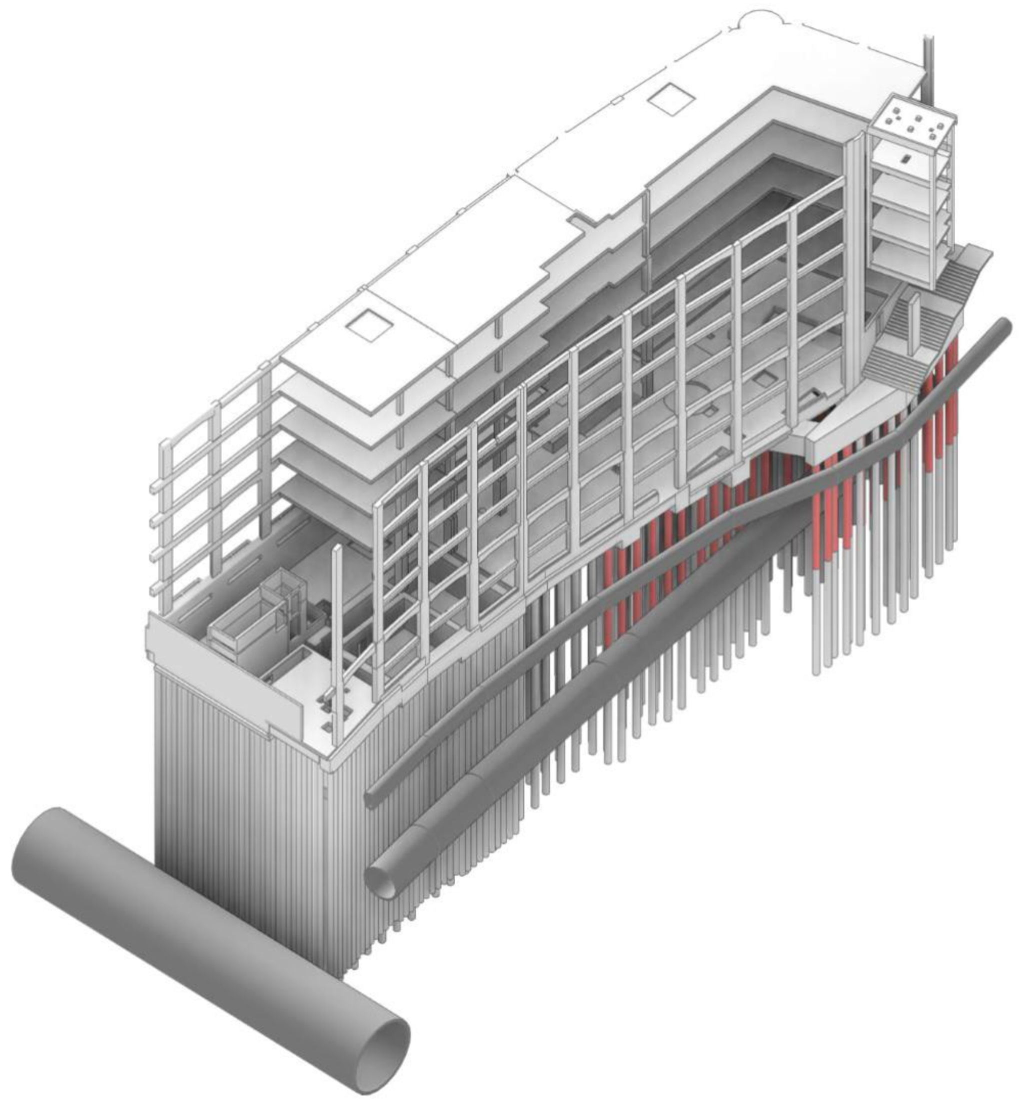


Figure 3-6 DMAG Retained Structure (in red is 'existing sleeved piles' rather than new ones)

Services

The building services strategy outlines the development as a shell and core, designed for future customisation to Category 'A' or 'B' specifications once tenants are secured. It includes on-floor air handling units (AHUs) for efficient heating and cooling, supplemented by Variable Refrigerant Flow (VRF) units on the roof. The mechanical and electrical systems are designed to support a single tenancy per office level, with dedicated ventilation for toilets and end-of-trip facilities. The primary electrical supply will come from two UKPN 11kV circuit breakers, ensuring N+1 redundancy and efficient distribution. An on-site standby diesel generator will provide essential power for life safety systems.

Designing for Longevity

The consolidation of the three existing cores into a single primary core along the western facade not only creates a generous and open office floorplate but also contributes to the longevity and adaptability of the building design. This singular core efficiently accommodates all the necessary components for a standard office scheme, allowing for a streamlined layout that maximises usable space. The lift bank, positioned to face the lobby, provides direct access to the office floorplate while ensuring that the toilet facilities are strategically located between the second lift core for both fire escape and servicing purposes, enhancing safety and functionality.

Moreover, the placement of split Air Handling Units (AHUs) at either end of the core is a significant design feature that supports longevity. These AHUs are designed to service the entire floorplate efficiently while offering the flexibility to accommodate future tenant requirements or changes in office layout. This adaptability means that if a tenant chooses to divide the space or adjust the ventilation needs, the existing infrastructure can easily accommodate these changes without requiring extensive renovations or the replacement of major systems.

Designing for Flexibility and Adaptability

The flexibility and adaptability of on-floor Air Handling Units (AHUs) are essential attributes that significantly enhance their utility in contemporary building designs. One key aspect is their modular design, which allows for easy configuration and reconfiguration based on changing space requirements or tenant needs. This modularity enables quick installation and replacement, reducing downtime during upgrades or

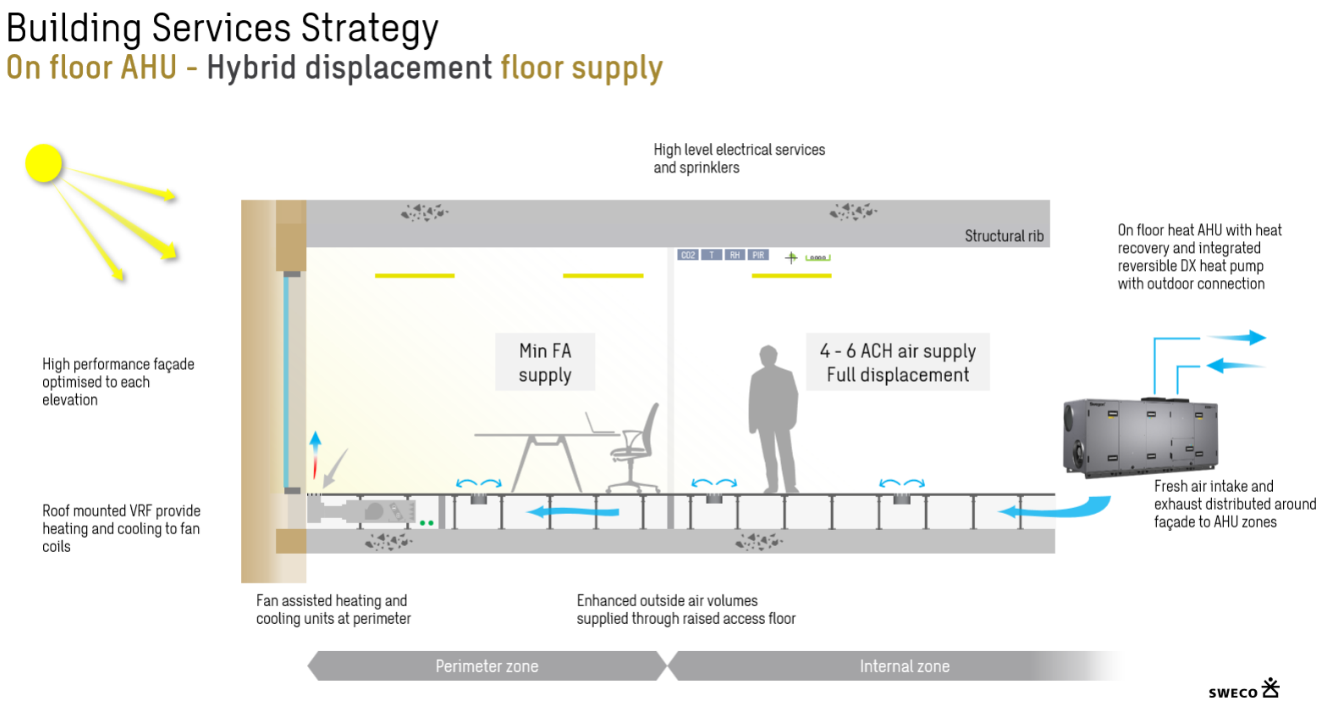


Figure 3-7 Sweco On-Floor AHU - Hybrid Displacement Floor Supply Strategy

renovations. Additionally, on-floor AHUs can be designed to accommodate various airflow and temperature requirements, making them suitable for a wide range of building types and purposes. Their ability to integrate with advanced building management systems (BMS) allows for real-time monitoring and control, enabling adjustments to be made easily in response to evolving environmental conditions or occupancy levels. Furthermore, the incorporation of energy-efficient technologies within these units ensures that they can adapt to sustainability goals and regulatory changes, promoting long-term operational efficiency. Overall, the adaptability of on-floor AHUs supports the dynamic nature of modern buildings, allowing for seamless transitions in usage and enhancing overall occupant comfort.

Designing for Disassembly, Recoverability, and Reusability

The design of the building services systems will emphasise ease of disconnection and dismantling, enabling straightforward removal or replacement. Ample space and dimensions have been allocated for the risers to accommodate disassemblable products that utilise screws and bolts, ensuring there are no constraints. The systems are designed for easy modifications, allowing for adaptation to future technological advancements or changes in building usage without requiring significant alterations.

The on-floor air handling units (AHUs) will be designed for disassembly, allowing components to be sorted by material type during the deconstruction process. This approach promotes efficient recycling by effectively separating metals, plastics, and electronics. Recyclable materials such as copper, steel, and aluminium will be collected and sent to recycling facilities to be melted down and repurposed into new products. Moreover, the use of modular on-floor AHUs will enhance this efficiency, as these units can be easily removed and replaced without major changes to the surrounding infrastructure, thereby supporting sustainable practices in building design and operation.

Designing Out Waste

The building services strategy effectively minimises waste through several key approaches. By establishing the development as a shell and core, it allows for future customization to Category 'A' or 'B' specifications, which reduces the need for extensive renovations and the associated waste generated during fit-outs. The inclusion of on-floor air handling units (AHUs) for efficient heating and cooling, along with Variable Refrigerant Flow (VRF) units on the roof, optimises energy use and reduces the waste associated with inefficient systems. The mechanical and electrical systems are specifically designed to support a single tenancy per office level, promoting efficient resource utilisation and reducing the need for redundant infrastructure. Additionally, dedicated ventilation for toilets and end-of-trip facilities ensures that systems function effectively without excess material use or energy consumption.

Space-Plan

The merging of the three existing cores into a single primary core along the western facade results in a spacious and open office floorplate. This office floorplate features frontage along the entirety of Farringdon Road, extending around to Charterhouse Street and offering impressive views of Smithfield Market and St. Paul's Cathedral. The new core fulfils all the requirements of a standard office layout. A lift bank situated across from the lobby provides direct access to the office floorplate while positioning the toilet facilities conveniently between the second lift core for fire escape and servicing purposes.

Designing for Longevity

The design of the office floors emphasises longevity by incorporating flexibility into the commercial floor plates, which can be proportionally divided into multiple tenancies due to the on-floor AHUs. This adaptability allows the space to meet changing market demands and tenant requirements over time, ensuring that the building remains relevant and functional for a longer period. By enabling various configurations for occupancy, the design minimises the need for extensive renovations or modifications, which can be resource-intensive and costly.

The ability to accommodate multiple tenancies also enhances the building's economic viability, as it can attract a diverse range of businesses and maintain higher occupancy rates. While tenancy three does not have access to the atrium, it offers private amenities in the form of a balcony, which adds value and appeal to potential occupants. This thoughtful layout not only supports long-term occupancy but also encourages tenant satisfaction, further contributing to the building's overall longevity.

Designing for Flexibility and Adaptability

As noted in the Superstructure section - the adaptable floorplate structural design facilitates modifications in function and usage throughout the expected life cycle of the development. This method enables the interior spaces within the Proposed Development to be readily altered or refreshed without necessitating a complete structural renovation of the building.

In addition, the open floor plates create seamless spaces within the Proposed Development, free from internal structural walls or permanent partitions. This design greatly improves the adaptability and versatility of the interior environment, enabling future tenants to tailor the layout to their specific needs—whether they prefer an open-plan office, individual workstations separated by temporary partitions, collaborative areas, or a combination of these options. Furthermore, the design allows for the possibility of tenancy splits, further enhancing flexibility within the space. This feature enables multiple tenants to occupy different sections of the open floor plates, accommodating varying business sizes and operational needs. By providing the option for tenancy splits, the development can cater to diverse tenant requirements while maintaining an adaptable layout that can evolve as businesses grow or change.

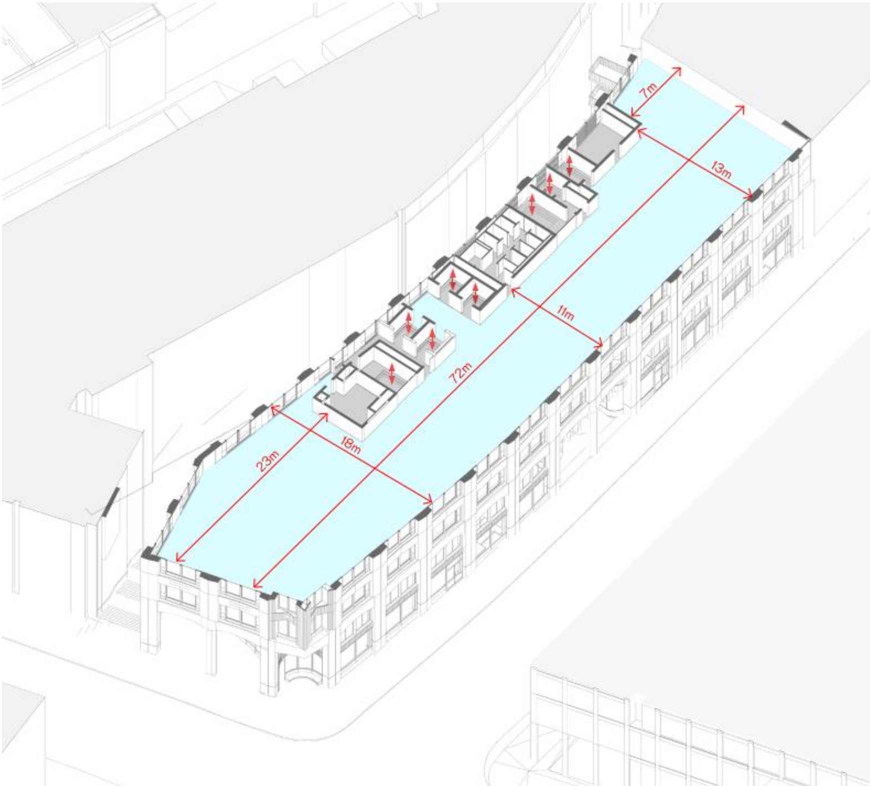


Figure 3-8 DSDHA Proposed axonometric typical level (L1-L6) floor plan

Designing for Disassembly, Recoverability, and Reusability

The raised access flooring system is designed for easy removal and reinstallation of individual panels, facilitating maintenance and reconfiguration while providing quick access to underlying infrastructure without causing significant disruption. This feature promotes efficient upkeep and long-term adaptability within the space. Additionally, the system emphasises reusability and recyclability, with its modular structure allowing for straightforward disassembly and the potential to reuse panels in various layouts. The materials used, such as steel and recyclable polymers, are selected for their recyclability, enabling easy disassembly into individual components at the end of their lifecycle, thereby simplifying the recycling process.

The lighting design of the building could utilise circular track-mounted downlighters to focus on disassembly and recovery, ensuring that components can be easily detached for reuse or recycling at the end of their lifecycle. Sustainable materials, such as aluminium, are prioritised for their recyclability, while LED technology enhances energy efficiency and reduces waste due to its longer lifespan.

Designing Out Waste

The scope of the Proposed Development places significant emphasis on excluding Category B fit-out components, which include the internal finishes, fixtures, and fittings tailored to meet the specific requirements of tenants. By omitting these elements during the initial construction phase, the project is strategically designed to minimise the surplus waste that is typically generated during the tenant fit-out process. This approach not only lessens the environmental impact but also enhances flexibility, allowing future tenants to implement their preferred finishes without the limitations imposed by existing materials.

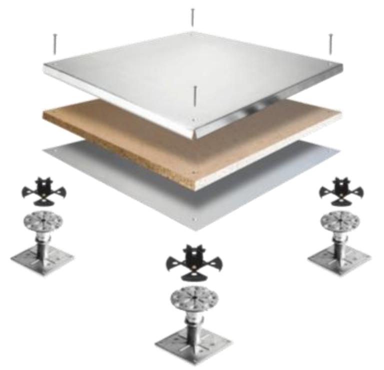
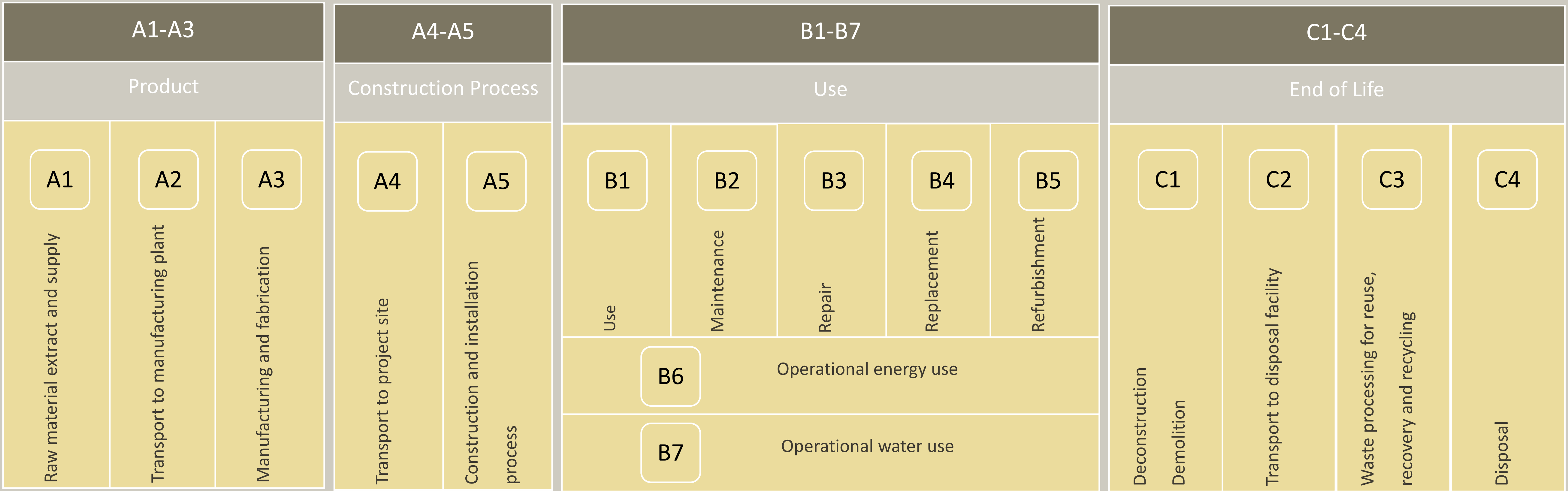


Figure 3-9 Kingspan Exploded View of Raised Access Flooring to demonstrate disassembly

3.3 Circular Impacts on Whole Life Carbon

The application of circular design principles has the potential to reduce carbon emissions (Modules A1-A5). However, the advantages of some principles may only manifest in the reduction of emissions during the operational phase or at the end-of-life disposal (Modules B-C) of a structure and its elements. Additionally, certain principles could yield benefits in subsequent projects (Module D). It's also worth noting that implementing these circular principles might inadvertently lead to increased carbon emissions at specific phases. Gaining a deeper insight into this dynamic is essential to mitigate any unforeseen consequences arising from such design decisions.

Figure 3-10 Life Cycle Stages Based on the definitions of BS 15978:2011



Modules A1-A3 – Minimising Resources – **Section 3.2**

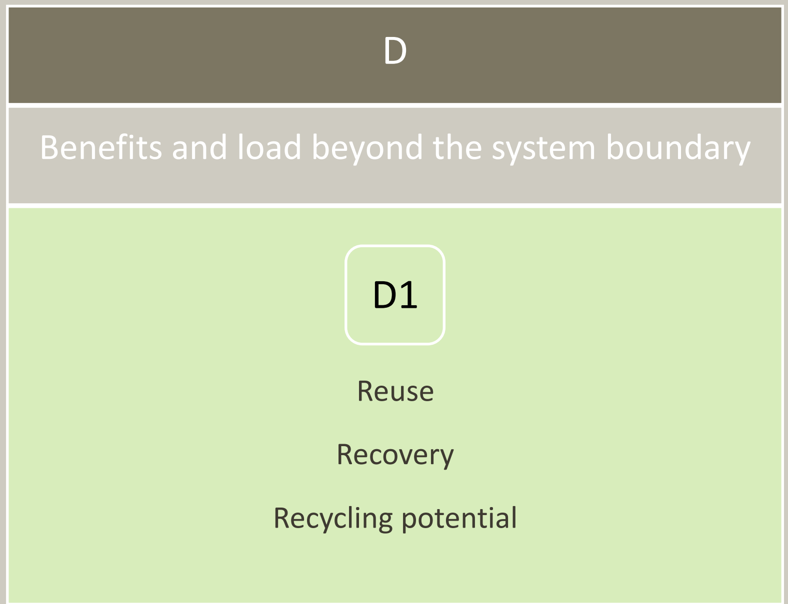
Modules A4-A5 – Construction Waste – **Section 3.5**

Modules B1-B5 – Adaptability & Longevity – **Section 3.2**

Modules B6-B7 – Operational Waste – **Section 3.5**

Modules C1-C4 – End of Life – **Section 3.6**

Module D – Useful Storage at End of Life – **Section 3.6**



3.4 Recycling and Waste Reporting

The Recycling and Waste Reporting Table is set out in the GLA Sheet provided in Appendix A. The Table includes estimated amounts of waste generated from construction and demolition, excavating activities, and operational waste across different phases of the building's life. A concise overview of the waste reduction goals can be found in Section 4. The planned development will strive to achieve these objectives and an update on progress will be provided at Stage 4.

Demolition Waste

Section 2.2 and 4.2 outline the demolition waste targets for the existing development strip out and demolition. The Proposed Development will meet the GLA Policy requirement of *a minimum of 95% diverted from landfill for reuse, recycling, or recovery*.

Excavation Waste

The Proposed Development will be completed without any changes to the current foundations and with no requirement for excavation. All existing foundations and piles will be reused, and there will be no need for additional foundations.

Construction Waste

The current waste management targets are set at less than 6.5 tonnes of construction waste generated per 100m^2 (GIA). Diversion from landfill targets will achieve the proposed requirements of 95% of construction waste diverted from landfill.

The targets set for the Proposed Development in respect of diversion of resources from landfill are more onerous than those required by the BREEAM Version 6 assessment, which only requires 80% by tonnage construction waste / 90% by tonnage of demolition waste to be diverted from landfill. In addition, the GLA diversion from landfill targets are set at 95%. This demonstrates the strong intent of the project to manage waste associated with construction sustainably and in accordance with current best-practice.

Operational Waste

Momentum have outlined the waste storage requirements within their Delivery and Servicing Plan (DSP). The below outlines a summary of this strategy along with the implementation measures.

The DSP outlines the proposed operational waste management strategy, which details the expected volume of waste to be generated from both the commercial and residential aspects of the site, as well as the waste transfer routes and the configuration of waste storage areas. The Proposed Development is dedicated to prioritising waste prevention by ensuring that waste is segregated into various recycling streams at the source for each unit, in line with the Waste Hierarchy. In terms of future waste requirements, the Waste Management Strategy has been developed with the understanding that all occupants of the development will have access to and are required to use the waste storage facilities. Waste generation rates have been calculated using data from WCC's 'Recycling and Waste Storage Requirements 2023' document, as no specific rates were provided by LB Camden. The expected waste generation over a two-day period for the Proposed Development is outlined in the Momentum DSP. It is anticipated that various land uses within the development will utilise shared bins. Based on the projected waste generation, the necessary quantities and capacities of storage bins are as follows:

- 1 x 1,100L Eurobin for general waste
- 2 x 660L Eurobins for paper, cardboard, and dry recyclables
- 5 x 360L Eurobins for glass
- 4 x 240L Eurobins for food waste

Furthermore, Momentum provides a breakdown of projected daily waste generation by waste stream for the site, indicating that 80% of the waste generated by volume, after compaction, is intended to be recycled. A compactor for general and dry recyclable waste is also proposed, assuming a compaction ratio of 1 in 3.

Waste related to the Proposed Development is suggested to be stored in bins located on the lower ground floor within a dedicated bin store, with shared use among different land uses. The required storage bins include various Eurobin capacities for general waste, recyclables, glass, and food waste.

To ensure the effectiveness of the Waste Management Strategy and its compliance with the Waste Hierarchy, all future users will be educated about the strategy, its benefits, and actions for enhancement. Facilities Management will oversee the review and monitoring of the Waste Strategy, tracking waste generation and recycling levels with evaluations conducted every six months to assess progress and identify potential improvements.

Table 3.1 Momentum Waste Management Measures

Measure	Description	Benefit	Timescale	Responsibility
Adoption of the Waste Strategy	Involvement of Facilities Management / Tenants at the earliest stage is important to ensure that the Waste Strategy is active and a living document	More policies can be implemented, and better results delivered	Upon occupation	Applicant
Assign responsibility of the Waste Strategy to relevant site employee	Relevant site employee to be responsible for managing the ongoing development, delivery and promotion of the Waste Strategy	To ensure that the Strategy is taken forward and delivered	Upon occupation	FM / Tenants
Bin volume surveys	FM team to log-in how full bins are on collection day in a dedicated spreadsheet (half empty, full, ¼ full)	To monitor progress on waste generation reduction and recycling improvement	Upon occupation and ongoing	FM team
Tenant awareness	Ensure all tenants are made aware of the Waste Strategy and its requirements upon entering tenancy agreement	To ensure all tenants are aware of the Waste Strategy and its likely implications	Prior to tenant occupation	Landlord / FM

Increasing amount of waste recycled	Commit to working towards London Environment Strategy business waste recycling target of 75% (by weight/ tonnage) by 2030	Increasing amount of waste recycled will reduce the quantum of waste being directed to landfill	Upon occupation and ongoing	FM / Tenants

For the full operational waste strategy please refer to the Momentum Delivery and Servicing Plan.

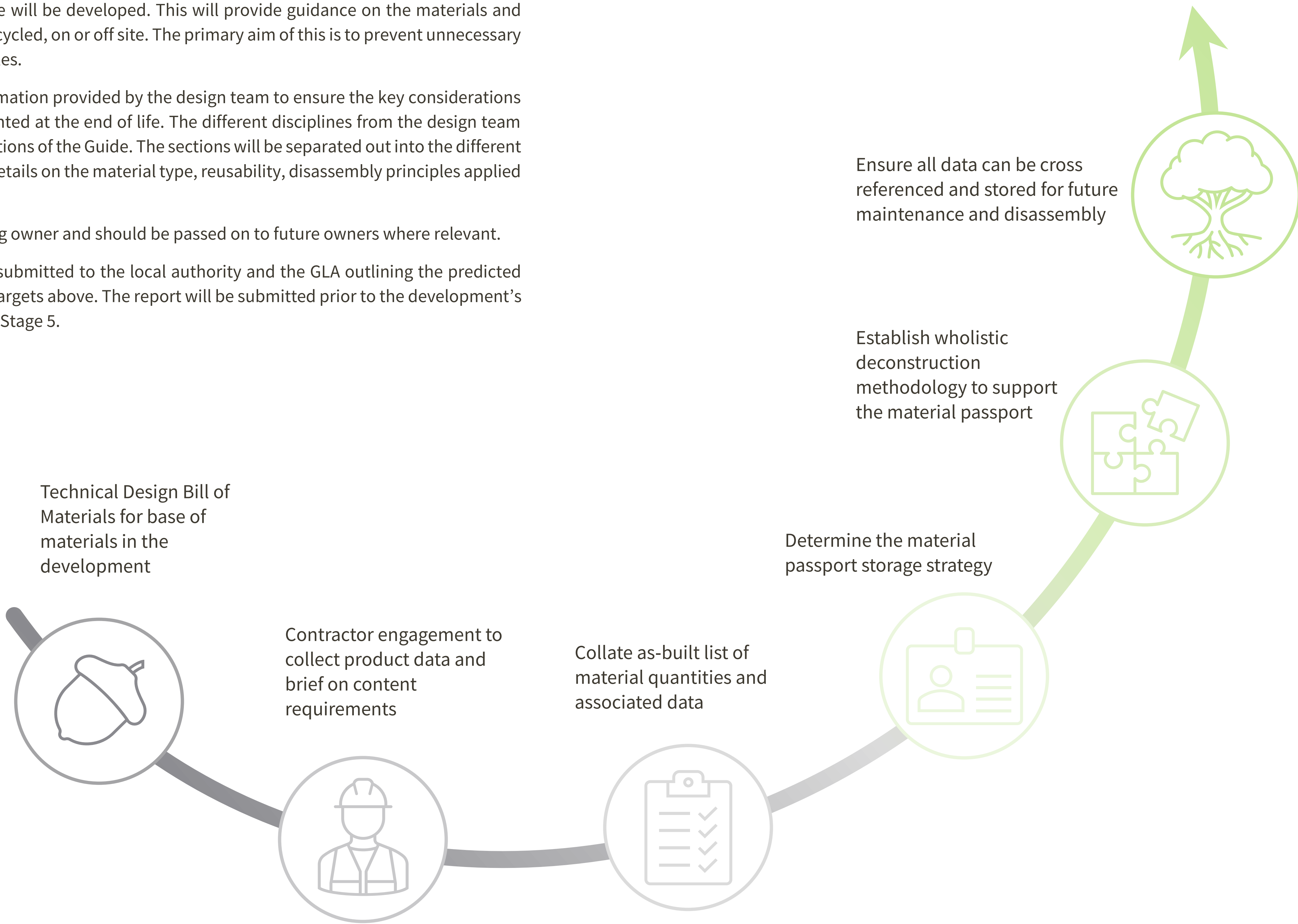
3.5 End of Life Strategy

The Circular Economy Principles guide the design and specification to extend the building's life using the measures incorporated by the design team. To ensure that the design aspects can benefit the development at its end of life, a Disassembly Guide will be developed. This will provide guidance on the materials and components that can be reused or recycled, on or off site. The primary aim of this is to prevent unnecessary waste in line with the circular principles.

The Disassembly Guide will use information provided by the design team to ensure the key considerations and principles adopted are implemented at the end of life. The different disciplines from the design team will contribute to the appropriate sections of the Guide. The sections will be separated out into the different buildings elements and will include details on the material type, reusability, disassembly principles applied and recycled content.

The Guide will be given to the building owner and should be passed on to future owners where relevant.

The Post Completion Report will be submitted to the local authority and the GLA outlining the predicted and actual performance against the targets above. The report will be submitted prior to the development's Handover following to completion of Stage 5.



Strategy Summary

4

4.1 Circular Reporting

Bill of Materials & Material Intensity

The material intensity has been calculated for the Proposed Development and aligns with the current cost plan quantities and the submitted Whole Life Carbon Assessment for Stage 2. The performance indicators are outlined in Figure 4-1. For the full material breakdown please see the GLA Sheet in Appendix A and the *lpg wlca assessment template for planning* submitted as part of this application.

Element Category	Quantity (t)	Intensity (t/m2 GIA)
1 Substructure	36 t	3
2.1 Superstructure: Frame	7,498 t	584
2.2 Superstructure: Upper Floors	1,312 t	102
2.3 Superstructure: Roof	443 t	34
2.4 Superstructure: Stairs & Ramps	215 t	17
2.5 Superstructure: External Walls	160 t	12
2.6 Superstructure: Windows & External Door	TBC t	
2.7 Superstructure: Internal Walls & Partitions	463 t	36
2.8 Superstructure: Internal Doors	16 t	1
3 Finishes	812 t	63
4 Fittings, Furnishings & Equipment (FFE)	TBC t	
5 Services (MEP)	477 t	37
Total	**11,431 t**	

Figure 4-1 Bill of Materials- Performance Indicators (Element Quantity and Element Intensity)

The GLA Circular Economy Statement Sheet provides Performance Indicators against data collated from applications reviewed between 2020 and 2022. This results in each estimated figure being attributed a quartile based on the data set it is assessed against. The icons against each Element Category or Type of Waste indicate the associated Quartile as confirmed in the GLA Sheet in Appendix A and Legend (Right).

1st Quartile
2nd Quartile
3rd Quartile
4th Quartile

Recycling and Waste Reporting

Section 3.4 confirms the narrative surround the recycling and waste reporting for demolition, construction, and the municipal waste. Figure 4-2 provides the summary waste figures and intensity for each as outlined in the GLA Sheet in Appendix A.

Type of Waste	Quantity (t)	Intensity (t/m2 GIA)
Demolition Waste	15,560 t	1.211
Construction Waste	835 t	0.065
Municial Waste	TBC t/annum	

Figure 4-2 Waste Figures Summary

4.2 Circular Performance – Waste

Materials Retained

A substantial quantity of materials, representing 42% or 6,529 tons, has been earmarked for retention. This elevated retention rate is vital for avoiding unnecessary demolition, lowering transportation requirements, and minimising waste generation. The retained materials are predominantly structural components, which make up 92% of the total weight of materials present on site.

Reuse & Recycling (Demolition)	Quantity (t)	Percentage (%)
	6,529t	42%

Materials Reused or Recycled from Demolition

Opportunities for material reuse amount to 639 tons, or over 4% of the total materials, categorised into on-site and off-site options. During the strip-out and demolition phases, efforts will focus on optimising the repurposing of existing materials, with detailed assessments provided in Section 2. Additionally, off-site recycling constitutes 54% of the total materials, equating to 8,386 tons, and is essential for materials that cannot be reused or are at the end of their life cycle.

Diversion from Landfill (Demolition)	Quantity (t)	Percentage (%)
	9,024t	58%

Demolition, Excavation, & Construction Waste Diverted from landfill

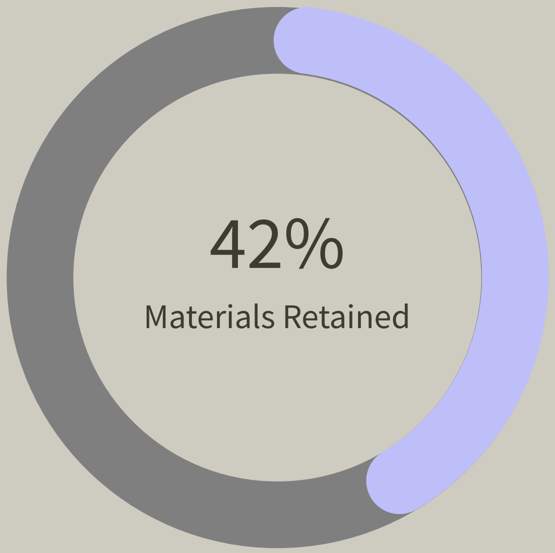
The performance target for diverting excavation and construction waste from landfill is set at 95% and is aligned with the London Plan and GLA's London Plan Guidance. These guidelines emphasise minimising waste and enhancing the reuse and recycling of materials in construction.

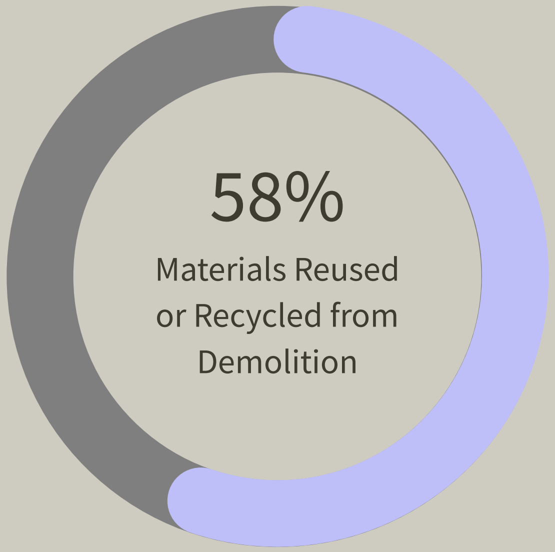
Diversion from Landfill	Quantity (t)	Percentage (%)
	15,575t	95%

Municipal Waste Recycling by 2030

The London Plan outlines ambitious waste recycling targets aimed at promoting sustainability and reducing landfill use by 2030. A key target is for London to achieve a recycling rate of at least 65% for municipal waste. This goal reflects a strong commitment to enhancing recycling practices and minimising waste.

Municipal Waste Recycling	Quantity (t)	Percentage (%)
	TBCt	65%





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4.3 Circular Performance – Design

Sustainable Certification

This circular element aims to establish the future procurement of materials with associated sustainable certifications. This is typically driven by the Mat 03 credits in the BREEAM assessment however the aim is to put this in place earlier in the design for higher success. Each material for each NRM category in the bill of materials has been reviewed for the potential for sustainable certifications. Ultimately this will be finalised during the procurement phase with the Contractor and this figure is currently speculative.

Sustainable Certification	Quantity (t)	Percentage (%)
	9,993t	87%

Recycled Content

At this stage the recycled content target is a minimum of 20% of the total value of materials used will derive from recycled and reused content in the products and materials selected, meeting the requirements set out by the published GLA Circular Economy Guidance. The Stage 4 submission will include a more detailed breakdown of this target how this will be achieved.

Recycled Content	Quantity(t)	Percentage (%)
	2,286t	20%

Deconstruction Potential

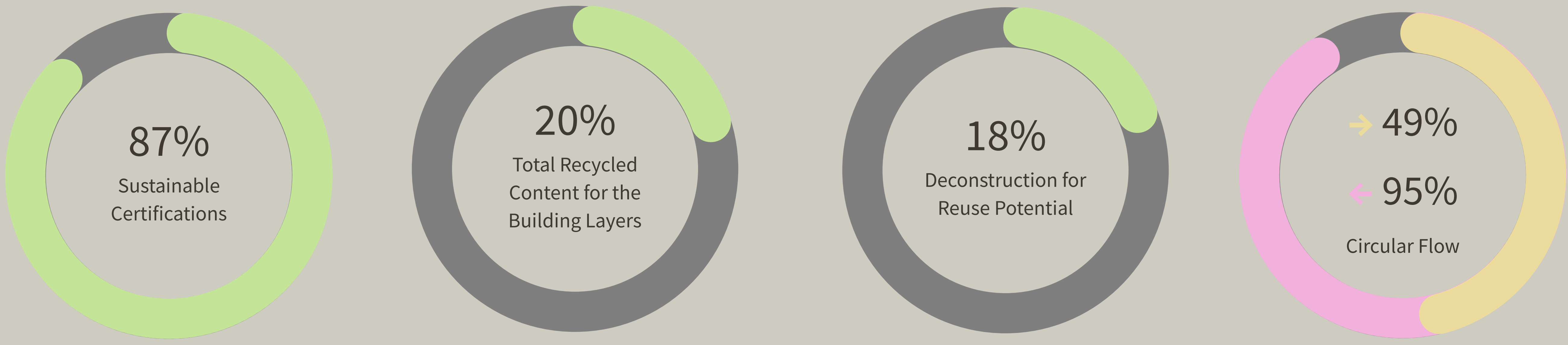
The future deconstruction for reuse potential of the development is calculated by assessing the initial material and assuming the most disassembly friendly method of assembly. This figure is estimated by assessing the material type and whether this can support mechanical fixing for the ease of disassembly in alignment with the material laid out in the Bill of Materials. During Stage 4 the feasibility of these will be reevaluated to ensure a realistic outcome. This figure is indicative at this stage and will progress with the design.

Deconstruction Potential	Quantity (t)	Percentage (%)
	2,047t	18%

Circular Flow

The Circular Flow of the development has been calculated in line with the weight quantities estimated for the development. The baseline flow is the sum of all materials proposed and retained in the development. The inflow has been calculated using the quantity of retained materials and the targeted percentage of recycled content. For the Circular Outflow, it is assumed that a minimum of 95% diversion from landfill will be anticipated.

Flexibility of the Space	Quantity (t)	Percentage (%)
Inflow	8,815t	49%
Outflow	17,062t	95%

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Appendix A GLA Circular Economy Template

GREATERLONDONAUTHORITY

Detailed Application Stage - Circular Economy Statement

Project Details	
Project name	19 Charterhouse Street
Planning application reference number (if applicable)	
Applicant	Farrview Limited
London Borough	London Borough of Camden
Brief description of the project	Remodelling, refurbishment and extension of the existing building to provide Use Class E (commercial, retail/restaurant and jewellery workspace), landscaped amenity terraces, balconies, relocated entrances, commuter facilities, on-site loading bay and plant; and other associated works.
Author/s	Rosi Cole
Date of assessment	26.03.2025
Number of Use Types	3
Use Class / Type	Floor Area by use type (m2)
Office	12,016
Retail	310
Jewellery Workspace	520
Overall GIA (m2)	12846.00

Circular Economy Design Approaches

Circular Economy Design Approaches for Existing Structures / Buildings		Applicant Response
Is there an existing building on the site?		Yes
Is it technically feasible to retain the building(s) in whole or in part?		Yes
Is the existing building, or parts of the building, suited to the requirements for the site?		Yes, in part
The preferred strategy is:		**PARTIAL RETENTION and REFURBISHMENT**
Circular Economy Design Approach	**Phase/Building/Area/Layer**	**Strategic Response**
Retain and Retrofit		n/a
Partial Retention and Refurbishment	All layers	By following the GLA Decision tree the most suitable route to circularity is a Partial Retention and Refurbishment and Disassembly and Reuse and Strategy. This approach will prioritise the retention and reuse of materials prior to recycling for the existing development.
Disassemble and Reuse	All layers	As above
Demolish and Recycle	All layers	Where reuse is not feasible, high value recycling will be reviewed.
Circular Economy Design Approaches for New Buildings, Infrastructure and Layers		Applicant Response
Is the whole building designed to have a short life on its current site? (e.g. less than 10 yrs)		No
Is it foreseeable that the building will need to change use/function within its design life?		No
All developments should apply the 6 Circular Economy principles, including:		**Designing for DISASSEMBLY and ADAPTABILITY, MATERIAL REUSE ON-SITE and/or RECYCLING should be maximised**
Circular Economy Design Approach	**Phase/Building/Area/Layer**	**Strategic Response**
Building relocation		n/a
Component or material reuse	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES
Adaptability	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES
Flexibility	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES
Replaceability	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES
Disassembly	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES
Longevity	Skin, Structure, Services, Space	Included within the strategy - Section 3.2 of the Detailed CES

Circular Economy Design Principles by Building Layer

The Circular Economy Design Principles by Building Layer table should consider where the Applicant seeks to go beyond standard practice. If there are multiple phases / buildings / areas with different measures / strategies, please specify these separately within the table below.

		Site	Substructure	Superstructure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Summary	Challenges	Actions & Counter-Actions, Who and When	Plan to Prove and Quantify
Is it likely the layer (or components within it) will need to be moved or otherwise modified within 5-15 years, e.g. due to changing use patterns or user requirements?		N/A	No	No	No	Yes	Yes		N/A				
Is it likely the layer (or components within it) will need to be changed, upgraded or replaced within 5-15 years, e.g. for improved performance, aesthetics		N/A	No	No	Yes		Yes		N/A				
The preferred strategy is:		-	Design for ADAPTABILITY	Design for ADAPTABILITY	Design for REPLACEABILITY	Design for FLEXIBILITY	Design for FLEXIBILITY		-				
Design Principles		All developments should apply the 6 circular economy principles, including designing for DISASSEMBLY and ADAPTABILITY, MATERIAL REUSE ON-SITE and/or RECYCLING should be maximised											
Designing out waste	Module A - Product Sourcing and Construction Stage	n/a Site is retained in full	See Superstructure	The design focuses on reducing waste by reusing existing foundations and piles, minimizing the need for new materials and the waste associated with excavation. This strategy not only conserves resources but also streamlines the construction process, aligning with waste reduction principles. By prioritizing the reuse of existing structures, the design supports sustainability and contributes to a circular economy by extending material lifecycles and reducing new resource extraction.	By using robust textures and carefully selected materials, the design minimizes excess material usage, effectively reducing waste. High-quality, durable materials lead to less frequent replacements, while pre-manufactured elements like the unitised curtain walling system optimize material use and minimize offcuts. This strategy significantly lowers the potential for construction waste, contributing to a more sustainable building process.	The building services strategy minimizes waste by implementing a shell and core approach, allowing for future customization and reducing renovation-related waste. The efficient design of AHUs, combined with Variable Refrigerant Flow (VRF) units, optimizes energy use and resource utilization. Additionally, dedicated ventilation systems ensure effective operation without excess material use or energy consumption, promoting a sustainable building process.		n/a Cat A Scope			tbc	Early engagement with supply chains to mitigate supply risks so far as possible.	Pre-demolition Audit, has been produced to quantify options for existing building retention and the materials arising from the deconstruction. Waste targets will be included as a contractual requirement in the Contractor Preliminaries. This includes requirement to record and report construction waste arisings in the Resource Management Plan (RMP). New materials to be tracked as part of BREEAM sustainable procurement process. A BREEAM-compliant Sustainable Procurement Plan will be produced before the end of RIBA Stage 2.
	Module B - In-Use Stage	n/a Site is retained in full	See Superstructure	n/a	Materials will be specified with a focus on high durability and robustness. Standardised facade components will aid in-use upgrades and reuse.	n/a		n/a Cat A Scope	n/a		tbc		
	Module C - End-of-Life Stage	n/a Site is retained in full	See Superstructure	n/a	The facade system is designed with mechanical fasteners (between elements), and bolted connections to the structure to minimise waste during deconstruction.	n/a	n/a	n/a Cat A Scope	n/a		tbc		
	Module D - Benefits and Loads Beyond the System Boundary	n/a Site is retained in full	See Superstructure	n/a	Optimise potential for reuse and recycling through design for disassembly strategies, selection of materials with high reusability/ recyclability.	n/a	n/a	n/a Cat A Scope	n/a		tbc	Early identification of potential end of life routes for key reusable materials, to be captured in Material Passports.	Early identification of potential end of life routes for key reusable materials will be captured in Material Passports. The data for key reusable products will be collected and stored in a Material Passport.
Designing for longevity		n/a Site is retained in full	See Superstructure	The Proposed Development emphasizes robust design elements that enhance longevity, directly supporting circular economy principles. By using durable materials like steel and integrating existing structural components, the design minimizes the need for repairs and new materials, thereby reducing environmental impacts associated with construction. This approach encourages maintenance and resource recovery, valuing materials over their lifecycle.	The design utilizes rusticated stone or concrete for durability and a timeless look, reducing wear and tear while minimizing maintenance costs and resource use. This choice ensures the facade remains functional and attractive over time, supporting sustainability by lowering its lifecycle impact. The polished column base adds to the aesthetic and structural integrity, helping the building endure heavier loads and resist impacts.	The consolidation of three existing cores into a single core enhances adaptability and longevity by creating an open office floorplate that maximizes usable space. This design efficiently integrates essential components like lift banks and strategically located toilet facilities for improved safety and functionality. The placement of split Air Handling Units (AHUs) offers flexibility for future tenant modifications, accommodating changes in layout and ventilation needs without extensive renovations.		n/a Cat A Scope	n/a		tbc		
Designing for adaptability or flexibility		n/a Site is retained in full	See Superstructure	The redesign transitions from three cores to two, optimizing the building layout for improved flexibility and adaptability. This change allows for efficient distribution of services and maximizes available floor space, making it easier to accommodate diverse functions and tenant needs over time. Such adaptability supports the building's lifecycle by reducing resource consumption through potential repurposing.	The use of a unitised curtain walling system allows for a flexible facade that can adapt to changing layouts and tenant needs. The modular design facilitates quick installation and reconfiguration, while terraces at upper levels promote greenery and biodiversity. This combination enhances the building's responsiveness to aesthetic and environmental considerations, fostering a connection to nature and enabling the facade to evolve over time.	On-floor Air Handling Units (AHUs) feature a modular design that allows for easy configuration based on changing tenant needs. This flexibility enables quick installation and replacement while integrating with advanced building management systems for real-time monitoring. The incorporation of energy-efficient technologies supports sustainability goals, ensuring long-term operational efficiency and enhancing occupant comfort.		n/a Cat A Scope	n/a		tbc	Details of bolted and mechanical connections to be developed. Consistent LCA studies on options and evaluation of carbon reduction potentials. Programme implications incorporated in the options studies to be coordinated with cost consultant and contractor.	End of life routes (reuse, adaptability, disassembly, etc.) will be captured as part of Material Passporting process. Potential end of life routes for key reusable materials will be identified early on. The data for these key reusable products will be collected and stored in a Material Passport.
Designing for disassembly		n/a Site is retained in full	See Superstructure	The new structure features a steel frame paired with reinforced concrete hollow core planks, enhancing disassembly and reusability. Steel allows for easy modifications, supporting circular economy goals by extending material lifespans and reducing waste. The modular design of the hollow core planks facilitates their recovery for future projects, promoting resource conservation. The systematic disassembly strategy further enhances sustainability by enabling recycling and repurposing at the end of the building's lifecycle.	The unitised curtain walling system simplifies disassembly, making future renovations efficient and reducing construction waste. Designed for easy removal, materials like precast columns and metal curtain walling panels can be repurposed or recycled, supporting sustainable practices and a circular economy. This approach ensures resources are used efficiently and aligns with a commitment to sustainability.	The building services systems are designed for easy disconnection and dismantling, with ample space for risers that accommodate disassemblable products. On-floor AHUs will facilitate effective recycling by allowing components to be sorted by material type during deconstruction. This modular design promotes sustainability by enabling efficient removal and replacement without significant changes to surrounding infrastructure.		n/a Cat A Scope	n/a		tbc	Details of bolted and mechanical connections to be developed. Consistent LCA studies on options and evaluation of carbon reduction potentials. Programme implications incorporated in the options studies to be coordinated with cost consultant and contractor.	End of life routes (reuse, adaptability, disassembly, etc.) will be captured as part of Material Passporting process. Potential end of life routes for key reusable materials will be identified early on. The data for these key reusable products will be collected and stored in a Material Passport.
Using systems, elements or materials that can be re-used and recycled		n/a Site is retained in full	See Superstructure	As Designing for Disassembly	As Designing for Disassembly	As Designing for Disassembly	As Designing for Disassembly	n/a Cat A Scope	n/a		tbc	Early engagement with supply chain to ensure capacity and review of options with design team.	As above

Bill of Materials

Please click the + symbol to the left hand side of the Bill of Materials table to view or hide the input rows for each Building Element Category. The rows for substructure and frame have been unhidden to highlight this. A fixed number of rows has been provided for each Building Element Category based on a sub-set of typical WLCA submissions. Should the number of rows provided not be sufficient to allow input of all materials for a given ... materials with the highest quantity.

	BUILDING ELEMENT CATEGORY - LEVEL 1 (based on the RICS New Rules of Measurement (NRM) classification system level 2 sub-elements https://www.rics.org/globalassets/rics-website/media/products/data-products/bcis-construction/bcis-elemental-standard-form-cost-analysis-4th-nrm-edition-2012.pdf) Building Element Category	Material Type	Material quantity (Module A) (kg)	Material intensity (Module A) (kg/m² GIA)	Performance Indicator (LPG Appendix 1)	Construction Waste Factor (Module A)
0.1	Demolition: Toxic/Hazardous/Contaminated Material Treatment	-	0	0	-	-
0.2	Major Demolition Works	-	15,560,658	1,211	-	-
0.2	Major Demolition Works	Demolition Materials	15,560,658	1,211	-	0%
0.3	Temporary Support to Adjacent Structures	-	143,405	11	-	-
0.3	Temporary Support to Adjacent Structures	Formwork	143,405	11	-	0%

Recycled Content by value (%)	Expected Lifespan (years)	Number of Replacements (over assumed 60-year period)	Repair and Replacement quantities of materials (Module B) (kg)	Construction Waste Factor (Module B)
-	-	-	0	-
-	-	-	0	-
		0	0	0%
-	-	-	0	-
		0	0	0%