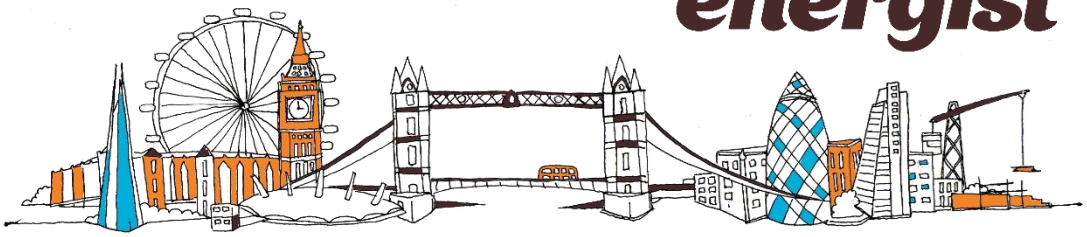
Detailed Circular Economy Statement

Ham Close Regeneration

On behalf of Hill Residential

R05

Date: September 22



REVISION HISTORY

Revision	Issue Date	Description	Issued By	Checked By
R00	17/03/22	First issue	JA	TW
R01	07/04/22	Updated with comments	JA	-
R02	27/04/22	Updated plans	JA	-
R03	17/08/22	Updated with GLA comments	JA	RP
R04	08/09/22	Updated with GLA comments	JA	-
R05	27/09/22	Updated Refuse Plan	JA	-

Calculations contained within this report have been produced based on information supplied by the Client and the design team. Any alterations to the technical specification on which this report is based will invalidate its findings.

All advice provided by Energist UK Ltd regarding the performance of materials is limited solely to the purposes of demonstrating compliance of the Circular Economy Statement. The performance of materials under other criteria, including but not limited to fire, structural, acoustics are not considered in our advice. It is the responsibility of the client to ensure the wider suitability of materials specified in our assessments.

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CONTENTS

1. EXECUTIVE SUMMARY

This Circular Economy Statement has been produced by Energist UK on behalf of Hill Residential ('the Applicant') and demonstrates compliance with the requirements set out in the GLA London Plan Policy SI7 '*Reducing waste and supporting the Circular Economy*', following the guidance outlined in the GLA '*Circular Economy Statements (2022)*' guidance document.

It supports a full planning application for the regeneration of Ham Close. The Development proposals comprise the demolition of existing buildings on-site and phased mixed-use development comprising 452 residential homes (Class C3) up to six storeys; a Community/Leisure Facility (Class F2) of up to 3 storeys in height, a "MakerLabs" (sui generis) of up to 2 storeys together with basement car parking and site wide landscaping.

This circular economy strategy was developed in collaboration with the Design Team and Developer, following a virtual workshop held on 22nd September 2021. The workshop minutes are detailed in the Appendices. An overall strategic approach has been identified for both the existing buildings on the site and the proposed new development.

A number of key commitments and design strategies have been identified to ensure the Development will contribute towards a circular economy. These involve design decisions to minimise resources used, minimise waste and strategies to manage waste effectively. The Strategic Approach has been defined following the Circular Economy Core Principles. This report should be read in conjunction with the submitted GLA circular economy template spreadsheet.

2. INTRODUCTION

2.1 Development Summary

This report summarises the Circular Economy strategy for the regeneration of Ham Close. It details the approach taken by the Applicant and Design Team to support a circular economy and to incorporate the GLA Circular Economy Core Principles within the Development design.

The Development proposals comprise the demolition of existing buildings on-site and phased mixed-use development comprising 452 residential homes (Class C3) up to six storeys; a Community/Leisure Facility (Class F2) of up to 3 storeys in height, a “MakerLabs” (sui generis) of up to 2 storeys together with basement car parking and site wide landscaping.

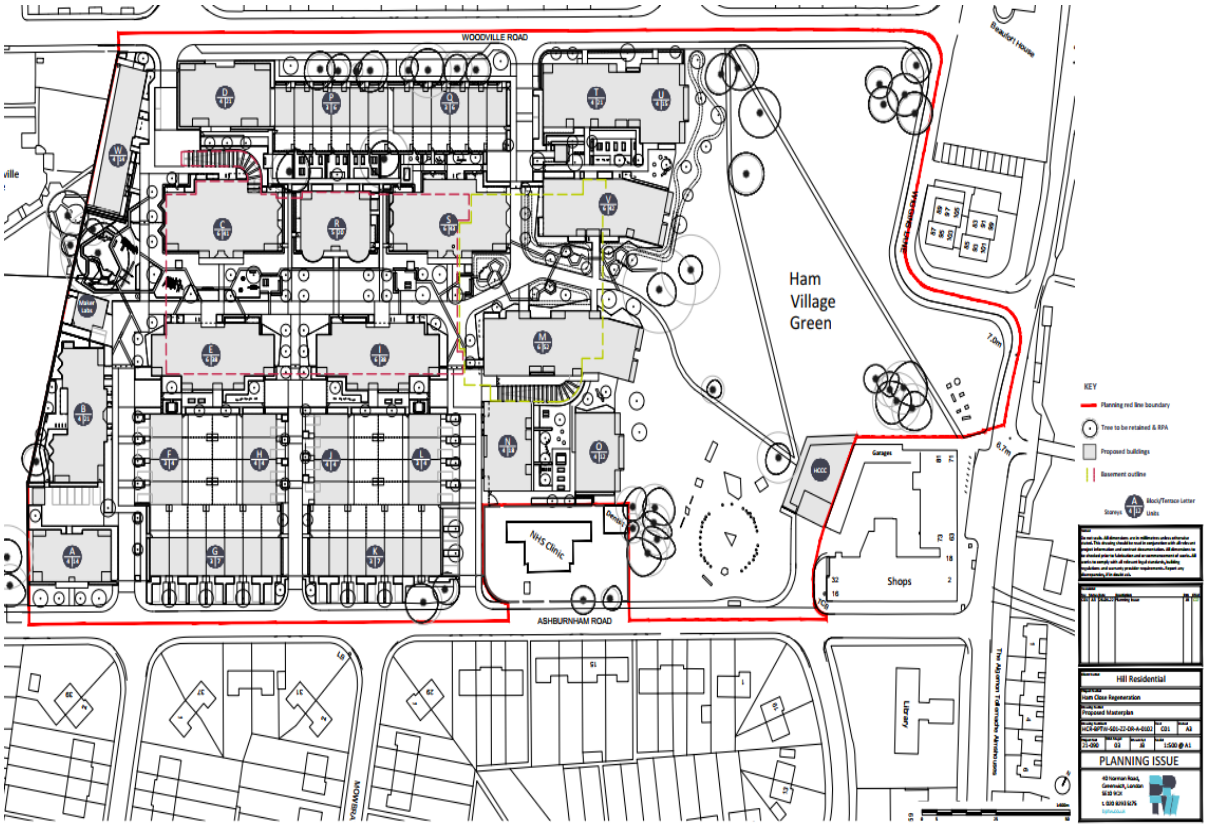


Figure 1 – Masterplan providing an overview of the site layout (BPTW drawing HCR-BPTW-S01-ZZ-DR-A-0102-C01)

Table 1 - Proposed floor area for development and number of apartments

Area of Development	Planning Use Class	GIA (m2)	No. Apartments
Residential	C3	41,817.4	452
Community Facility	F2	716	-
Maker Labs	sui generis	130	-

2.2 Circular Economy Definition

A Circular Economy is defined in the GLA London Plan (2021) Policy SI7 '*Reducing waste and supporting the Circular Economy*' as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste. The end goal is to retain the value of materials and resources indefinitely, with no residual waste at all. This is possible, requiring transformational change in the way that buildings are designed, built, operated, and deconstructed.

A circular economy stands in contrast to our current linear system, where materials are mined, manufactured, used, and thrown away. The '*Take, Make, Dispose*' model, or '*Linear*' economy, has fuelled rapid growth but is inherently unsustainable in the long term where resources are finite.

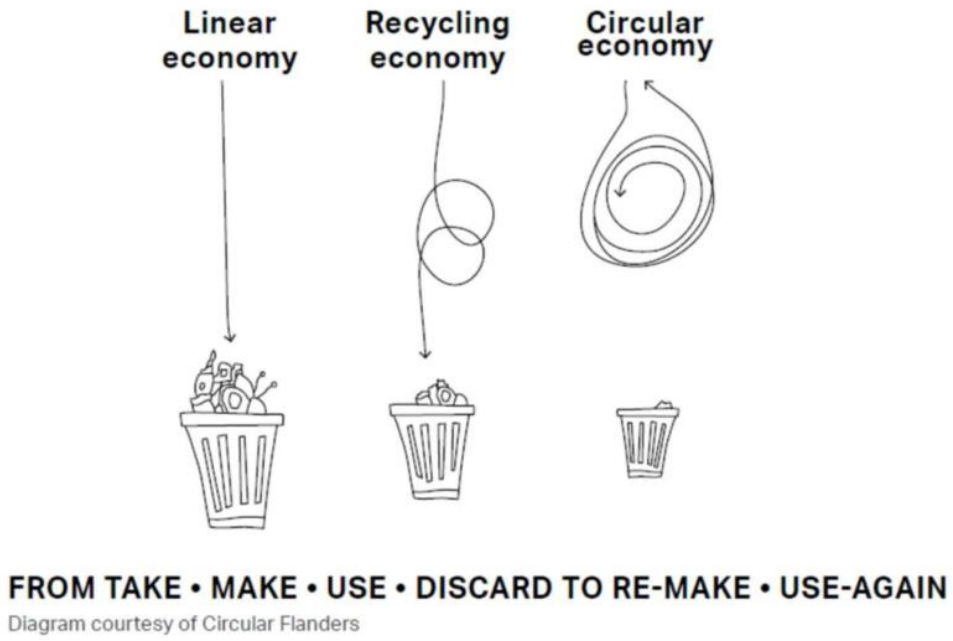


Figure 2 - Circular Economy Concept - migrating from a linear economy towards a circular economy. Source: Circular Flanders

Widespread adoption of circular economy principles would dramatically reduce the quantity of new material imported into London and the amount of waste needing to be managed, including that which is exported. Alongside this reduction in imported material and exported waste, smart technologies, infrastructure, and logistics can contribute significantly to reduced vehicle movements, air pollution, noise, and greenhouse gas emissions. Developers can also benefit from cost savings, for example by purchasing fewer materials and managing less waste.

Circular Economy Statements are intended to demonstrate how a development, including any public realm, and supporting infrastructure, will incorporate Circular Economy Principles into all aspects of the design, construction, and operation process. This will help to ensure that applicants:

- consider strategies to facilitate the transition towards a circular built environment
- report against numerical targets that will facilitate monitoring of waste and recycling
- recognise opportunities to benefit from greater efficiencies that can help to save resources, materials, and money

2.3 Planning Targets

The Mayor of London wants to see London's homes, buildings and supporting infrastructure adopt innovative design. London Plan policies D3 '*Optimising site capacity through a design-led approach'*, and SI7 '*Reducing waste and supporting the Circular Economy'* set out a policy framework that supports the delivery of a circular built environment.

Policy SI7 of the London Plan also requires development proposals that are referrable to the Mayor of London to submit a Circular Economy Statement as part of a planning application.

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:
    i. construction and demolition – 95 per cent reuse/recycling/recovery
    ii. 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.

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

2.4 Method Statement

This circular economy report was developed in line with the London Plan Policy SI7, following the guidance outlined in '*London Plan Guidance: Circular Economy Statements'* LPG (March 2022). However, it should be noted that the assessment was started and workshop were held prior to the revised 2022 guidance being issued by the GLA.

This circular economy strategy has been developed in collaboration with Hill Residential and the appointed design team following a workshop held 16th August 2021. The workshop minutes are detailed in the Appendices. The workshop was used to facilitate circular economy targets and to ensure these have been integrated into the design and implementation strategy (Section 7). The structure of the workshop was to identify opportunities and measures

incorporated into the Development design which minimise waste in line with the GLA Circular Economy Core Principles and the waste hierarchy for the existing site, new development, the Development in use and end of life.

3. CIRCULAR ECONOMY TARGETS

3.1 Circular Economy Aspirations

A Circular economy is one where materials are retained, reused, and recycled at their highest value for as long as possible, with the ultimate goal of having no residual waste at all. To make this possible requires dramatic change in the way buildings are designed, built, operated, and deconstructed. Achieving a more circular economy will dramatically reduce the requirement for virgin materials and resources, as well as reduce the amount of waste produced.

The design responds to the circular economy principles outlined in the GLA Circular Economy Statement Guidance (2022); Conserve resources and source sustainably, Design to eliminate waste, and Manage waste sustainably and at the highest value, as well as identifying and incorporating London Plan Policy SI 7 targets.

The circular economy aims and targets are detailed below, which align with the London Plan Policy SI 7 targets and follow the waste hierarchy as outlined by the GLA.

This Circular Economy statement has been developed in line with the latest version of the GLA Circular Economy Statement Guidance (March 2022) and sets out how the Application aligns with the outcomes sought by London Plan 2021 Policy SI7.

3.2 Targets and Commitments

The Applicant is committed to achieving the following circular economy targets.

Table 2 - Circular Economy Targets: Waste

Waste Stream*	Policy Requirement**	Project Target**	Explanation
Demolition	95%	98%	An independent pre-demolition audit has been conducted prior to start on site in order to quantify volume of materials and waste generation expected. The independent demolition audit report estimates 18,728.88 tonnes waste (0.57t/m^2 GIA). This is broken down into material types and quantities, highlighting potential recovery of materials, for reuse or recycling. It is

			expected that a 98% diversion from landfill target can be achieved with careful segregation techniques.
Excavation	95%	95%	High level earthwork excavation quantities have been provided to better understand the volume of excavation material expected. The Applicant estimates 49,248 m^3 of excavation waste. The Applicant is committed to a 95% diversion from landfill for all non-hazardous excavation waste arisings.
Construction	95%	95%	Resource Management Plan to be developed as the design progresses, in order to maximise opportunities for reusing and recycling construction waste. Non-hazardous waste materials from on-site construction and dedicated offsite manufacture or fabrication shall be included. The Applicant sets a target of ≤ 6.5 of waste generated per 100m^2 (gross internal floor area).
Municipal	65%	65%	Block by block refuse store accessible by waste and recycling collection operators at ground floors in line with the London Borough of Richmond Upon Thames requirements.

** Non-hazardous waste*
*** Diverted from landfill and reused, recycled, or recovered*

On-site opportunities to re-use and manage waste shall be maximised where practicable. Where this is not possible and waste is sent off-site for recovery, reuse or recycling, the Applicant shall endeavour to use local waste management facilities, as informed by the London Waste Map.

In addition to landfill diversion targets, the Applicant is committed to the following recycled content target.

Table 3 - Circular Economy Targets: Recycled Content

Circular Economy Target	Policy Requirement*	Project Target*	Explanation
Recycled Content	20%	20%	The Applicant shall endeavour to ensure materials have a minimum 20% recycled content and are easily re-used or recyclable at the end-of-life stage to minimise the amount of virgin materials used.

** By value for the whole building*

4. STRATEGIC DESIGN APPROACH

4.1 Circular Economy Goals and Strategic Approach

The figure below sets out a hierarchy for building approaches that maximises the use of existing materials. Diminishing returns are gained by moving through the hierarchy outwards, working through refurbishment and reuse through to the least preferable option of recycling materials produced by the building or demolition process.

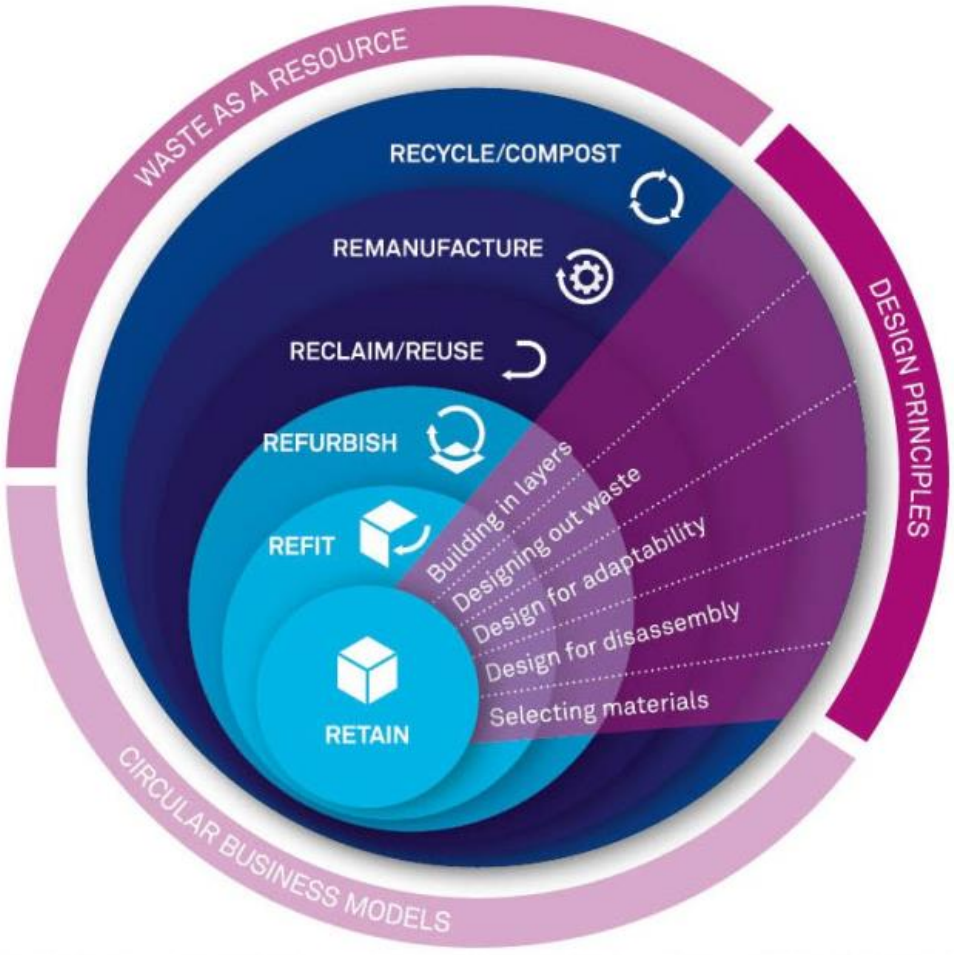


Figure 3 - Circular Economy Hierarchy, adapted from Building Revolutions (2016)

The Applicant's commitments to Circular Economy principles are described within various policies and initiatives. These include:

- *Responsible Sourcing and Specification:* The Applicant shall highlight the requirement to preferentially select materials which have a low environmental impact and high

recycled content or can be re-used. A Sustainable Procurement plan shall be developed for the site and is a targeted credit under the commercial BREEAM assessment. BREEAM Life Cycle Impacts assessment to be completed, with Green Guide ratings of A+ or A targeted for majority of major building elements. EPD certificates provided for major building elements – refer to Whole Life-Cycle Carbon Assessment.

- Opportunities to source materials locally will be prioritised. Local labour will be encouraged to reduce transport emissions during construction.
- *Sustainable Places:* The Applicant commits to recognise existing good practice in design and construction, and trial and incorporate any new and emerging technologies and approaches in sustainable development.
- *Reducing Waste:* The Applicant has a commitment to divert 95% of site waste (excluding hazardous waste) from landfill. From the earliest stages, they encourage design teams to consider opportunities to design out waste, while the production teams are responsible for evaluating how best to re-use or recycle materials.
- *Environmental and Energy Management Policy:* The Applicant is committed to minimising carbon emissions and water consumption across operations. They aim to achieve the sustainability targets by using efficient technologies and implementing training and behaviour change initiatives.
- *Environmental Procedures:* The Applicant adopts the waste hierarchy to reduce waste from all sites and developments, this includes accurate ordering of materials, ordering materials at the size required to avoid off cuts, liaising with suppliers to reduce packaging, creating employee awareness of environmental matters through Toolbox talks, and the use of construction materials which can be re-used to extend lifespan.

4.2 Circular economy approach for the existing site

The site is located on Ham Close, between St Richard's CE Primary School and Ham Street/Wiggins Lane, in a predominantly residential setting. The site is an existing Richmond Housing Partnership (RHP) owned estate, with 6 small parcels of land owned by the London Borough of Richmond Upon Thames. An agreement is in place for RHP to purchase the parcels to enlarge the development site. The site has 14 existing residential blocks, plus some ancillary uses including garages. The site is allocated in the local plan for redevelopment.

The site has also been allocated for regeneration within the draft Richmond Local Plan *'The best for our borough' Draft for consultation* (December 2021). It is noted that the existing flats are generally of poor construction, with poor insulation by modern standards, and many have condensation and damp issues. The blocks of flats do not have lifts, thus leaving a number of flats inaccessible to people with disabilities.

The under-occupied existing site has been selected to be regenerated to provide a mixed-use development comprising 452 residential homes (Class C3) up to six storeys; a Community/Leisure Facility (Class F2) of up to three storeys in height, a "MakerLabs" (sui generis) of up to two storeys together with basement car parking and site wide landscaping. As such, using the GLA decision making tree for the existing site the strategy is to demolish the existing on-site structures and to demolish and recycle materials as far as practicable in accordance with the waste hierarchy.

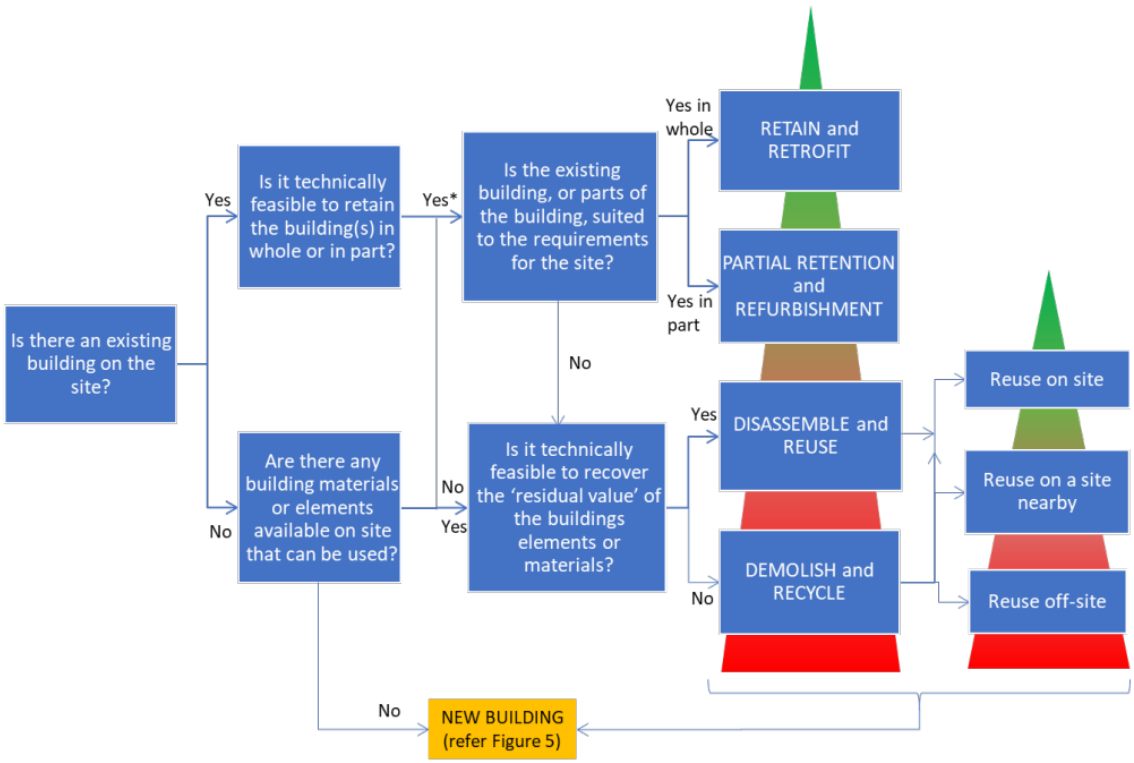


Figure 4 – GLA decision tree for design approaches for existing structures/buildings

4.3 Circular economy approach for demolition and construction

The below decision tree for the new build elements has been used to determine the best approach to circular economy on a buildings layer basis. The proposed new development is a long-life development. As a residential led scheme, it is not intended for regular change and as such shall primarily be guided by the principles and requirements for longevity. As such these sections of the Development shall be designed to meet long term needs while being durable and resilient to a changing climate. These areas have had internal layouts fully designed to optimise the usage of the internal space, met by utilising an intelligent grid to maximise future adaptability.

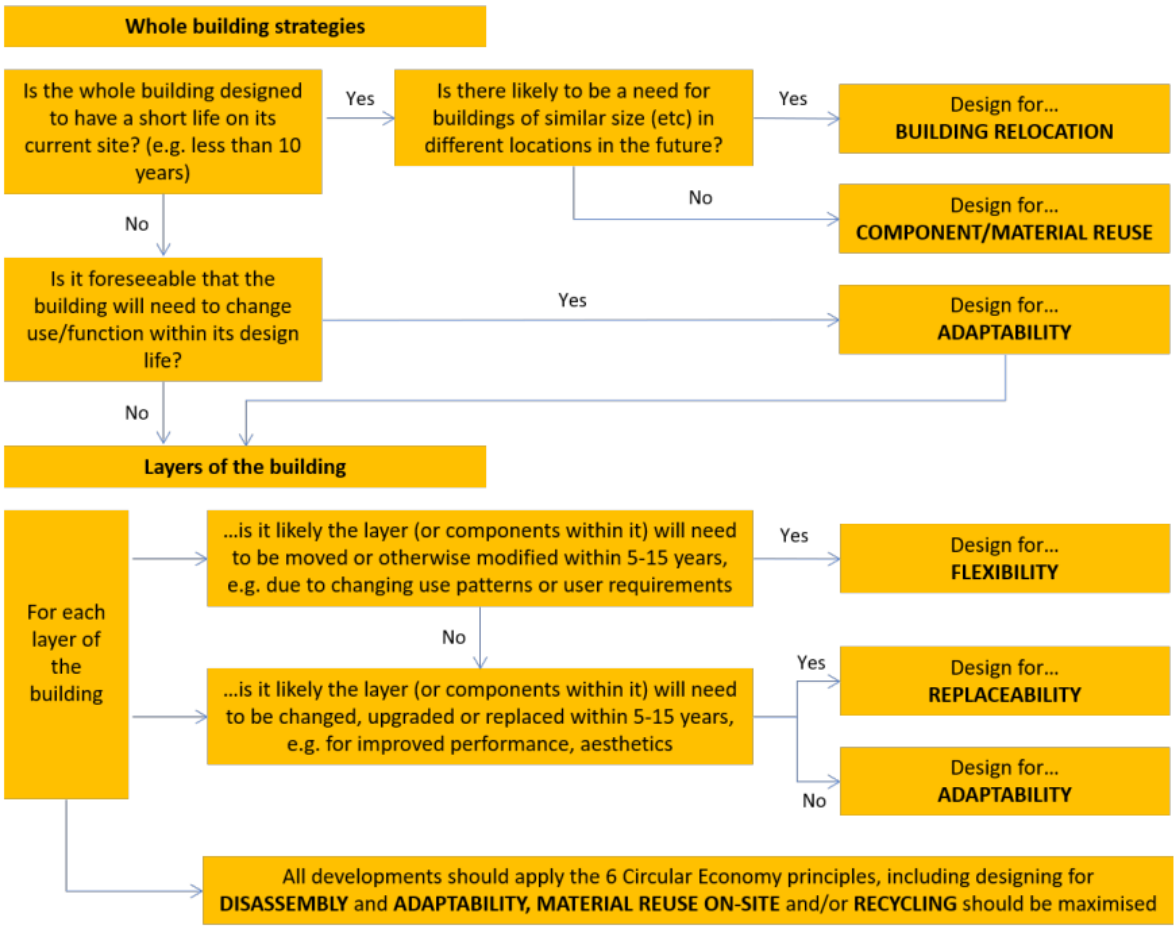


Figure 5 - GLA decision tree for design approaches for new buildings, infrastructure, and layers over the lifetime of development

Dynamic Simulation modelling shall be undertaken in accordance with CIBSE TM59 'Design methodology for the assessment of overheating risk in homes', TM52 'The limits of thermal comfort: avoiding overheating in European buildings', and a ventilation strategy will be

developed to demonstrate successful mitigation from the risks of overheating in accordance with CIBSE TM49 weather data climate scenarios.

The Development design will ensure significant carbon savings are achieved over the Part L baseline and reduce the site energy consumption through a highly efficient building fabric design. The proposed energy strategy is to implement a site-wide communal heat network with the heating demand supplied by high efficiency heat pumps (ASHP). This will supply efficient and low carbon space heating and hot water to all units. The renewables contribution will be from the inclusion of solar photovoltaics (PV) to suitable roof spaces. With the continual decarbonisation of the national grid, this provides a pathway for the Development to meet net zero carbon in the future.

Opportunities for site claimed timber from tree felling to be explored for use in low balancing/play trails and for sculpture/art interventions. Bricks from the demolition of the western boundary brick wall and the existing Maker Labs shall be reclaimed and re-used elsewhere on site.

As far as practicable, the Applicant shall look to maximise the use of recycled content within the Development where feasible. The use of pre-fabricated elements shall be prioritised, as these reduce construction waste, and include the use of precast floors and stairs.

Further details of how the new build element of the Site incorporates circular economy principles are provided in Section 5 below.

4.4 Circular economy approach for municipal waste during occupation

The Applicant shall provide refuse and waste storage in accordance with the London Borough of Richmond upon Thames requirements. Easily accessible communal waste storage shall be provided, with each residential core having its own waste and recycling stores on the ground floor. Waste storage shall be segregated by waste streams to maximise recycling rates. Bin stores shall be provided for houses to neatly accommodate all Local Authority recycling and waste containers to encourage recycling rates.

Furthermore, the Applicant is committed to delivering a management framework, which shall be developed for waste management, energy monitoring, and water monitoring for the Site in operation. This shall help deliver the 65% recycling of municipal waste by 2030 target.

5. CIRCULAR ECONOMY DESIGN PRINCIPLES

5.1 Circular Economy Narrative

A number of key commitments, metrics, targets, and design strategies have been identified which have been incorporated into the Development, and which contribute towards a circular economy. Full details are provided in the GLA circular economy template spreadsheet, and follow the GLA Circular Economy Core Principles. A summary has been provided below of the outline strategy for each principle.

5.2 Building in Layers

A useful way to understand a building or development is in terms of 'layers', where each layer has its own life cycle, life span, and relevant circular economy design approaches. To support reuse and recycling, the different layers should be independent, accessible, and removable whilst maintaining their value, where possible. This is especially important for layers that may need more frequent replacement, such as building services and internal fit-outs.

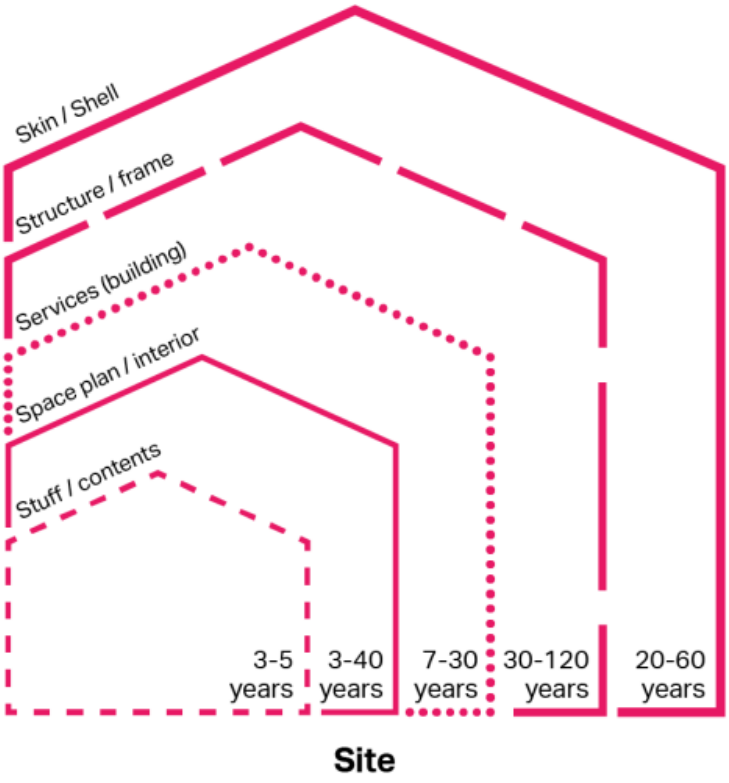


Figure 6 - GLA building layers and their indicative lifespans

The Applicant and Design Team have reviewed the following circular economy principles on a building layers basis and provide full details within the GLA circular economy reporting template spreadsheet which accompanies this report.

5.3 Designing out Waste

Module A: Product Sourcing and Construction Stage

This module concerns carbon emissions from the sourcing, transportation, fabrication and construction of all materials and products used within the Development. To ensure that the choices that are made will help reduce future carbon emissions through subsequent life-cycle stages, a close understanding of the supply chain is needed.

The following points highlight the design decisions which have been made to reduce waste during Module A:

- Minimising materials - slab type, foundation type, façade construction has been considered within the WLC assessment to reduce embodied carbon and total building weight. This reduces the quantity of materials used in the construction process. Floor plates will be rationalised as much as possible to maximise material efficiency whilst achieving a balance between form factor and dual aspect provision.
- Repetitive design has been utilised throughout the masterplan to minimise quantities of materials without impacting architectural character, seven pairs of blocks share the same designs and unit types have been rationalised and replicated throughout the scheme. Building form factor will be optimised where possible to increase efficiency and thus reduce the comparative thickness of insulation and overall area of facade required.
- Modern Methods of Construction and offsite manufacturing options shall be developed at the detailed design stage. Standard bathroom and en-suite types across scheme minimises variation. Stair master, balconies, utility cupboards, bathroom pods etc. shall be considered from a prefabrication perspective.
- The Applicant shall ensure that materials have a high recycled content and are easily recyclable to minimise the amount of virgin materials used (in-line with SI 7 minimum targets). The concrete used on the project will have a high GGBS content to minimise the amount of cement used and reuse a waste material from another process.

- Bricks from the demolition of the western boundary brick wall and the existing Maker Labs shall be reclaimed and re-used elsewhere on site.
- Aluminium and timber composite windows are proposed which will contain FSC certified timber and highly recyclable aluminium. Internal framing products to be specified with a high recycled content. All timber will be FSC certified.
- For the community centre facilities, investigating the use of timber structural components and timber internal finishes where feasible. The proposed window systems will potentially be a composite system incorporating aluminium and timber finishes. Proposing large format architectural masonry blocks with a recycled content of over 30% for the external envelope – these will also require less mortar joints compared to traditional sized brickwork i.e. meaning less cement is used in the envelope make-up.
- The Applicant works with suppliers to minimise packaging for construction deliveries and promote re-use, as well as implementing careful storage and management of on-site materials to prevent damage and consequent wastage.
- Service coordination and clash detection shall be carried out at the detailed design stage to minimise site mistakes and clashes leading to wastage.
- Basement designed so part of the temporary works structure, required to create a temporary watertight barrier to allow the phased construction of the basement, can be retained and used to provide permanent support to the completed structure.
- Community Centre fit-out to client specification – minimises the use of speculative finishes. Massing optimisation studies have been undertaken to review and reduce the overall building form and massing, thus reducing material quantum.

Module B: In-Use Stage

The objective of this module is to understand, at the design stages, how the building will perform post-construction; and how to ensure that in-use emissions will be minimised.

The proposed energy strategy is to implement a site-wide communal heat network with the heating demand supplied by high efficiency heat pumps (ASHP). This will supply efficient and low carbon space heating and hot water to all homes within apartment blocks. Individual homes will be supplied with individual ASHPs to maximise carbon savings and reduce occupant energy costs. Non-domestic areas will have heating and cooling provided by efficient VRF systems. The renewables contribution will be further maximised from the inclusion of solar photovoltaics (PV) to suitable roof spaces. This will ensure significant carbon savings

are achieved over the Part L baseline and reduce the Site energy consumption through a highly efficient building fabric design. The proposed energy strategy has demonstrated a 66% carbon reduction over the baseline emissions for the Site. This energy strategy is 100% reliant on electricity, and shall take advantage of the decarbonisation of the national grid as it continues to become 'greener' through increased renewable energy contributions.

Furthermore, enhanced energy modelling has been carried out as part of the Energy Strategy in accordance with CIBSE TM54 'Evaluating operational energy use at the design stage' which seeks to address the performance gap between Part L building regulation compliance and energy consumption in-use for non-domestic areas, including basement car parks, external lighting, lifts, and common areas. This shall allow for detailed analysis of predicted energy loads and allow for the design to be tailored.

Water consumption for the Site is to meet 105 litres per person per day in accordance with the London Plan Policy SI 5 for the residential element, and BREEAM WAT01 credits have been targeted for the non-domestic element, including leak detection.

Module C: End-of-Life Stage

This module captures the emissions from when the building has reached the end of its useful life, i.e. at the end of the 60-year reference study period. It covers deconstruction and demolition, transport, waste processing for reuse, recovery or recycling, and disposal, until the Site is cleared, level and ready for further use

Building Information Modelling will be stored to facilitate end-of-life strategy, disassembly, future reuse, waste avoidance, waste reduction etc. which will be outlined in the Operations and Maintenance manuals. The end-of-life strategy is provided in Section 8.

Module D: Benefits and Loads Beyond the System Boundary

Deciding what will happen to a building after it has been dismantled or demolished many years in the future is clearly speculative. However, in order to transform London to a resource-efficient, zero-carbon economy, it is essential that these issues are given careful consideration at the design stage. The principle is that for a project that follows the 'end of life' of the applicant's project, the future carbon emissions from making a component will be avoided and the saving will be equivalent to providing a new component or system.

The proposed Development has been designed for longevity, however durable external works materials, which can be re-used, have been maximised. High strength paving materials have been applied to high traffic areas to reduce breakage, and the façade is brick cladding and clay tile hangings will be used which will have a lifespan beyond the design life. The external skin will be predominantly brick, which is a natural, durable, and reusable material. Curtain walling system fixed to the structural slabs and soffits. This can be removed and replaced in the event of a major refurbishment and are easily accessible from outside of the building using mobile elevating work platforms (MEWP) or similar relevant machinery. This allows for clean and easy replacement at the disassembly stage without causing deconstructive damage to components to maximise refurbishment potential.

The Applicant shall explore specifying products which are componentised and can be repaired by replacing failed components, for example LED luminaires with replaceable lamps rather than chip on board luminaires. Specifying products which are easily dismantled and do not have fixings such as screws etc. reduces deconstructive damage and facilitates refurbishment for use elsewhere.

5.4 Designing for Longevity

The new Development is a long-life development. As a residential led scheme, it is not intended for regular change and as such shall primarily be guided by the requirements for longevity. As such these sections of the Development shall be designed to meet long term needs while being durable and resilient to a changing climate.

Use of a reinforced concrete frame which will last for at least the design life of the Development and can be extended with sufficient maintenance. Minimum design life of 50 years in accordance with Eurocode design standard requirements and LABC standards.

External brick cladding and clay tile hanging will be used which will have a lifespan beyond the design life of the Development. The external skin will be predominantly brick, which is a natural, durable, and reusable material

A dynamic overheating assessment has been completed to reduce overheating of the building using future climate scenarios.

High efficiency interior and exterior LED lighting has been specified to reduce quantities and improve operational life span.

5.5 Designing for Adaptability or Flexibility

The Community Centre and MakerLabs spaces are likely to undergo use changes intermittently, and as such will be guided by the requirement for adaptability. However, these are not likely to undergo changes as frequently as commercial spaces so are also guided by longevity.

Lightweight partitioning within apartments means no load bearing partitions will be provided, which maximises internal remodelling for adaptability for future tenants.

MEP services and energy centre designed for ease of access and for ease of replacement in the future, with direct access to the Energy Centre from the exterior of the building with large doors to enable easy replacement of MEP equipment.

Future connection to local DHN when available - plant switch-over maximised and allocated pipework routes to minimise disruption.

5.6 Designing for Disassembly

Components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. Building information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction. There shall be a requirement for method statements on end of life from contractors and sub-contractors to be provided in the Operation and Maintenance Manuals - this shall form part of contractual obligations.

Disassembly is facilitated by principles allowing the building or parts of the building to be easily disassembled at the end of its life, or to be refurbished rather than demolished. The following measures shall be implemented to facilitate disassembly at end of life:

- Improve durability of materials where practicable in common areas
- Use reversible and/or mechanical connections where practicable, to facilitate disassembly and ensure materials can be recovered in a high value state

- Utilise layer independence where practicable (designing building systems and components in layers so that removal, adjustment, or replacement of some elements is feasible, especially when different components have different life spans and maintenance needs)
- Utilise standardised products and/or modular systems, including pre-fabricated elements

5.7 Using Systems, Elements or Materials that can be Re-used and Recycled

The Applicant is committed to increasing the use of Modern Methods of Construction on their developments. The use of MMC enables the Applicant to increase resource efficiency and reduce the amount of waste produced compared to traditional on-site construction methods. For this Development, the Applicant shall consider:

- Precast stairs for the communal stairs constructed off-site
- Precast bolt on balconies constructed off-site
- Utility cupboards constructed off-site
- Bathroom pods constructed off-site
- Mechanical risers constructed off-site

6. PRE-REDEVELOPMENT & PRE-DEMOLITION

6.1 Pre-Redevelopment

A pre-redevelopment audit is a tool for understanding whether existing buildings, structures and materials can be retained, refurbished, or incorporated into the new Development. If there are existing buildings on a site, a third-party, independently verified or peer-reviewed pre-redevelopment audit is strongly encouraged, including analysis that fully explores options for retaining existing structures, materials, and the fabric of existing buildings into the new Development; and the potential to refurbish buildings before considering substantial demolition.

At the time of the initial workshops (Appendix 1) the requirement for a pre-redevelopment audit was not included in the GLA Circular Economy Statement Guidance *Draft for Consultation* (October 2020). However, these proposals still adopt the circular economy principles and seek to improve resource efficiency and innovation. In lieu of this, as detailed in section 4.2, the site has also been allocated for regeneration within the draft Richmond Local Plan *'The best for our borough' Draft for consultation* (December 2021). It is noted that the existing flats are generally of poor construction, with poor insulation by modern standards, and many have condensation and damp issues. The blocks of flats do not have lifts, thus leaving a number of flats inaccessible to people with disabilities. Many of the existing structures are not suitable for re-use as accommodation, however, where practicable materials shall be reclaimed and re-used on-site.

6.2 Pre-Demolition

A pre-demolition audit is a detailed inventory of the materials in the building that will need to be managed upon demolition. The audit should be undertaken by a third-party independent specialist with expertise in reclamation of components and materials and experience in preparing these types of reports.

A pre-demolition audit has been undertaken by a third-party independent specialist, Rye Demolition Ltd, which aims to provide an understanding of the materials arising during the refurbishment and demolition phases of a redevelopment, and to help with the development of a resource management plan. The Audit identifies products and/or materials that could be

incorporated into subsequent development, and ensures the management of material from the demolition/refurbishment process is in line with the waste hierarchy i.e. maximise reuse and closed loop recycling and minimise waste to landfill.

The pre-demolition audit (Appendix 2) identifies that the potential recycling and diversion from landfill rate for the Site is **98**%, which is above the London Plan Policy SI 7 95% minimum target.

7. BILL OF MATERIALS

As part of the GLA guidance outlined in '*London Plan Guidance: Circular Economy Statements'* LPG (March 2022) document, the Applicant should demonstrate that they have considered opportunities to conserve resources by applying lean design principles and to source materials sustainably.

Detailed Circular Economy Statements must include a completed Bill of Materials which estimates the quantity of materials used in each 'layer' of the building (kg), the material intensity (kg/m2 GIA) and set targets for the minimum amount of recycled content to be used (% by value). Applicants should identify opportunities for use of reused or recycled materials and set individual targets of at least 20% by value of materials.

The purpose of reporting material intensity is twofold: first, to gather evidence about the material intensity of different structural systems and development types; and second, to ensure that material optimisation is considered as part of the design process.

The Bill of Materials Table (within the GLA circular economy reporting template spreadsheet) has been completed using building calculations provided by the Design Team and the cumulative results tabulated. The reported data are based on a best estimate and shall be reviewed at the post construction stage.

The Bill of Materials 'End of Life Stage (Module C)' assumed end of life scenarios (within the GLA circular economy reporting template spreadsheet) has been completed using reference numbering which correlate to the descriptions set out below.

1 = Recycled into new product
2 = Left in Ground
3 = Recycled as aggregate
4 = Product recovered for reuse
5 = Reused once Refurbished
6 = Recycled into new product

8. END-OF-LIFE STRATEGY

The end of the life of the scheme has been considered from an early stage to ensure it can be simply deconstructed. The first priority is to ensure that buildings last beyond their design life. The proposed development is built out of a conventional reinforced concrete flat slab frame and brick external cladding, both of which are well established and robust materials. These materials, when properly maintained and looked after, can outlast the proposed design life of the Development. As such, at the end of its design life, the building would be suitable for refurbishment.

To aide this, there are a number of techniques that can be used to extend the life of key materials. It is likely over the lifetime of the Development further techniques will be developed to extend the life of the materials. Information on these techniques will be included in the O&M manual.

When dissembling the building, the key structural materials are all recyclable, re-useable or can be re-used on site as crushed aggregate for future developments. Guidance on disassembly and disposal of key materials shall be provided within the O&Ms.

The following sections detail principles which shall be implemented to facilitate material recovery at the end of life stage.

8.1 Durability

Durable materials shall be specified in all areas that are subject to high pedestrian movement, such as communal spaces. This will extend the lifespan of building materials, in particular those that are exposed, thereby reducing the need for replacement over the building's lifecycle.

8.2 Design for Disassembly

Components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. Building Information will be stored to facilitate end of life strategy, disassembly, future reuse, waste avoidance, and waste reduction. There shall be a

requirement for method statements on end of life from contractors and sub-contractors to be provided in the O&Ms - this shall form part of contractual obligations.

Disassembly is facilitated by principles allowing the building or parts of the building to be easily disassembled at the end of its life, or to be refurbished rather than demolished. The following measures shall be implemented to facilitate disassembly at end of life:

- Improve durability of materials where practicable in common areas
- Use reversible and/or mechanical connections where practicable, to facilitate disassembly and ensure materials can be recovered in a high value state
- Utilise layer independence where practicable (designing building systems and components in layers so that removal, adjustment, or replacement of some elements is feasible, especially when different components have different life spans and maintenance needs)
- Utilise standardised products and/or modular systems, including pre-fabricated elements

8.3 Layer Independence

The Development has been designed with the RICS 'building layers' in mind, and where practicable building elements and components with different lifespans will form independent layers. This will ensure those layers with shorter lifespans can be replaced without causing damage to layers which have longer lifespans.

8.4 Standardisation

Standard-size materials shall be used where practicable to accommodate and facilitate multiple uses, reuse and upgrading. Additionally, standard types of connections shall be specified, as these can be separated and reused more easily. A review of standardisation has been carried out and it is proposed to use standard M&E cupboards, standardised bathroom layouts, and prefabricated components such as precast stairs & ramps. Standardisation and modularity allow elements to be slotted together or taken apart to promote disassembly and flexible environments, as well as reducing construction waste. The feasibility of inclusion of modular elements will be fully evaluated post planning.

9. OPERATIONAL WASTE MANAGEMENT

Operational waste shall be management to demonstrate that the Development will achieve the relevant targets set out in London Plan Policy SI 7. This includes shared, adequate, flexible, and easily accessible storage space and collection systems, as required by London Plan policies D3, SI 7 and D6. This will help the Site to achieve the Policy SI 7 65 % municipal waste recycling target by 2030.

The Applicant shall provide refuse and waste storage in accordance with the London Borough of Richmond upon Thames requirements ‘‘Refuse and recycling storage requirements supplementary planning document - Adopted April 2015’. Each house is to be provided with a brick-built, covered external bin store at the front of the property and shall have the capacity for 1 No. 23L green bin and 2 No. 55L recycling bins for separate recycling requirements. Each block of flats is provided with a ground floor refuse store with level, step free access and space for manoeuvring and turning wheelchairs where required, with suitable segregation to facilitate waste recycling. Note there is currently no communal collection services within LBRuT, however illustrative space has been provided should such a service become operational. Full refuse storage provision drawings are provided in Appendix 4.

The Applicant has considered measures such as consolidated, smart logistics and community-led waste minimisation schemes. This includes a proposed community-led composting scheme by the communal growing spaces and planters in the courtyard gardens to keep compost waste on-site, and partnering with Richmond MakerLabs charity on-site to give them suitable spare build/construction materials and tools for them to re-use. The on-site management team shall have responsibility for implementing smart logistics and for monitoring and reporting on operational waste performance.

Furthermore, the Applicant is committed to delivering a management framework, which shall be developed for waste management, energy monitoring, and water monitoring for the Site in operation. This shall help deliver the 65% recycling of municipal waste by 2030 target, and the business waste recycling target of 75 per cent by 2030 where applicable. The Applicant is committed to managing operational waste in accordance with the Waste Hierarchy.

10. RECYCLING AND WASTE REPORTING

In order to minimise waste streams sent to landfill, and in an effort to maximise diversion in line with the waste hierarchy, the GLA guidance outlined in '*London Plan Guidance: Circular Economy Statements'* LPG (March 2022) document requires estimating and reporting the total amount of waste/ material generated during demolition, excavation, construction, and operation (in-use).

Detailed Circular Economy Statements must complete the Recycling and Waste Reporting Table (within the GLA circular economy reporting template spreadsheet) with clearly defined activities and targets relating to the following London Plan policy targets:

- 95% reuse/recycling/recovery of construction and demolition waste
- 95% beneficial use of excavation waste
- 65% recycling of municipal waste by 2030

The Applicant's target is to reuse or recycle a minimum of 95% of all the demolition, excavation, and construction waste generated from the proposed Development. This target will be monitored by the Applicant, with waste logged against the contractor producing the waste, the end destination and the type of waste generated. Prior to a new contractor joining the Site they will be required to provide copies of the appropriate licences for their intended waste carriers and proof that as far as possible the end destinations are Material Recovery Facilities.

During construction a Timber Tracker will be used on site to record the source of all timber brought to site by all contractors. As part of the procurement process all contractors will be required to use only FCS or PEFC certified timber on site. The chain of custody certificates must be submitted to the Applicant before a supplier will be allowed onto site and all deliveries cross referenced with these.

11. CONCLUSION

This report summarises the Circular Economy strategy for the regeneration of Ham Close, in order to meet the sustainability requirements of the GLA London Plan Policy SI7 '*Reducing waste and supporting the Circular Economy'*, following the guidance outlined in '*Circular Economy Statements (2022)*' guidance document.

This circular economy strategy was developed in collaboration with the Design Team and Developer, following a virtual workshop held on 22nd September 2021. The workshop minutes are detailed in the Appendices. An overall strategic approach has been identified for both the existing buildings on the site and the proposed new Development.

A number of key commitments and design strategies have been identified to ensure the Development will contribute towards a circular economy. These involve design decisions to minimise resources used, minimise waste and strategies to manage waste effectively. The Strategic Approach has been defined following the Circular Economy Core Principles. This report should be read in conjunction with the submitted GLA circular economy template spreadsheet.

APPENDIX 1: CIRCULAR ECONOMY WORKSHOP MINUTES

CIRCULAR ECONOMY WORKSHOP MEETING

Date:	22nd September 2021		
Location:	Online meeting (MS Teams)		
Attendees:	Kirsty Dougan	-	Hill Residential
	Nick Silk	-	Hill Residential
	Teo Lall	-	Hill Residential
	Joe Boyton	-	Hill Residential
	Jonathan Burnham	-	BPTW
	Jo Peycheva	-	WR-AP
	Jeremy Lord	-	LUC
	Mark Fisher	-	LUC
	Tony Miller	-	Jubb
	Bomi Ogunade	-	AWA Building Services
	Juliano Mandinga	-	Energist UK
	James Alexander	-	Energist UK
Distribution:	As above		

	Item	**Action**
1.0	**Introduction to Circular Economy**	
1.1	JA introduced the concept of the circular economy and provided the GLA definition and how it can be considered within the built environment and to resolve issues surrounding a linear economy. The core guiding principles of the circular economy were explained and how these relate to the built environment on a 'building layer' basis.	
2.0	**Targets**	
2.1	Targets for the site were discussed and comparison drawn to BREEAM credits for adaptation studies and waste management. It was noted that this is a regeneration development, with demolition required for existing buildings and hardstanding.	**Hill**

A demolition audit shall be required prior to start on site to ascertain quantities of materials and identify the most valuable end-use for wastes streams.

2.2 JA confirmed that the GLA circular economy targets are for a 95% diversion from landfill for demolition, construction, and excavation waste, as well as a 65% target for operational municipal waste.

2.3 It was discussed that the GLA have a target for a minimum of 20% recycled or reused materials for each building element. Applicants can either report against targets for different building layers (for example, structure, shell/skin and space) or for different materials (for example, metals, plastic, timber). If reporting by material, calculations should focus on those with the highest value and aim to address at least 80% of the material used (i.e. 80% by value). If reporting by building layer, applicants should focus on the 'structure', 'shell/skin' and 'space' as a minimum.

3.0 Strategic Approach

3.1 With reference to the GLA decision tree, it was discussed that the strategic approach for the site was to redevelop the existing site as the existing buildings and sites are underutilised and not fit for repurposing. The strategy for the building design shall thereafter be to maximise flexibility, adaptability, and longevity principles for the respective building layers.

3.2 A review of the design strategies and design features currently incorporated into the design and potential changes were reviewed against the GLA Circular Economy 'Core Principles'. A number of key commitments and design strategies were identified to ensure the Development will contribute towards a circular economy. These involve design decisions to minimise resources use, minimise waste and strategies to manage waste effectively. Draft commitments to be issued to the team for further review and assessment of the impacts on the circular economy and designing to eliminate waste. **All**

3.3 As the design develops, an estimate of material quantities shall be provided by Design Team in order to complete the GLA Table 3 template for estimated bill of materials, as part of the Detailed Circular Economy Statement. These data will be as provided for the WLC assessment. **All**

3.4 A disassembly and end-of-life strategy will need to be developed for major building elements, to facilitate recovery of materials and maintain them at their highest value for as long as possible. This shall be required for the Detailed Circular Economy Statement. **All**

APPENDIX 2: DEMOLITION AUDIT

Provided Separately, the below is a summary of the recommended demolition waste targets.

	Weight (tonnes)	Reuse rate	Recycling rate	Sent to efW/landfill
Concrete	12,438.50	0%	100%	0%
Brick	5,229	0%	100%	0%
Plaster products	167	0%	75%	25%
Bitumen	3	0%	100%	0%
Metal	300	0%	100%	0%
Timber products	285	1%	100%	0%
Ceramic	23	0%	100%	0%
Carpet	28	0%	35%	65%
Glass	29	0%	100%	0%
Plastics	21	0%	95%	5%
Asbestos	120	0%	0%	100%
Stone	185	75%	25%	0%

Figure 7 - Rye Demolition Ltd. pre-demolition audit estimates

APPENDIX 3: EXCAVATION CALCULATION

James Alexander

From: Ben Stone <BenStone@hill.co.uk>
Sent: 24 March 2022 11:40
To: James Alexander; Kirsty Dougan; Juliano Mandinga
Cc: Nick Silk; Nick Silk
Subject: RE: Demo assessment

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Circular Economy

Hi James,

Is the below what you are looking for with regards to earthworks quants for Ham Close. Sorry if wrong, but this was my take on what's needed having not provided this previously.

Thanks

Ham Close				
Approximate Earthworks Quantities				
	Area	Depth	Quantity	
Basement Excavation	7,726	4	30,904	m3
Ramps	300	2	599	m3
Reduced Level Dig	23,968	0.25	5,992	m3
Residential Units Reduced Level Dig	10,104	0.35	3,537	m3
Commercial Reduced Level Dig	407	0.35	142	m3
Roads	3,548	0.35	1,242	m3
Attenuation Tank			540	m3
Adopted Drainage			2,880	m3
Private Drainage			2,993	m3
Services			420	m3
TOTALS			**49,248**	**m3**

Ben Stone
Commercial Manager
Mob: 07966 121178

APPENDIX 4: REFUSE STORAGE AND COLLECTION

The refuse and recylcing strategy has been developed in accordance with the LBRuT 'REFUSE AND RECYCLING STORAGE REQUIREMENTS SUPPLEMENTARY PLANNING DOCUMENT - Adopted April 2015'.

Houses with individual refuse containers:

Refuse:
Storage capacity of 360 litres for refuse per household more than three bedrooms

Dry recycling storage capacity:
Storage capacity for two 55 litre recycling boxes.

Food Recycling:
Storage capacity for one 23 litre food waste container per unit

Space must be provided so that the boxes can be presented within the property boundary and be visible from the kerbside on collection day.

Apartments with communal stores:

Refuse
Storage capacity of 70 litres per bedroom. This requirement relates to communal waste containers.

Dry Recycling:
12 to 17 flats - 4x 360L
18 to 25 flats - 2x 1100L
26 to 45 flats - 4x 1100L

Food waste :
There is currently no communal food waste collection for properties of six units and above

4.2 Carry and push distances for the collection of refuse and recycling

- Waste collection operatives should not be required to carry waste sacks, dustbins or move wheeled bins more than 20 metres in total.
- Storage areas for residential dwellings should be sited so that the occupiers are not required to carry refuse or recycling more than 30 metres from an external door.
- In residential dwellings, consideration should be given to access for disabled persons, where appropriate

4.3 Vehicle access

In the event that it is not possible to create permeable through routes for collection vehicles, British Standard (BS 5906: 2005) recommends a maximum reversing distance for vehicles of 12m.

Greater distances may be acceptable within functional limits where this would allow for substantial gains in other aspects of design. Whatever the distance agreed, any reversing routes should be straight and free from obstacles and visual obstructions.

Figure 8 - Proposed refuse strategy (BPTW drawing HCR-BPTW-S01-ZZ-DR-A-0104)

4.7.4 Typical Refuse Storage Provision

The refuse and recycling strategy has been developed in accordance with the LBRuT "Refuse and recycling storage requirements supplementary planning document - Adopted April 2015' capacity and is as follows:

Houses

Each house is to be provided with a brick-built, covered external bin store at the front of the property. This is sized to accommodate the required bins listed below:

Refuse	360 litres per household over 3 bed - 60 x 90 x 110cm (w x d x h)
Dry Recycling	Two 55 litre recycling boxes - 59 x 39 x 35cm (w x d x h)
Food Recycling	One 23 litre food waste container - 32 x 41 x 42cm (w x d x h)

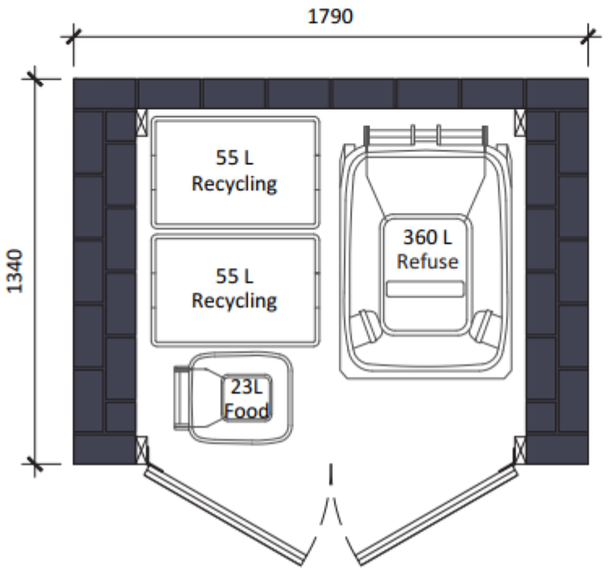
Flats

Each block of flats is provided with a ground floor refuse store with level, step free access and space for manoeuvring and turning wheelchairs where required.

Storage provision is calculated as per the below requirements, from the Refuse and Recycling Storage Requirements SPD:

Refuse	70 litres per bedroom. This relates to all communal waste containers. 110 litre euro bin - 127 x 100 x 138cm (w x d x h)
Dry Recycling	12 to 17 flats - 4x 360L 18 to 25 flats - 2x 1100L 26 to 45 flats - 4x 1100L 110 litre euro bin - 127 x 100 x 138cm (w x d x h)
Food Recycling	No communal collection provided. Allowance made for one 240 litre bin per block for future collections. - 59 x 74 x 106cm (w x d x h)
Bulky items	Additional storage space considered in each flat block refuse store for redundant bulky household goods.

Illustrative house bin store plan
Scale 1:20



Illustrative flat block bin store plan
Scale 1:50

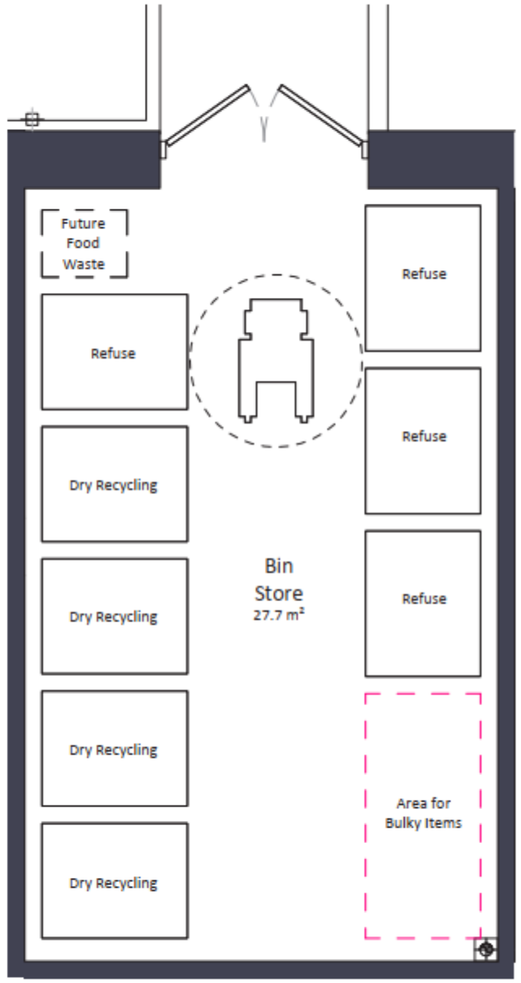
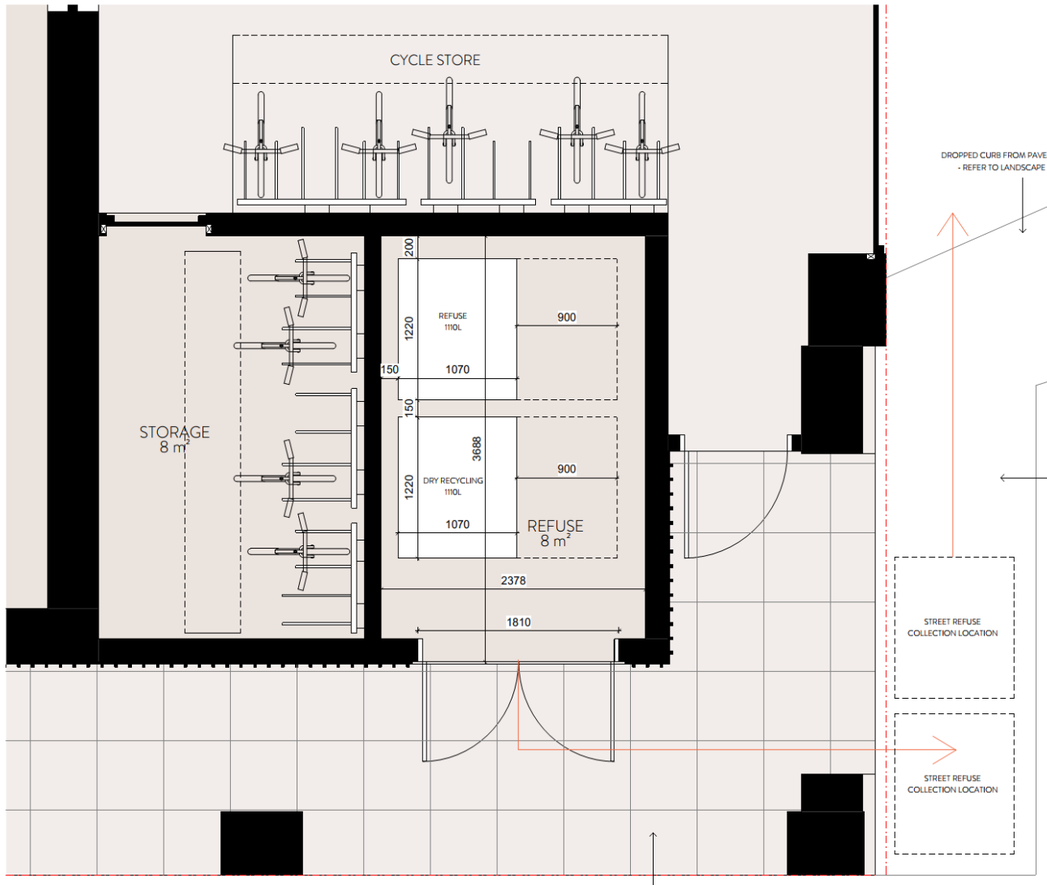


Figure 9 - Design and Access Statement, Section4.7.4 detailing waste storage provisions for typical houses and flat blocks, showing suitable waste segregation in accordance with LBRuT requirements

2 PROPOSED GROUND FLOOR PLAN



1 PROPOSED GROUND FLOOR REFUSE STORE PLAN

SCALE 1:20

200 0 200 400 600 800 1000 mm

N

DISCLAIMER:
1. This drawing is copyright and remains the property of Wesson Rengifo Architects Practice
2. This drawing is protected by copyright and is for use on this specific project site only.
3. Do not scale from this drawing.
4. This drawing is to be read in conjunction with all related drawings.
5. The originator should be notified immediately of any discrepancy.
6. All dimensions and Setting-out must be confirmed on site, prior to start fabrication and installation.
7. This drawing is to be read in conjunction with M&E, Fire, Structural, Landscape information, drawings and specifications.
8. Fire rating as per fire strategy.
9. Refer to landscape drawings for further information on landscape strategy
10. All existing drawings show indicative heights and measurements
11. Drawings based on topographical information from SURVEY SOLUTIONS no. 353188WUG-01

PROPOSED PLANS LEGEND

Denotes site boundary

Existing garages

LBRuT Rufuse and recycling storage requirements for commercial developments is suggested to be 2.6m³ for every 1,000m² gross floor space.

The Community Centre has a gross floor space of 716m² so the required storage should be 2.6m³.

50% of this capacity should be retained for the storage of separated waste for recycling. Therefore 1.3m³ of the area is allocated to recycled storage.

2 x 770l bins (1,220 (w) x 770 (l) x 1,360 (h)) would provide this 2.6m3 requirement.

The bins will be located in the enclosed refuse store which is located for clear and easy access on collection day.

rev	description	date	dr by	ch by
P01	Planning Issue	25/05/22	JP	SW
P02	Refuse Store - Amended Configuration	13/06/22	JP	SW

ORIGINAL BY JP

WRAP

Client
HILL RESIDENTIAL

Project
HAM CLOSE COMMUNITY CENTRE

Drawing
PROPOSED GROUND FLOOR REFUSE STORE PLAN

Drawing number: WRAP_GA_A_0190
Scale: AS INDICATED
Project number: 20019
Issue status: PLANNING ISSUE

WRAP	GA	A	0190	P02
ORIGINATOR	VOLUME	LEVEL	NUMBER	REV

Figure 10 - Community Centre refuse storage plan, showing suitable waste segregation in accordance with LBRuT requirements

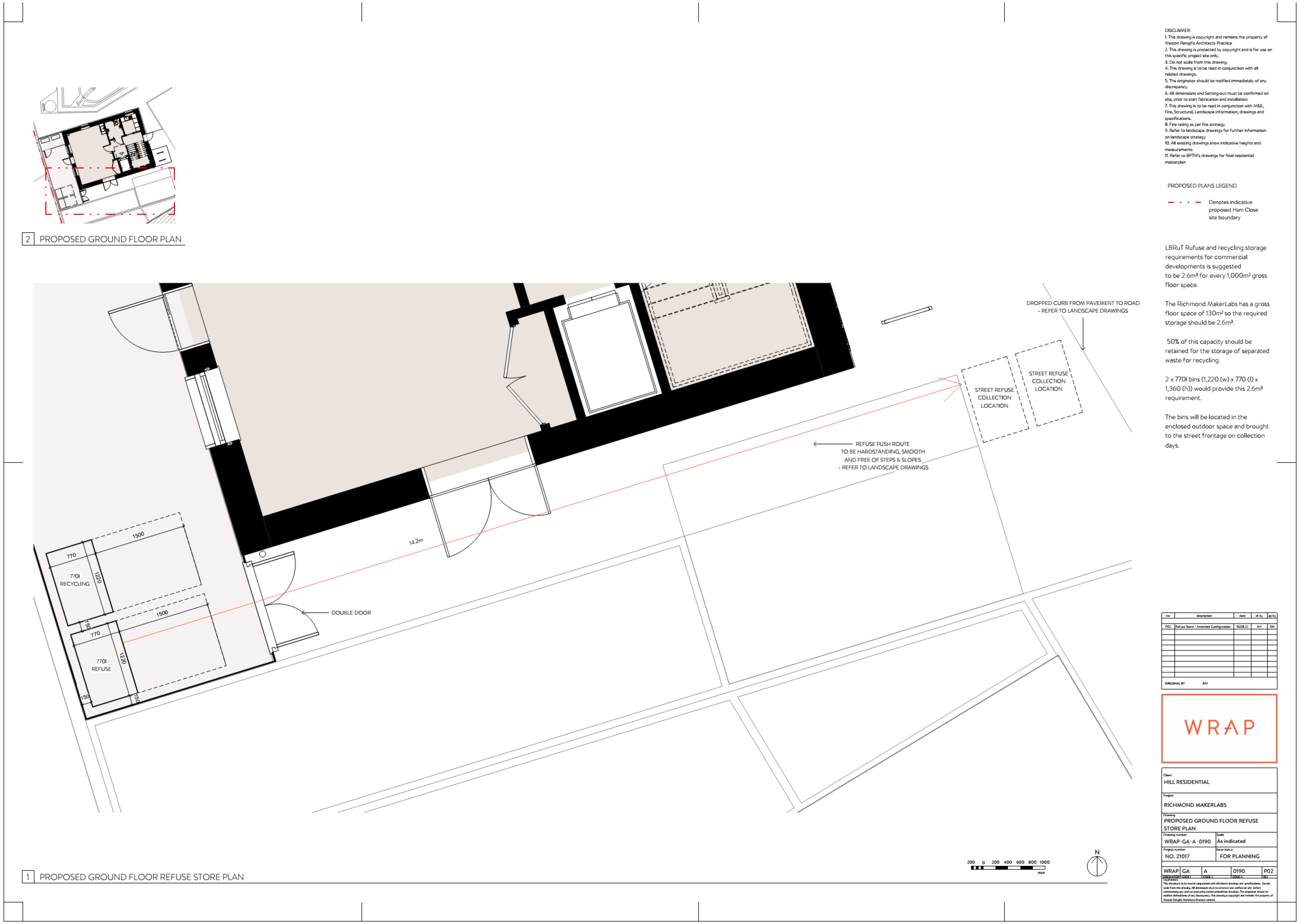


Figure 11 - Markerlabs refuse storage plan, showing suitable waste segregation in accordance with LBRuT requirements

APPENDIX 5: OPERATIONAL WASTE ESTIMATES

The below refuse and recycling storage provisions have been used to estimate operational waste in tonnes for the residential areas.

Based on the weekly required capacity of 43,190 litres for the total dwellings, and using a typical weight of 270kg per cubic metre (data taken from Defra), this equates to circa 11.66 tonnes per week for the residential use, or circa 606 tonnes per year based on a weekly collection cycle. This is likely to be something of a worst-case given this assumes all bins are at capacity during collection and noting the actual weight will vary depending on the type of waste.

Block	Number of flats per block	No. of Inhabitants	No. of bedrooms	Waste Volume (L) per bedroom	Waste Volume (L) per Block	Number of Recycling bins needed
A	14	46	24	70	1680	2
B	21	69	37	70	2590	2
C	41	125	68	70	4760	4
D	21	63	32	70	2240	2
E	38	112	59	70	4130	4
I	38	112	59	70	4130	4
M	52	132	68	70	4760	6
N	18	36	18	70	1260	2
O	12	42	21	70	1470	2
R	20	62	32	70	2240	2
S	43	130	69	70	4830	4
TU	36	100	53	70	3710	4
V	42	108	55	70	3850	4
W	14	39	22	70	1540	2

Figure 12 - Refuse and recycling storage provisions for residential areas

As detailed in Appendix 4, the houses are provided with:

- 1 x 55 litre open box for mixed paper;
- 1 x 55 litre open box for mixed containers

In addition to this, the flats are provided with:

- Paper/card recycling: Wheeled bins of between 240-1100 litres providing at least 55 litres per household;
- Mixed container recycling: Wheeled bins of between 240-1100 litres providing at least 55 litres per household

According to London Borough of Richmond upon Thames, they collect the following which shall be accommodated within the bin stores:

Mixed paper:

- Paper and card
- Cardboard
- Envelopes and junk mail
- Cartons (e.g. TetraPaks)

Mixed containers:

- Glass bottles and jars
- Plastic bottles, pots, tubs and trays
- Cans and tins
- Aerosols (empty)
- Foil

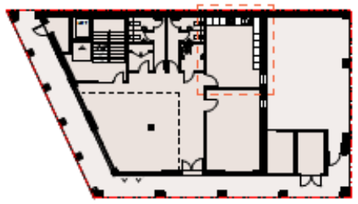
The non-domestic areas are provided with the following refuse and recycling storage bins:

- Community Centre – 2 No. 1,100 litre bins
- MakerLabs – 2 No. 770 litre bins

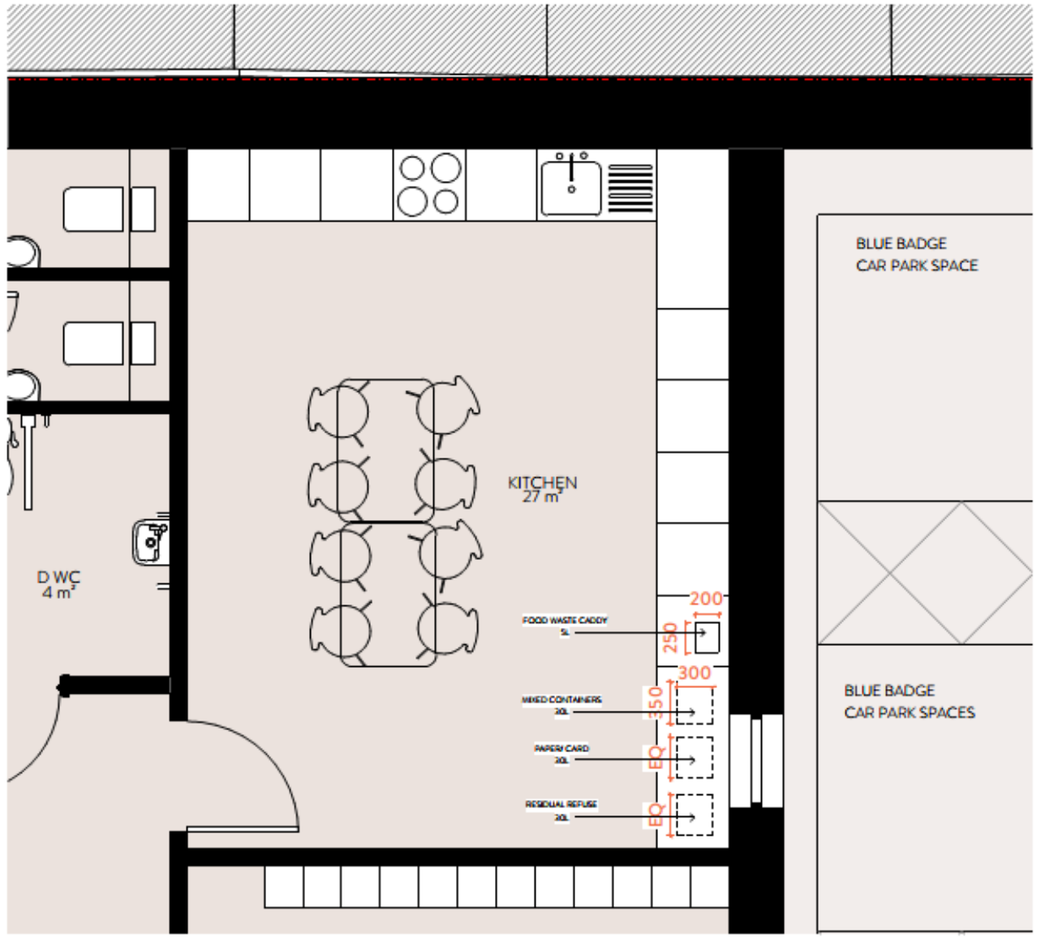
The worst-case scenario results in 3,740 litres in total, of which 50% would be assumed as residual waste (1,870 litres). This equates to circa 0.50 tonnes per week, or 26.25 tonnes annually. Both the Community Centre and Maker Labs have an allocated dry recycling bin which will accommodate the following waste streams:

- card
- paper
- mixed plastics
- metals
- glass

Provided below is a kitchen floor plan of the community centre, which shows where the Applicant has allocated the required bins for kitchen areas following the guidance from the new LBRuT SPD “kitchen design should cater for at least three streams of waste namely (i) mixed containers; (ii) paper/card; and (iii) residual refuse. This storage space should typically be provided under the counter and should provide at least 30 litres capacity for each of these three waste streams. Occupants should also have suitable space to store a five litre food waste caddy on the kitchen counter.” The Maker Labs are not expected to generate any food waste due to the nature of the operation.



2 PROPOSED GROUND FLOOR PLAN KEY PLAN



1 PROPOSED GROUND FLOOR KITCHEN REFUSE BINS

PROPOSED PLANS LEGEND

Denotes site boundary

Existing garages

The following bin dimensions and requirements are based on the new draft LBRuT SPD, which states:

Whilst outside the planning process, in addition to the waste and recycling container requirements detailed below, kitchen design should cater for at least three streams of waste namely (i) mixed containers; (ii) paper/card; and (iii) residual refuse. This storage space should typically be provided under the counter and should provide at least 30 litres capacity for each of these three waste streams. Occupants should also have suitable space to store a five-litre food waste caddy on the kitchen counter."

Three 33 litre bins (350 (w) X 200 (d) x 350 (h)) have been provided under the counter in the kitchen area, alongside a 5 litre (250 (w) x 200 (d) x 200 (h)) food waste caddy on the kitchen counter.

ORIGINAL BY	JP			

WRAP

HILL RESIDENTIAL

HAM CLOSE COMMUNITY CENTRE

PROPOSED GROUND FLOOR KITCHEN REFUSE BINS

WRAP_A_01H	AS INDICATED
20019	PLANNING ISSUE

WRAP	A	01H	P01

Figure 13 - Community Centre kitchen food waste storage provision plan, showing suitable waste segregation in accordance with LBRuT requirements