11-12 INGESTRE ROAD, LONDON

Reuse and Restoration Strategy – Revision B

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Reference: PN/VL/P17-1282/16 Rev B

Date: May 2024

11-12 INGESTRE ROAD, LONDON
Reuse and Restoration Strategy
Revision B

Contents

Appendices

Registration of Amendments

Revision	Amendment Details	Revision Prepared By	Revision Approved By
Rev A 03/07/2024	Added appendices B (Pre-redevelopment and Pre-demolition audit) and Appendices C (Refuse and Recycling plan)	PN	SS
Rev B 29/07/2024	Revised Appendix B (Pre-redevelopment and Pre-demolition audit)	PN	SS

EXECUTIVE SUMMARY

This Reuse and Restoration Strategy has been prepared by Create Consulting Engineers Ltd on behalf of the Client to support the discharge of condition 24 (Circular Economy) of planning permission 2018/4449/P in relation to the Development at 11 – 12 Ingestre Road, London, NW5 1UX.

The report sets out the strategies for the reuse and restoration through Circular Economy approach principles for the Proposed Development. The holistic approach has been undertaken in accordance with London Plan policy SI7 'Reducing waste and supporting the Circular Economy'.

The site is surrounded by residential buildings and is located in close proximity to Tufnell Park tube station to the east and Kentish Town tube station to the south-east. Hampstead Heath Park is located approximately 500 meters to the north-west of the site.

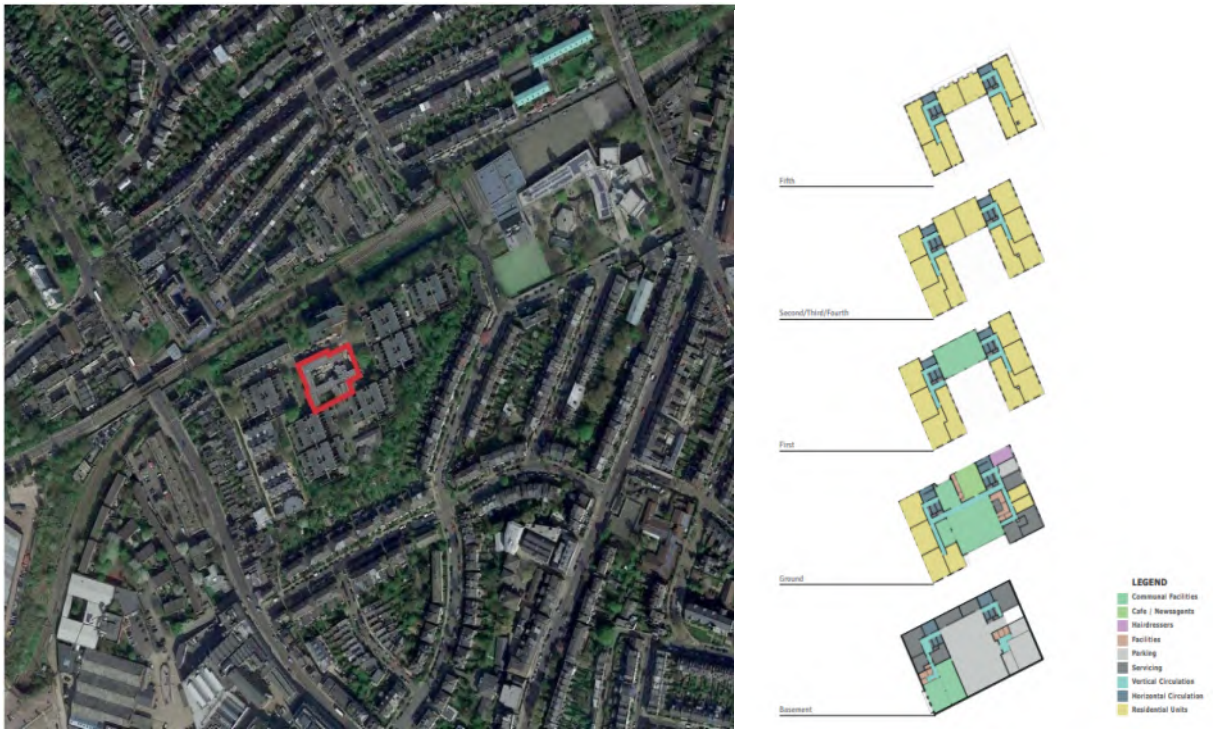

Figure 1: Site Location and Design Strategy

The proposal is to demolish the existing buildings and the erection of a six-storey building plus a single-storey basement building accommodating 50 Assisted Living residential apartments. The building will include associated communal and support facilities and an ancillary cafe, salon and mini gym, together with external amenity spaces, car lift, basement parking, laundry, plant, CCTV, lighting, access, landscaping, infrastructure and other ancillary works.

The Circular Economy approach has been undertaken and commitments for this project have been developed through a collaborative and cross-disciplinary approach. The measures proposed demonstrate Four Quarters's desire to contribute to waste reduction and to implement circular economy principles within the built environment for both existing building and the new development.

The Reuse and restoration Strategy has been prepared following the guidance set out within the GLA Circular Economy Statement Guidance (March 2022) and the supporting document 'Design for a Circular Economy Primer' (March 2020).

This document outlines how the proposed development aims to meet the following principles:

- 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 project 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 building layer approach has been used to ensure that each of the principles outlined below has been explored fully. The principles (and sub-principles) that are used in developing reused and restoration strategy for the development at both the design and construction phase can be found in the Circular Economy Statement Guidance (March 2022).

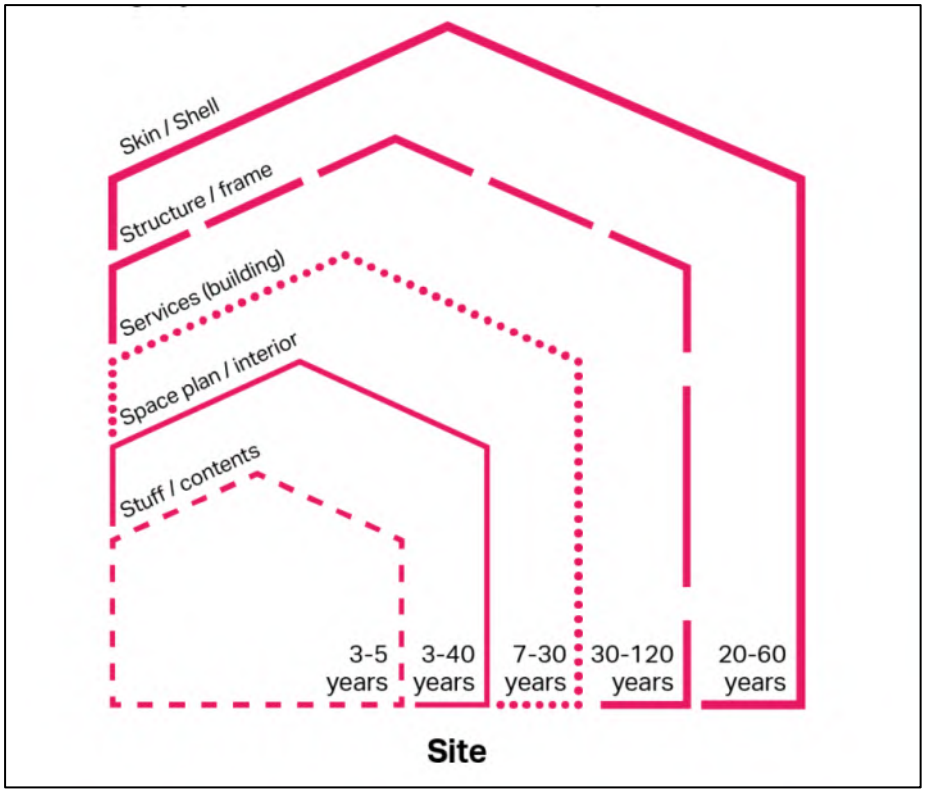

Figure 2: The building layers and their indicative lifespans (London Plan Guidance 2022)

In summary, the report outlines an execution plan for disassembling and reusing materials and plant equipment from the existing building in section 3. A Pre-redevelopment and Pre-Demolition Audit has been carried out which has identified reusable components, and will be used along with this document to guide the disassembly process. Salvageable materials will be carefully extracted during demolition and assessed for potential reuse in the new development if possible or recycled off-site, contributing to sustainability goals. The report also addresses the site restoration strategy for the new building in sections 4 & 5. The disassembly and site restoration strategy shall follow national, regional, and local policy requirements, embodying sustainable development principles throughout its lifecycle.

The following further documentation will be completed before demolition and construction.

- Resource Management Plan
- Construction/Site Waste Management Plan – A revision of the Outline Site Waste Management Plan (SWMP) issued as Appendix E of the Construction Environmental Management Plan (CEMP) at RIBA Stage 2 will be required (Ref: CB/CS/P17-1282/06).

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd have been commissioned by Four Quarters to prepare a Reuse and Restoration Strategy for the discharge of condition no.24 for planning permission 2018/4449/P in relation to the Development at 11 – 12 Ingestre Road, London, NW5 1UX.

1.2 The objective of this strategy is to outline how the design prioritises Circular Economy principles and meets the policy requirements of the London Plan 2021 and the Camden Local Plan. This document serves as a guiding document for the appointment main contractor and demolition contractor to implement a reuse and restoration strategy throughout the demolition and construction phases.

Site Location and Description

1.3 The Site is located at 11 – 12 Ingestre Road in the London Borough of Camden. The Site is surrounded by residential buildings and is located in close proximity to Tufnell Park tube station to the east and Kentish Town tube station to the south-east. Hampstead Heath Park is located approximately 500 meters to the north-west of the site. Please refer to Figure 1.1 below for site location.

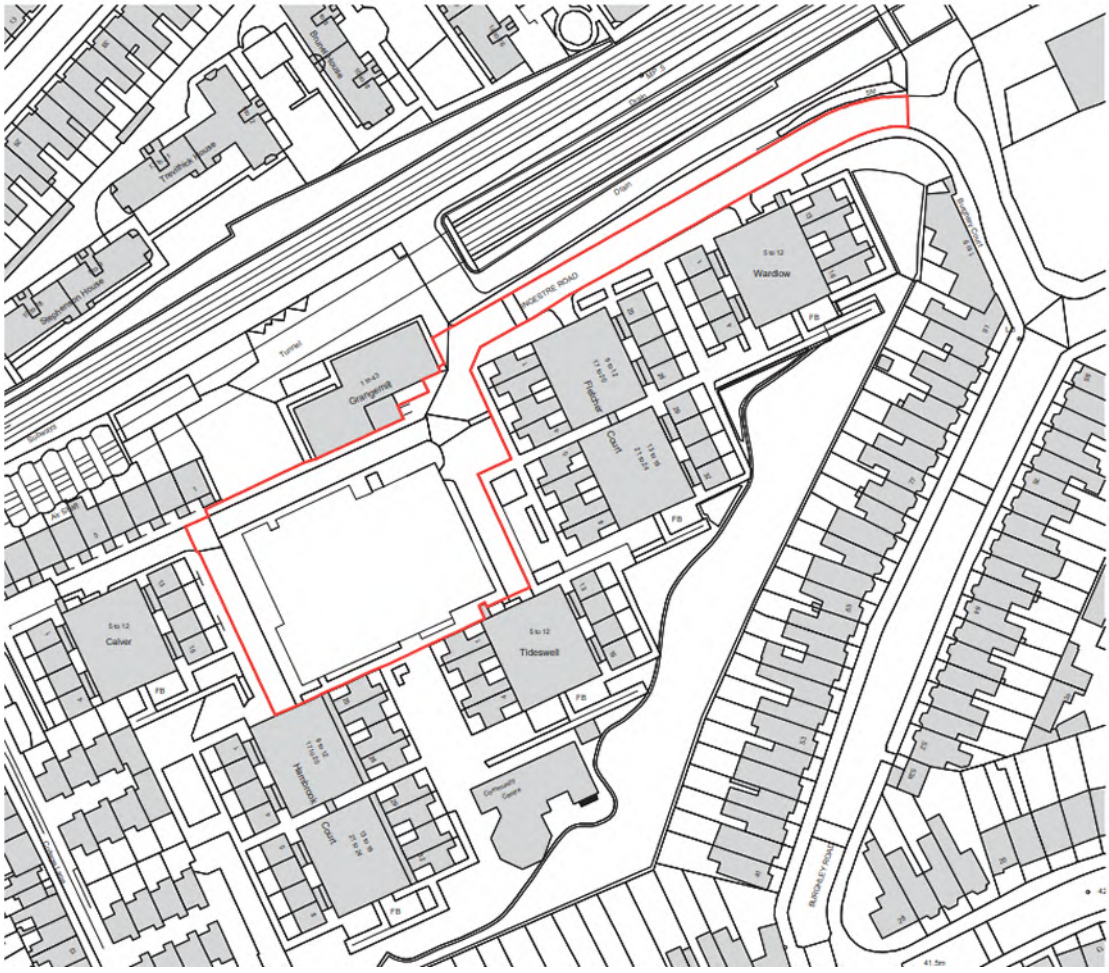

Figure 1.1: Site Location Plan

1.4 The proposed site has an area of 0.33ha and comprises a part two-storey, part three-storey purpose-built former elderly persons' home on the south side of Ingestre Road that includes 48 self-contained bedrooms for residents.

1.5 The property consists of four wings arranged around a central courtyard. The building, built in the 1970s, is of red brick construction and limited architectural design merit.

Figure 1.2: Onsite picture of the Existing Building

Proposed Development

1.6 The Site is approximately 0.18 hectares in area and comprises a part two, part three-storey redundant building, originally built as an elderly person's home. The building comprises three wings arranged around a central courtyard.

1.7 The proposal is to demolish the existing buildings and the erection of a six-storey building plus a single-storey basement building accommodating 50 Assisted Living residential apartments. The building will include associated communal and support facilities and an ancillary cafe, salon and mini gym, together with external amenity spaces, car lift, basement parking, laundry, plant, CCTV, lighting, access, landscaping, infrastructure and other ancillary works.

Figure 1.3: Map View Model Photo

Objectives

1.8 The objectives of this report are to:

- Demonstrate how the proposed development will meet the policy requirements of relevant planning policy, D1, D2 and CC2 of the London Borough of Camden and the London Plan Policy SI7 Reducing waste and supporting the circular economy;
- Identify areas for consideration at the early stages of the project to facilitate the incorporation of the principles of circular economy into the design and construction of the development and
- Inform the reuse and restoration strategies for the existing building to be demolished and a new building to be erected.

1.9 Waste arising from construction and demolition of the built environment accounts for 60% of total UK waste. A linear economic approach (take, make, dispose of) to materials is currently the standard approach, however, this is unsustainable. A circular economy designs out waste by keeping resources circulating through the system at their highest value for as long as possible before recovering and regenerating materials when they reach the end of service life.

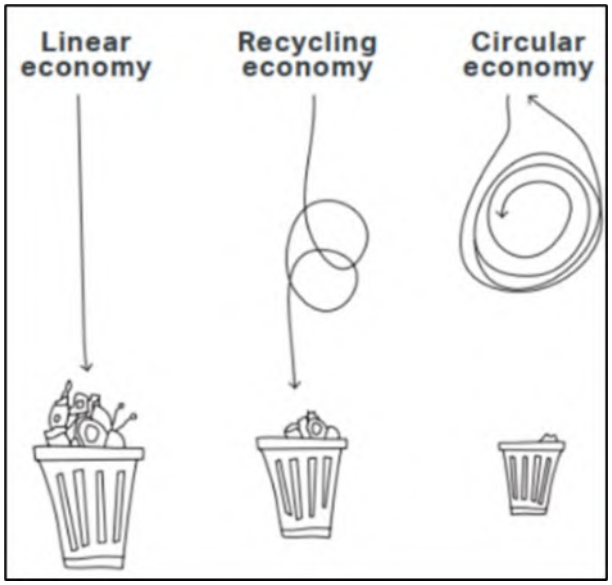

Figure 1.4: Linear, recycling, and circular economies (London Plan Guidance 2022)

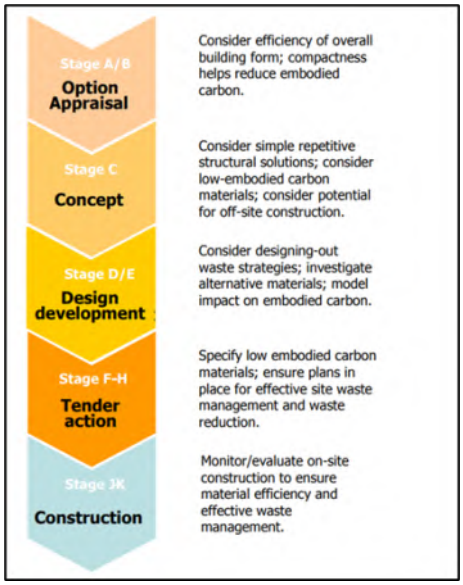

Figure 1.5: RICS Design Plan (WRAP 2016)

Method Statement – Summary of the workshop

1.10 A multi-disciplinary approach to the sustainability strategy has been adopted for the proposed development. A Circular Economy workshop was held on the 2nd of May 2024 with the following parties:

- Four Quarters (Client/Project Manager);
- Symmetrys (Structure Consultant);
- Create Consulting Engineers (Sustainability Consultants);

1.11 The purpose of the meeting was for the design team to agree on a strategic approach, identify opportunities for minimising waste and evaluate options to be explored at the next stage. Information provided and agreed upon during the meeting has been used to complete tables 1 and 2 from the GLA Circular Economy Guidance document which are presented in sections 3 and 4 respectively.

2.0 CURRENT AND FUTURE PLANNING POLICIES/GOOD PRACTICE REVIEW AND PROJECT REQUIREMENTS

Climate Change Act 2008 (2050 Target Amendment)

2.1 On 26th November 2008, the UK Government published the Climate Change Act 2008, the world's first long-term legally binding framework to mitigate against climate change. The Act initially set legally binding targets for greenhouse gas emissions reduction of 80% by 2080 (from 1990 levels). This was amended in 2019 to a revised target of a 100% reduction in carbon emissions by 2050, over the 1990 baseline emissions levels, known as the net-zero target. In addition, there are interim carbon budget levels, which provide stepping stones to achieve the overall target.

National Planning Policy Framework (December 2023)

2.2 The National Planning Policy Framework (NPPF) was updated in December 2023, replacing the previous NPPF that was adopted in September 2023.

2.3 The NPPF sets out the Government's planning policies for England and how they are expected to be applied. It exerts additional responsibility on Local Planning Authorities (LPA) and sets out requirements for the Planning System to support transition to a low carbon future while taking into full account of changing climate, flood risk, water supply, biodiversity and landscape, risk of overheating etc.

2.4 At the heart of the NPPF is a 'presumption in favour of sustainable development' which requires Local Authorities as part of any plan-making or decision-making, to provide clear guidance on how the presumption should be applied locally.

2.5 The NPPF sets out that all new development should be planned in ways that; a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and b) can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

2.6 The LPA should expect new development to comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

2.7 In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

2.8 Chapter 2 of NPPF covers sustainable development. As per section 11, Plans and decisions should apply a presumption in favour of sustainable development.

2.9 Chapter 9 details sustainable transport requirements to promote sustainable transport. Chapter 14 addressed climate change issues. As per section 159, New development should be planned for in ways that: a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and b) can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

The Greater London Authority - London Plan 2021

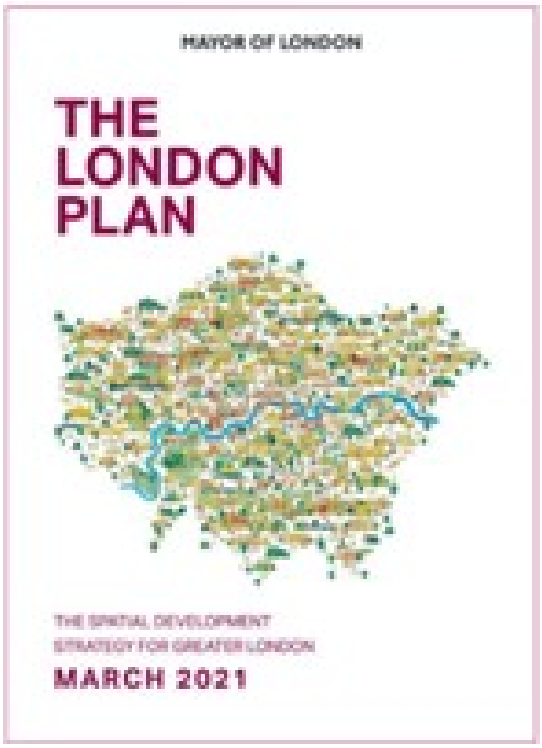

Figure 2.1: The London Plan

2.10 The London Plan (January 2021), sets out the overall strategic plan for London, including a fully integrated economic, environmental, transport and social framework for the development of the capital to 2036. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor. For a GLA referable scheme, the development must comply with the policies within the London Plan.

2.11 Certain additional criteria apply to developments which are referred to by the Mayor. To be referable an application must meet one of the three following criteria outlined with the Mayor of London Order (2008):

- Include 150 domestic units or more.
- Be over 30 metres in height if outside of The City of London.
- Be on Green Belt or Metropolitan Open Land.

Policy SI 7 Reducing Waste and Supporting the Circular Economy

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

- promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible
- encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
- ensure that there is zero biodegradable or recyclable waste to landfill by 2026
- meet or exceed the municipal waste recycling target of 65 per cent by 2030
- meet or exceed the targets for each of the following waste and material streams:
  - construction and demolition – 95 per cent reuse/recycling/recovery
  - excavation – 95 per cent beneficial use
- design the development 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.

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

- how all materials arising from demolition and remediation works will be re-used and/or recycled
- how the proposal's design and construction will reduce material demands and enable building materials, components, and products to be disassembled and re-used at the end of their useful life
- opportunities for managing as much waste as possible on-site

- adequate and easily accessible storage space and collection systems to support recycling and re-use
- how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
- how performance will be monitored and reported.

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

Greater London Authority (GLA) guidance on preparing circular economy statement (March 2022)

2.15 The March 2022 revision to the GLA guidance on preparing a circular economy statement details the key aims, commitments and structure and content of a Circular Economy Statement.

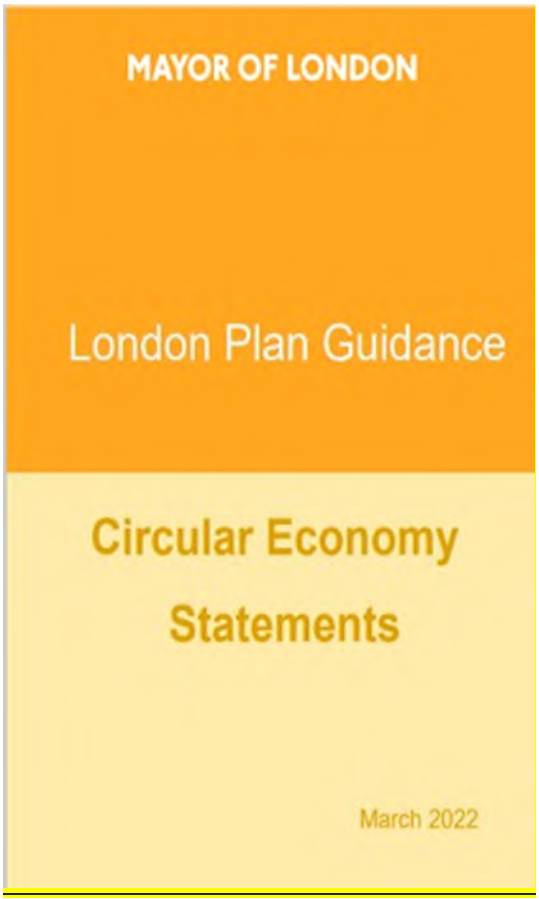

Figure 2.2: Circular Economy statement

Local Policy

Camden's Local Plan Strategic Policies 2016-2031

2.16 The following policies have been identified as appropriate for assessing the sustainable performance of new developments:

Figure 2.3: Camden's Local Plan Strategic Policies 2016 – 2031

Policy D1 design

2.17 The Council will seek to secure high-quality design in development. The Council will require that the development:

a. respects local context and character;
b. preserves or enhances the historic environment and heritage assets in accordance with Policy D2 Heritage;
c. is sustainable in design and construction, incorporating best practice in resource management and climate change mitigation and adaptation;
d. is of sustainable and durable construction and adaptable to different activities and land uses;
e. comprises details and materials that are of high quality and complement the local character;

f. integrates well with the surrounding streets and open spaces, improving movement through the site and wider area with direct, accessible and easily recognisable routes and contributes positively to the street frontage;
g. is inclusive and accessible for all;
h. promotes health;
i. is secure and designed to minimise crime and antisocial behaviour;
j. responds to natural features and preserves gardens and other open space;
k. incorporates high quality landscape design (including public art, where appropriate) and maximises opportunities for greening for example through planting of trees and other soft landscaping,
l. incorporates outdoor amenity space;
m. preserves strategic and local views;
n. for housing, provides a high standard of accommodation; and
o. carefully integrates building services equipment.

2.18 The Council will resist development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions.

Tall buildings

2.19 All of Camden is considered sensitive to the development of tall buildings. Tall buildings in Camden will be assessed against the design criteria set out above and we will also give particular attention to:

a. how the building relates to its surroundings, both in terms of how the base of the building fits in with the streetscape and how the top of a tall building affects the skyline;
b. the historic context of the building's surroundings;
c. the relationship between the building and hills and views;
d. the degree to which the building overshadows public spaces, especially open spaces, and watercourses; and
e. the contribution a building makes to pedestrian permeability and improved public accessibility.

2.20 In addition to these design considerations tall buildings will be assessed against a range of other relevant policies concerning amenity, mixed use and sustainability.

Public Art

2.21 The Council will only permit development for artworks, statues or memorials where they protect and enhance the local character and historic environment and contribute to a harmonious and balanced landscape design.

Excellence in Design

2.22 The Council expects excellence in architecture and design. We will seek to ensure that the significant growth planned for under Policy G1 Delivery and location of growth will be provided through high quality contextual design.

Policy D2 Heritage

2.23 The Council will preserve and, where appropriate, enhance Camden's rich and diverse heritage assets and their settings, including conservation areas, listed buildings, archaeological remains, scheduled ancient monuments and historic parks and gardens and locally listed heritage assets.

Designated Heritage Assets

2.24 Designed heritage assets include conservation areas and listed buildings. The Council will not permit the loss of or substantial harm to a designated heritage asset, including conservation areas and Listed Buildings, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

a. the nature of the heritage asset prevents all reasonable uses of the site;
b. no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation;
c. conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and
d. the harm or loss is outweighed by the benefit of bringing the site back into use.

2.25 The Council will not permit development that results in harm that is less than substantial to the significance of a designated heritage asset unless the public benefits of the proposal convincingly outweigh that harm.

Conservation Areas

2.26 Conservation areas are designated heritage assets, and this section should be read in conjunction with the section above headed 'designated heritage assets'. In order to maintain the character of Camden's conservation areas, the Council will take account of conservation area statements, appraisals and management strategies when assessing applications within conservation areas.

2.27 The Council will:

a. require that development within conservation areas preserves or, where possible, enhances the character or appearance of the area;
b. resist the total or substantial demolition of an unlisted building that makes a positive contribution to the character or appearance of a conservation area;
c. resist development outside of a conservation area that causes harm to the character or appearance of that conservation area; and
d. preserve trees and garden spaces which contribute to the character and appearance of a conservation area, or which provide a setting for Camden's architectural heritage.

Listed Buildings

2.28 Listed buildings are designated heritage assets and this section should be read in conjunction with the section above headed 'designated heritage assets'. To preserve or enhance the borough's listed buildings, the Council will:

a. resist the total or substantial demolition of a listed building;
b. resist proposals for a change of use or alterations and extensions to a listed building where this would cause harm to the special architectural and historic interest of the building; and
c. resist development that would cause harm to significance of a listed building through an effect on its setting.

Archaeology

2.29 The Council will protect remains of archaeological importance by ensuring acceptable measures are taken proportionate to the significance of the heritage asset to preserve them and their setting, including physical preservation, where appropriate.

Other Heritage Assets and Non-Designated Heritage Assets

2.30 The Council will seek to protect other heritage assets including non-designated heritage assets (including those on and off the local list), Registered Parks and Gardens and London Squares. The effect of a proposal on the significance of a non-designated heritage asset will be weighed against the public benefits of the proposal, balancing the scale of any harm or loss and the significance of the heritage asset.

Policy CC2 Adapting to Climate Change

2.31 Over the lifetime of the Local Plan, reducing energy use in buildings and working towards a low-carbon borough will be one of the key challenges facing Camden. The Council will

promote the measures outlined below to reduce carbon emissions from new and existing buildings. The Council will require development to be resilient to climate change.

2.32 All development should adopt appropriate climate change adaptation measures such as:

a. the protection of existing green spaces and promoting new appropriate green infrastructure;
b. not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;
c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
d. measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

2.33 Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

Sustainable Design and Construction Measures

2.34 The Council will promote and measure sustainable design and construction by:

a. ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
b. encouraging new build residential development to use the Home Quality Mark and Passivhaus design standards;
c. encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve “excellent” in BREEAM domestic refurbishment; and
d. expecting non-domestic developments of 500 sqm of floorspace or above to achieve “excellent” in BREEAM assessments and encouraging zero carbon in new development from 2019.

3.0 SUSTAINABLE DESIGN AND CONSTRUCTION STATEMENT

3.1 The high-level strategic approach was taken using the "decision tree" provided in Circular Economy Statement Guidance (March 2022) to inform whether to disassemble or demolish the existing building before redevelopment.

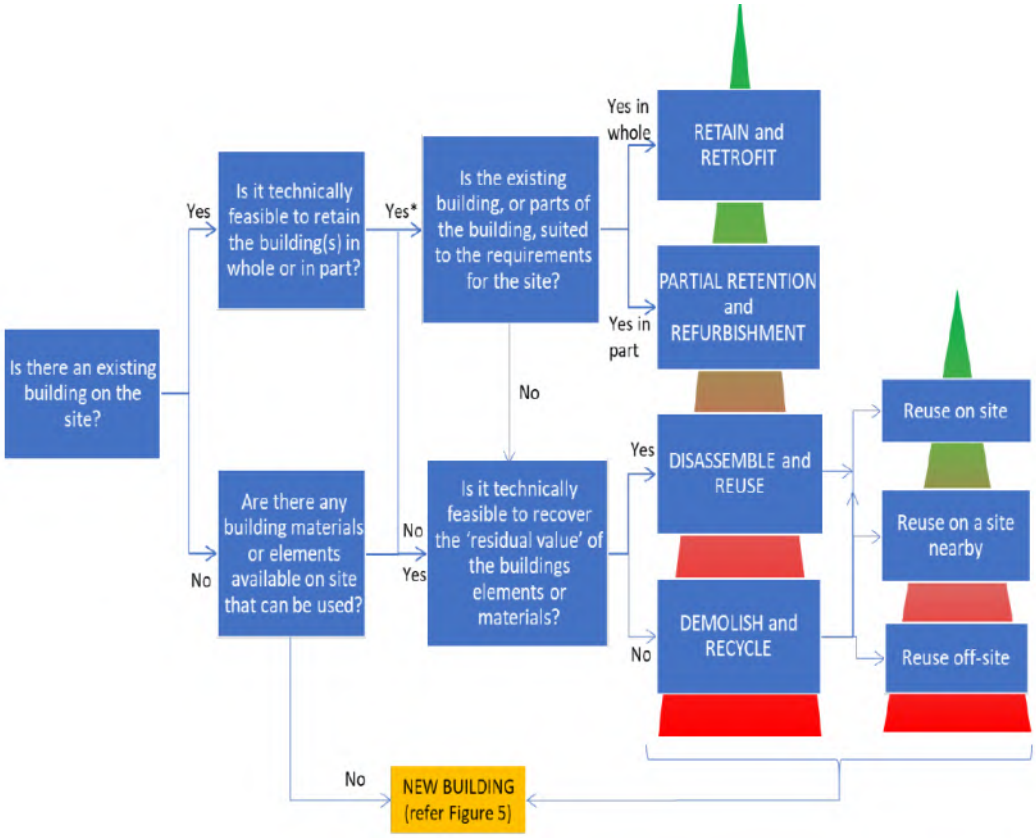

Figure 3.1: Strategic Approach Decision Tree for existing building (Source: London Plan Guidance for CE Statement 2022)

3.2 The Strategic approach decision trees were discussed in the CE workshop with the design team, and it was understood that due to the following reasons it was not technically feasible to retain the existing building.

- The existing building has reached the end of its useful economic life for its current use as a care home. This implies that the building's infrastructure and systems are outdated and no longer meet modern standards for care facilities.
- The building is deemed to lack architectural merit, suggesting that its design and structural features are not considered valuable or worthy of preservation. This indicates that refurbishment efforts would not yield significant architectural or aesthetic benefits.
- The existing building is too small to meet the Client's requirements in its current form. The site also doesn't lend itself to easy refurbishment due to the dark, maze-like

interior layout, extreme level changes across the site and lack of external community space.

- Policy Compliance: The proposed demolition and redevelopment align with Camden Local Policy CC1, which likely emphasizes the need for modern, sustainable, and high-quality developments in the area. This suggests that retaining the existing building does not meet policy objectives.
- Brownfield Redevelopment: The principle of redeveloping redundant buildings on sustainably located brownfield land is supported by national planning policies, such as the NPPF. This implies that the site's redevelopment is aligned with broader planning principles and objectives.
- Under-Utilized Land: The NPPF encourages the development of under-utilized land and buildings, especially in areas where land supply is constrained. This suggests that repurposing the existing building may not effectively utilize the available land or meet housing needs.

3.3 Hence, the decision to pursue demolition as the sole recourse is driven by a commitment to ensure the safety, functionality, and long-term sustainability of the built environment.

3.4 Before Demolition, a thorough site analysis will be assessed to identify the opportunities for reusing existing materials or components. Existing materials will be evaluated to see if they align with the new building design's requirements. If no reuse opportunities exist, demolition will follow best practices to maximize material recovery through recycling. Any materials which cannot be reused on-site will be sent to organizations for potential reuse elsewhere, aiming for a 95% beneficial use of excavation waste and demolition waste.

3.5 The process of disassembling, reusing and recycling materials and plant equipment from the existing building is integral to the project's circular economy strategy. Through careful planning and execution, the following steps will be taken:

- The Pre-redevelopment and Pre-demolition audit conducted has evaluated the materials within the existing building, identifying components suitable for reuse or recycling. This assessment informs the disassembly process.
- Based on the audit findings, a detailed disassembly plan will be developed. This will form part of the Resource Management Plan. This plan will outline how different building elements and plant equipment will be dismantled, ensuring minimal damage and facilitating reuse.
- During demolition, salvageable materials and plant equipment will be carefully extracted. This may include items such as bricks, timber, windows, and mechanical systems. Salvaged materials will be stored onsite or transported to appropriate facilities for reuse or recycling.
- The salvaged materials and plant equipment will be assessed for potential reuse in the proposed development or shall be sent to the recycler which contributes to the project's sustainability goals.

- The design team will collaborate closely with the demolition contractor to incorporate salvaged materials and plant equipment into the new development if possible. This may involve adapting architectural plans and engineering systems to accommodate reused elements.
- Throughout the disassembly, reuse, recycling and construction process, progress will be monitored to ensure adherence to circular economy principles. Adjustments may be made as needed to optimize resource utilization and minimize waste.
- By following this step, the disassembly process is executed efficiently, maximizing resource efficiency, reducing environmental impact, and contributing to a sustainable built environment.

3.6 By connecting the disassembly and reuse of materials and plant equipment from the existing building, the project aims to maximize resource efficiency, reduce environmental impact, and contribute to a sustainable built environment.

3.7 The following section, including table 3.1 below outlines the development-specific Circular Economy opportunities identified for each aspect of the development.

Aspect	Steering Approach	Strategy Implemented	Target	Supporting Analysis/ Studies/ Surveys/ Audits
Circular economy approach for the existing site	**Disassemble and Re-Use** The existing site three-storey redundant building, originally built as an elderly person's home. The building has been identified as unsuitable for re-use, however, there is potential to minimise waste through recovery and recycling of materials in line with the waste hierarchy. It is technically feasible and viable to recover the 'residual value' of the building elements or materials; therefore, a strategy of 'disassembly and re-use' will be pursued. A Pre-demolition Audit has been completed for the site before demolition to evaluate the materials' quantities and their potential recovery options. The Pre-redevelopment and Pre-demolition report in Appendix B highlights elements of the existing building and the hardstanding on the site which can be reused or recycled/recovered.	The following opportunities identified for the existing structures for the development include: **Recycle/Recover:** • Bricks: sections of the existing brick wall will be reclaimed by an external contractor. • Timber framed doors and windows: door and window system and glass products will be recycled, and timber will be reclaimed offsite. • Insulation: will be recycled offsite. • Floor and ceiling coverings: carpet and tile products will be recycled offsite. • Internal fit outs and furnishing reclaimed and recycled offsite **Dispose:** • Contaminated and hazardous materials – If identified, shall be collected, handled, and managed by a licenced waste recycler. • Advanced building survey prior to commencement of the soft strip works including an asbestos and hazardous materials survey, in accordance with the Hazardous Waste Regulations and the Control of Asbestos Regulations shall be carried out. • To ensure that any potential risks are minimised whilst maximising recovery, reuse and recycling, a range of measures will be implemented including by not limited to: • Covering of skips to prevent dust and debris from blowing about the site and immediate environment. • Colour coding and signposting of skips to reduce the risk of cross-contamination. • The sealing and secure storage of all potentially hazardous materials when not in use.	1) In line with the GLA's target of 95% diversion of non-hazardous waste from Landfill. 2) At least 95% of demolition and excavation waste will be reused and/ or recycled. 3) Special attention will be given to topsoil from excavation activities, such that no topsoil is sent to landfill.	Appendix B provides the Pre-redevelopment and Pre-demolition audit report of the project. Sections 8.3 & 8.4 on pdf page 20 of Appendix B highlights the targets.
Circular economy approach for demolition and construction waste	Demolition waste arising from the proposed development will be minimised in line with the relevant planning requirements. The current building is unsuitable for reuse however, there is potential to minimise waste through recovery of materials in line with the waste hierarchy. The Prepared Pre-redevelopment and Pre-demolition audit report will be shared with the Demolition contractor before the demolition. Based on this report, the Resource management plan will be prepared by the demolition contractor.	The Resource Management Plan (RMP) will be prepared and implemented along with strategies outlined in pre-demolition audit report and site waste management plan. Monthly monitoring shall be carried out to ensure that subcontractors are engaged in the process. The following opportunities for reducing construction waste have been identified: • Waste will be segregated on-site to assist with the recycling rate; • Just-in-time material deliveries to avoid stockpiling on site and reduce the risk of damage; • Supplier's take-back schemes will be utilised.	In line with the GLA's target of 95% diversion of non-hazardous waste from Landfill.	Will be Supported by the Pre-Demolition Audit and Resource Management Plan.

Table 3.1: Strategic Approach for existing building

4.0 CIRCULAR ECONOMY STRATEGIC APPROACH FOR NEW BUILDING

4.1 The decision tree provided in the Circular Economy Statement Guidance (March 2022) serves as a crucial tool for determining the high-level strategic approach to building design.

4.2 Its purpose is to guide decisions that enable buildings to be adapted for extended lifespans. Additionally, buildings should be designed for deconstruction and reconstruction, facilitating the salvaging of components and materials for reuse or recycling, thus preserving their economic and environmental value. The adopted design approach to circular economy for the new structure on the site has been guided by the decision tree showing Fig 4.1. This section of the report details how the design approaches proposed support the implementation of the six circular economy principles and in particular principles for designing for longevity, designing for adaptability or flexibility, and designing for disassembly.

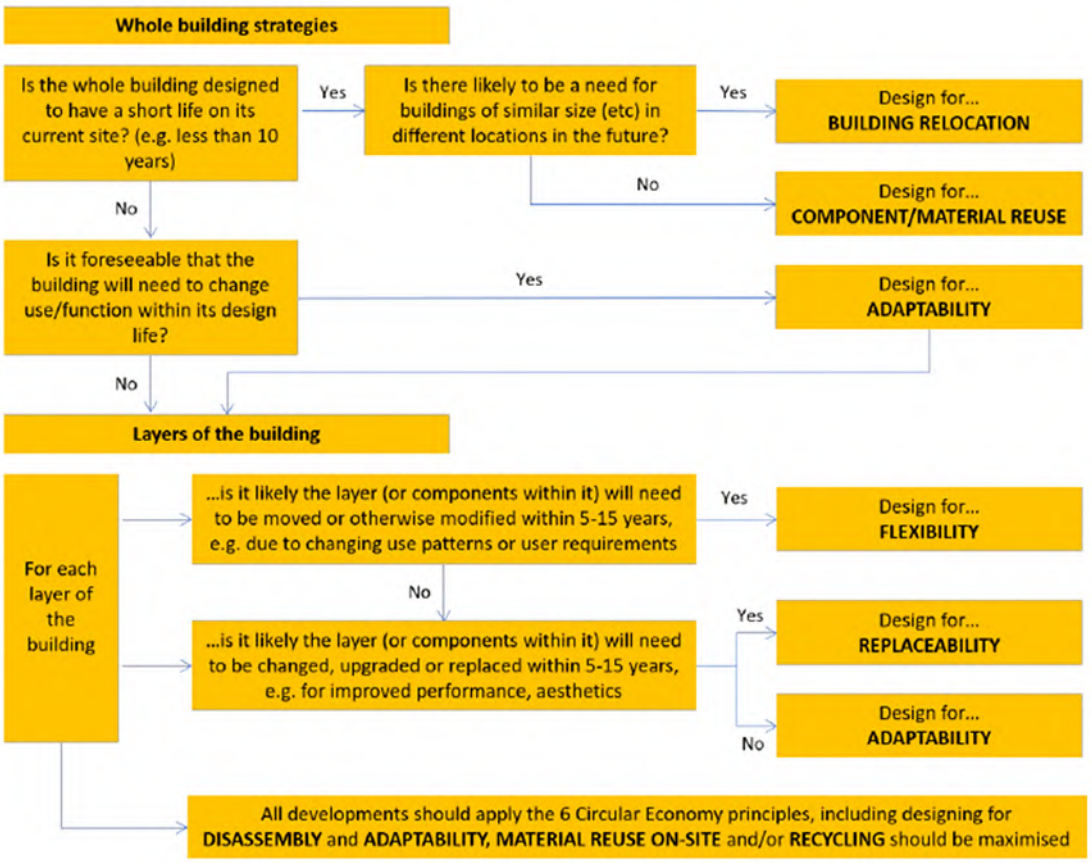

Figure 4.1: Decision tree for design approaches for new buildings, infrastructure and layers over the lifetime of development (Circular Economy statement ,2022)

4.3 A circular economy workshop was undertaken with the design team to investigate Circular Economy objectives with specific metrics for each building layer. A detailed analysis of the design was undertaken to identify opportunities to increase material efficiency and reduce embodied carbon and source materials sustainably. Efficient building and services design will minimise energy and water use.

4.4 The building has been designed with a long lifespan; therefore, 'Design for Relocation' and 'Component/ Material Reuse' are not relevant to this development. It is unlikely that the building will change use patterns and/ or user requirements within a timeframe of 5-15 years. However, certain layers of the building such as interior spaces shall mainly require changing or upgrading within 5-15 years for improved performance/ aesthetics. Not all layers of the building will require this. Therefore, a strategy of 'Design for Replaceability' or 'Design for Adaptability has been adopted. The building design considers all six circular economy principles and, as part of this, it will be designed to facilitate disassembly at the end of life.

4.5 Table 4.1 outlines design approaches proposed for different buildings used, alongside an explanation of why each approach has been adopted. Associated targets have also been outlined.

Aspect	Steering Approach	Strategy Implemented	Target	Supporting Analysis/ Studies/ Surveys/ Audits
Circular economy approach for the new development	A circular economy workshop was undertaken with the design team to investigate Circular Economy objectives with specific metrics for each building layer. A detailed analysis of the design was undertaken to identify opportunities to increase material efficiency and reduce embodied carbon and source materials sustainably. Efficient building and services design will minimise energy and water use. The building is designed for long-term use, making "Design for Relocation" and "Component/Material Reuse" unnecessary. While changes may occur within 5-15 years, the focus is on "Design for Replaceability" and "Design for Adaptability" for specific layers. Overall, the design prioritizes all circular economy principles and emphasizes easy disassembly at the end of its lifespan.	Active engagement will continue between design teams, developers, and any other relevant stakeholders, not limited to contractors and building operation managers, for engagement in the design and procurement of materials for the site and the waste management materials taken off-site.	Under BREEAM Wst01, the targeted construction waste for the proposed development < 6.5 t/100m2 In addition, the contractor will set targets for total construction waste generation and monitor these throughout construction works. A range of measures are proposed to ensure relevant targets are met.	Will be Supported by the Resource Management Plan
Circular economy approach for municipal waste during operation	The Operational Waste Collection Strategy will be developed in line with the London Plan and Camden Waste Plan requirements to inform the management of municipal waste at this stage of design. Sufficient space will be provided to accommodate 1 week's worth of residual waste and recyclable waste. Dedicated waste storage areas will be accessible to all building users and will allow for the segregation of at least three waste streams. A separate bulky waste disposal area will be provided separately.	Refuse and Recycling plan has been developed to further ensure waste arising within the development will be managed and disposed of in a manner which ensures optimum levels of waste recycling. Each assisted living unit will be provided with adequate internal space to allow for the separation of waste streams. Similarly separate space will be provided for the non-residential part of the building such as a café, salon etc.	The proportion of municipal waste sent to landfills to be 10% or less by 2035; A 65% recycling rate for municipal solid waste; Legislation for mandatory separate food waste collections by 2023; and Eliminate avoidable waste of all kinds by 2050.	Supported by Refuse and Recycling plan.

Table 4.1: Strategic Approach for Proposed Development

4.6 The below sections highlight all six circular economy principles and their application to the proposed development.

Minimise the quantities of materials used and designing out waste

4.7 During the circular economy workshop a detailed analysis of the design was undertaken to identify opportunities to increase materials' efficiency and develop an efficient, lean design. The efficiency of the structural frame will be scrutinised to avoid over-specification. Building weight will be minimised through the application of the following:

- Use of cement replacement products and water-reducing admixture.
- Lightweight internal partitions;
- Lightweight finishes and limited screed use will assist in keeping the building weight down.
- Standard window sizing

4.8 Virgin materials will be conserved, and materials will be selected with lower carbon intensities using cement replacement products and sustainably sourced timber on site. Local suppliers to be preferred where possible to reduce material transport distance.

4.9 Materials selected will be reused or will contain a high recycled content. Reinforced steel (rebar) with a high recycled content will be sourced, where possible. Reclaimed bricks will be utilised for the façade design, providing lower carbon intensities when compared to primary sourced bricks.

4.10 The building will utilise an efficient form to minimise quantities of new materials. Material efficiency measures will optimise the use of materials within building design, procurement, construction, maintenance, and end-of-life; and ultimately reduce the quantities of new materials used. The proposed development will utilise the following measures to ensure that materials are used efficiently and minimise the quantities of new materials brought to the site:

- Efficient building form
- Design to standard materials dimensions to reduce off-cute
- Rationalise structural design to reduce the volume of structural material
- Utilise materials with a high recycled content. 97% recycled steel for reinforcement will be targeted
- Avoid over-specification and participate in take-back schemes where possible

Minimise the quantities of other resources used

4.11 The proposed development will be built upon a previously developed brownfield site which will minimise disruption to the existing landscape and optimise use of the London's limited resources.

4.12 The Energy Statement issued for planning identifies the most suitable energy efficient design approach for the scheme. Specification of a highly efficient building fabric, efficient heating and ventilation systems and the use of renewable technology on the site (ASHP+ EAHP and PV panels) have reduced operational energy consumption. The proposed system of heat pumps works at a greater efficiency than gas boilers and can take advantage of the projected decarbonisation of the grid.

4.13 Building services have been reduced as far as possible by implementing a 'fabric first' approach. A lean design option appraisal can be found in the Energy Statement issued.

4.14 During the construction stage the contractor will be reduced to set targets for energy and water used on-site and ensure measures are put in place to minimise consumption of these resources through implementation of construction management plan and site waste management plan (SWMP). An outline SWMP has been provided in Appendix E of the Construction Environmental Management Plan (CEMP) report (Ref- CB/CS/P17-1282/06). This plan needs to be updated before implementation.

4.15 At least 95% of construction waste will be recycled (i.e. diverted from landfill). In accordance with government targets, the demolition and construction contractor will be required to maximise the proportion of recycled materials, including reclaimed aggregate.

4.16 Although the vast majority of construction and deconstruction waste will be recycled, some waste will be sent to landfill. Once appointed, the contractor will contact local waste facilities to ensure the local landfill has the capacity to receive any construction or deconstruction waste that will not be recycled.

4.17 The principal contractor is responsible for ensuring SWMP is reviewed and updated accordingly at regular intervals, and as necessary throughout the construction phase. The principal contractor will provide monthly reports to the client on the process of Waste Management Strategy.

Specify and source materials and other resources responsibly and sustainably

4.18 The specification of sustainable construction products will be in line with the Four Quarter's Sustainable Procurement Plan. The plan will aim to support local procurements of construction products and prioritise products under a recognised responsible certification scheme.

Design for longevity, adaptability or flexibility and reusability or recoverability

4.19 The strategic approach for the proposed development is to design for longevity. It is unlikely that the building will be used for non-residential use, however, lightweight internal walls and efficient column design will allow flexible internal configuration. Key exposed building elements have been designed to limit degradation from environmental factors such as solar radiation, wind and temperature variations. A disassembly guide will be produced to indicate how the deconstruction and recoverability of materials could be maximised at the end of their life.

4.20 Materials selected will possess high levels of durability and low through-life maintenance, for example through selecting façades and fixing components which last as long as the building frame. One key example is the use of brick as the material for façade design.

4.21 Aluminium specified for window systems has corrosion resistance which means that carbon-intensive coatings, such as paint, can be avoided throughout the life of the product. Metals have a long lifetime, are durable and can easily be recovered for recycling at the end of the building's lifetime.

4.22 Electrical distribution equipment will be sized to allow for spare capacity, to cater for future changes in equipment size/increase of equipment size. Equipment and plant spaces therefore have been sized to cater for the current scheme. Therefore, there is limited scope for increasing future equipment.

4.23 The development will be provided and supplied with a new integral substation which allows flexibility for the increase in minor electrical loads. The current water supply can accommodate minor changes in the water consumption needs of the development over time.

4.24 **Adaptability of Internal Layout -** Internal spaces are arranged in a largely uniform pattern which may allow for combination into standard floor plate design via removal of internal partitions.

4.25 **Plant replacement –** It will be possible to remove and replace all major items of the plant without needing to demolish sections of wall or floor. The plant will be located either externally (e.g., condenser units) or within the basement floor plant room and will be accessible. All large plants such as tanks and pumps will be housed in the plantrooms, for which the access and maintenance strategy shall be developed. By centralising circulation and service routes through risers, flexibility can be achieved. A plant replacement strategy shall be fully developed to ensure that building services equipment can be replaced when required (at the end of life) without damage to the building fabric or structure.

4.26 The ease of disassembly and the functional adaptation potential of different design scenarios are to be explored as per the BREEAM Wst 06 credit. Recommendations or solutions based on

the study that aim to enable and facilitate disassembly and functional adaptation are to be developed.

Design for Disassembly

4.27 The proposed development has been designed for repurpose and independent replacement of individual elements, based on their design life periods. As noted previously, an approach of 'building in layers' is proposed to ensure that layers with shorter lifespans can be replaced without damage to layers which have longer life spans. This will include the following principal layers:

- Site
- Substructure
- Superstructure
- Shell/Skin
- Services
- Space
- Stuff
- Construction materials

4.28 The majority of building elements have a service life of <60 years and will be replaced at least once over the building's 60-year lifespan. The building's structure has been designed with an indicative design life of 60 years (based on current British Standards). The building's envelope has been designed for a minimum 60 years for the finished primary cladding system and 30 years for secondary components.

4.29 **Services Accessibility -** The design of the services within the proposed scheme considers accessibility to local services, such as local power and data infrastructure. This will allow for ease of maintenance as well as the potential to upgrade these services more easily at a future date if required. All buried services (water and electrics) are within earth or ducting which can be recovered when required.

4.30 **Component Disassembly -** As far as possible, components and products will be designed and selected to allow for disassembly and reuse at the end of their useful life. However, the main construction strategies of the building do not promote ease of disassembly; the foundations and structural frame are both insitu concrete, and the external façade will be built insitu with a traditional construction methodology. Due to the strong cement bonds utilised in traditional brick construction, it is not easy to reclaim these individually at the end of life. For the external walls and main concrete frame, the likeliest outcome will be that the frame is demolished and crushed to form new aggregate for reuse at a lower use-value. Due to this, the longevity of the design is very important, utilising robust materials and promoting flexibility of space to prolong the use value of the building. The RC frames should be kept within the operational phase of the building life cycle for as long as possible.

4.31 It is recommended that screeds are minimised throughout the design, with dry floating floor construction prioritised over wet cement-based floors. Removing screeds facilitates disassembly at the end of life, rather than bonding the assemblies together.

4.32 The details of services fixings and internal finishes are not resolved at this stage, as this will be the contractor's/installer's responsibility, though it will be strongly recommended that exposed and reversible connections will be utilised where possible to facilitate disassembly and ensure materials can be recovered in a high-value state. Mechanical fixings will be prioritised over welded/chemical fixings to assist with deconstruction. Internal non-loadbearing partition walls and ceilings should be easily removable through mechanical connections without affecting any structural layers.

4.33 Building Information will be stored to facilitate end-of-life strategy, disassembly, future reuse, waste avoidance, and waste reduction. The information regarding the construction of the building shall be easily communicable for future building professionals to aid future redevelopments that maximise the repurposing of the building with minimal demolition.

4.34 Non-loadbearing external and internal walls to be easily removed without affecting the main structure and directly re-used offsite or recycled.

Design out construction and municipal waste

4.35 A resource management plan will be developed prior to the start of construction works on site. It will outline the strategy to reduce construction waste and monthly monitoring will ensure that subcontractors are engaged in the process. During the circular economy workshop opportunities to reduce construction waste were identified. One example of a reuse initiative on site is the reuse of brick onsite as hardscaping.

4.36 There is a 95% diversion of waste from landfill target onsite. Onsite waste storage areas will be segregated and clearly labelled to assist with recycling. Closed-loop recycling will be utilised where possible for materials such as unused plasterboard, carpet tiles and insulation.

4.37 The Refuse and Recycling plan will be provided post-planning to further outline how waste arising within the development will be managed and disposed of in a manner which ensures optimum levels of waste recycling.

4.38 Sufficient space has been provided to accommodate 1 weeks' worth of residual waste and recyclable waste. Dedicated waste storage areas will be accessible to all building users and will allow for the segregation of at least three waste streams. The target recycling rate for municipal waste is 65%. The waste storage areas are present on the basement floor and have sufficient space for residents' waste, and a separate bulky waste disposal area will be provided separately.

4.39 Measures to minimise operational waste such as consolidated, smart logistics and community-led waste minimisation schemes will be explored at a later stage. This shall also extend to investigating the adoption of schemes which specifically target the recycling of unwanted clothing and furniture and collection schemes to encourage the re-use of these items, available for future occupants of the proposed development.

4.40 A non-technical building user guide will be provided to residents which will outline the waste strategy for the development and promote recycling. Monitoring and evaluation of the operational waste strategy will be an ongoing process. Options for monitoring waste could include a regular visual assessment of the fill levels by the building manager or waste audits to provide a snapshot of waste and recycling streams. To promote residents' participation, the outcomes of the monitoring will be communicated to the residents via a newsletter or on a noticeboard.

End-of-life Strategy

4.41 The proposed building structure has been designed with an indicative design life of over 60 years (based on current British Standards). However, it is anticipated that the building's lifespan will greatly exceed 60 years. The building has been designed for repurpose and independent replacement of individual elements, due to their design life periods, as the majority of building elements have a service life of >60 years and will be replaced at least once over the building's 60-year lifespan. An approach of 'building inlayer' is used in design to ensure that the layer with shorter lifespans can be replaced without damage to layers which have longer life spans.

4.42 At the end of life, the following activities can be carried out where possible to facilitate material re-use.

- Recycling of façade elements
- Bricks reclaimed or crushed to form aggregate
- Glass recycled
- Steel reinforcement reclaimed and recycled
- Products and MEP materials are recycled where possible
- Arrangements should be made for fixtures, fittings and furniture to be taken away by a company for refurbishment for reuse, recycling, or sold/ given to local salvage agents
- The remaining building elements will likely require demolition or crushing, such as the concrete to RCA for further use as a concrete replacement in a new site.

4.43 At handover, the building design and maintenance information will be captured in the O&M manual produced by the contractor. This will include the as-built drawings, system descriptions, and contact details for the product and materials suppliers. The O&M manual shall contain a section on the envisaged end-of-life strategy.

4.44 In line with Circular Economy principles, the main priority is to extend the lifetime of the building through careful design and specification and to ensure that if the building is to be deconstructed at a later date there is a clear process to follow. Before the deconstruction of the building, a disassembly guide will be produced for the site, which will contain a material inventory of the development. Opportunities for disassembly and re-use of elements will be outlined in the guide. The guide will aim to keep the value of materials, products and components as high as possible for as long as possible.

5.0 CIRCULAR ECONOMY COMMITMENTS

Building layer (as per GLA guidance)	Site	Substructure	Superstructure	Shell/ Skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions + who + when	Plan to prove quality
SECTION A: Conserve Resources												
Minimising the quantities of materials used	Existing structures on site have been identified as unsuitable for reuse.	The structural design is resource-efficient through the use of cement replacement products and water-reducing admixture. These will conserve virgin material used in the concrete. Rebar with recycled content will be used on-site. Use of natural or mineral-based insulation products instead of fossil fuel-based insulation.		The Bricks from the façade will be recycled. The building weight will be reduced overall through the use of a secondary lightweight steel structure instead of traditional blockwork.	Efficient and early design of the plant has been undertaken to inform structural design. Where possible items will be assembled offsite.	Select finishes and screed that will assist in reducing the building weight. Lightweight internal partitions have been specified.		A 'just-in-time' delivery system will be used onsite to minimise stockpiling and reduce the risk of damage to materials. Protective coverings will be left on products for as long as possible to reduce the risk of damage during the construction process. Initiatives to focus on sourcing building materials from local suppliers. Materials and construction warehouses in close proximity to the site. Lower transport distances are therefore required for the supply of materials to the site.	Early identification of opportunities for increased material efficiency and avoiding over-specification. Optimisation of the design to reduce overall weight and building loads.	All opportunities for reducing materials may not have been fully explored at this or future stages. The challenge of earth excavation for landscaping and the minimisation of materials in the design has been identified.	Structural engineers and architects to ensure that opportunities to maximise material efficiency have been identified and implemented where possible. Revision of the Outline Site Waste Management Plan will be required prior to site preparation. Plant Replacement Strategy for plants and services before the end of technical design.	Material efficiency review and implementation will be investigated. Pre-redevelopment and Pre-Demolition Audit report Resource Management Plan Site Waste Management Plan Plant Replacement Strategy
Minimising the quantities of other resources used (energy, water, land)	The site utilises a previously occupied site, therefore no virgin land resources are consumed. The proposed development has multiple storeys, which together	The proposed design provides efficient use of land and space. The building fabric has been optimised to reduce energy demand through reduced thermal losses and efficient daylighting design.			The highly efficient ASHP & EAHP system will be complemente d by the installation of PVs on the roof.	Water-efficient fittings will be installed to ensure the target potable water consumption of 105l/p/day can be achieved. Energy and water meters will be installed so residents can		Energy and water consumption will be monitored and presented on the site noticeboard throughout the construction period.	Energy-efficient design and on-site monitoring of energy and water consumption.	There could be increased costs associated with some of the proposed energy efficiency measures.	Potential cost premium.	Review at the next stage of the design. Energy and Sustainability statements.

Building layer (as per GLA guidance)	Site	Substructure	Superstructure	Shell/ Skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions + who + when	Plan to prove quality
	minimises land usage.					monitor their usage.						
Specifying and sourcing materials responsibly and sustainably	Materials will be sourced in accordance with Four Quater's sustainable procurement plan. The plan includes: – Sustainability aims, objectives and strategic targets to guide procurement activities. – A requirement for assessing the potential to procure construction products locally. – Details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. Responsible and sustainable resourcing of timber products. Local sourcing of materials and building components will be prioritised in later design and commissioning stages. Early engagement with the supply chain for appropriate EPDs for the development.							Sourcing materials with EPDs or with a high recycled content may limit the supply chain and/or increase the materials' transport distances.			Pre-construction supply chain engagement. Design team to ensure that product specification complies with the sustainable procurement plan.	Implementation will be reviewed at the next stage.
SECTION B: Design to Eliminate Waste (and for ease of maintenance)												
Designing for reusability/ recoverability/ longevity/ adaptability/ flexibility		-	The secondary steel framing system can be disassembled at the end of its life.	The building has been designed for robustness and protection against material degradation.	Column locations and lightweight internal partitions facilitate reconfiguration if required. Areas with high pedestrian traffic have been designed to minimise the risk of damage. Windows can be cleaned from the inside.			Sustainable Procurement Plan to be followed throughout the construction phase.	Designing flexible spaces which can be adapted and maintained with ease.	Ensuring the design is appropriate for current use whilst not constraining disassembly/ recoverability.	Pre-construction supply chain engagement. Design team to ensure design for disassembly approach has been followed.	Implementation will be reviewed at the next stage.
Designing out construction, demolition, excavation, industrial and municipal waste arising	95% of non-hazardous demolition waste will be diverted from landfill.	Pre-fabrication of building elements will be utilised where possible. Earth removal associated with the excavation of hardscaping on the existing development will be re-purposed on the site to level out areas of uneven/low ground. The concrete foundations have the capacity for reuse at the end of the building's life, minimising future demand for materials, as the crushed products from demolition can be processed into hardcore and fed into other structures or turned into aggregate.						A 'just-in-time' procurement will be used onsite to minimise stockpiling and reduce the risk of damage to materials. Protective coverings will be left on products for as long as possible to reduce the risk of damage during the construction process.	Identifying opportunities for offsite construction of some building elements.	Opportunities to reduce waste are not fully explored at this stage.	Contractor engagement is required to update the Outline Site Waste Management Plan (SWMP) provided in the CEMP (Ref- CB/CS/P17-1282/06)	SWMP is to be produced prior to demolition and construction.

Building layer (as per GLA guidance)	Site	Substructure	Superstructure	Shell/ Skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions + who + when	Plan to prove quality
								Reuse of materials associated with temporary works for the various phases of development. Supplier take-back schemes will be used where available for material surpluses and offcuts. Work sequences will be planned to minimise waste and re-work to reduce waste allowances for major materials.				
SECTION C: Manage waste												
Demolition Waste (how waste from demolition of the layers will be managed)	95% of non-hazardous demolition waste will be diverted from landfill. A Pre-Demolition Audit will be undertaken to identify re-use and recycling opportunities. The waste hierarchy will be followed for all aspects of the development: Reuse in-situ> Reuse on site> Reuse off-site> Recycling> Other recovery (with energy recovery)> Disposal	-						Ensuring 95% of waste is diverted from landfill following the waste hierarchy.			An early-stage pre-demolition audit has been provided.	SWMP waste records.
Excavation waste (how waste from excavation will be managed)	There is excavation associated with the removal of the existing building Where possible this waste will be sent to recycle.	-						-			-	-
Construction waste (how will waste arising from the construction of the layers be reused or recycled)	Prior to commencement on site, the Contractor will update the Site Waste Management Plan (SWMP) provided in Appendix E of CEMP (Ref-CB/CS/P17-1282/06). The waste hierarchy will be followed for all aspects of the development: Reuse in-situ> Reuse on site> Reuse off-site> Recycling> Other recovery (with energy recovery)> Disposal	SWMP will be undertaken with a target of 95% diversion from landfill. Closed-loop recycling will be utilised for items such as unused plasterboard, carpet tiles and insulation.						Ensuring the 95% target is achieved.			SWMP is to be developed by the contractor. Sub-contractors should be engaged with prior to commencement on site.	SWMP waste records.

Building layer (as per GLA guidance)	Site	Substructure	Superstructure	Shell/ Skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions + who + when	Plan to prove quality
Municipal Waste (how the design will support operational waste management)	Areas for building users will be designed to be adequately sized to allow for the segregation of waste streams. Spaces will be clearly labelled to promote the segregation of recyclable waste. The site will also have an area for residents to dispose of bulky waste items. Current refuse storage for the resident's flats and non-resident spaces are both in line with the Camden Council's requirements and have provisions for food waste disposal and recycling. The current general allowance is suitable for colour-coding the bins to display which bin is allocated for recycling, refuse or glass, this will be further addressed at a later stage in the design process. Measures to minimise operational waste such as consolidated, smart logistics and community-led waste minimisation schemes will be explored at a later stage. This shall also extend to investigating the adoption of schemes which specifically target the recycling of unwanted clothing and furniture and collection schemes to encourage the re-use of these items, available for future occupants of the proposed development.				The Refuse and Recycling Plan has been developed in line with the London Plan and Camden Council's requirements.			Participation of building occupants. Methods for monitoring and reporting operational waste against the target will be investigated at a later stage in the design process.			The waste storage area will be clearly labelled to maximise recycling rates.	Refuse and Recycling plan

6.0 SITE RESTORATION STRATEGY

6.1 After the demolition of the existing building, the site restoration process will commence to prepare the land for the construction of the proposed development.

6.2 This entails clearing debris, levelling the ground, and addressing any environmental concerns such as soil contamination.

6.3 Site restoration efforts will prioritize sustainability, aiming to minimize environmental impact and promote ecological regeneration.

6.4 Measures may include soil remediation, landscaping to enhance biodiversity, and installation of erosion control measures.

6.5 Additionally, temporary site facilities, such as fencing and access roads, will be removed or repurposed to ensure a clean and safe environment.

6.6 The site restoration process aligns with the project's commitment to sustainable practices, fostering a harmonious integration of the new development within its surroundings.

6.7 The project has committed to sustainable and environmentally responsible practices throughout the demolition, site clearance, construction and operation of the development, including minimizing excavation, recycling materials, reducing construction waste, and managing operational waste effectively.

6.8 Sequence for taking apart existing structures or components, restoring the site to its desired condition, and then proceeding with the construction or installation phase of the project so that activities are well planned and will occur in order to effectively manage the project.

6.9 The time frame for conducting the above-said activities will be mentioned in the pre-demolition audit report.

7.0 PLAN FOR IMPLEMENTATION

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

7.2 The plan outlined in the table below explains how short- and medium-term commitments will be implemented, monitored, and reported. Where possible information has been provided on meeting longer-term targets; however, it is acknowledged that the majority of these will depend on collaboration with building occupiers/ tenants. More information will be provided on implementing longer-term targets.

Targets	Action	Responsible Party	Anticipated implementation date
At least 95% of all demolition waste will be reused, repurposed and/ or recycled.	Implement waste management recommendation outlined in the pre-demolition waste audit report and reuse and restoration strategy shall be carried out. Also, prepare a resource management plan outlining material inventory and their management to achieve a 95% diversion rate. Contact local waste processing facilities to ensure that they have the capacity to accept the estimated demolition waste. Have a procedure in place for segregating and sorting demolition waste prior to collection by a licenced waste contractor.	Demolition contractor	Prior to demolition work
At least 95% of all excavation waste will be diverted from landfill and put to beneficial use on-site or off-site.	Complete cut and fill calculations and Excavated Materials Options Assessment and put procedures in place to ensure 95% of excavation waste is put to beneficial use.	Contractor (below ground works)	Prior to excavation

Targets	Action	Responsible Party	Anticipated implementation date
At least 95% of all construction waste will be reused or recycled on-site or offsite or returned to suppliers for recycling.	Put procedures in place for waste segregation and sorting of construction waste prior to collection by a licenced waste contractor. Update a Site Waste Management Plan (SWMP) prior to site preparation.	Contractor	Prior to the commencement of Stage 5
Adequate facilities will be provided to enable 65% of municipal and 75% of commercial waste to be recycled or composted by 2030	Review the bin stores to ensure that they meet the following criteria. • Accessible to building users • Adequately sized for anticipated waste volume • Clearly signed to assist with segregating and storing recyclables, compostables and general/ landfill waste stream.	Architect	Stages 3 and 4
	Implement the Refuse and Recycling Plan prepared for the development. Develop a process for monitoring waste performance once the development is operational.	Client, tenant(s) & Facilities manager	Post-planning once tenants are identified
	Explore measures such as consolidated, smart logistics and community-led waste minimisation schemes for operational waste.	Client, architect, facilities manager, tenant(s) &waste contractor	Post-planning once tenants are identified
	Support tenants with their waste management policies and procedures to ensure the required recycling/composting targets are met by 2030	Client & tenant(s)	Post-planning once tenants are identified
Above and beyond standard practice commitments and targets			
The building will utilise an efficient form to Minimise quantities of new materials. Material efficiency	Review and update the Material Efficiency report and implementation plan at RIBA Stage 3.	Architect / Sustainability Consultant	Post-planning but prior to commencement Of Stage 3.

Targets	Action	Responsible Party	Anticipated implementation date
measures will optimise the use of materials within building design, procurement, construction, maintenance, and end-of-life; and ultimately reduce the quantities of new materials used.	Review and update the Material Efficiency report and implementation plan at RIBA Stages 4.	Architect /Sustainability Consultant	Prior to commencement Of Stage 4.
	Review and update the Material Efficiency report at Stage 5.	Contractor	Prior to commencement of Stage 5.
Reusing steel materials in the existing building as much as possible	Complete a pre-demolition waste audit to determine estimated quantities of steel waste arisings and quality/ suitability for reuse.	Demolition contractor	Prior to demolition works
The scheme utilises previously occupied land.	No action required		
The scheme will use the GLA's energy hierarchy to minimise operational energy use and has been designed to minimise water consumption.	Review energy modelling post-planning and ensure targets are being met.	Energy specialist	Post-planning, prior to Completion of Stage 3.
	Review specification of water-consuming equipment in the non-domestic portion of the development to ensure BREEAM water use targets are being met.	Architect	Prior to the final specification of sanitaryware.
	Review specification of water-efficient fittings to ensure water consumption is limited to less than 100 litres per person per day for domestic uses.	Architect	Prior to the final specification of sanitaryware
The contractor will be required to set targets for energy and water used during construction and put in place measures to minimise consumption of these resources.	Assign responsibility to an individual for monitoring, recording, and reporting energy use, water consumption and transportation data resulting from all on-site construction processes throughout the building programme.	Contractor	Prior to commencement of construction works.
	Set targets/KPIs for construction site energy use, water consumption and transport of materials and waste.	Contractor	Prior to commencement of construction works.

Targets	Action	Responsible Party	Anticipated implementation date
100% timber FSC or PEFC certified; 100% concrete BES 6001 certified; where possible steel sourced from suppliers rated under the CARES Sustainable Constructional Steel Scheme; Steel to contain high recycled content; other major construction materials certified under an Environmental Management System (EMS) such as ISO 14001.	Produce a Sustainable Procurement Plan outlining key material suppliers and corresponding responsible sourcing certifications.	Contractor	Prior to commencement of construction works.
Environmental Product Declaration (EPD)	Manufacturers with EPD certificates will be prioritised.	Contractor	Prior to commencement of construction works
A systematic risk assessment will be carried out to identify and evaluate the impact of climate change on structural and fabric resilience.	Review BREEAM Climate Change Adaptation Strategy at RIBA Stage 3 to ensure all recommendations are being implemented.	Architect & Structural Engineer	Prior to the completion of Stage 3.
It will be possible to remove and replace all major items of the plant without needing to demolish sections of wall or floor. Local services will be adaptable to a range of uses.	Review plant replacement strategy at RIBA Stage 3 to ensure all recommendations are being implemented.	Architect, Structural Engineer & MEP	Prior to the completion of Stage 3.

Targets	Action	Responsible Party	Anticipated implementation date
The structural design will allow for reconfiguration of the internal environment to accommodate changes in working practices and business models.	Review the design of the superstructure and internal layouts to ensure that the adaptability of space is maintained. Review targets and recommendations within the BREEAM Design for Functional Adaptability and Disassembly report to ensure all items are being achieved.	Architect & Structural Engineer	Prior to the completion of Stage 3.
End-of-Life Strategy	Prior to the deconstruction of the building, prepare a disassembly guide for the site. This will contain a material inventory of the development. Opportunities for disassembly and re-use of elements will be outlined in the guide.	Demolition Contractor	Prior to Deconstruction

8.0 DISCLAIMER

8.1 Create Consulting disclaims any responsibility to the Client, Four Quarter Ltd, and others in respect of any matters outside the scope of this report.

8.2 The copyright of this report is vested in Create Consulting Engineers Ltd and the Client, Four Ltd. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Four Quarter Ltd.

8.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

APPENDICES

APPENDIX A

Circular Economy Workshop Minutes of Meeting

Date: 2nd May 2024

Location: Microsoft Teams

Attendees: Hiten Raghwani- Four Quarters
Ahmed-Kolia - Symmetrys
Sunanda Swain- Create Consulting Engineers
Pooja Nair- Create Consulting Engineers

Minutes: Prepared by PN

1.0	**INTRODUCTION TO CIRCULAR ECONOMY AND POLICY REQUIREMENTS**	
1.1	SS introduced the concept of the circular economy, provided a definition, stated the scale of the problem within the built environment, its alignment with the waste hierarchy and noted the aim to keep products, parts and materials at their highest use and value for the longest time.	SS
1.2	SS explained that it is a requirement of the London Plan and Camden Plan on the importance of the Circular Economy Statement.	SS
2.0	**INITIATIVES WORKSHOP**	
2.1	SS explained the link between CE design approaches and each building layer such as skin/shell, Structure /frame, Services, space plan/interior and stuff content with their indicative lifespans.	SS
2.2	**SITE DESCRIPTION**	

2.2.1	Existing structures on the site have been identified as unsuitable for reuse hence demolition of the building would be carried out. HR confirms that a pre-demolition audit will be undertaken by the demolition contractor at a later stage. Pre-demolition audit will identify opportunities to recover materials and re-use/ recycle them either on-site or locally.	HR
2.3	**DEMOLITION**	
2.3.1	If no reuse opportunities exist, demolition will follow best practices to maximize material recovery through recycling. Any materials not reused on-site will be sent to organizations for potential reuse elsewhere, aiming for a 95% beneficial use of excavation waste and demolition waste.	HR
2.4	**EXCAVATION**	
2.4.1	As part of the excavation process for the existing building, there will be earth removal. However, the potential for reusing the excavated soil within the project is limited due to the likelihood of inert material presence. Therefore, before sending the soil to the recycler, it will undergo soil testing to determine its suitability.	HR
2.5	**STRUCTURE**	
2.5.1	The current design for the proposed new blocks comprises reinforced concrete structures, external wall will be brick masonry with a cavity. Blue and green roofs are proposed for the roofs.	AK
2.6	**SERVICES**	
2.6.1	The use of plastic ductwork will be reviewed and specified where possible.	HR
2.6.2	ASHP's, EAHP and PV specified as part of the energy strategy for the development	HR
2.7	**SPACE**	
2.7.1	The team agreed that the residential elements of the scheme have been designed for residential use only (would not have the required floor-to-ceiling heights for other uses). HR confirmed that the structure has been designed for assisted living homes.	HR
2.7.2	Construction material will be procured from a local vendor near the site. Lower transport distances will therefore be required for the supply of materials to the site.	HR

2.8	**CONSTRUCTION**	
2.8.1	The team noted that the contractor when appointed will produce a SWMP to outline procedures for minimising waste on site and diverting it from landfills.	HR
2.9	**DISASSEMBLY**	
2.9.1	The brick façade can be disassembled.	HR
2.9.2	Non–load–bearing partitions such as Lightweight internal partitions have been specified.	HR
2.9.3	Where possible internal fixtures and fittings will avoid adhesives.	HR
2.9.4	Glazing units are separate from one another so each unit can be refurbished or replaced locally.	HR
2.9.5	Select finishes and screed that will assist in reducing the building weight.	HR
2.10	**RE-ARRANGEMENT**	
2.10.1	The proposed building incorporates the design principle of replaceability. HR confirms if any rearrangement is required in future the design of the proposed building does support it.	HR
2.11	**SUSTAINABILITY PROCUREMENT PLAN**	
2.11.1	HR confirms that currently there is no Sustainability procurement plan placed. SS recommended to implement a Sustainability procurement plan before appointing the contractor to the project.	HR
2.12	**OPERATIONAL WASTE MANAGEMENT**	
2.12.1	The Refuse and Recycling plan has been developed for the proposed project which fulfils the London plan and Camden local plan requirements.	HR

APPENDIX B

WE ARE SYMMETRYS

PRE-REDEVELOPMENT & PRE-DEMOLITION AUDIT

FORMER CARE HOME SITE
INGESTRE ROAD
LONDON
NW5 1UX

17371-SYM-XX-XX-RP-S-0004- REV P3

SYMMETRYS.COM

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

REVISION HISTORY

Revision	Description	Date	By	Checked
Draft	For comment	21/06/2024	JS	
P1	For comment	28/06/2024	JS	
P2	For comment	01/07/2024	JS	
P3	Issued for Comment	24/07/24	AH	
P4	Final Issue	26/07/24	AH	

TABLE OF CONTENTS

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

0.0 Executive Summary

The former care home site at Ingestre Road is to be redeveloped into a new assisted living facility. This report details the materials that would be generated from demolishing the existing building and whether they could be reused, recycled or sent to landfill.

0.1 Detailed analysis was carried out to determine if the existing structure could be refurbished to accommodate the proposed works. Our findings indicate that refurbishment is not feasible as extensive modifications would be necessary to meet the modern standards and requirements for an assisted living facility.

0.2 Material Assessment

- Bricks: 49% of the total materials produced on site will be bricks. 100% of the bricks will be diverted from landfill.
- Concrete: 31% of the total materials produced on site will be concrete. 100% of the concrete will be crushed and repurposed on site.
- Glass: 8% of the total materials produced on site will be glass. 100% of the glass will be sent off-site to be crushed and recycled.
- Miscellaneous: Where possible the remaining materials will be reused on-site, if this is not possible it is to be recycled off-site and sent to landfill as a last resort.

0.3 Environmental Impact

- Waste Management: Efficient sorting and processing of demolition debris are critical to minimising landfill contributions.
- Air and Water Quality: Dust and runoff control measures are necessary to mitigate impacts on local air and water quality during demolition.

0.4 Recommendations & next steps:

- Conduct lifecycle analysis of new construction materials and integrate reuse/ recycling targets into the design process and construction contract.
- Engage with suppliers for takeback schemes or, if not possible, work with recycling companies to maximise material recovery.
- Incorporate materials into a Site Waste Management Plan (SWMP)/ Construction Resource Management Plan (CRMP) for effective waste management and landfill diversion.
- Set up on-site storage for waste segregation, train staff on waste management, and implement a reporting procedure to prevent stockpiling.
- Appoint a Waste Champion to oversee the SWMP/CRMP and prioritise reducing, reusing, and recycling.

0.5 This pre-redevelopment and pre-demolition audit underscores the necessity for meticulous planning and execution of demolition activities at Ingestre Road. Addressing the identified structural issues, hazardous materials, and potential environmental impacts will ensure a safe and efficient redevelopment process. Adherence to the provided recommendations will mitigate risks, promote sustainability, and facilitate compliance with all relevant regulations.

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

1.0 Introduction

1.1 Symmetrys was appointed by Four Quarters Limited ('Client') to prepare this Pre-Redevelopment & Pre-Demolition Audit Report for the works at Ingestre Road, London, NW5 1UX ('Site').

1.2 As per the BREEAM UK New Construction non-domestic buildings Technical Manual 2014, a maximum of 4 credits can be obtained for Wst 01 Construction waste management. These credits are split into two parts:

- Up to 3 credits – Construction resource efficiency
  - Where a Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to on-site construction and dedicated off-site manufacture or fabrication (including demolition and excavation waste) generated by the building's design and construction (see CN3).

CN3	Resource Management Plan records	The project waste arisings should be recorded and include construction, demolition and excavation waste. Note that the performance benchmarks for the award of credits do not include demolition and excavation waste.

  - Where construction waste related to on-site construction and dedicated off-site manufacture/fabrication (excluding demolition and excavation waste) meets or is lower than the following (Table 1)

Table 1 Construction waste resource efficiency benchmarks

BREEAM Credits	Amount of waste generated per 100m² (gross internal floor area)	
	m³ (actual volume of waste)	tonnes
One credit	≤ 13.3	≤ 11.1
Two credits	≤ 7.5	≤ 6.5
Three credits	≤ 3.4	≤ 3.2
Exemplary level	≤ 1.6	≤ 1.9

  - Where existing buildings on the site will be demolished a pre-demolition audit of any existing buildings, structures or hard surfaces is completed to determine if, in the case of demolition, refurbishment/reuse is feasible and, if not, to maximise the recovery of material from demolition for subsequent high grade/value applications. The audit must be referenced in the RMP and cover:
  - Identification of the key refurbishment/demolition materials.
  - Potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials in accordance with the waste hierarchy.
- One credit – Diversion of resources from landfill
  - The following percentages of non-hazardous construction (on-site and off-site manufacture/ fabrication in a dedicated facility), demolition and excavation waste (where applicable) generated by the project have been diverted from landfill:

Table 2 Diversion from landfill benchmarks

BREEAM Credits	Type of waste	Volume	Tonnage
One credit	Non-demolition	70%	80%
	Demolition	80%	90%
	Excavation	N/ A	N/ A
Exemplary level	Non-demolition	85%	90%
	Demolition	85%	95%
	Excavation	95%	95%

- Waste materials will be sorted into separate key waste groups as per Table 16 (according to the waste streams generated by the scope of the works) either on-site or through a licensed contractor for recovery.
- Exemplary level criteria
  - Non-hazardous construction waste generated by the building's design and on-site construction and off-site manufacture or fabrication (excluding demolition and excavation waste) is no greater than the exemplary level resource efficiency benchmark (outlined in Table 1).
  - The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmark (outlined in Table 2).
  - All key waste groups are identified for diversion from landfill in the RMP.

1.3 As per the London Plan Guidance: Circular Economy Statement (Ref. 3), to meet Policy SI7 (B) of the London Plan (Ref. 4) one of the requirements is to submit a Pre-Redevelopment audit. The Pre-Redevelopment audit is a tool for understanding whether existing buildings, structures and materials can be retained. The Pre-Redevelopment audit should outline an explanation of the existing buildings on the site and a brief description of the state of their repair. The details should include the building's age, key materials, photos of typical internal spaces and facades, and site plans.

2.0 Site Information

2.1 Project Background

2.1.1 The site is a 1970s former Council care home. The site was sold to a private developer in 2013 and is currently unoccupied.

2.2 Site Location

2.2.1 The site is within the middle of a Council estate on Ingestre Road. The site is bounded by Ingestre Road to the North, unnamed access roads to the East and West and a pedestrian access to the South.

2.3 Existing Site

2.3.1 The existing site was constructed in the 1970s. It is understood that the building will have seen a periodic replacement of component parts, especially the doors and windows, however, the products that form this building are typically approaching the end of their design life.

2.3.2 The building is 'doughnut' shaped consisting of 2-3 storeys of load-bearing masonry and reinforced concrete construction.

2.3.3 The heating system is unknown so it is assumed that there is a local heating system.

2.3.4 Figure 2.1 below shows the typical building façade.

Figure 2.1 Typical building façade

2.4 Existing Site Analysis

2.4.1 To establish whether retrofitting would be a suitable option, in comparison to the demolition of the existing buildings (on-site), several parameters were analysed. These parameters have been outlined in this section.

2.4.2 Heritage and Cultural Value

2.4.2.1 The heritage and cultural assessment concluded that, in its existing state, the site does not integrate into the wider area due to the excessive and unattractive paved areas. The existing building has been deemed redundant and of no architectural merit.

2.4.3 Spatial Capacity – Existing Building Uses

2.4.3.1 The existing building is too small to meet the Client's requirements in its current form. The site also does not lend itself to easy refurbishment due to the dark, maze-like interior layout, extreme level changes across the site and lack of external community spaces.

2.4.4 Spatial Capacity – Proposed Building Uses

2.4.4.1 The existing site can accommodate approximately 40 residents served by communal kitchens and bathrooms which does not match Camden's requirement for 100 specialist housing units for older people per annum. The proposed site will house over 100 residents in private units of varying sizes with additional communal facilities. The existing floor plate has insufficient space to accommodate the proposals even with extensive internal reconfiguration.

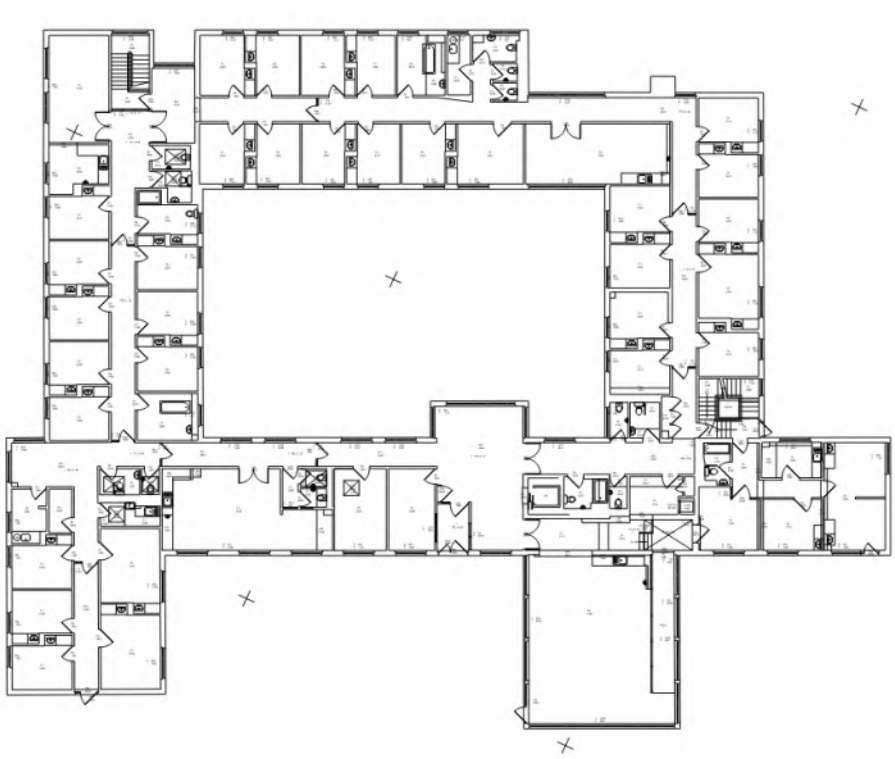

Figure 2.2 Existing Site plan

2.4.5 Existing Structure

2.4.5.1 An intrusive structural survey has not been carried out, however, it can be seen on-site that the building is constructed of load-bearing masonry and reinforced concrete slabs.

2.4.5.2 To meet the required number of housing units, the existing site would need additional storeys as the site footprint is insufficient to accommodate 100 residents while maintaining large amounts of natural light and a feeling of space. The existing walls have insufficient capacity for the required number of additional storeys.

2.5 Regulatory Requirements

2.5.1 In addition to the existing Site constraints, several regulatory requirements need to be met to consider any retrofit proposal. A few examples are provided in this section.

2.5.2 Acoustics

2.5.2.1 The primary concern related to acoustics for refurbishment is the difficulty in achieving acceptable standards of sound insulation between residential units. This is primarily an issue of the existing building limiting the degree to which new internal (party) walls can accommodate effective detailing, for example, the junction of party walls with the existing frame.

2.5.2.2 Building Regulations Approved Document E does provide guidance on this issue, where a lower standard can be adopted for the refurbished buildings. However, it should be noted that this

standard is more applicable when the use of the buildings is changed e.g., from office/retail to residential, which is not the case for the Proposed Development.

2.5.2.3 Therefore, using a lower standard for acoustics would result in sub-optimal living conditions for residents in the refurbished homes.

2.5.3 Part M Compliance

2.5.3.1 To allow for the provision of wheelchair units would be hard to achieve through retrofit and therefore, would likely require partial demolition and reconstruction in some areas.

2.5.4 Asbestos Containing Materials (ACM)

2.5.4.1 Considering the age of the building, it is likely that asbestos will be present. It is understood that to refurbish the existing building would require a significant disturbance of the existing structure.

2.6 Summary

2.6.1 The below list summarises the analysis undertaken in the above sections:

- The site does not integrate into the wider area due to the excessive and unattractive paved areas.
- The existing building has been deemed redundant and of no architectural merit.
- The existing building does not optimise the site's capacity.
- The amount of residential units does not currently meet Camden's needs and the existing structure is insufficient to meet the requirements.
- There is difficulty in achieving acceptable standards of sound insulation between potential residential units due to the limitations implied in existing structures being able to accommodate effective detailing.
- Asbestos is likely to be present in the building, substantial investigations would be required before refurbishment could commence.

2.6.2 In addition to the above list, the following aspects should also be considered:

- The risk of overheating, which has not been analysed in this study, is very high in retrofits and can affect the comfort in the homes if not assessed carefully.
- A thorough fire risk assessment should be carried out, as there can be higher risks associated with an over-cladding solution.
- Retrofit can be technically difficult to implement correctly, it requires careful execution to achieve high levels of performance without compromising the existing fabric of the building

2.6.3 Based on the above analysis, it was concluded that the demolition of the existing building would be a more suitable option.

3.0 Proposed works

3.1 As part of the proposed works, the entire site is proposed to be demolished. Figure 3.1 below shows the proposed demolition plan.

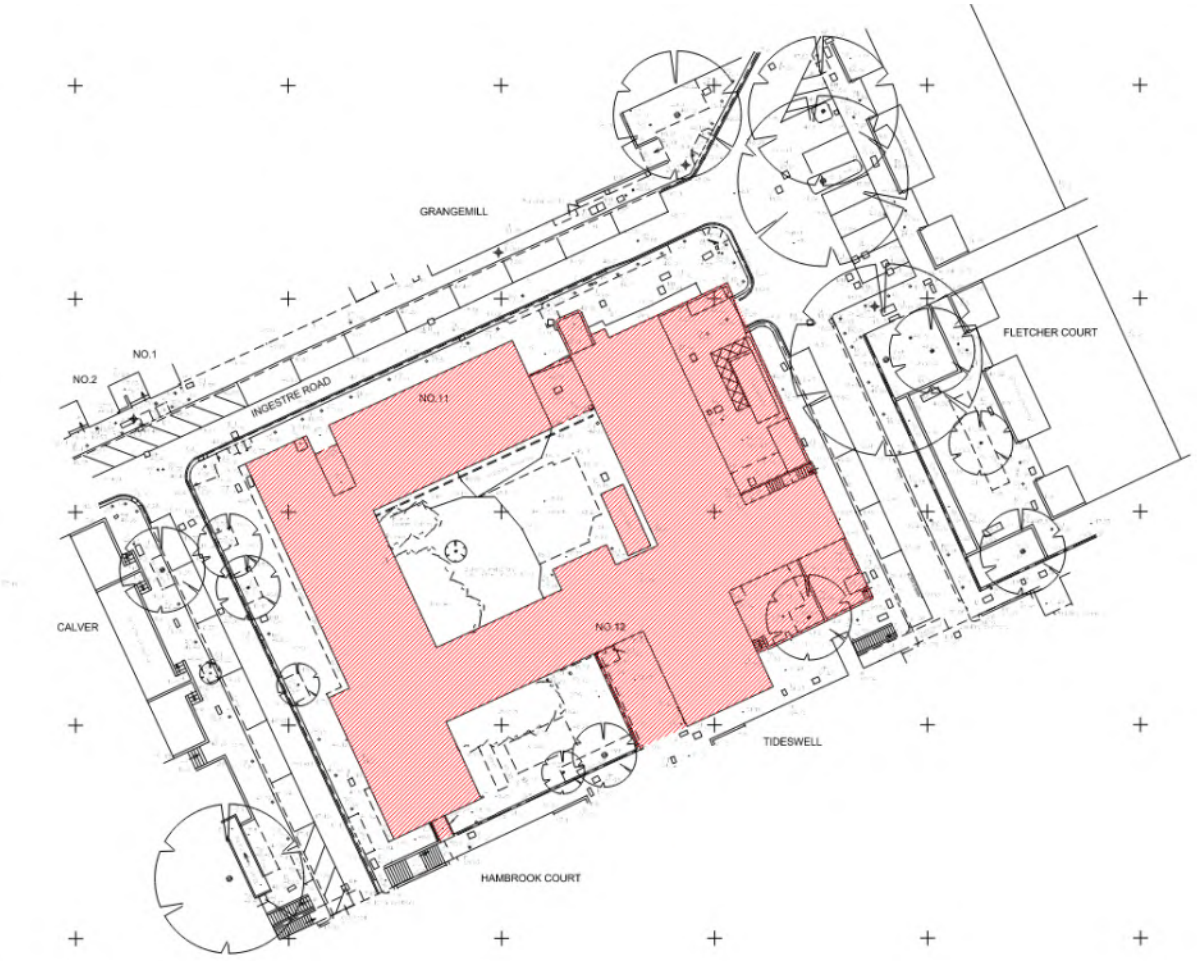

Figure 3.1 Demolition site plan

4.0 Aims and Objectives

4.1 The main aim of this report is to understand whether the existing building and materials can be retained, refurbished or incorporated into the new development. This report will also help to identify and quantify the materials that might be generated on-site and to provide the Client with this information to assist the Client in maximising the recovery of materials for subsequent high-grade or value applications.

4.2 The objectives of this report are to:

- Provide brief information on the existing building on site and its condition,
- Identify the types and quantities of key materials present in the existing building and hard services,
- Identify potential applications and any related issues for the reuse and recycling of the key waste/materials following the waste hierarchy,
- Identify opportunities for reuse and recycling on-site and off-site,
- Identify local re-processors or recyclers for recycling of materials,
- Identify overall recycling targets where appropriate,
- Identify reuse targets where appropriate, and
- Identify the overall landfill diversion rate for all key materials.

5.0 Key Principles

5.1 The Waste Hierarchy

5.1.1 Clause 12 of The Waste (England and Wales) Regulations 2011 requires that anyone involved in the import, generation, collection, transfer, recovery, or disposal of waste must take all such measures available to apply the waste hierarchy.

5.1.2 This Report considers the waste hierarchy and encourages materials identified on-site to be reused before they are sent for recycling, recovery, or disposal. The main principles of the waste hierarchy are summarised in Figure 5.1.

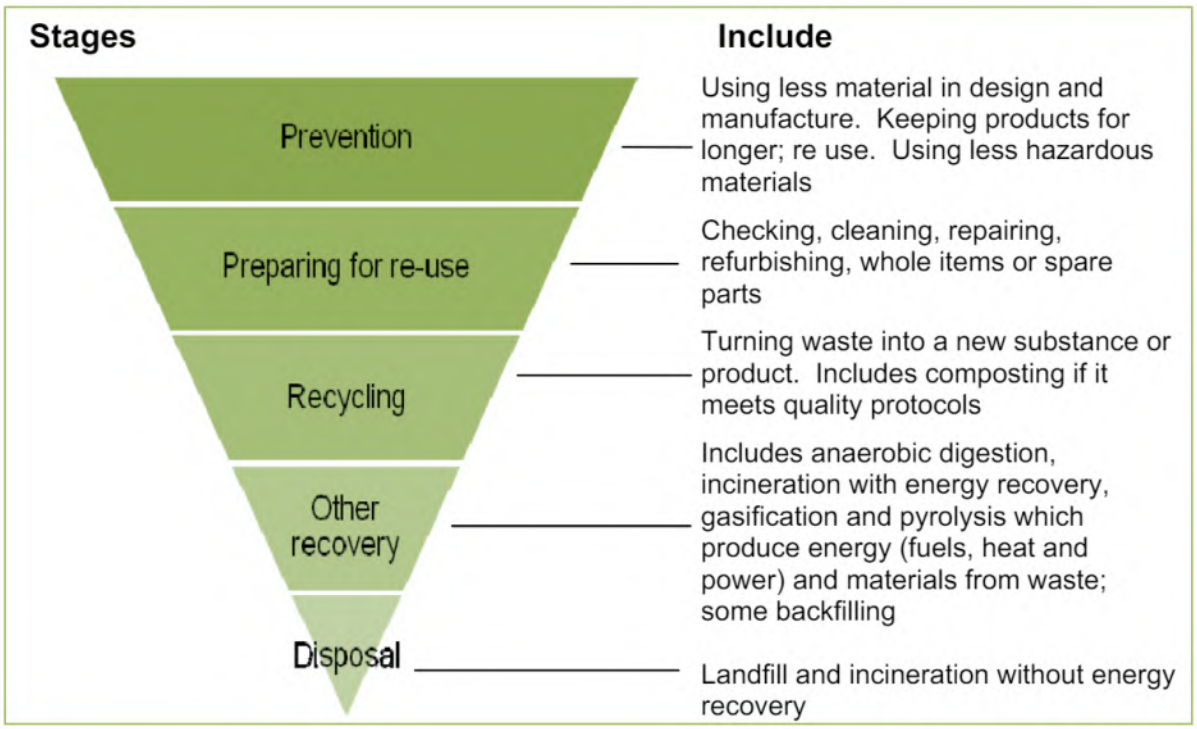

Figure 5.1 Department for Environment, Food and Rural Affairs (Defra) waste hierarchy from the Guidance on applying the Waste Hierarchy report dated June 2011

5.2 The Circular Economy

5.2.1 A Circular Economy (CE) is a systematic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take make waste' linear model, a Circular Economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources. The Circular Economy activity focuses on design that is regenerative and restorative. This is based on three principles:

- Design out waste and pollution,
- Keep products and materials in use, and
- Regenerate natural systems.

5.2.2 This Report can help encourage a Circular Economy by:

- Influencing the wider design team to consider reclamation and reuse of waste/materials found on-site to be incorporated in the proposed development, avoiding disposal of valuable materials, and
- Identifying reuse and re-processors companies for materials found on-site, extending the products' useful life before being remanufactured.

5.2.3 Figure 5.2 demonstrates the key stages and principles used when applying the Circular Economy to the built environment.

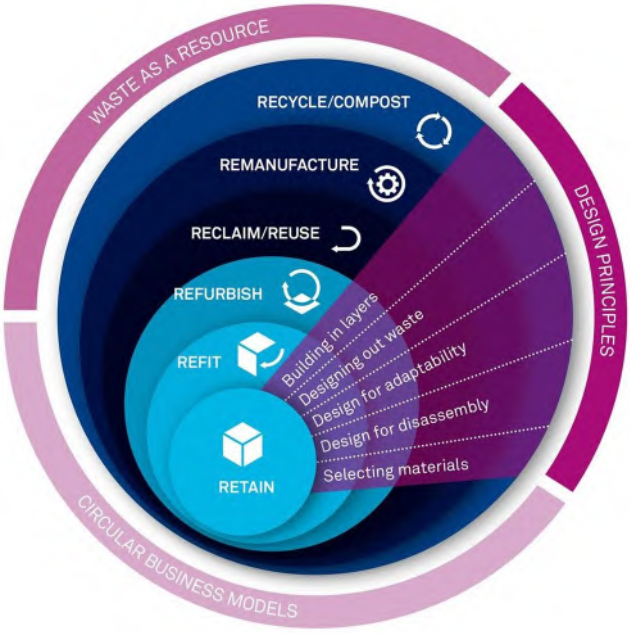

Figure 5.2 RIBA Journal – Break the vicious circle of waste

6.0 Methodology

6.1 A site visit was undertaken by Ashwin Halaria and Jessica Swinton of Symmetrys on 18/06/2024.

6.2 The site visit consisted of a non-intrusive visual audit of the building fabric of the external and internal parts of the building to be demolished.

6.3 Exclusions and Assumptions

6.3.1 The following assumptions, exclusions and caveats apply to this Report:

- This report is based purely on the findings of a non-intrusive visual survey.
- Where a clear line of sight/ access was not available to attain measurements e.g., thicknesses, best judgement and assumptions have been made.
- All facing brick elevations are assumed to be brick/ cavity installations.
- Where areas of the built frame were not visible, the size and lengths of the columns were assumed.
- An allowance of 200 mm concrete slabs has been considered for all floors.
- 5% of the volume of concrete reinforcement is assumed to be steel.
- No allowance was made for the removal of foundations.
- It is assumed that the demolition would be to the ground floor level.
- Small power, data, and large specialist plants or any other mechanical, electrical, and plumbing (MEP) equipment are not considered within this report.
- It is assumed that the site was left vacant when it was sold in 2013 and so all remaining furniture, equipment, and miscellaneous non-fixed items were removed, therefore, these are not considered within this report.
- No hardstanding has been considered as part of this report.
- It is assumed that foundation excavations would be 1m deep and cover the total area of the building

6.3.2 The information provided within this report is based on a visual inspection (non-intrusive) of the existing site and a survey undertaken by Glanville Group dated August 2017 (drawings provided by Barton Willmore dated 19/06/2018). Where elements of the site were unknown, assumptions were made based on professional judgment. It is understood that the quantities provided within this report might vary, therefore, the principal contractor will be responsible for monitoring and reporting these changes (if any).

7.0 Key Waste/ Materials Identified

7.1 The following section describes the key waste/materials identified, their location, and images taken during the Site visit. Based on the condition of the waste/materials and their market demand, a circularity rating (i.e., how likely is the material reused on/off-site) for the waste/materials has been provided (based on professional judgement) to determine whether they can be reused, recycled, or sent for recovery or disposed to landfill as a last resort.

7.2 The circularity rating is based on the following key shown in Table 1. The ratings and related descriptions are recommendations for the waste management route of the materials identified; the exact routes for the materials will be determined by the appointed demolition contractor (when appointed).

Table 3 Circularity Rating

Indicator	Description
■	Good condition and reuse of this material is possible.
■	Wear and tear – this material is likely to be recycled. Alternatively, this indicator may be used if the material is in good condition but there is no market for reuse and therefore must be recycled.
■	Poor condition/ not reusable or non-recyclable material, this may be due to several reasons such as there being no end market for the material to be recycled (e.g. composite materials) or due to the small quantity of the material present, which therefore makes it unviable to recycle separately. This material is likely to be sent to landfill or energy recovery.

7.3 Concrete

7.3.1 Concrete has been assumed to be located in the floor slabs of the building. Due to ceiling and floor coverings, it was not visible during the site visit.

Table 4 Concrete Quantities

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	139.22	320.20
First	25.13	57.80
Total	**164.35**	**378.00**

7.3.2 ■ For all the concrete elements we recommend that the material is crushed on site and then reused to form the piling mat, this would equate to all the concrete being used for the piling mat.

7.4 Bricks

7.4.1 Bricks (including external and internal walls) are located throughout the building as they are the primary construction material. Inside they aren't visible due to the finishes. The visible, external bricks are shown in the figures below.

Figure 7.1

Figure 7.2

Figure 7.3

Figure 7.4

Table 5 Brick Quantities

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	230.19	437.36
First	81.33	154.53
Total	**311.52**	**591.88**

7.4.1 Overall, the bricks are in good condition for reuse. However, these bricks need to be matched with the requirements of the proposed development (including colour) before reuse. If they do not meet the requirements of the proposed development, then those bricks need to be sent off-site for recycling or reuse (depending on the needs of the development).

7.5 Suspended Grid Mineral Ceiling Tiles

7.5.1 Suspended grid mineral ceiling tiles are found throughout the building. The figures below show some of the ceiling tiles found on-site.

Figure 7.5

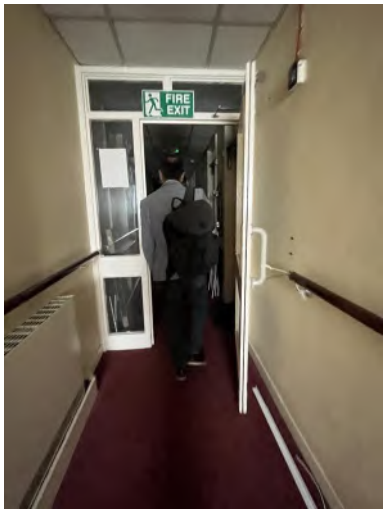

Figure 7.6

Table 6 Suspended Grid Mineral Ceiling Tiles Quantities

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	14.13	42.38
First	2.26	6.77
Total	**16.38**	**49.15**

7.5.2 The majority of the mineral ceiling tiles will be appropriate for reuse off-site. Where mineral ceiling tiles can't be reused, it is recommended that they are recycled via ceiling recycling programmes.

7.6 Metals

7.6.1 Metal radiators are found throughout the building. The figures below show some of the radiators found during the site visit.

Figure 7.7

Figure 7.8

Table 7 Metals Quantities

Floor	Approximate Quantity (m³)	Approximate Quantity (tonnes)
Ground	0.03	0.08
First	0.01	0.01
Total	**0.04**	**0.10**

7.6.2 It is recommended that all metals found on-site are to be recycled off-site.

7.7 Timber

7.7.1 It is assumed that the internal partition walls are timber. Due to internal finishes, they were not visible during the site visit.

Table 8 Timber Quantities

Floor	Approximate Quantity (m³)	Approximate Quantity (tonnes)
Ground	73.57	0.39
First	40.70	0.22
Total	**114.27**	**0.61**

7.7.2 Where high-quality solid timber cannot be reclaimed, it is recommended that it is sent for recycling.

7.8 Tiles and Ceramics

7.8.1 Tiles and ceramics (also including toilets and basins) are found in the bathrooms throughout the building. The figure below shows some of the tiles and ceramics found during the site visit.

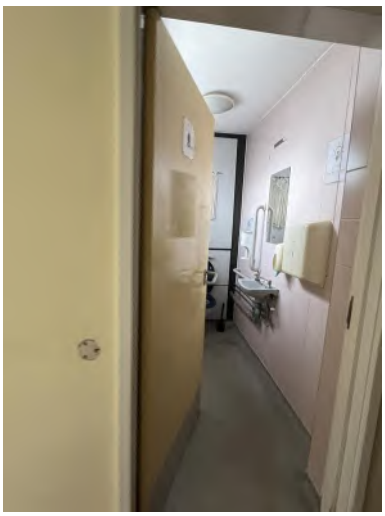

Figure 7.9

Table 9 Tiles and Ceramics Quantities

Floor	Approximate Quantity (m³)	Approximate No. of WCs	Approximate No. of Basins	Approximate Quantity (tonnes)
Ground	4.05	15.00	64.00	6.34
First	2.69	0.00	0.00	0.00
Total	**6.74**	**15.00**	**64.00**	**6.34**

7.8.2 Due to the adhesive binding of the tiles and the time required to carefully remove them without breakage, it is recommended that these materials be segregated, so that they can be crushed and recycled off-site.

7.9 Plasterboard

7.9.1 Plasterboard walls are found throughout the building. The figure below shows some of the plasterboard walls found during the site visit.

Figure 7.10

Table 10 Plasterboard Quantities

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	37.30	37.30
First	6.18	6.18
Total	**43.48**	**43.48**

7.9.2 Reuse of plaster is not yet possible, assuming a best case, this material would be recycled.

7.9.3 It is currently not possible to separate and recycle plaster from walls. It is therefore envisioned this material would be disposed of.

7.10 Glass

7.10.1 Glass is found throughout the building. The figures below show some of the glass found during the site visit. The quantities include the glazing from the double-glazing window units covered in 7.10.3

Figure 7.11

Figure 7.12

Figure 7.13

Figure 7.14

Table 11 Glass Quantities

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	30.20	80.63
First	4.04	10.79
Total	**34.24**	**91.42**

7.10.2 It is recommended that all glass be sent off-site to be crushed and recycled into new products.

7.11 uPVC Window frames

7.11.1 The window frames are plastic frames with double-glazing units. The frames are approximately 15 years old and will not comply with current regulations and therefore are not suitable for reuse.

Figure 7.15 Plastic Window Frames

Floor	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Ground	1.94	2.8
First	2.1	3.05
Total	**4.04**	**5.58**

7.11.2 The frames will be separated from the glazing and sent for recycling off-site.

7.12 Textiles

7.12.1 Textiles (i.e. carpeting) are found throughout the ground floor of the building. The figures below show some of the textiles found during the site visit.

Figure 7.16

Figure 7.17

Table 12 Textiles Quantities

Floor	Approximate Quantity (m³)	Approximate Quantity (tonnes)
Ground	10.87	16.09
First		0.00
Total	**10.87**	**16.09**

7.12.2 Due to the age of the carpet recycling is recommended.

7.13 Asphalt

7.13.1 Asphalt has been assumed to be on the roof of the building. Access to the roof was not available during the site visit.

Table 13 Asphalt Quantities

Floor	Approximate Quantity (m³)	Approximate Quantity (tonnes)
Ground	16.30	17.03
First	3.59	3.75
Total	**19.89**	**20.78**

7.13.2 All asphalt should be sent for recycling off-site. In case there is any contamination present then the asphalt cores samples can be taken and tested.

7.14 Insulation

7.14.1 Insulation has been assumed throughout the walls of the building. The insulation was not visible during the site visit.

Table 14 Insulation Quantities

Floor	Approximate Quantity (m³)	Approximate Quantity (tonnes)
Ground	39.00	2.34
First	49.44	2.97
Total	**88.44**	**5.31**

7.14.2 It is recommended that insulation containing polystyrene sheets be sent to an energy recovery plan or disposed of off-site.

7.15 Lighting

7.15.1 The figure below shows some of the lighting found during the site visit.

Figure 7.18

Table 15 Lighting Quantities

Floor	Approximate Quantity No. of Units
Ground	110.00
First	30.00
Total	**140.00**

7.15.2 Where possible, lighting can be used as temporary lighting during the initial stages of demolition. The reuse of lightbulbs and their fixtures beyond temporary works is likely impractical; it is, therefore, likely that LED lighting would be recycled, whereas older incandescent lightbulbs would be sent for energy recovery.

8.0 Identified Materials Type and Estimated Quantities

8.1 Estimated quantities of the materials anticipated to be generated during the demolition process are provided in Table 16. The estimated volumes are based on the site visit and survey drawings and do not consider the actual skip volumes that may result from the site (i.e., does not account for bulking and the inevitable voids within the skip during disposal). Figure 8.1 shows the percentage breakdown of waste identified during the Site visit.

8.2 It should be noted that the recovery potential provided within Table 16 is based on the best practices suggested by the Waste and Resource Action Programme (WRAP). Therefore, this should be used as a reference only. The % of materials to be reused or recycled in Table 19 provides the quantities the design team intend to use onsite.

Material	European Waste Catalogue Code (EWC)	Volume (m^3)	% of Total Volume (m^3)	Tonnes (t)	% of Total Tonnage (t)	Recovery Potential (%) (Best Practice) i.e. % diverted from landfill	Recovery Potential (i.e. m^3 diverted from landfill)	Disposal to Landfill/ Energy from Waste (m^3)	Recovery Potential (i.e. Tonnes diverted from landfill)	Disposal to Landfill/ Energy from Waste (Tonnes)
Concrete	17-01-01	164.35	20%	378.00	31%	100%	164.35	0	378.00	0
Bricks	17-01-02	311.52	38%	591.88	49%	100%	311.52	0	591.88	0
Suspended Grid Mineral Ceiling Tiles	17-09-04	16.38	2%	49.15	4%	75%	12.29	4.10	36.87	12.29
Metals	17-04-05	0.04	0%	0.10	0%	100%	0.04	0	0.10	0
Timber	17-02-01	114.27	14%	0.61	0%	95%	108.55	5.71	0.58	0
Tiles & Ceramics	17-01-03	6.74	1%	6.34	1%	100%	6.74	0	6.34	0
Plasterboard	17-08-02	43.48	5%	43.48	4%	95%	41.30	2.17	41.30	2.17
Glass	17-02-02	34.24	4%	91.42	8%	100%	34.24	0	91.42	0
uPVC Window Frames	17-02-03	17.12	2%	30.47	2%	100%	17.12	0	30.47	0
Textiles	20-01-11	10.87	1%	16.09	1%	100%	10.87	0	16.09	0
Asphalt	17-03-02	19.89	2%	20.78	2%	0%	0	19.89	0	20.78
Insulation	17-06-01	88.44	11%	5.31	0%	0%	0	88.44	0	5.31
Total		**827.33**	**100%**	**1233.64**	**100%**		**707.02**	**120.31**	**1193.05**	**40.58**

Table 16 Estimated Quantities of Materials

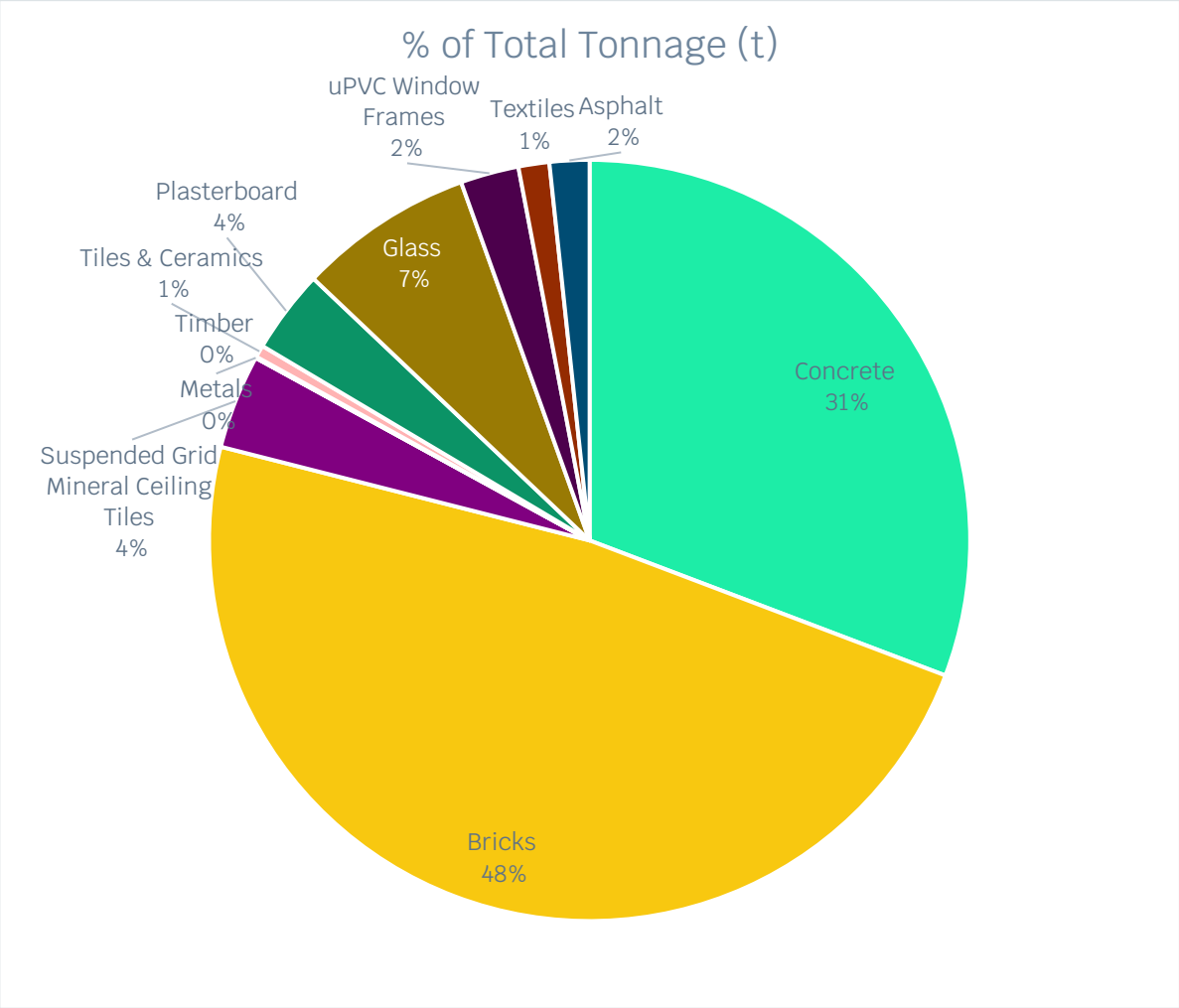

Figure 8.1 Approximate Quantities of Materials (%) by Weight (Tonnes)

8.3 It can be noted from Table 16, that approximately 85% (volume) and 97% (tonnage) of the demolition waste can be recovered i.e., diverted from landfill, which is in line with the guidance provided within BREEAM UK New Construction non-domestic buildings Technical Manual 2014.

8.4 In addition to the materials identified, a total of 1397 m^3 of surplus material would also be generated due to the excavation activities. It is anticipated that approximately 98 m^3 would be used as refill, and the remaining quantities of this material will be sent off-site for recycling.

9.0 Waste Management Opportunities

The key shown in Table 17 has been adopted to show the opportunity of each waste/ material identified.

Table 17 Opportunities Key

Icon	Description
	Reduction in landfill costs

	Reduced environmental impact
	Less carbon/ energy intensive
	Preserve natural resources
	Corporate social responsibility

9.1 The potential opportunities for reusing and recycling the waste/ materials generated on-site as well as the benefits of such initiatives have been identified in Table 19.

9.2 There are several opportunities to apply the waste hierarchy and Circular Economy to the building being demolished and examples of local reprocessing and recycling facilities have been identified, where appropriate, in this report. However, these facilities suggested in Table 19 are not an exhaustive list. The final choices of the recommendations made within this report will need to be determined by the demolition contractor, based on the costs and benefits of the options presented. There are clear benefits to implementing waste reduction initiatives, these include:

- Reducing costs associated with disposal,
- Realising financial benefits by diverting waste from landfill, and
- Environmental and social benefits of implementing the waste hierarchy and Circular Economy.

9.3 The only materials that would be reused on-site would be inert materials such as concrete, which will be crushed and used as secondary aggregate for piling mats. Due to several constraints, on-site reprocessing is not feasible:

- The limited on-site space restricts the ability to set up the necessary equipment and infrastructure.
- The significant initial investment required for reprocessing facilities exceeds our current budget.
- On-site operations could lead to increased noise and emissions, which may not be permissible under local regulations.

9.4 Hence, the material mentioned in Table 19 will be sent to offsite recyclers. To mitigate vehicle movements and reduce dust and mud on the roads while transporting materials to the recycler off-site, the following prevention methods will be employed:

- Scheduling transportation during off-peak hours to minimise traffic disruption.
- Using covered or sealed containers to prevent spillage of materials during transit.
- Implementing wheel-washing systems for vehicles exiting the site to reduce mud and debris on public roads.
- Regularly monitoring and cleaning access roads to maintain cleanliness and reduce dust generation.

9.5 A site-specific construction management plan will be implemented before any work commences on-site to ensure these measures are effectively enforced.

9.6 Waste contractors in the area that collect multiple construction streams (segregated) are shown in Table 18. This list is not intended to be comprehensive, and waste generators will need to meet their legal duty of care by making sure that any waste produced is managed responsibly and only given to businesses authorised to take it. The presence of a company on the list below does not remove the requirement for waste generators to carry out their own duty of care checks.

Table 18 Waste Companies in London, which collect multiple Construction, Demolition and Excavation (CD&E) Waste Streams

Waste Company

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

Capital Waste www.Capwaste.co.uk
London Waste Removal Service www.Londonwasteremovalservice.co.uk/demolition
O'Donovan Waste Disposal https://www.odonovan.co.uk/
Junk Bunk Limited https://junkbunk.co.uk/
Swift Waste Management https://swiftwaste.co.uk/
Powerday https://powerday.co.uk/
Bywaters https://www.bywaters.co.uk/

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

Table 19 Waste Reduction Opportunities

Material Type	Circularity Rating	Suggestion					Opportunity	Constraints	Example Reprocessors
		On-Site Reuse	On-Site Recycling	Off-Site Reuse	Off-Site Recycling	Off-Site Disposal			
Concrete	■	It is assumed that 100% of the concrete can be reused on-site for the piling mat.	Once used for piling mat the crush will be sent for regrading and then reused permanently on-site for	It is assumed that 0% of the concrete can be reused off-site.				Additional space to keep materials segregated.	A list of recycling companies that collect crushed aggregate is provided in Table 18.
Bricks	■■	At this stage, it is assumed that 0% (by weight) of bricks will be reused on-site. However, it is proposed that a specialised contractor be taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-site.	At this stage, it is assumed that 0% (by weight) of bricks will be recycled on-site. However, it is proposed that a specialised contractor be taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-site. If on-site crushing is allowed (considering the noise and dust constraints), then the crushed material can be used as bulk fill in areas, where the levels are built up.	Based on the condition and quality (subject to testing) approximately 50% (by weight) would be reused off-site.	Based on the condition and quality (subject to testing) approximately 50% would be recycled off-site.	At this stage, it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated to then transport off-site for crushing. Additional time in the demolition programme will have to be allowed and it is likely to incur increased demolition costs, however, there will be a resale value for the bricks, and it would considerably reduce the amount of material that is downcycled for secondary aggregates.	Globe Chain is a reuse marketplace that connects companies with charities, Small and Medium-sized Enterprises (SMEs) and individuals to redistribute unneeded construction material while collating social, environmental and economic data GlobeChain: https://www.globechain.co.uk Salvage opportunities for bricks: https://www.salvoweb.com

Suspended Grid Mineral Ceiling Tiles	At this stage, it is assumed that 0% (by weight) of this material will be reused on-site. However, it is proposed that a specialised contractor be taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site. However, it is proposed that a specialised contractor be taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-site.	Based on the condition and quality (subject to testing) approximately 50% (by weight) would be reused off-site.	Based on the condition and quality (subject to testing) approximately 50% would be recycled off-site.	At this stage, it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.		Additional space is required to keep material segregated.	Armstrong Ceiling Solutions has a recycling service for acoustic ceiling tiles https://www.armstrongceilingsolutions.co.uk/en-gb/performance/sustainable-building-design/recycling-programmes
Metals	At this stage, it is assumed that 0% (by weight) of metal will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to testing) - 100% (by weight) would be recycled off-site.	At this stage, it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	EMR Scrap Metal: http://www.emrgroup.com/
Timber	At this stage, it is assumed that 0% (by weight) of metal will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	Based on the condition and quality (subject to testing) approximately 50% (by weight)	Based on the condition and quality (subject to testing)	At this stage, it is assumed that 100% of this material would be recycled and		Additional space to keep materials segregated.	Globechain: https://www.globechain.co.uk

				would be reused off-site.	approximately 50% would be recycled off-site.	therefore not be subject to disposal to landfill.			Community Wood Recycling can reclaim wood and reuse it: https://www.communitywoodrecycling.org.uk/
Tiles and Ceramics		At this stage, it is assumed that 0% (by weight) of tiles and ceramics will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to testing) 100% (by weight) would be recycled off-site.	At this stage, it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	https://www.globechain.co.uk
Plasterboard		At this stage, it is assumed that 0% (by weight) of plasterboard will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to testing) 100% (by weight) would be recycled off-site.	Based on the condition and quality (subject to testing) some material may be disposed of off-site		Additional space to keep materials segregated.	British – Gypsum: https://www.british-gypsum.com/about-us/csr/environmental-challenges/plasterboard-recycling Junk Removal London provides collection services for plasterboard: http://junkremovalslondon.com/plasterboard-collection/
Glass		At this stage, it is assumed that 0% (by weight) of glass will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to	At this stage, it is assumed that 100% of this material would be		Additional space to keep materials segregated.	May Glass Recycling: https://www.mayglassrecycling.co.uk/services

					testing) 100% (by weight) would be recycled off-site.	recycled and therefore not be subject to disposal to landfill.			Nationwide Waste Services: https://www.nationwidewasteservices.co.uk/recycling/ Guardian Glass: https://www.guardianglass.com/gb/en Pilkington Glass Manufacturing: https://www.pilkington.com/
Plastics **(uPVC windows)**		At this stage, it is assumed that 0% (by weight) of plastics will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site	Based on the condition and quality (subject to testing) - 100% (by weight) would be recycled off-site	At this stage, it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	Recovinyl offers a takeback scheme for vinyl flooring via Axion Group: https://axiongroup.co.uk/services/specialist-collection-schemes/recovery/
Textiles		At this stage, it is assumed that 0% (by weight) of this material will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to testing) 100% (by weight) would be	At this stage, it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	Carpet Recycling UK: https://carpetrecyclinguk.com/

					recycled off-site.				
Asphalt		At this stage, it is assumed that 0% (by weight) of asphalt will be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site.	0% (by weight) will be reused off-site.	Based on the condition and quality (subject to testing) 100% (by weight) would be recycled off-site.	At this stage, it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	A list of recycling companies that collect crushed aggregate is provided in Table 18.
Insulation		At this stage, it is assumed that 0% (by weight) of insulation will be reused on-site. Insulation containing hazardous material is not expected to be reused on-site.	At this stage, it is assumed that 0% (by weight) of this material will be recycled on-site. Insulation containing hazardous material is not expected to be recycled on-site.	0% (by weight) will be reused off-site. Insulation containing hazardous material is not expected to be reused off-site.	0% (by weight) will be recycled off-site. Insulation containing hazardous material is not expected to be recycled off-site.	100% Disposal off-site.		Additional disposal costs.	RJS Waste Management UK: Rjswastemanagement.co.uk
Lighting		At this stage, it is assumed that 0% (by weight) of lighting will be reused on-site.	At this stage, it is assumed that 0% (by weight) of concrete will be recycled on-site.	At this stage, it is assumed that 0% (by weight) of metal will be recycled on-site.	Only low-energy light bulbs and fluorescent light tubes are recyclable. Incandescent (old-fashioned) light bulbs	Based on the condition and quality (subject to testing) some material may be disposed of off-site.		Additional space to keep materials segregated. Additional disposal costs.	Recolight: https://www.recolight.co.uk/ BPR Group: http://www.bprgroup.co.uk/ Globechain:

		cannot be recycled. Therefore, 100% (by weight) is expected to be recycled off-site.	https://www.globechain.co.uk Salvo: https://www.salvoweb.com/

10.0 General Guidance for Management of Demolition Materials and Waste

10.1 This pre-demolition and pre-redevelopment audit has been conducted to allow material and waste management to be considered in the early stage of the project. The client, architect and demolition contractor should be involved in the material and waste management process from the offset. This will allow for effective planning to realise the value of materials on-site and their subsequent management (i.e., consideration of the waste hierarchy).

10.2 The reuse of material on-site or on a nearby similar project is the ideal option from an environmental and economic perspective. The client and architect are best positioned to consider these options and enable these initiatives. Doing so also often results in reduced transportation, reducing embodied CO_2 emissions and costs associated with material management on the project. To maximise this opportunity, it is advised that the following are considered:

- Opportunities for reuse on-site,
- Safe storage of these items on-site, in a separate storage area if feasible,
- Opportunities for reuse by the client on other projects,
- Opportunities for reuse on local/ similar projects,
- Advertisement of specific items on websites (e.g., www.salvo.co.uk),
- Contacting local architectural salvage merchants about specific items, and
- Selling or gifting items locally.

10.3 Waste arisings during demolition works should be continually monitored to provide a thorough understanding of the types and amounts of waste coming from the site. This data collection will help with the continual improvement of material and waste management on-site. Data collection can also be used to help set more demanding waste segregation targets for future demolition and refurbishment projects.

11.0 Recommendations and Next Steps

11.1 The type and quantities of material present on-site have been identified, and opportunities to apply the principles of waste hierarchy and Circular Economy applied to different material types, with local reprocessing and recycling facilities identified. Ahead of construction works taking place, the following recommendations and next steps are suggested:

- Lifecycle analysis of new construction materials for the proposed development, in conjunction with the reuse/ recycling of materials as identified in this report.
- Embed the recommendations within this report in the design process at the pre-tender stage so the measures concerning reuse and recycling targets are included in the awarded construction contract.
- Engagement with construction material suppliers to explore opportunities for takeback schemes.
- Where takeback schemes with suppliers are not possible, it is recommended that early engagement with reprocessing and recycling companies take place, to best capture recyclable materials and avoid downcycling.
- It is recommended that the materials identified within this report are incorporated into a Site Waste Management Plan (SWMP)/ Construction Resource Management Plan (CRMP) for effective management of waste. This is considered good practice for all construction projects and is a key step in facilitating diversion from landfills.
- Identify storage areas on-site as appropriate for the types and quantities of waste anticipated to be produced during construction works. These areas should allow for the successful segregation of waste, as appropriate to avoid contamination of the different waste and material streams.
- All staff should have appropriate levels of training to enable the segregation of waste. Waste management information should be included within the site induction for all personnel. It is recommended that a reporting procedure SWMP/CRMP is put in place to catalogue the materials/ waste produced, which is regularly updated. This will allow for the appropriate organisation of the transport of materials/ waste on-site and prevent stockpiling.
- Further to this, it is recommended that a Waste Champion is nominated by the principal contractor to facilitate the management of the SWMP/ CRMP. This role would also aim to allow the waste hierarchy to be always considered, with the emphasis being on reducing, reusing, and recycling before landfill disposal is considered.

11.2 Once the principal contractor is commissioned to undertake the construction works, the following should be considered:

- The principal contractor should engage all contractors in the process of maximising high-grade reuse and recycling opportunities, and
- The principal contractor should refer to the Pre-Demolition and Pre-Redevelopment Audit Report in the SWMP/CRMP.

12.0 Further Information

12.1 In addition to the resources detailed in Table 19, further information on sustainable waste management for construction projects can be found through the following sources:

- Bioregional, Reclaimed Buildings Product Guide: https://www.bioregional.com/resources/reclaimed-building-products-guide

13.0 About Symmetrys

13.1 At Symmetrys, we understand our responsibility as designers to mitigate the impact of the built environment on our planet. We also understand that the materials we use and specify have the potential to further contribute to the climate crisis through high emissions, biodiversity and habitat loss, and pollution.

13.2 Following our sign-up and commitment to 'Structural Engineers Declare', we are working to develop an approach to design that delivers solutions that not only benefit the client but positively impact the local community, wider society and the environment. To do this, we have put together a code of practice; a minimum set of requirements that we expect all our engineers to adhere to.

13.3 We intend to count every kilogram of embodied C02e in every one of our projects. This approach will provide us with the data we need to identify where we can design more efficiently, and begin to phase out the construction techniques and design practices that do not further the pursuit of a low-carbon built environment.

13.4 Design decisions can be influenced by several different factors but where we can, we will seek to drive sustainable solutions as a priority. Ultimately, the most sustainable option is to build nothing, and understanding how this idea can be meaningfully implemented in the design of a new structure can be tricky. However, being able to critically appraise design decisions, challenge the brief where necessary and reuse wherever possible, we can reduce our impact drastically.

13.5 Now more than ever, it is important that we use no more material than absolutely necessary. Typical design practices and short programmes can often result in the overdesign of elements. At Symmetrys, we work to produce considered design that is refined throughout a project to ensure that the most efficient version is built.

13.6 Once the material use has been minimised through reduction of structure and efficient design, we can focus on getting the best out of the material we do use. We are committed to specifying the lowest carbon materials we can – that can be in the form of cementitious replacements, reusing structural steelwork or the use of natural materials like timber, as opposed to more carbon-intensive options such as new light-gauge steelwork.


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APPENDIX C

create
CONSULTING
ENGINEERS LTD

11-12 INGESTRE ROAD, LONDON

Refuse & Recycling Plan

11-12 INGESTRE ROAD, LONDON, NW5 1UX
Refuse & Recycling Plan

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Reference: CB/VL/P17-1282/17

Date: April 2024

11-12 INGESTRE ROAD, LONDON
Refuse & Recycling Plan

11-12 INGESTRE ROAD, LONDON, NW5 1UX
Refuse & Recycling Plan

Contents

Figures

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

Brief

1.1 Create Consulting Engineers Ltd was instructed by Four Quarters (Ingestre Road) Ltd to produce a Reuse & Recycling Plan (R&RP) to support the proposed Extra Care Development at the site of the former care home at 11-12 Ingestre Road, London, NW5 1UX.

Project Context

1.2 The proposed development is to comprise the demolition of existing buildings and the erection of a six storey plus single storey basement building accommodating 50 Assisted Living residential apartments with associated communal facilities and ancillary café, salon and mini gym, together with external spaces, car lift, basement parking, laundry, plant, CCTV, lighting, access, landscaping, infrastructure and other ancillary works.

1.3 Architectural Drawings of the Basement and Ground floor Layouts are included as Figure 1.1a and 1.1b below.

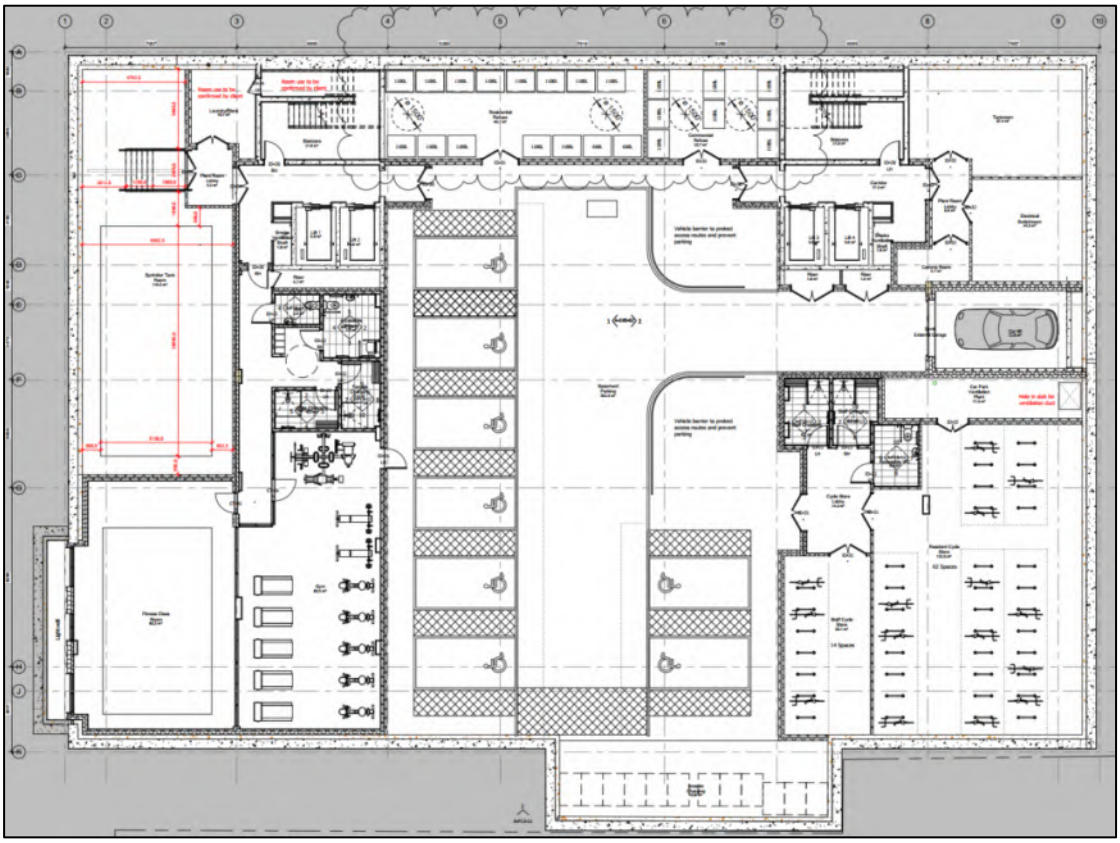

Figure 1.1a: Proposed Basement Plan (Ref: 30149-A-P11-00 T7)

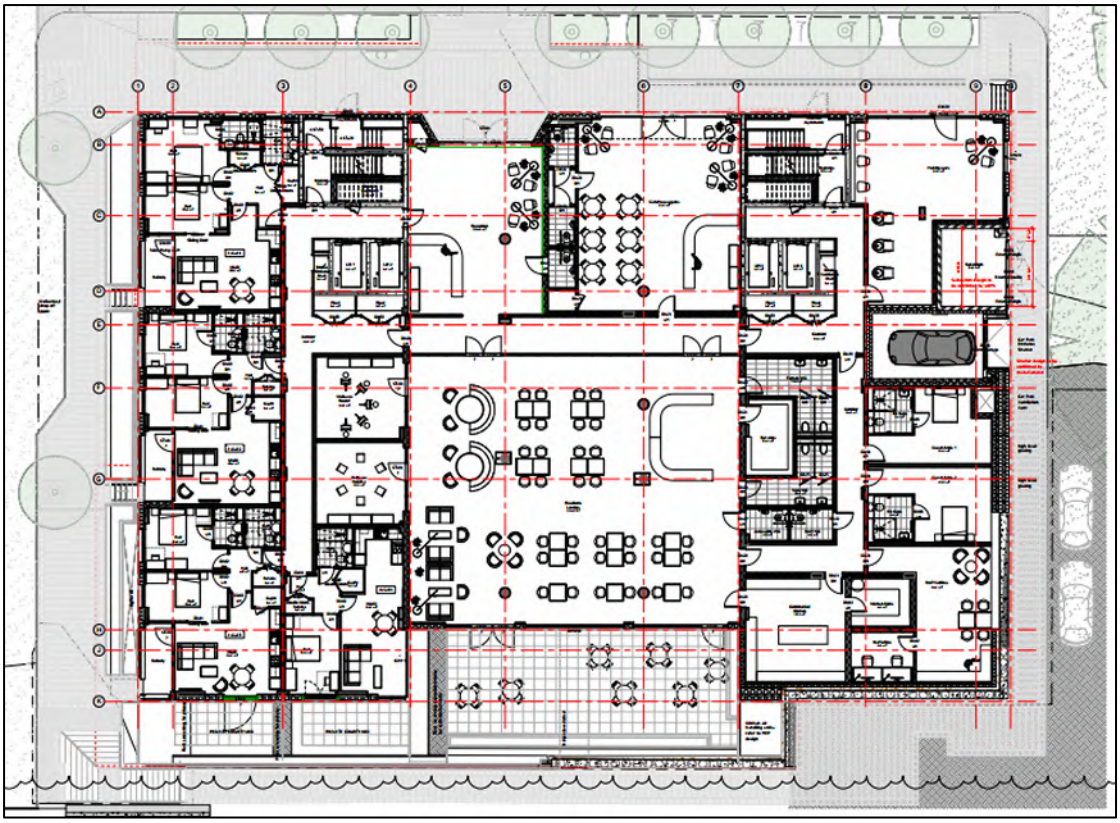

Figure 1.1b: Proposed Ground Floor Plan (Ref: 30149-A-P11-01)

Planning Context

1.4 The proposed development (Ref: 2018/4449/P) was granted permission subject to a number of conditions and informatives, including the following.

CONDITION 5: REFUSE & RECYCLING

Prior to first occupation of the residential units a waste management plan shall be submitted to and approved in writing by the Local Planning Authority. Such a plan shall include details for the arrangement of moving waste from the storage room to grade level to the pick-up point. The development shall not be implemented other than in accordance with such measures as approved. All such measures shall be in place prior to the first occupation of any residential units and shall be retained thereafter.

Reason: To safeguard the amenities of the future occupiers and adjoining neighbours in accordance with the requirements of policy CC5 of the Camden Local Plan.

Objective

1.5 The objective of this report is to provide a refuse and recycling strategy to support the proposed use development including requirements for waste storage and management prior to collection and discharge the planning condition above.

Scope of Works

1.6 In order to prepare a R&RP for the scheme, the following scope of works is required:

- A review of the scheme application details;
- A review of the relevant legislation and local borough policy guidance;
  Liaison with the Council/Waste Officer to prepare confirm requirements for the scheme;
- An estimation of waste volumes (and composition) and outline design considerations for waste infrastructure (liaising with architect and transport consultant for the scheme) for the class uses required; and
- Assessment of waste storage, management and collection requirements for the class uses required.

2.0 SITE LOCATION

2.1 The site is located in the London Borough of Camden, approximately 375m west of Tufnell Park tube station and approximately 600m northwest of Kentish Town tube station as shown on Figure 2.1 below**.**

2.2 The site is located on Ingestre Road and accessed from the northeast, via Burghley Road and to the west (pedestrian access only) from Little Green Street, via Highgate Road (B518).

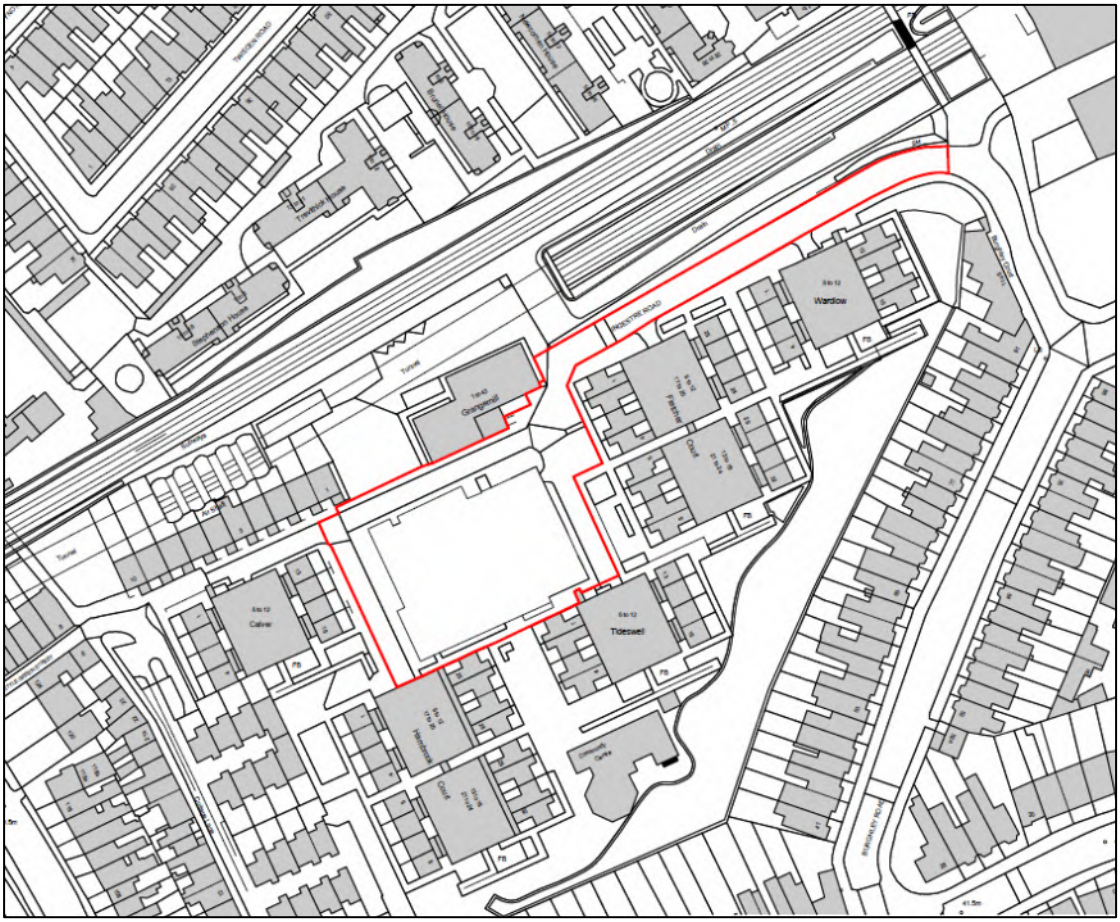

Figure 2.1: Site Location Plan

3.0 POLICY AND LEGISLATION

3.1 A summary of national legislation and national, regional and local planning policy relevant to the proposed development is provided in the following sections.

3.2 It should be noted that this summary identifies those elements of the policy or guidance applicable to waste management within the proposed development and does not provide a comprehensive summary of the identified legislation or policy.

Legislation

- Clean Neighbourhoods and Environment Act 2005 (as amended 2015);
- Control of Pollution Act (COPA) 1974 (as amended 1989);
- Control of Substances Hazardous to Health (COSHH) Regulations 2002;
- The Controlled Waste (England and Wales) Regulations 2012;
- The Environment Act 1995;
- Environmental Protection Act 1990 (EPA);
- The Waste Enforcement (England and Wales) Regulations 2018;
- The Landfill Tax Regulations 1996 (as amended 2017);
- The List of Wastes (England) Regulations 2005;
- The Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended 2017);
- The Hazardous Waste Regulations 2005 (as amended 2016);
- The Waste (England and Wales) Regulations 2011 (as amended 2021);
- The Waste Batteries and Accumulators Regulations 2009 (as amended 2015);
- The Waste Electrical and Electronic Equipment (WEEE) Regulations 2015; and
- The Waste Management (England and Wales) Regulations 2006 (as amended 2007).

National Policy and Legislation

National Planning Policy Framework

3.3 The National Planning Policy Framework (NPPF) outlines the Government's planning policies for England and how they are expected to be applied. The document identifies three dimensions to sustainable development, with the environmental dimension being one of them. As part of the environmental dimension, the document notes that efforts must be made to minimise waste generation and increase re-use and recycling.

3.4 The NPPF does not contain specific waste policies; instead, national waste planning policy is contained within the Waste Management Plan for England (2013), the National Planning Policy for Waste (2014), the Resources and Waste Strategy for England (2018) and Planning Practice Guidance as discussed below.

Planning Practice Guidance (2014)

3.5 Planning Practice Guidance (PPG) provides a web based resource in support of the NPPF. There are two guidance documents that are relevant to waste: 'Design' and 'Waste'.

3.6 The document entitled 'Design' states that carefully planned bin storage is particularly important and Local Authorities should make sure that each dwelling is carefully planned, so that sufficient storage is provided, which is discretely designed and accessible. Storage should be allocated based on practices within the specific Local Authority (e.g., relating to recycling, food waste collection and landfilling).

3.7 The document entitled 'Waste' outlines the consideration local planning authorities should give towards waste management, both within Local Plans and with regards to the Waste Hierarchy. This includes guidance on considerations to be included within development planning applications:

- The promotion of the "sound management of waste from any proposed development, such as encouraging internal management of waste where this is appropriate, or including a planning condition to encourage or require the developer to set out how waste arising from the development is to be dealt with";
- "Ensuring that collections of household and similar waste are organised so as to help towards achieving the higher levels of the Waste Hierarchy";
- That steps are "taken to ensure effective segregation of wastes at source including, as appropriate, the provision of waste sorting, storage, recovery and recycling facilities"; and
- That it will be useful for proposals that are likely to generate significant volumes of waste through the development or operational phases to include a waste audit. "This audit should demonstrate that in both construction and operational phases of a proposed development, waste will be minimised as far as possible and that such waste as is generated will be managed in an appropriate manner in accordance with the Waste Hierarchy".

Resources and Waste Strategy for England (DEFRA, 2018)

3.8 This strategy lays out a number of aims and actions to be taken to preserve natural resources, minimise waste, promote resource efficiency and move towards a circular economy. The document has many ambitions in line with the Government's 25 Year Environment Plan. The targets include:

- The proportion of municipal waste sent to landfill to be 10% or less by 2035;
- A 65% recycling rate for municipal solid waste;
- Legislation for mandatory separate food waste collections by 2023; and
- Eliminate avoidable waste of all kinds by 2050.

Waste Management Plan for England (DEFRA, 2021)

3.9 The Waste Management Plan for England is a high level document which describes how the government intends to work towards a more efficient and sustainable approach to waste and resource use/management and outlines the steps required to move towards a zero waste economy.

3.10 It provides an analysis of the waste management situation in England and how it will aim to achieve the objectives and provisions of the EU Waste Framework Directive.

3.11 A number of key targets from the Waste (England and Wales) Regulations 2011 (as amended 2021) are reiterated in the plan, including the following:

- To work towards eliminating food waste to landfill by 2030;
- To eliminate avoidable plastic waste over the lifetime of the 25-Year Environment Plan; and
- To eliminate avoidable waste of all kinds by 2050.

National Planning Policy for Waste (2014)

3.12 The National Planning Policy for Waste provides the planning framework to enable local authorities to put forward, through local waste management plans, strategies that identify sites and areas suitable for new or enhanced facilities to meet the waste management needs of their areas.

3.13 The National Planning Policy for Waste states that when determining planning applications for non-waste developments, Local Authorities should ensure that:

- "the likely impact of proposed, non-waste related developments on existing waste management facilities, and on-sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the Waste Hierarchy and/or the efficient operation of such facilities";
- "new, non-waste developments make sufficient provision for waste management and promote good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape. This includes providing adequate storage facilities at residential premises, for example, by ensuring that there is sufficient and discrete provision for bins, to facilitate a high quality, comprehensive and frequent household collection service"; and
- "the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal."

British Standard

3.14 British Standard BS 5906:2005 Code of Practice for Waste management in Buildings outlines the methods for the storage, collection, segregation for recycling & recovery and on-site treatment of waste arising from residential and non-residential buildings.

3.15 The guide outlines the principles to be considered in the design of storage facilities, the consultation process between designers and collection authorities and ensure sufficient capacity and adequate accessibility is provided for waste storage areas to facilitate both deposits by residents/commercial entities as well as collections.

3.16 The guidance outlines the various waste streams that need to be catered, including the separate recyclable waste streams, and outlines the methods of storage, handling and on-site treatment where applicable and the conditions for waste collection.

Regional and Local Planning Policy

Camden Planning Guidance (CPG) Design (January 2021)

3.17 Camden's CPG design provides guidance on the storage and collection of recycling and waste for the borough and relates t Camden Local Policy CC5 Waste which requires developments to include facilities for the storage and collection of waste and recycling.

3.18 In the guidance, it is advised that developers should ensure that all waste systems and storage areas in new developments or refurbished developments are:

- designed to provide adequate space for the temporary storage of all types of waste, including internal storage areas with sufficient space for the separation of temporary storage of all recycling, food waste and residual waste;
- sensitively designed and located in relation to the local environment especially in conservation areas and listed buildings;
- safely located and accessible for all users, including waste contractors, and designed to minimise nuisance to occupiers and neighbours and their amenity;
- sufficiently flexible to accommodate future increases in recycling targets; and
- designed to include where appropriate, innovative waste management solutions that increase efficiency and help meet and exceed recycling and other waste reduction targets.

4.0 WASTE GENERATION AND COMPOSITION

4.1 The proposed development is to comprise the erection of a six storey plus single storey basement building accommodating 50 Assisted Living residential apartments with associated communal facilities and ancillary café, salon and mini gym, together with external spaces, car lift, basement parking, laundry, plant, CCTV, lighting, access, landscaping, infrastructure and other ancillary works.

4.2 As the development comprises both commercial and residential units, separate storage areas will be provided for both uses. Each storage area will require separate code/fob/key access to prevent misuse. Commercial waste is not permitted enter the household waste stream

4.3 Residents will be responsible for segregating waste into the waste streams catering for mixed recyclables, organic waste and general refuse.

4.4 Waste storage areas have been allocated within the basement for both domestic and commercial waste (see Drawing Number 27463-A-P11-00a), with 49.7m^3 allocated for residential waste and 25.7m^3 allocated for commercial waste. The location of these areas are shown in Figure 4.1 below.

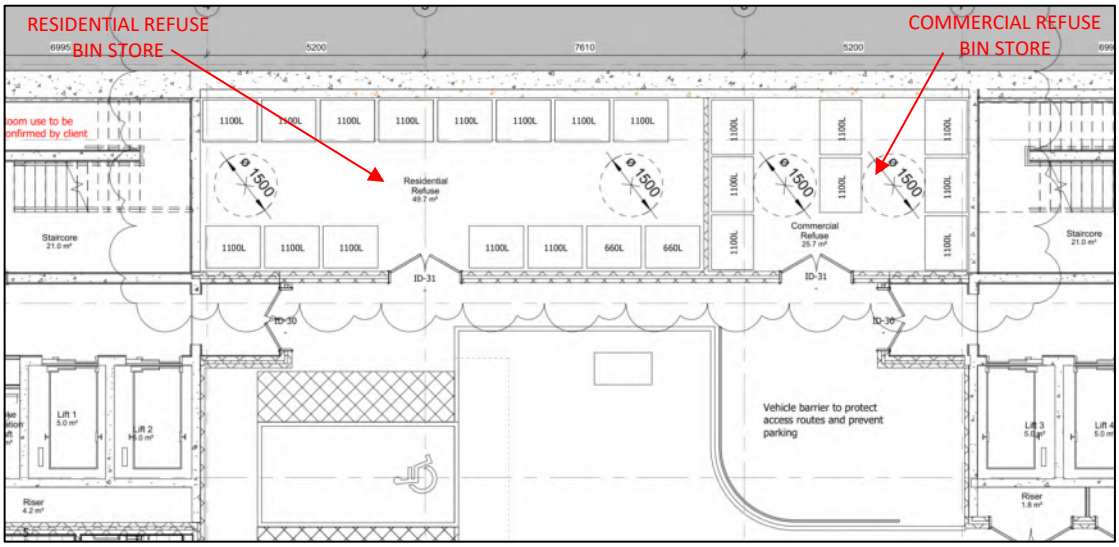

Figure 4.1: Waste Storage Areas

4.5 The basement storage areas are of sufficient size to accommodate the required number of bins for both residential and commercial wastes and the residential storage area will not be used for commercial waste.

4.6 The residents do not need to carry their waste more than 30m horizontal distance from their door to bin store and the there is sufficient space in front of the bins for access and the stores will be lit. Passive ventilators will be incorporated to allow air flow and prevent unpleasant odours.

4.7 Arrangements will be made by the Concierges to clean the stores with a suitable drainage system and the construction of the storage area will conform to all necessary fire standards.

Residential Waste Storage

4.8 Camden Planning Guidance (CPG 1) requires waste volumes to be calculated using a minimum volume per three bedroom dwelling; 120 litres for general waste, 140 litres for mixed dry recyclables and 23 litres for food waste.

4.9 The volume of waste anticipated and corresponding number of bins required for three key waste streams is detailed in Table 4.1 below.

Type of Unit	No. of Units	Volume of waste per unit (litres)	Total Volume of Waste (litres)	General Waste Bins (1,100L)	Recycling Waste Bins (1,100L)	Food Waste Bins (660L)
General Waste	50	120	6,000	6	-	-
Mixed Dry Recycling	50	140	7,000	-	7	-
Food Waste	50	23	1,150	-	-	2

Table 4.1: Anticipated volume of waste

4.10 The waste storage area for residents of the site will require 13No. 1,100 litre containers (6No. for general waste and 7No. for recyclables) and 2No. 660 litre blue containers for food waste.

4.11 The storage area will be approximately 49.7m^2 in order to accommodate the waste containers identified.

Commercial Waste Storage

4.12 The volume of waste generated and the number of bins required for a commercial use is dependent on the use of the building. The general guidance from Camden (CPG 1) is to provide approximately one cubic metre of storage per 300-500 sq. m of commercial space.

4.13 The total commercial use space is approximately 480m^2, with approximately 137m^2 for café/kitchen and the following areas for the other ancillary uses: Salon (36.6m^2), Gymnasium (196m^2), Laundry (55.7m^2) and office space for staff (54.6m^2).

4.14 On the basis of this use, it is considered that the following bins would be sufficient:

- 3 No. Recycling bins (1,100L);
- 3 No. General Refuse bins (1,100L); and

- 2 No. Organic waste bins (660L).

4.15 The commercial waste storage area will be approximately 25.7m^2 and will accommodate the waste containers identified above.

5.0 WASTE STORAGE AND MANAGEMENT

5.1 Residents and commercial entities will be responsible for segregating waste into the waste streams catering for dry recyclables, food waste and general waste.

Residential Storage

5.2 To encourage residents to recycle waste, all flats and shared kitchens will be provided with internal storage space for recyclables, residual and organic waste, which will enable the residents to segregate their waste.

5.3 A combined external storage area for residents has been provided to accommodate for 13No. 1,100 litre bins (7No. for dry mixed recycling and 6No. for general waste) and 2No. 660 litre blue containers for food waste. The storage areas are provided in the basement

5.4 All external refuse stores provided are of sufficient size to store the containers required for the development. The communal bins will be supplied with flat tops which fold fully back, rather than the sprung “roll-top” sliding lid type, which are more likely to be broken during the emptying operation. The bins will be clearly identifiable for the segregation of recycling and rubbish.

5.5 The storage areas will be designed to minimise noise and smell impacts on residents and suitable signs in place to direct the residents.

5.6 The container areas are conveniently presented so that residents can access all containers. There is access to each of these storage areas from within the building for residents. The storage areas will be well ventilated and well-lit and cater for recycling, general refuse and organic wastes. The enclosures will be of robust construction and able to withstand any impact from laden 1,100 and 660 litre bins during bin movements with gate stops, hinges, frames, latches and striking plates of sufficient strength and construction.

5.7 The enclosure for the refuse stores provides sufficient room for each individual bin to be manoeuvred without moving other bins in the enclosure and have a clear turning circle area to fully manoeuvre 1,100 litre bins (with dimensions 1360mm by 1070m).

Commercial Storage

5.8 A storage area has been provided for the commercial refuse.

5.9 Each of the containers in the allocated commercial refuse store are individually accessible and can be wheeled out without moving other containers. The communal bins will be supplied with flat tops which fold fully back, rather than the sprung “roll-top” sliding lid type, which are

more likely to be broken during the emptying operation. The bins will be clearly identifiable for the segregation of recycling and rubbish.

5.10 The storage areas will be designed to minimise noise and smell impacts on users and suitable signs in place to direct the commercial occupants.

5.11 The kerb adjacent to the storage area will be dropped to enable the collection operatives to manoeuvre the full/empty bins into and out of the storage area. The enclosure will be of robust construction and able to withstand any impact from laden 1,100 litre bins during bin movements with gate stops, hinges, frames, latches and striking plates of sufficient strength and construction.

6.0 WASTE COLLECTION

6.1 The collection of the bins will be managed by a concierge system. The bins will be brought up from the basement storage areas (residential and commercial on separate collection days) to ground level by the concierge via the car lift on the day of their respective collection. The bins will be temporarily stored adjacent to northeast of the Site building (see Figure 6.1 below) and then returned back to the basement storage area on completion of collection.

6.2 An allocated loading area (cross-hatched to keep clear) will be provided on the northeast corner of the Site, adjacent to the estate entrance (see Figure 6.2). This will enable the refuse collection vehicle to enter this allocated area in forward gear and temporarily park adjacent to the Site and temporary bin storage area to collect the refuse / recyclables.

6.3 The bins will be less than 10m from the collection vehicle and a dropped kerb will be provided to enable the safe movement of bins to the collection vehicle.

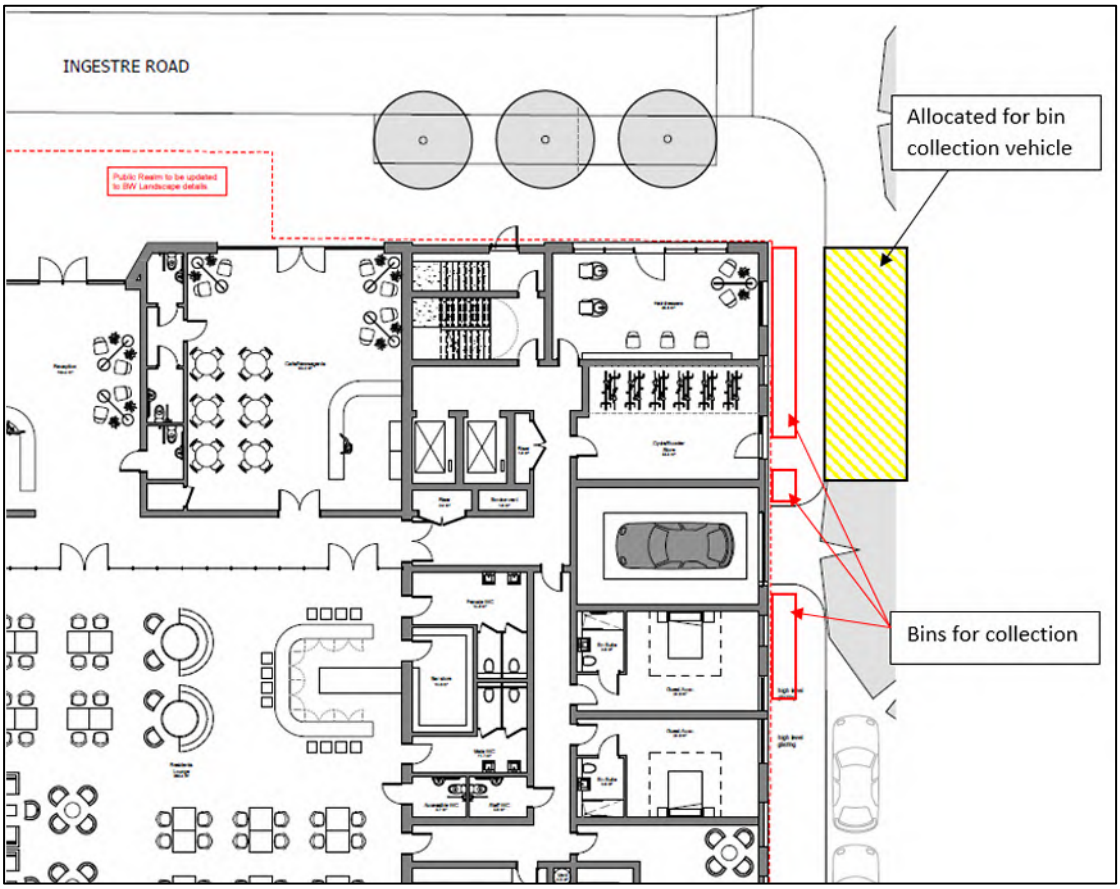

Figure 6.1: Ground Floor Plan showing waste collection area and temporary bin storage

6.4 The collection vehicles will then move off in a forward direction to collect other waste within the estate, in the undercroft to the southeast of the Site i.e. there will, be no deviation to the existing collection route.

6.5 The collection vehicles are typically 9m long, 2.45m wide and 3.75m high and a swept path analysis entering/exiting this allocated area is shown in Figure 6.3 overleaf.

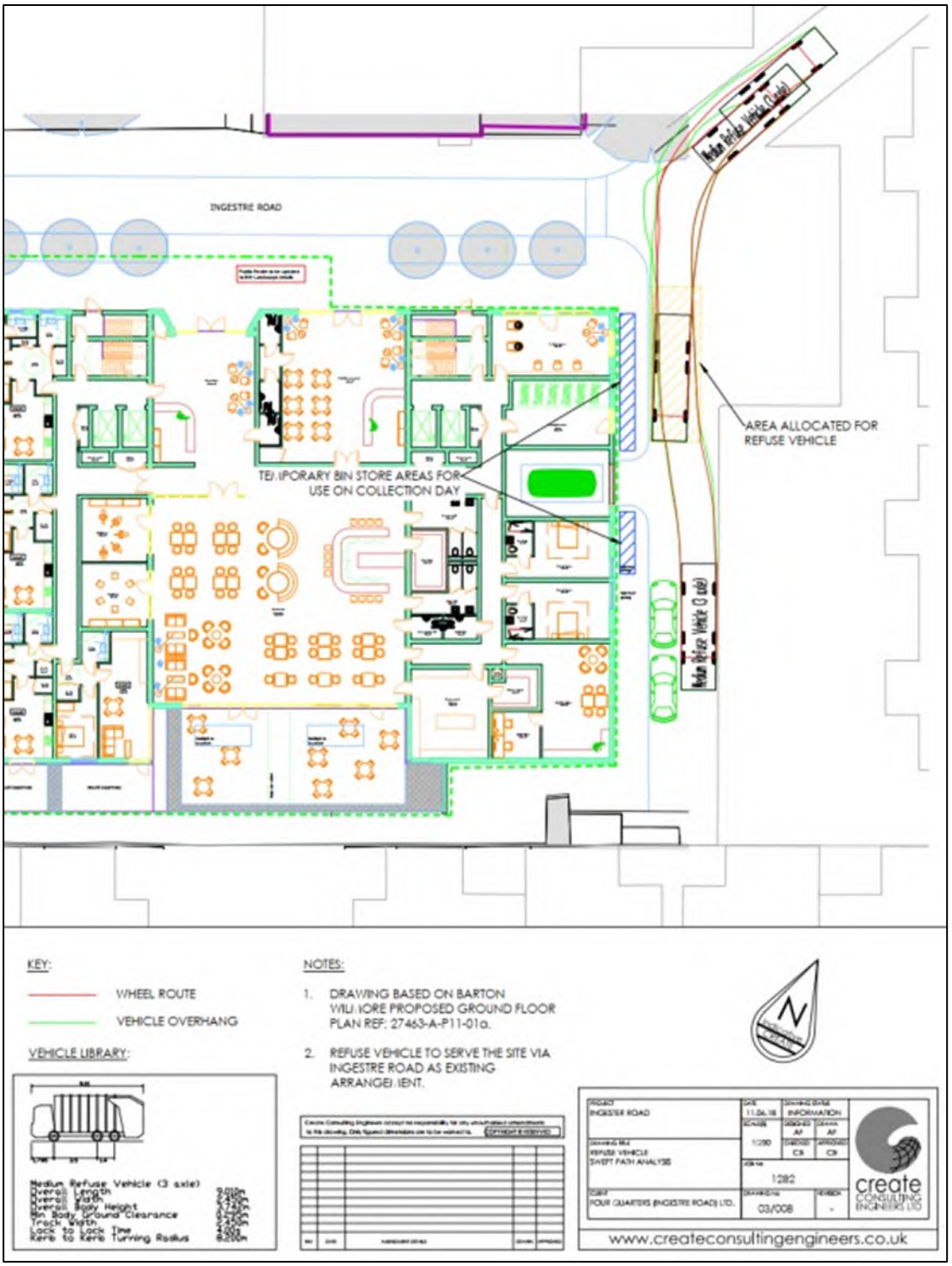

Figure 6.2: Swept Path Analysis for Waste Collection Vehicle

6.6 The access pathway to the collection point (where the vehicle stops) will be:

- level or gradient will not be steeper than 1:12;
- at least 2 metres wide;
- free from kerbs and steps;
- have solid foundations and a smooth continuous impervious surface;
- have shallow ramps where they meet roadways; and
- no more than 10 metres from the point where the collection vehicle will stop.

6.7 The access road will have:

- suitable foundations and surfaces to withstand the maximum weight of the vehicle (generally 26t GVW, 11.5t axle loading);
- heavy-duty manhole covers, gully gratings etc.;
- a minimum of 5 metres width;
- adequate space for turning; and
- road hatchings adjacent to the storage area, to ensure area kept clear at all times.

7.0 DISCLAIMER

7.1 Create Consulting disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

7.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Four Quarters (Ingestre Road) Ltd. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd and Four Quarters (Ingestre Road) Ltd.

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