

An architectural rendering of the Berol Quarter development. The image shows a mix of historic and modern architecture. In the foreground, there's a historic building with a red-tiled roof and arched windows. Behind it, a tall, modern skyscraper with a grid-like facade rises. The scene is set in an urban environment with trees and a paved area in the foreground. The overall color palette is warm and sepia-toned.

BEROL QUARTER

Detailed Circular Economy Statement

WSP

BEROL QUARTER LIMITED

December 2022



Berol Quarter Limited

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Detailed Circular Economy Statement

PUBLIC

PROJECT NO. 70094918

DATE: DECEMBER 2022

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QUALITY CONTROL

Issue/revision	First Issue	Revision 1	Revision 2	
Remarks	Draft for comment		Final issue	
Date	12/10/2022	08/11/2022	05/12/2022	
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Project number	70094918			
Report number				
File reference	\\uk.wspgroup.com\Central Data\Projects\70094xxx\70094918 - Ashley Road - 2 Berol Yard\03 WIP\CE Circular Economy & WLC\05 Reports			

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1 EXECUTIVE SUMMARY

This Circular Economy Statement is submitted in support of the full planning application ('the Application') made on behalf of Berol Quarter Limited ('the Applicant') for Berol Quarter (the Proposed Development) in the London Borough of Haringey.

WSP has been commissioned by the Applicant to write the Circular Economy Statement (CES) for the Proposed Development, which will be submitted along with other planning documents.

This CES has been produced to demonstrate how the design and construction of the development addresses the challenges of the climate emergency by prompting resource efficiency and adopting a circular economy approach that contributes to sustainable development.

1.1 SUMMARY OF CIRCULAR ECONOMY COMMITMENTS

CONSERVE RESOURCES

The Proposed Development has been designed to ensure that material and resources are effectively used, managed, and reduced as far as possible, in accordance with the GLA's principles of circular economy. The Proposed Development has ensured that material quantities and other resources are minimized, responsibly, and locally sourced throughout the development process. On average, at least **20% of new material used will contain reused/recycled content** by total volume of material.

ELIMINATE WASTE

The Proposed Development has also been designed to eliminate waste generation as far as possible, in accordance with the GLA's second principle of circular economy.

The Proposed Development has been designed to be flexible and adaptable, therefore increasing the building durability and longevity, thereby reducing construction, demolition, and excavation waste arising.

95% of the construction, demolition, and excavation waste will either be reused, recycled, or diverted from landfill as per planning and GLA requirements. This aligns with BREEAM Wst 01 credit – Diversion from landfill.

MANAGE WASTE SUSTAINABLY

The Proposed Development has been designed to manage waste sustainably, in accordance with the GLA's circular economy principles.

A Waste Management Plan will be submitted with the application which covers normal waste as well as recycling for the building once occupied. This was developed to help with the management of operational waste generated from the development during occupation and outlines how it will be segregated and diverted from landfill.

Sufficient and compliant bin areas and appropriately sized bins have been provided to help maximise the recycling and reuse of municipal waste in accordance with local and GLA

requirements. Moreover, a target of **65% recycled municipal waste** is anticipated to be achieved by 2030 as per planning requirements. **Summary of the GLA's Circular Economy Targets:**

- 20% of new materials used should contain reused/recycled content.
- 95% of construction and demolition waste should be reused/recycled/diverted from landfill
- 95% of excavation waste should have beneficial use
- 65% of municipal waste should be recycled by 2030

All of the above targets are being pursued, this report highlights how they will be achieved, performance monitored, and the metrics that will be used to do this.

1.2 IMPLEMENTATION APPROACH

The CES will be reviewed throughout all design stages of the project, alongside the following reports in order to achieve and exceed the GLA's Circular Economy targets:

- Chapter 5 of the EIA/Site Waste Management Plan (construction waste) – Sustainability
- Manager/Waste Champion– RIBA 4-6
- Bill of Materials – Design Team
- Pre-redevelopment/Pre-demolition Audit - Demolition Contractor–RIBA 4/5
- Sustainable Procurement Plan-Sustainability Manager/BREEAM Assessor–RIBA 4-6
- Operational Waste Management Strategy–Sustainability Manager/ Waste Champion–RIBA 5/6

Moreover, 'as built' figures will be reported at practical completion, as requested by the GLA against each of the key commitments made in the document.

2 INTRODUCTION



Figure 2-1 – Photocomposite view of the Proposed Development with the Ashley Road South Masterplan highlighted in orange.

2.1 OVERVIEW

This report has been produced to respond to the adopted London Plan (March 2021). The assessment was carried out in accordance with the GLA's Circular Economy Methodology updated in March 2022 and The London Plan policy requirements (2021) D3 'Optimising Site Capacity Through the Design-led Approach' and Policy SI 7 'Reducing Waste and Supporting the Circular Economy'.

A Circular Economy Statement (CES) is required to inform early design decisions and should be submitted at the planning stages:

- Draft Circular Economy Statement: submitted at outline/pre-application stage
- Detailed Circular Economy Statement: submitted at full planning stage (RIBA 2/3)
- 'As Built' Circular Economy Statement: submitted at post-completion stage (RIBA 5/6)

This report covers the Detailed Circular Economy Statement submission (RIBA 2), which is submitted as part of the full planning application alongside other documents commissioned by the Client.

2.2 BACKGROUND TO THE DEVELOPMENT

The existing site comprises 2 Berol Yard, a currently vacant plot of land on Watermead Way, and Berol House, the former Berol pencil factory, which is now an existing office building, that runs north-south along Ashley Road. The Site was granted planning permission (HGY/2017/2044), as part of a wider hybrid application for 1 Berol Yard, 2 Berol Yard (college site) and Berol House, on 8 June 2018. The original intention was for the 2 Berol Yard plot to provide a new campus for ADA: National College for Digital Skills. Since the granting of the hybrid permission, the College has unfortunately pulled out of the scheme. As a result, BSD is revisiting planning permission ref. HG/2017/2044 in the context of the loss of the Ada college and the subsequent marketing exercise. A new full planning application at the Berol Quarter site is now proposed comprising comprehensive refurbishment and extension of Berol House to provide high quality workspace and retail accommodation, alongside a new mixed use building accommodating Build to Rent (BtR) homes alongside commercial/retail space at the 2 Berol Yard plot.

2.3 PROPOSED DEVELOPMENT

"Full planning permission for the refurbishment and extension of Berol House to include Use Class E floorspace and the redevelopment of 2 Berol Yard to provide new residential homes, Use Class E floorspace and associated landscaping, public realm improvements, car and cycle parking and other associated works."

2.4 CIRCULAR ECONOMY METHOD STATEMENT

The next section (3) will cover the approach and the goals that were considered to achieve a circular economy for the development and give details of the specific targets that are set, following the London Plan CES Guidance, in relation to the six circular economy principles below. This section will also give details of how the measures identified will be incorporated and monitored during the whole design process, up to practical completion. The GLA's CE Principles are:

- Building in layers-ensuring that different parts of the building are accessible and can be maintained and replaced where necessary
- Design out waste-ensuring that waste reduction is incorporated from project inception to completion, including consideration of standardised components, modular build, and reuse of secondary products and materials
- Design for longevity
- Design for adaptability & flexibility
- Design for disassembly
- Use systems, elements & materials that can be reused and recycled

A Circular Economy workshop was held with the Design Team in August 2022. The six CE principles were discussed, and targets set for the commitments made, such as: building in layers, designing out waste throughout all stages of the process, designing for longevity through material efficiency and durability, designing for adaptability & flexibility by ensuring the building can be made fit for multiple purposes, designing for disassembly, the use of low-carbon systems and the use of reused/recycled materials and components.



Figure 2-2 - Extract of the Agenda for the CES workshop

A BREEAM pre-assessment has been carried out and it is anticipated that the Proposed Development will achieve an 'Very Good' rating. This puts emphasis on targeting credits within the materials and waste sections. It is planned that these sustainability workshops will continue over the course of the design process to capture and monitor the project progress against the targets set.

Early engagement will be sought with contractors to assist in refining the sustainability strategy for delivery. As mentioned previously, as per the GLA policy, the report will be reviewed in full and updated with the 'as built' information if required at post completion stage. The following design measures/principles were considered during the design of the Proposed Development, in no order of importance:

- Minimisation of excavation waste
- Re-use of materials on-site
- Offsite/modular construction
- Material efficiency
- Recycled content
- Material circularity
- Structural and fabric resilience
- Lifecycle assessments
- Low carbon construction
- Lean design principles
- Adaptability
- Flexibility
- Responsible procurement
- Sustainable sourcing
- Local sourcing
- Supply chain engagement
- Tenant engagement
- Flexible and easily accessible waste segregation and storage spaces

- Community-led waste minimisation schemes
- Consolidated waste schemes
- Smart logistics

2.5 POLICY CONTEXT REVIEW

The CES has been produced in response to the planning requirement and guidelines outlined in the following table:

Table 2-1 – London Plan (March 2021) - Relevant to CES

NEW LONDON PLAN (MARCH 2021)	
Policy D3 Optimising Site Capacity Through the Design-led Approach	A) All developments must make the best use of land by following a design-led approach that optimises the capacity of sites, including site allocations. The design-led approach requires consideration of design options to determine the most appropriate form of development that responds to a site's context and capacity for growth, existing and planned supporting infrastructure capacity (as set out in Policy D2 Infrastructure Requirements for Sustainable Densities), and best delivers the requirements set out in Part B. B) Development proposals should: Quality and character: 12) Be of high quality, with architecture that pays attention to detail, and thoroughly considers the practicality of use, flexibility, safety and building lifespan through appropriate construction methods and the use of attractive, robust materials that weather and age well. 13) Aim for high sustainability standards (with reference to the policies within London Plan Chapter's 8 and 9) and take into account the principles of circular economy.
Policy SI7 Reducing Waste and Supporting Circular Economy	A) Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste 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 quality for as long as possible - Encourage waste minimisation and waste prevention through the reuse of materials and use fewer resources in the production and distribution of products - Ensure that there is zero biodegradable or recyclable waste sent to landfill by 2026 - Meet or exceed the municipal waste recycling target of 65% by 2030 - Meet or exceed the targets for each of the following waste and material streams: - Construction and demolition – 95% reuse/recycling/recovery - Excavation waste–95% beneficial use - Design developments with adequate, flexible, and easily accessible storage spaces and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food. B) Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted to demonstrate: - How all materials arising from demolition and remediation works will be re-used and/or recycled

NEW LONDON PLAN (MARCH 2021)

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

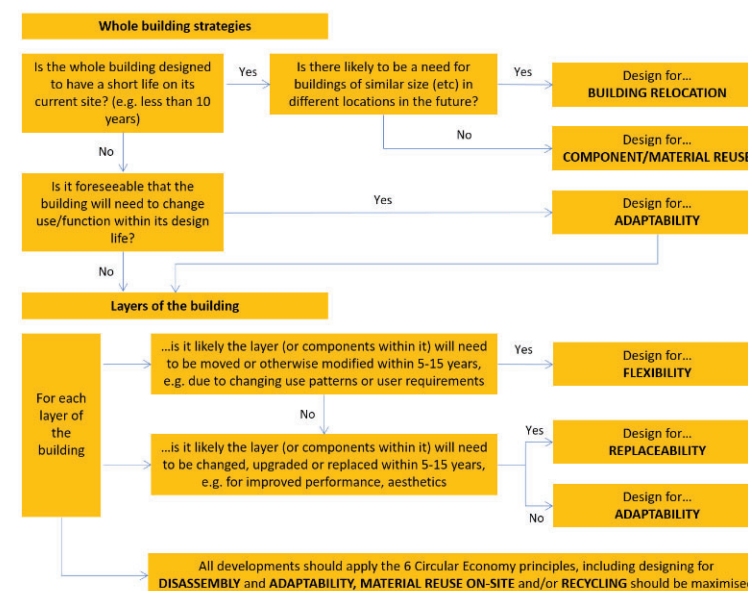


Figure 2-3 - Design Approaches for New Buildings, Infrastructure and Layers over the Lifetime of a Development Decision Tree (Source: London Plan CES Guidance, March 2022)

3 CIRCULAR ECONOMY APPROACH

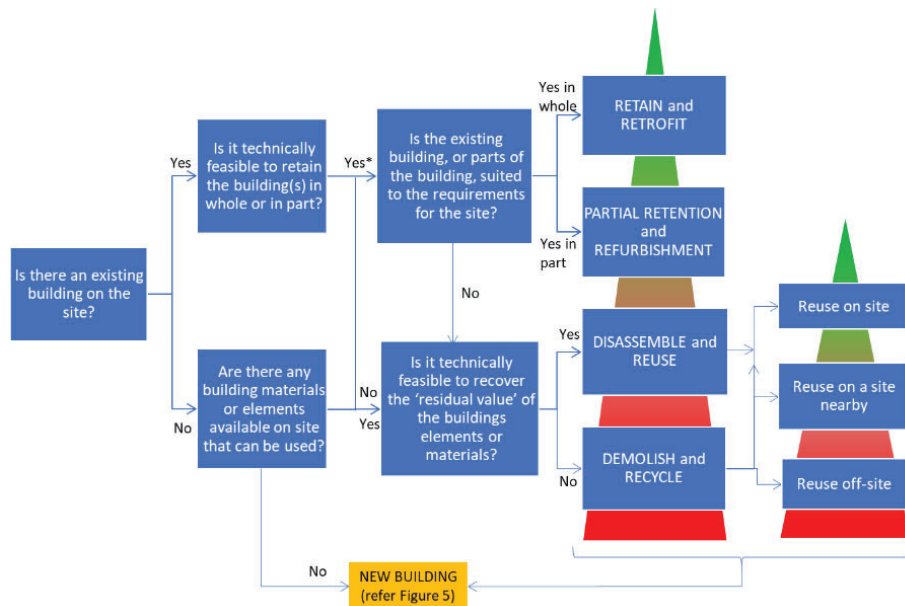


Figure 2-4 - Design Approaches for Existing Buildings, Infrastructure and Layers over the Lifetime of a Development Decision Tree (Source: London Plan CES Guidance, March 2022)

2.6 CIRCULAR ECONOMY DESIGN APPROACH

Due to the Proposed Development being both a refurbishment and a new build project, a combination of the Circular Economy design approaches for new and existing buildings were used to support the achievement of the Circular Economy principles. Figure 2-3 and Figure 2-4 show some of the design approaches adopted for the new and existing building.

The preferred strategy for Berol House is partial retention & refurbishment due to there being an existing building on site. The preferred strategy for Berol Yard is a new building. A summary of the design approaches adopted for each building layer are summarised in Section 3 and 5.

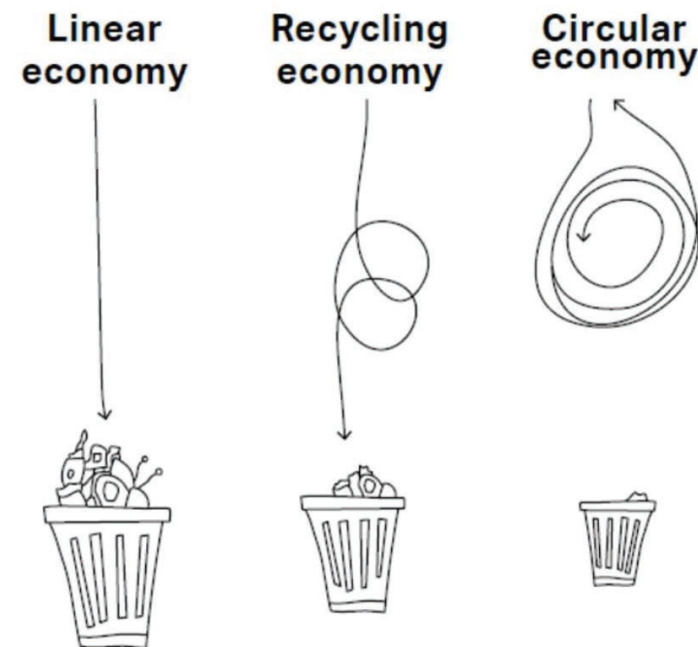


Figure 3-1 - Difference Between Linear Economy vs Circular Economy (Source: London Plan CES Guidance, March 2022)

This section of the report provides detailed information on how the circular economy principles will be implemented for the Proposed Development; this includes specific measures in relation to building in layers, designing out waste, designing for longevity, adaptability, flexibility, disassembly, and using systems, elements and materials that can be reused and recycled.

Circular economy consideration is part of the project's sustainability strategy, given the size, location, and the client's wider sustainability aspirations. These design principles are most effective when explored and considered at early design stages of the development process.

3.1 BUILDING IN LAYERS

A building should be designed and constructed in 'layers'. This involves each layer having its own lifecycle and approaches to circular economy which will be dependent on their function and life expectancy. Each layer should be independent, accessible, removable, and adaptable whilst, where possible, upholding their value. This will support each layer's reuse and recycling.

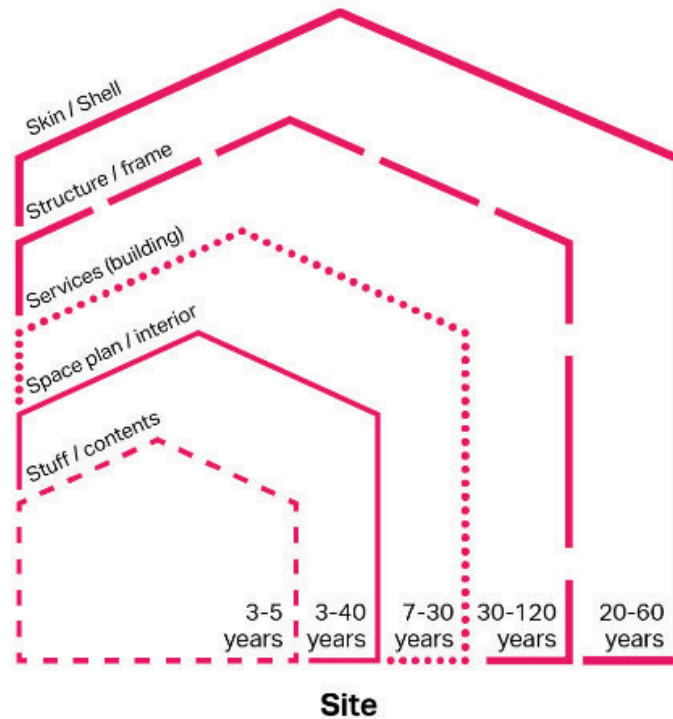


Figure 3-2 - Building in Layers & Lifespans (Source: London Plan CES Guidance, March 2022)

Figure 3-2 shows each building layer and their lifespans. This includes the site, skin/shell (façade), structure, frame, substructure, building services, interior space, stuff/contents, and construction materials. The layered design of the building has ensured that it enables independent layers to be upgraded or replaced.

MINIMISING QUANTITIES OF MATERIAL

EXISTING SITE

The Pre-redevelopment Audit further identifies materials with reclamation and reuse potential from the existing building. The full report is located in Appendix B of this document.

In the event that contaminated materials are identified onsite as part of the ground contamination inspection, the contaminated material will be segregated and disposed of accordingly. Otherwise, most of the demolition waste will be diverted from landfill. The current aspiration for demolition waste is to divert over 95% weight of material or more for recycling or reuse.

Furthermore, any waste that is generated during the construction, operation, maintenance, and refurbishment/de-construction of the project in the future will be reduced as much as possible.

Lean Design Options have been explored which not only reduced the quantity of new materials used but also reduced the building weight, cost, carbon, and improved floor to ceiling heights. The maximum retention and refurbishment of Berol House (it is proposed to maintain the structure, the façade and other constructive elements) has significantly reduced the need for new materials when compared to demolition and new construction. A façade study was carried out on the existing buildings and the final design accounts for an efficient heating and cooling strategy, reducing the need for additional materials. The RC concrete frame for Berol Yard provides inherent fire resistance which has consequently removed the need for additional fire protection boarding. Imposed load reduction has been used to design efficient columns, walls and foundations which enables efficiency in design and reduction of materials. Lean design options can be observed in Appendix D.

NEW DEVELOPMENT

Material Efficiency

Material efficiency is a priority for the Design Team and one of the key considerations during detailed design. Potential measures for reducing the material demand and for designing out waste have been and will be further explored by all key design team disciplines at each design stage. Material efficiency seeks to optimise the use of materials within building design, procurement, construction, maintenance, and end of life; with the aim being to reduce the quantities of new materials used in the development. A Whole Life Carbon (WLC) Assessment has been carried out to help identify and manage the carbon emissions arising from the material specification of the development, it is anticipated that at least an average of **20% or more** of the material used by weight of the whole building will contain reused and/or recycled content.

By selecting components that score well under The Green Guide to Specification the environmental impact of the proposed materials will be minimised. In addition, when reviewing options, the Design Team will include the environmental impact of each component as a key performance indicator which will include favouring materials with Environmental Product Declaration (EPD) certification.

The design and specifications will ensure that environmentally sensitive (non-toxic) building materials are used throughout. Specifically, the design and specification of materials used internally will be based on the use of products that contain low levels of or no Volatile Organic Compounds (VOCs).

The selection criteria for external materials will include the specification of low toxicity to humans and the wider environment, especially those that deplete stratospheric ozone.

Mass timber was proposed for its numerous benefits and sustainable credentials. It can allow quicker, cleaner assembly, as well as being lighter and less carbon-intensive than traditional construction materials.

For fire compartmentation and resistance reasons, as well as its acoustic properties a reinforced concrete frame has been selected for the tower structure. To reduce material usage and provide economic slabs, columns are provided at relatively close centres and have been coordinated to sit in walls between flats where possible. This allows a slab thickness of 225mm, providing an efficient, structurally stiff building with inherent fire resistance, removing the need for additional fire protection boarding.

Imposed load reduction has been used to design efficient columns, walls and foundations. This statistical approach which is based on the principle that all floors in the building will not be fully loaded at the same time, which allows for efficiency in design and a reduction in material usage.

MINIMISING QUANTITIES OF OTHER RESOURCES

The Proposed Development has also focused on minimising the use of other resources such as land, ecosystems, energy, and water.

During the construction stage the Principal Contractor will be required to set targets for energy and water used on site and ensure measures are put in place to minimise consumption of these resources. These could consist of:

- Low carbon energy sources used during construction phase (renewable sources of energy and offset of main utilities)
- Use of highly efficient plant and battery power energy storage

As can be observed in the Energy Strategy (October 2022), the energy demand of the Proposed Development has followed the London Plan Energy Hierarchy (BE LEAN – BE CLEAN – BE GREEN - BE SEEN).

The Proposed Development will be energy efficient and sustainable. The Proposed Development will be designed to achieve optimum energy performance, and will incorporate the following design features:

- During design development, significant consideration has been given to how the building fabric will respond to its environment in order that the energy consumption of the building is reduced as far as possible through passive means. The building fabric will be designed to significantly exceed the minimum fabric requirements of Part L1 and L2 (2021) of the Building Regulations.
- Passive design measures will be incorporated into the design to reduce energy demand and the risk of overheating.
- A high-performance building services solution is proposed for the Proposed Development.
- WSP has investigated the London Heat Map been in contact with Haringey Council regarding a proposed District Heat Network. It has been determined that there is an opportunity to connect to a planned District Heat Network.
- Subject to future legal and technical agreements, the plant space will be designed for future connection into the district heating network through the provision of capped connections.
- Space heating and hot water are provided by the district heat network to the whole development.
- There is provision for gas boilers as a temporary solution, if there is a time lag between occupation of development and district heat network being read.
- Terminal units are designed to achieve a specific fan power in operation significantly lower than the Part L 2021 limiting SFP.

- All spaces will include 100% low energy lighting. Lighting controls will be specified as appropriate across the development.

As stated previously a WLC assessment has been carried out for the development which includes the impact of material replacement/repair.

As outlined in the Sustainability Statement (October 2021), the Proposed Development has ensured the site has maximised the opportunities for incorporation of water saving measures which include the use of water saving fixtures and fittings, optimised water management through leak detection and reduced water flow rates. Further key sustainability measures include:

- “Proposed glazing and shading design to optimise daylight and prevent excessive solar gains
- All existing site features of ecological value will be protected during construction, in accordance with the BREEAM Ecology criteria
- Any planting on the new terraces and roofs will be designed to improve the site’s biodiversity, any selected planting species will be locally relevant and beneficial to London’s Biodiversity Action Plan (BAP), where appropriate
- Recycling of waste generated during occupation shall be encouraged through the provision of dedicated on-site waste storage and recycling facilities
- The potential for incorporating renewable technologies has been investigated and there is potential for PV technology on the roof
- Measures shall be implemented on site during construction to prevent air and water pollution. Such measures include regular damping down and the use of dustsheets”

RESPONSIBLE SOURCING AND SPECIFICATION

The responsible sourcing of materials will be a key consideration in the selection of suppliers. A Sustainable Procurement Strategy should be produced for the Proposed Development prior to commencement of construction to control this aspect. Materials from suppliers who participate in responsible sourcing schemes such as the BRE’s BES 6001:2008 Responsible Sourcing Standard should be prioritised.

All timber shall be certified sustainable in line with the UK government’s timber procurement policy. This is in line with BREEAM Mat 03 Prerequisite.

Consideration will be given to locally sourcing materials where possible, to reduce site related transport emissions. This will be implemented through procurement routes with contractors. This is in line with Mat 03 – Measuring responsible sourcing.

Natural resource depletion will be minimised throughout the development. Additionally, a WLC assessment has been undertaken and used to guide the material selection of products.

3.1.1 DESIGN OUT CONSTRUCTION, DEMOLITION, EXCAVATION AND MUNICIPAL WASTE ARISING

It has been acknowledged in the wider industry that the best way to design out waste (both construction and demolition waste) is for developments to use '**material standardisation and modularity**' of building components and '**offsite construction**'. This will help to minimise waste of materials during construction and elements can easily be dissembled at the buildings end of life and the materials and components reused or repurposed depending on their lifespan.

According to the WRAP case study (WAS031), as seen in Figure 3-3 there was circa 50% savings in material waste when a site-based construction is compared to a volumetric construction.

Another method that encourages waste reduction during the operation of a project is the '**supplier take-back scheme**' where the supplier is responsible for collecting and recycling/dismantling/remanufacturing said product/element once it has reached its end of life or becomes faulty and needs to be replaced. This method will reduce municipal waste and encourage waste to be diverted from landfill. This will also help the supplier to reduce the use of raw materials for manufacturing new products as they can easily dismantle and reuse elements that are still in good condition from the element/product collected from the development.

Other methods include, but are not limited to:

- Design for Manufacturing and Assembly (DfMA)
- Just-in-time delivery
- Larger pack sizes to reduce amount of package per unit. (e.g., paints delivered in tanks than containers)

During the CE workshop, all of these methods were discussed and considered. In general, as the design progresses, these methods will be investigated further for incorporation into the buildings design to help reduce construction waste generation. A Site Waste Management Plan (SWMP) should be prepared for the project in accordance with the local plan and BREEAM requirements.

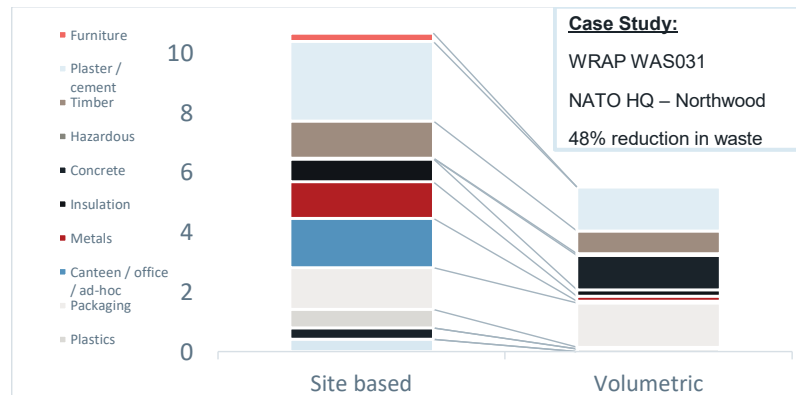


Figure 3-3 - WRAP Case Study - Waste Reduction by Using Volumetric Method of Construction

3.1.2 MANAGING WASTE SUSTAINABLY

The Proposed Development will incorporate best practice waste reduction measures developed in line with the waste hierarchy to reduce, reuse, and recycle. These include:

CONSTRUCTION WASTE

- Prefabricated and standardised modulation components will be used for building elements where possible
- A Site Waste Management Plan should be prepared by the appointed contractor including the following:
 - Setting of a target benchmark for construction site waste management (in line with BREEAM Wst 01)
 - Procedures and commitments for minimising non-hazardous waste in line with the benchmark
 - Procedures for minimising hazardous waste
 - Procedures for monitoring, measuring, and reporting hazardous and non-hazardous site waste
 - Procedures for sorting, reusing, and recycling construction waste into defined waste groups
 - 80% per volume or 90% by tonnage of non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled (in line with BREEAM Wst 01 -Diversion from landfill)

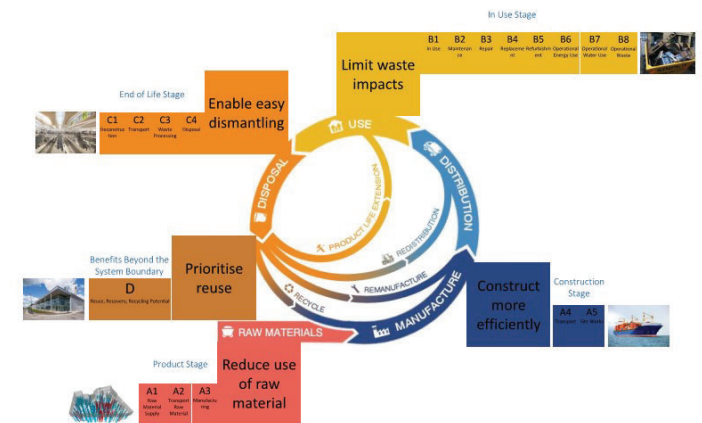


Figure 3-4 - Benefits of Offsite and Modular Construction

It is anticipated that **95% of the construction waste will be recovered for recycling and diverted from landfill.**

OPERATIONAL WASTE

A Waste Management Strategy has been produced separately to support the planning application of the Proposed Development, please refer to the report for full information. The waste management services for the Proposed Development will be provided by the London Borough of Haringey (LBH) Waste Management Services. A summary is provided below:

RESIDENTIAL WASTE (2 BEROL YARD)

Stage 1: Within Individual Apartments

“In the first instance, residents would segregate and store their refuse and recycling through the use of internal compartmentalised waste storage. This would promote the segregation of refuse and recyclable materials at source. Food waste would be segregated in black kitchen caddies provided by LBH.”

Stage 2: Communal Bin Stores

“Residents will be responsible for manually transporting their waste down to communal bin stores on the ground floor. Communal bin stores will be adequately ventilated and lit (with PIR fittings) for residents to use 24/7. They will have floor drainage and water point to allow for easy cleaning. Gullies will have a sealed trap. Residents would deposit their refuse, recycling, and food waste in dedicated wheeled bins in the communal bin store indicated in Figure 3.5.”

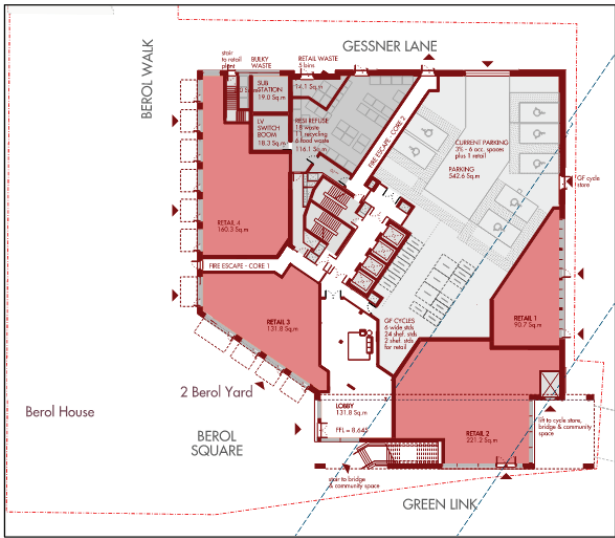


Figure 3-5 - Map demonstrating location and access to Residential Waste Storage at Berol Yard

“It has been assumed that residential waste collections would be made twice a week, with residents depositing their refuse, recycling and food waste into dedicated containers in communal bin stores. The bin stores can be directly accessed by RCVs within 10m of collection points.”

No. of units 210	Refuse (1,100L bin)	Recycling (1,100L bin)	Food Waste (360L bin)
Ratio units/Bin	6	10	35
1 Collection per week	18 Bins	21 Bins	6 Bins
2 Collections per week	18 Bins	11 Bins	3 Bins

Table 3-1 – Summary of Fortnightly Residential Waste Storage Requirements

Stage 3: Household Waste Collection

“The Refuse Collection Vehicles (RCVs) will access the communal bin store from Gessner Lane via Ashley Road access to Berol Walk. This allows collection within a 10m drag distance.”



Figure 3-6 - Anticipated swept paths of vehicles for waste collection into 2 Berol Yard

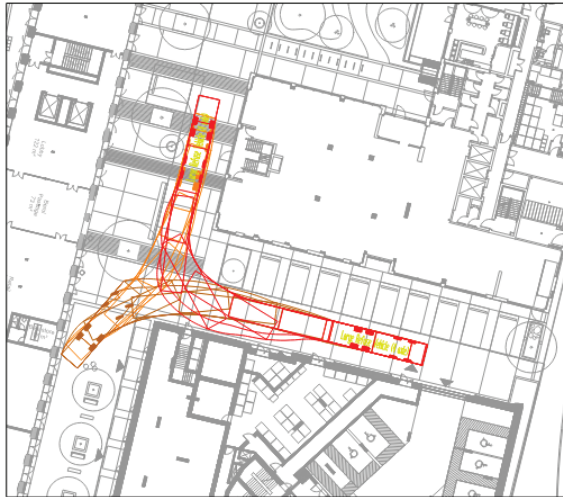


Figure 3-7 - Swept path tracking showing large refuse vehicle access to bin stores in 2 Berol Yard

“For bulky waste (furniture etc.), it has been assumed that residents will make arrangements with LBH for collection and temporarily store the waste in an agreed location at ground floor level.”

COMMERCIAL WASTE

Commercial waste and recycling will be collected by a private waste contractor for the whole life cycle of the Proposed Development. There will be separate collection points for each of Berol House (in Ashley Road) and 2 Berol Yard (in Gessner Walk).

2 BEROL YARD

“It is proposed that each commercial tenant will provide a suitable waste storage area within their own demise as part of their fit-out, which will include provision for the segregation of refuse, recyclables, and food waste (if applicable).”

In addition, a dedicated commercial waste bin storage area is located on the ground floor, to allow RCVs to collect the waste as arranged directly by the commercial tenants. The tenants will be responsible for depositing their waste in the commercial bin store. An area of approx. 17 sqm has been made for the provision of 5 bins (1 per tenant).”



Figure 3-8 - Location of both Residential and Commercial Waste Arrangements for 2 Berol Yard

BEROL HOUSE

“All occupiers of Berol House are commercial tenants. Each commercial tenant will provide a suitable waste storage area within their own demise. In addition, a dedicated commercial waste bin storage area is located on the ground floor to allow RCVs to collect the waste as arranged directly by the commercial tenants. The tenants will be responsible for depositing their waste in the commercial bin store. An area of approx. 19 sqm has been made for the provision of 7 no. 1,100 L bins.”

3.2 ADAPTABILITY & FLEXIBILITY

The Proposed Development will ensure that the fourth principle of CE are embedded in the design of the project by ensuring the design is flexible and adaptable therefore increasing the site's lifecycle and providing a building lifespan of at least 50 years.

SERVICES

The plant replacement strategy utilised across the site is such that normal periodic plant maintenance activities and minor equipment replacement can be carried out using normal access routes such as the lifts and staircases.

STRUCTURES/ INTERNAL LAYOUT (BEROL HOUSE)

“The Proposed Development has been designed to shell and core level. The spacing of the columns the majority of the walls have been designed to be non-structural, incorporating adaptability

and flexibility into the design without significant structural works required for both the residential and commercial spaces.

The existing stairs and levels in the gable ends were proposed to be kept. This was due to the major impact on the existing building to realign the intermediate floors, as well as the desire to retain as much of the existing building as possible in the creation of a highly flexible commercial building at the heart of the new residential neighbourhood. They will be utilised as ancillary spaces for the building to support the office functions.”

GROUND FLOOR LAYOUT (BEROL HOUSE)

“The design of the ground floor seeks to activate the building within its immediate public realm. It is proposed to connect Ashley Road with Berol Square through a permeable ground floor dedicated to retail and commercial spaces. The final layout seeks to link both sides of the building through active frontages and a public passage.

Design protection measures and robust finishes for both Berol House and 2 Berol Yard will ensure maintenance and replacement cycles of building materials/components will be reduced, reducing the opportunity to generate waste and carbon emissions.”

LEAN DESIGN

BEROL HOUSE

“The main adaptive reuse strategy adopted for the intervention in the iconic industrial factory of Berol House is the maximum retention of the existing building. It is proposed to maintain the structure, the façade and other constructive elements, seeking to recover the original aesthetics through the restoration and minimal demolitions like the later added staircase on the rear façade, in order to enhance the historic character of the building.”

2 BEROL YARD

“The approach taken in the structural design is to reduce the quantity of materials used in the project where possible. This has many benefits, including weight (efficient foundations), cost, embodied carbon, and improved floor to ceiling heights (by limiting the structural zone). For fire compartmentation and resistance reasons, as well as its acoustic properties a reinforced concrete frame has been selected for the tower structure. To reduce material usage and provide economic slabs, columns are provided at relatively close centres and have been coordinated to sit in walls between flats where possible. This allows a slab thickness of 225mm, providing an efficient, structurally stiff building with inherent fire resistance, removing the need for additional fire protection boarding. Imposed load reduction has been used to design efficient columns, walls and foundations.

This statistical approach is based on the principle that all floors in the building will not be fully loaded at the same time, which allows for efficiency in design and a reduction in material usage.”

3.3 DESIGNING FOR DISSASSEMBLY/END OF LIFE STRATEGY

Building information for Berol House and 2 Berol Yard “will be stored for the site using material passporting and BIM to allow for end-of-life strategy, future reuse, disassembly, and waste reduction/avoidance. Given the size of the development, it is likely that all parties (engineers, architects, sub-contractors) will also produce and issue 3D model information. This would then be archived as part of the O&M documentation so that materials and manufacturers are known”. The building structures (Berol House and 2 Berol Yard) have been designed with the industry design life of 50 years (as per the British Standards and Eurocodes).

BEROL HOUSE

“Berol House has been designed to promote the dismantling and recycling strategies for its components, reducing the material demand and extending the use of the materials involved long after the building’s useful life. Modularity will be a key element in the design of Berol House which favours the future disassembly and reuse of components. The repeating and modular proportions of the existing building promotes the standardisation and serialisation of the components of the new build intervention. The design for the three-storey extension on top of the existing structure is based on a typical 3270mm wide bay that repeats along the 100m length of the building, ensuring modularity is a key element in the design proposal which favours the future disassembly and reuse of the components.

A hybrid structure has been considered for the building. Primarily mass timber construction for the extension and steel where required within the existing building. This sustainable approach to the extension lends itself to a potentially lighter weight structure, the opportunity to maximise spans for internal flexibility, reduces the quantum of internal finishes where the timber can be left exposed and ultimately can be design for end of life allowing for disassembly and reuse at the end of the building’s useful life.”

2 BEROL YARD

“Reinforced concrete (RC) structures are relatively difficult to disassemble but given the height and residential use of the development it remains the best overall choice for the superstructure. RC structures are robust and can well exceed the design life, offsetting the initial impact or demolition difficulty. The concrete waste from demolition can be recycled as aggregate, engineered fill material for site uses such as piling mats. There are also pioneering projects re-using sections of cut reinforced concrete slabs as pre-cast planks on other projects.”

4 CIRCULAR ECONOMY DESIGN APPROACHES (EXTRACT FROM GLA CE SPREADSHEET)

Circular Economy Design Approaches		
Circular Economy Design Approaches for Existing Structures / Buildings		Applicant Response
Is there an existing building on the site?		Yes
Is it technically feasible to retain the building(s) in whole or in part?		Yes
Is the existing building, or parts of the building, suited to the requirements for the site?		Yes, in whole
The preferred strategy is:		RETAIN and RETROFIT
Circular Economy Design Approach	Phase/Building/Area/Layer	Strategic Response
Refurbish	Berol House Whole Site	The preferred strategy for Berol House is retention & refurbishment due to there being an existing building on site. This will include the expansion and refurbishment. 2 Berol Yard will be a new building due to there being nothing currently on-site.
Repurpose	Berol House Whole Site	Berol House is being repurposed into a mixed office & retail development. There will be maximum retention of the existing building. It is proposed to maintain the structure, façade and other constructive elements, seeking to recover the original aesthetics through the restoration and minimal demolitions.
Disassemble / Deconstruct and Reuse	Berol House	Due to the retrofit of Berol House only minor demolition is required. Materials will be recovered and re-used either on-site or off-site.
Demolish / Deconstruct and Recycle	Berol House	Only minor demolition is required. Materials will be recovered and recycled either on-site or off-site.
Circular Economy Design Approaches for New Buildings, Infrastructure		Applicant Response
Is the whole building designed to have a short life on its current site? (e.g. less than 10 yrs)		No
Is it foreseeable that the building will need to change use/function within its design life?		No
All developments should apply the 6 Circular Economy principles, including:		Designing for DISASSEMBLY and ADAPTABILITY, MATERIAL REUSE ON-SITE and/or RECYCLING should be maximised

5 CIRCULAR ECONOMY DESIGN PRINCIPLES BY BUILDING LAYER (EXTRACT FROM GLA CE SPREADSHEET)

Circular Economy Design Approach	Phase/Building/Area/Layer	Strategic Response
Building relocation	The Proposed Development has not been designed to be relocated.	The development at Berol House is a retrofit and expansion scheme of the former Berol Pencil factory which was not designed to be relocated. 2 Berol Yard will not be designed for relocation due to the scale of the development.
Component or material reuse	Whole site (Proposed Development)	The Proposed Development has ensured, where feasible, recycling strategies for its components, reducing the material demand as much as possible. The Proposed Development will use recycled and reused/recycled materials where feasible, ensuring that at least 20% of new materials used will contain reused/recycled content. Elements of the existing facade, foundations, slabs, columns and beams for Berol House will be retained and reused.
Adaptability	Proposed Development (Berol House & 2 Berol Yard) Services, Structure, Internal layout	The Proposed Development is designed as mixed use, accommodating residential and retail at 2 Berol Yard and office and retail at Berol House. To accommodate for this, MEP services will be designed to facilitate different number of tenants (predominantly office). The Proposed Development (Berol House and 2 Berol Yard) has been designed to shell and core level. The spacing of the columns the majority of the walls have been designed to be non-structural, incorporating adaptability and flexibility into the design without significant structural works required for both the residential and commercial spaces. In Berol House, "the existing stairs and levels in the gable ends were proposed to be kept. This was due to the major impact on the existing building to realign the intermediate floors, as well as the desire to retain as much of the existing building as possible in the creation of a highly flexible commercial building at the heart of the new residential neighbourhood. Instead now they are planned to be utilised as ancillary spaces for the building to support the office functions."
Flexibility	Proposed Development (Berol House & 2 Berol Yard) Services, Structure, Internal layout	The Proposed Development is designed as a mixed use, accommodating residential and retail at 2 Berol Yard and office and retail at Berol House. To accommodate for this MEP services will be designed to facilitate different number of tenants (predominantly in the office at Berol House). The Proposed Development (Berol House and 2 Berol Yard) has been designed to shell and core level. The spacing of the columns the majority of the walls have been designed to be non-structural, incorporating adaptability and flexibility into the design without significant structural works required for both the residential and commercial spaces. In Berol House, "the existing stairs and levels in the gable ends were proposed to be kept. This was due to the major impact on the existing building to realign the intermediate floors, as well as the desire to retain as much of the existing building as possible in the creation of a highly flexible commercial building at the heart of the new residential neighbourhood. Instead now they are planned to be utilised as ancillary spaces for the building to support the office functions."
Replaceability	Proposed Development (Berol House & 2 Berol Yard)	The layered design of the new floors at Berol House and new development at 2 Berol Yard enables independent layers to be upgraded or replaced. Design protection measures and robust finishes across the site will ensure maintenance and replacement cycles of building materials/components will be reduced, reducing the opportunity to generate waste and carbon emissions.
Disassembly	Proposed Development (Berol House & 2 Berol Yard)	The Proposed Development has been designed and constructed to reduce material demands as far as practicable and will use systems, elements and materials that can be reused and/or recycled at the end of their useful life. Given the size of 2 Berol Yard, it is likely that all parties (engineers, architects, sub-contractors) will produce and issue 3D model information. This would then be archived as part of the O&M documentation so that materials and manufacturers are known, making the disassembly and reuse easier. The storage of the proposal information for Berol House will be encouraged through the use of BIM technologies and Materials Passports, allowing for future disassembly and end-of-life strategy. The building structures (new floors of Berol House and new development at 2 Berol Yard) will be designed to the 50-year industry life standard (following British Standards and Eurocodes). Modularity will be incorporated into Berol House and, where feasible, Berol Yard, to facilitate disassembly and EoL strategy.
Longevity	Building structure	The building structures (new floors of Berol House and new development at 2 Berol Yard) will be designed to the 50-year industry life standard (following British Standards and Eurocodes).

6 REFERENCE DOCUMENTS

This section of the report covers and provides document references and evidence for the commitments, targets and metrics contained within this CES.

EVIDENCE OF COMMITMENTS	COMMENT	DOCUMENT REFERENCE NUMBER/TITLE
Reused/ Recycled Content Calculations	As seen in Appendix A	- Attached as part of this report
End of Life (EoL) Scenarios	As seen in Appendix A	- Attached as part of this report
Building Weight Calculations (load take-down)	As seen in Appendix A	- Attached as part of this report
Pre-Redevelopment Audit	As seen in Appendix B	- Attached as part of this report
Municipal/Operational Waste Management Plan	As seen in Appendix C	- A summary has been attached as part of this report (Appendix C)
Lean Design Options & Design for Disassembly	As seen in Appendix D	- A summary of the proposed options are attached as part of this report (Appendix D)

7 CONCLUSION

This Circular Economy Statement is submitted in support of the planning application made on behalf of Berol Quarter Limited for the site (Berol Quarter).

WSP has been commissioned by the Applicant to write the Circular Economy Statement (CES) for the Proposed Development, which will be submitted during planning application. The development is targeting/anticipated to achieve the GLA's circular economy targets as stated below:

- At least 20% of new materials used should contain reused/recycled content.
- 95% of construction & demolition waste should be reused/recycled/diverted from landfill.
- 95% of excavation waste should have beneficial use.
- 65% of municipal waste should be recycled by 2030.

This CES was produced to demonstrate how the design and construction of the development addresses the challenges of the climate emergency by prompting resource efficiency and adopting a circular economy approach that contributes to a sustainable development by following the Circular Economy Statement Guidance (updated in March 2022) in the following areas:

- Building in layers
- Designing out waste by:
 - Minimising the quantities of materials and resources used
 - Specifying and sourcing materials and other resources sustainably
 - Design out construction, demolition, excavation, and municipal waste arising
 - Managing construction, demolition, excavation, and municipal waste
- Designing for longevity
- Designing for adaptability & flexibility
- Designing for disassembly
- Using systems, elements and materials that can be reused and recycled

In alignment with the London Plan (March 2021) and Circular Economy Statement Guidance (updated in March 2022), the Proposed Development is meeting all relevant policy thus the current approach proposed is meeting requirements for energy efficiency and sustainable development, in line with this Circular Economy Statement.

Appendix A

BILL OF MATERIALS & EOL SCENARIOS



Required Information for Whole Life Carbon Assessment

Project GIA: 30332

Building Part/ Element group		Building element		Typical Details Required	Material Quantities (kg)	Material Intensity (kg/m2 GIA)	% of recycled/reuse content/material	Material EoL Scenarios (Module C)
0	Facilitating works	Demolition and facilitating works	Demolition	Approx. floor area of buildings being demolished	150,000	4.95	n/a	95% recycled
			Facilitating works	Approx. area of facilitating works				
1	Substructure	Foundations	Concrete		8,928,482	294.36	20	80% recycled; 20% reuse
			Aggregate		639,839	21.09	20	100% recycled
			Rebar		362,500	11.95	97	80% recycled; 20% reuse
			Waterproof Membrane		1,507	0.05	n/a	100% incinerated
			Plywood		43,787	1.44	0	75% recycled, 20% reused, 5% incinerated
			Aggregate		42,235	1.39	20	100% recycled
			Concrete		589,380	19.43	20	80% recycled; 20% reuse
			Rebar		24,290	0.80	97	80% recycled; 20% reuse
			Waterproof Membrane		300	0.01	n/a	100% incinerated
		Plywood		2,923	0.10	0	75% recycled, 20% reused, 5% incinerated	
		Basement Areas	Excavation	Excavation Volume	12,000,000	395.62	n/a	95% recycled, 5% incinerated
2	Superstructure	Frame	Concrete		9,046,630	298.25	20	80% recycled; 20% reuse
			Steel		117,750	3.88	20	75% recycled, 20% reused, 5% incinerated
			Rebar		376,943	12.43	97	80% recycled; 20% reuse
			Plywood		44,902	1.48	0	75% recycled, 20% reused, 5% incinerated
			Concrete		838,750	27.65	20	80% recycled; 20% reuse
			Steel		300,000	9.89	20	75% recycled, 20% reused, 5% incinerated
			Rebar		34,567	1.14	97	80% recycled; 20% reuse
			Plywood		7,013	0.23	0	75% recycled, 20% reused, 5% incinerated
		Upper Floor	Concrete		1,066,320	35.15	20	80% recycled; 20% reuse
			Rebar		21,976	0.72	97	80% recycled; 20% reuse
			Concrete		12,745,520	420.20	20	80% recycled; 20% reuse
			Rebar		1,070,570	35.30	97	80% recycled; 20% reuse
		Roof	Concrete		439,500	14.49	20	80% recycled; 20% reuse
			Rebar		36,897	1.22	97	80% recycled; 20% reuse
			Aggregate		46,003	1.52	20	100% recycled
			Soil		46,003	1.52	n/a	100% recycled
			Waterproof Membrane		25,304	0.83	n/a	100% incinerated
			Insulation		8,047	0.27	20	75% recycled, 20% reused, 5% incinerated
			Concrete		828,571	27.32	20	80% recycled; 20% reuse
			Rebar		16,895	0.56	20	80% recycled; 20% reuse
			Aggregate		12,172	0.40	97	100% recycled
			Soil		12,172	0.40	n/a	100% recycled
			Insulation		7,025	0.23	20	75% recycled, 20% reused, 5% incinerated
			Waterproof Membrane		22,091	0.73	n/a	100% incinerated
		Stairs and Ramps	Concrete		422,240	13.92	20	80% recycled; 20% reuse
			Stainless Steel		1,408	0.05	20	75% recycled, 20% reused, 5% incinerated
			Rebar		28,042	0.92	20	80% recycled; 20% reuse
			Concrete		43,770	1.44	20	80% recycled; 20% reuse
			Stainless Steel		146	0.00	20	75% recycled, 20% reused, 5% incinerated
			Rebar		2,900	0.10	20	80% recycled; 20% reuse
			Mortar		3,118	0.10	n/a	n/a
			Gypsum Plasterboard		36,120	1.19	60	75% recycled, 20% reused, 5% incinerated
			Mortar		273,953	9.03	n/a	n/a
			Gypsum Plasterboard		276,576	9.12	60	75% recycled, 20% reused, 5% incinerated
			Brick		15,000	0.49	0	80% recycled; 20% reuse

		External Walls	Glazing	43,777	1.44	0	75% recycled, 20% reused, 5% incinerated
			Structural Steel	11,600	0.38	20	75% recycled, 20% reused, 5% incinerated
			Aluminium Façade Cladding	40,304	1.33	0	100% recycled
			Rock wool/mineral wool Insulation	9,067	0.30	20	75% recycled, 20% reused, 5% incinerated
			Waterproof Membrane	11,876	0.39	n/a	100% incinerated
			Insulated Glazing	150,415	4.96	0	75% recycled, 20% reused, 5% incinerated
			Brick	1,313,569	43.31	0	80% recycled; 20% reuse
			Structural Steel	149,837	4.94	20	75% recycled, 20% reused, 5% incinerated
			Rock wool/mineral wool Insulation	144,568	4.77	20	75% recycled, 20% reused, 5% incinerated
			Aluminium Façade Cladding	3,394	0.11	0	100% recycled
			Waterproof Membrane	44,733	1.47	n/a	100% incinerated
		Windows and External Doors	Aluminium Framed Double Glazed Doors	2,500	0.08	35	75% recycled, 20% reused, 5% incinerated
			Aluminium Framed Double Glazed Doors	11,278	0.37	35	75% recycled, 20% reused, 5% incinerated
			Aluminium Framed Window	78,943	2.60	35	75% recycled, 20% reused, 5% incinerated
			Aluminium Curtain Wall	75,000	2.47	0	75% recycled, 20% reused, 5% incinerated
			Aluminium Curtain Wall	43,777	1.44	0	75% recycled, 20% reused, 5% incinerated
		Internal wall and Partitions	Gypsum Plasterboard	3,240	0.11	60	75% recycled, 20% reused, 5% incinerated
			Steel Stud	51,569	1.70	20	75% recycled, 20% reused, 5% incinerated
			Steel Stud	1,027	0.03	20	75% recycled, 20% reused, 5% incinerated
			Gypsum Plasterboard	1,022,717	33.72	60	75% recycled, 20% reused, 5% incinerated
			Insulating Glass	3,081	0.10	n/a	100% recycled
		Internal Doors	Steel Interior Door	10,500	0.35	n/a	75% recycled, 20% reused, 5% incinerated
			Wooden Interior Door	3,825	0.13	n/a	75% recycled, 20% reused, 5% incinerated
			Wooden Interior Door	34,981	1.15	n/a	75% recycled, 20% reused, 5% incinerated
3	Finishes	Internal Finishes	Ceramic Floor Tiles	2,470	0.08	n/a	75% recycled, 20% reused, 5% incinerated
			Ceramic Floor Tiles	10,080	0.33	n/a	75% recycled, 20% reused, 5% incinerated
			Ceramic Wall Tiles	5,826	0.19	n/a	75% recycled, 20% reused, 5% incinerated
			Gypsum Finish Plaster	138,224	4.56	n/a	n/a
			Ceramic Wall Tiles	23,520	0.78	n/a	75% recycled, 20% reused, 5% incinerated
			Gypsum Finish Plaster	552,898	18.23	n/a	n/a
			Gypsum Plasterboard	22,080	0.73	60	75% recycled, 20% reused, 5% incinerated
			Gypsum Finish Plaster	12,000	0.40	n/a	n/a
			Gypsum Plasterboard	251,321	8.29	60	75% recycled, 20% reused, 5% incinerated
			Gypsum Finish Plater	49,000	1.62	n/a	n/a
			Steel Sheets	2,250	0.07	0	75% recycled, 20% reused, 5% incinerated
			Vinyl Flooring Tiles	18,296	0.60	n/a	75% recycled, 20% reused, 5% incinerated
			Paint	1,433	0.05	n/a	n/a
			Steel Sheets	250	0.01	0	75% recycled, 20% reused, 5% incinerated
			Vinyl Flooring Tiles	21,564	0.71	n/a	75% recycled, 20% reused, 5% incinerated
			Softwood Timber	273,420	9.01	0	75% recycled, 20% reused, 5% incinerated
			Softwood Timber	3,500	0.12	0	75% recycled, 20% reused, 5% incinerated
			Softwood Timber	43,283	1.43	0	75% recycled, 20% reused, 5% incinerated
			Paint	16,423	0.54	n/a	75% recycled, 20% reused, 5% incinerated
			Resin	760	0.03	n/a	n/a
			Resin	7,345	0.24	n/a	n/a
4	Fittings and furnishings	Fittings and furnishings	1% contribution based on overall WLC figure	48,000			
5	Building Services/ MEP	MEP	20% contribution assumed based on overall WLC figure	501,191			
			Refrigerant R-410A	548	0	n/a	10% EOL Recovery
8	External works		Concrete	51,800	1.71	20	80% recycled; 20% reuse
			Granite Products	3,000	0.10	0	100% recycled
			Aggregate	250,560	8.26	20	100% recycled
			Granite Products	20,000	0.66	0	100% recycled

56,656,757	1,868 kg/m2	20% average weighted
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Appendix B

**PRE-REDEVELOPMENT/PRE-
DEMOLITION AUDIT**





Berol Quarter

Pre-Redevelopment Audit

November 2022

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Document Control Sheet	
Report Reference	PP2017/BQ/PDA/202211-EC
Issue Purpose	For Planning
Authorised by	Ryan Thrower

Disclaimer

The information contained within this Report is based on Drawings and Specifications provided by the Design Team along with information assumed by NRG Consulting for the purposes of compliance.

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

1. INTRODUCTION

This Pre-Redevelopment Audit Report has been prepared by Formation Design & Build Ltd on behalf of Berkeley Square Developments. The report concerns the proposed demolition at the car park adjacent to Watermead Way, known as 2 Berol Yard and the refurbishment of the existing Berol House, and the management of materials resulting from this. The report is written to support the Planning Applications for both 2 Berol Yard and Berol House.

1.1 Purpose of Pre-Redevelopment Audit

The Pre-Redevelopment audit will help to identify and quantify the key materials generated from the demolition works. This information can then be used for the following purposes:

- To help guide the demolition works in a way that minimises waste generation;
- To identify materials that can be reused or recycled;
- To set waste management targets; and
- To ensure that all contractors are engaged in the process of maximising high-grade reuse and recycling opportunities.

In line with good practice, the audit has been carried out before demolition works commence in order to maximise opportunities for reusing and recycling materials.

1.2 Structure

The report is broken down into the following sections:

- **Site description:** this section provides a general description of the development, including its location and what other information can be gleaned from a desktop review;
- **Waste types and quantities:** this section summarises the findings of the desk-based study and site survey (carried out by Lendlease). Its main purpose is to identify and quantify the key materials likely to be generated from the demolition works;
- **Waste recovery/recycling/reuse recommendations:** this section outlines potential applications for the key materials identified. It includes an assessment of viable recovery routes and local reprocessing options;

2. SITE DESCRIPTION

2.1 Site Information

The site is currently a car park and mixed-use storage area associated with the former use of the surrounding properties, that are commercial. The car park also currently, and formerly, serves to the workers of these surrounding commercial areas.

The site's general area can be described as largely commercial, which juxtaposes the large-scale residential blocks to the east, along with the immediately adjacent Tottenham Hale station. The area to the west of the development site has been largely reformed into multiple sports areas including a basketball, football and tennis areas. Pavilion Pre-school also lies here just west of the site past further commercial warehouses and storage areas.

The scheme has a PTAL of 6a, which indicates a very high connectivity index to sustainable transport services. The scheme itself is 100m away from Tottenham Hale station. Overall, this implies excellent connectivity, the site benefits from proximity to plethora of public transport and main road making the scheme easily accessible for workers and suppliers. This extends to both deliveries and staff transport.

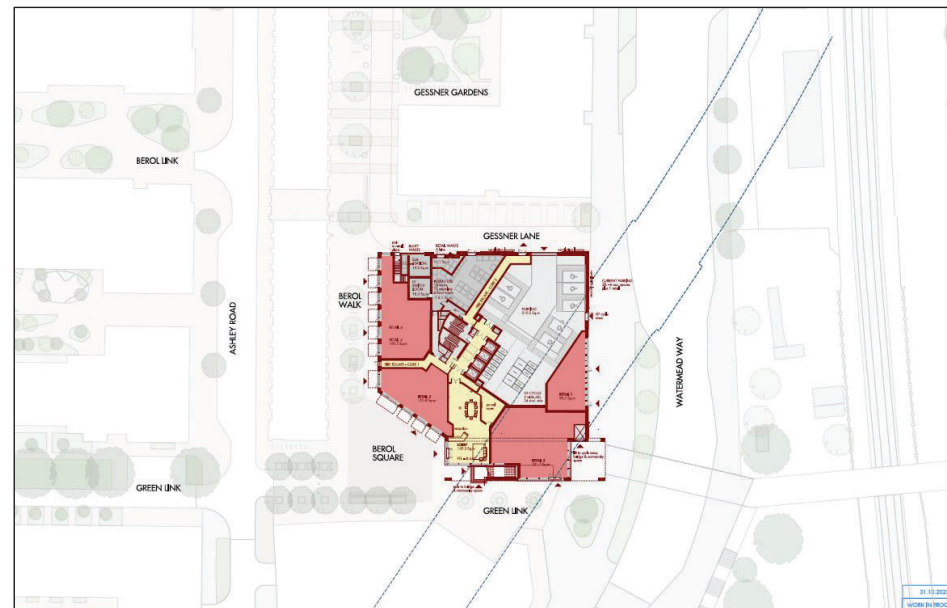


Figure 2.1: Proposed Ground Floor Plan 2 Berol Yard

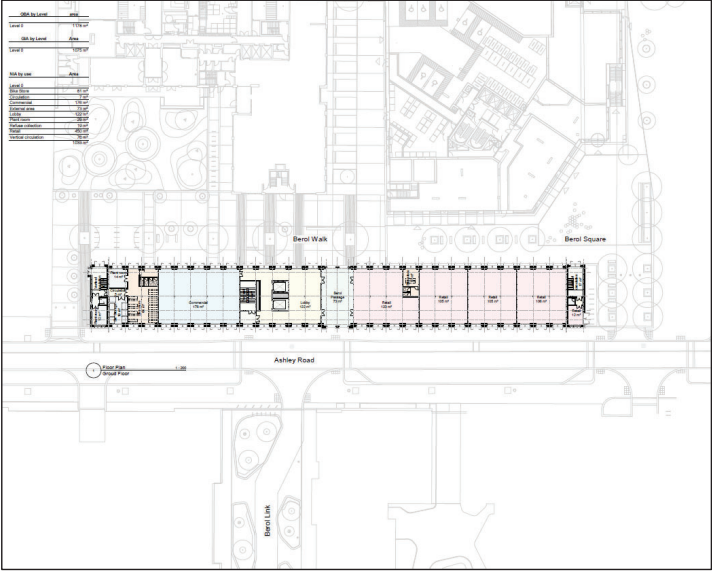


Figure 2.2: Proposed Ground Floor Plan Berol House

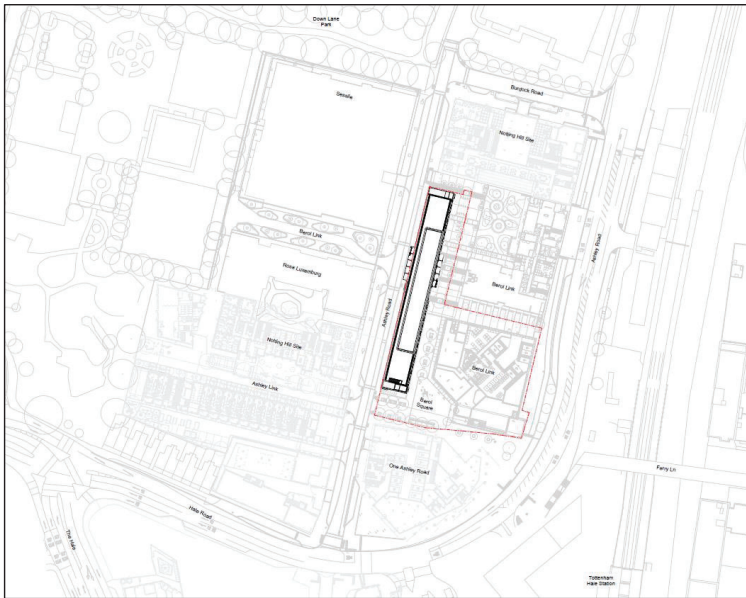


Figure 2.3: Proposed Site Plan

2.2 Proposed Demolition Works

Demolition will be limited to part of Berol House (comprising the external staircase and the north extension) while demolition at 2 Berol Yard will not be required as the site is cleared (an existing Car Park) with works on site commencing with setup and enabling works for the initial stages of construction development.

The proposed demolition approach for Berol House is summarised below:

Internal Strip-Out Works

- All suspected asbestos within the building will be tested to confirm, and if present, will be removed by a licensed contractor;
- All non-structural elements will be removed from the interior. This includes ceilings, plasterboard, internal partitions and floorboards/joists.

Removal of Walls

- If lead paint or other hazardous substances are found, the scaffolding will be fully encapsulated to contain the hazardous materials;
- An excavator will be used to dismantle the walls, starting from the top and ensuring that all material will be dropped within the building footprint. Water spray will be used to suppress dust created by the works.
- If possible, masonry bricks will be re-used, or if this is not possible, will either be crushed on site and recycled, or the rubble taken off-site and crushed and recycled elsewhere.

3. WASTE TYPES AND QUANTITIES

3.1 Introduction

The purpose of this section is to identify the types and quantities of materials that are likely to be generated during the demolition works.

3.2 Methodology

Due to the limited nature of the demolition phase the materials assessment has been informed by a desk-based study only with a site visit not deemed necessary.

3.3 Estimated Waste Quantities

Estimating waste arisings from demolition works is difficult. Many materials form composite mixes and, as such, their exact quantities can be difficult to calculate or assess in terms of recoverability. Despite this and in line with good practice, some form of waste estimation is required. The estimated volume of key waste materials generated from the demolition works is shown in table 3.1 and 3.2 below.

2 Berol Yard			
Waste Type	Forecast Estimated Quantity (tonnes)	Waste Minimisation Option	Waste management route
Hardcore	150	Segregate at source	Recycling
TOTAL	150		

Table 3.1 Estimated volume of key waste materials arising from the 2 Berol Yard works

Berol House			
Waste Type	Forecast Estimated Quantity (tonnes)	Waste Minimisation Option	Waste management route
Bricks	15.68	Segregate at source	Recycling
Tiles and Ceramics	5.23	Segregate at source	Recycling
Concrete	19.60	Segregate at source	Recycling
Inert	1.96	Segregate at source	Recycling
Insulation	5.88	Segregate at source	Recycling
Metals	4.57	Segregate at source	Recycling
Packaging	15.68	Segregate at source	Recycling
Gypsum	28.75	Segregate at source	Recycling
Binders	1.96	Segregate at source	Recycling

Plastics	2.29	Segregate at source	Recycling
Timber	11.11	Segregate at source	Recycling
Floor coverings (soft)	0.33	Segregate at source	Recycling
Electrical and Electronic Equipment	0.33	Segregate at source	Recycling
Furniture	2.61	Segregate at source	Recycling
Liquids	1.96	Segregate at source	Recycling
Asphalt and Tar	1.63	Segregate at source	Recycling
Hazardous	0.65	Segregate at source	Recycling
Mixed	6.53	Segregate at source	Recycling
TOTAL	126.75		

Table 3.2 Estimated volume of key waste materials arising from the Berol House works

4. WASTE RECOVERY AND RECOMMENDATIONS

4.1 Introduction

This section outlines the potential reuse/recycling applications for the materials identified in Section 3 and includes an assessment of viable recovery routes and local reprocessing options.

4.2 Potential Reuse and Recycling Applications

In line with Formations' ambition to promote resource efficiency in all aspects of their operations, the waste hierarchy will be followed throughout the works (see Figure 4.1). The preferred approach will be to prevent and reduce waste generation in the first instance, before recycling and recovering value from waste materials. Only after these options have been deemed unfeasible will the safe treatment and final disposal of waste be considered.



Figure 4.1: The Waste Hierarchy

4.3 Local Re-Processors or Recyclers

To minimise the amount of waste disposed of in landfill, any materials that cannot be reused should be segregated for recycling. There are two main segregation methods available. The first is to consign waste materials to a licensed materials recycling facility (MRF) or construction based transfer station and to segregate off-site. However, when mixed construction waste is consigned to a secondary sorting facility, the quality of recyclate is often compromised, as typically only bulky items are removed, including wood, rubble, and metals.

A more sustainable option is to therefore segregate materials on-site. Materials can then be reprocessed/recycled off-site at dedicated permitted facilities that have the correct approvals for receiving such waste. Several local examples within London shown in Table 4.1 below.

Key Material	Local reprocessors or recyclers
Hardcore	AMI Waste, 17 Stacey Avenue, Edmonton, N18 3PP GBN Services Ltd, Montagu Industrial Estate, Gibbs Road, Edmonton, N18 3PU Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH
Wood	AMI Waste, 17 Stacey Avenue, Edmonton, N18 3PP GBN Services Ltd, Montagu Industrial Estate, Gibbs Road, Edmonton, N18 3PU Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH

Metal	European Metal Recycling Ltd, Albert Works, Kenninghall Road, Edmonton, N18 2PD European Metal Recycling Ltd, Montague Road Industrial Estate, 22-26 First Avenue, Edmonton, N18 3PH AMI Waste, 17 Stacey Avenue, Edmonton, N18 3PP
Concrete	I Waste, 17 Stacey Avenue, Edmonton, N18 3PP GBN Services Ltd, Montagu Industrial Estate, Gibbs Road, Edmonton, N18 3PU Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH
Ceramic/Bricks	AMI Waste, 17 Stacey Avenue, Edmonton, N18 3PP Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH
Plastic	GBN Services Ltd, Montagu Industrial Estate, Gibbs Road, Edmonton, N18 3PU
Glass	Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH
Gypsum	GBN Services Ltd, Montagu Industrial Estate, Gibbs Road, Edmonton, N18 3PU Oakwood Plant Ltd, Oakwood House, Nobel Road, Eley Industrial Estate, London N18 3BH

Table 4.1: Local reuse, reprocessing and recycling opportunities

5 CONCLUSIONS

5.1 Summary

This report has identified the key materials that will be generated by the proposed demolition works at 2 Berol Yard and Berol House. The report has also outlined a number of opportunities for reusing and recycling these materials and, in doing so, improving the sustainability credentials of the site.

The intention is, first and foremost, to minimise the amount of waste generated by the demolition works. Opportunities for reusing materials off-site should therefore be explored in the first instance, ideally in the products' original form.

Where materials are less suitable for reuse, they should instead be separated for recycling off-site. Key materials are likely to include timber from the roof and floor structures, timber and plasterboard from partition walls, and masonry from the external walls.

Due to the generic minimal composite mix of the different building elements identified, it is likely that a high recovery rate will be achieved. The industry standard recovery rate of 80% (by mass) should be an absolute minimum target, with potential to achieve the best practice target of 90% recovery if substantial effort is made to tackle waste segregation at soft strip stages.

5.2 Next Steps

Going forward, Formation will ensure to action the recommendations in this report and must review the report prior to commencing any site works and engage their employees to ensure that the waste management objectives are understood and that steps are taken to achieve these targets.

As an additional step, it is recommended that actual waste arisings and waste management routes are monitored and compared with those forecasted in this report. Any barriers to achieving targets should be investigated and used to help improve waste management performance on future projects.

Appendix C

MUNICIPAL/OPERATIONAL WASTE MANAGEMENT



2 BEROL YARD & BEROL HOUSE

OPERATIONAL WASTE PLAN & MANAGEMENT STRATEGY

November 2022

WASTE POLICY CONTEXT

INTRODUCTION

This section contains details of the national legislation that have relevance to the Proposed Development. National, London and local waste policy and guidance reviewed during the preparation of this Waste Management Strategy are listed below.

NATIONAL LEGISLATION

A list of relevant items of national waste legislation is outlined below in reverse chronological order:

- **The Waste (England and Wales) Regulations 2011 (as amended)** – These regulations implement the revised EU Waste Framework Directive which sets requirements for the collection, transport, recovery and disposal of waste. Waste producers or those handling waste must apply the waste hierarchy as specified in the Waste Framework Directive (prevention, prepare for reuse, recycling, recovery, disposal), unless it can be justified on environmental or technical grounds that this are not appropriate. From 1 January 2015, waste collection authorities are required to collect wastepaper, metal, plastic and glass separately.
- **Revised Waste Framework Directive (2008)** – The WFD clarifies the definition of 'waste' and of other concepts such as 'recycling' and 'recovery'. It has applied a new Waste Hierarchy, expanded the 'polluter pays' principle by emphasising producer responsibility, applies more stringent waste reduction and waste management targets for Member States and requires enhanced content in waste management plans.
- **Environmental Protection Act 1990. Waste Management, Waste Management, The Duty of Care Code of Practice 2016** - This code of practice replaces the 1996 Code and is pursuant to Section 34(9) of the Environmental Protection Act 1990. It sets out practical guidance on how to meet waste duty of care requirements and is admissible as evidence in legal proceedings i.e. its rules will be taken into account where relevant in any case based on breach of the duty of care.
- **Environmental Protection Act 1990 (EPA 1990)** – Part II of the act was originally implemented by the Duty of Care Regulations 1991. The Duty of Care is a legal requirement for those dealing with certain kinds of waste to take all reasonable steps to keep it safe and is set out in Section 34 of the Act. The Waste (England and Wales) Regulations 2011 repealed the Environmental Protection (Duty of Care) Regulations 1991 and apply the Duty of Care requirements brought in by the Environmental Protection Act 1990.

NATIONAL, LONDON & LOCAL WASTE POLICY

The relevant national, London and local waste policy that was reviewed during the preparation of this Waste Management Strategy is outlined below:

- National Planning Policy Framework (2012);
- National Planning Policy for Waste (2014);
- Waste Management Plan for England (2013);
- The London Plan: The Spatial Development Strategy for London - consolidated with alterations since 2011 (2016 & 2021);
- North London Waste Plan: Draft North London Plan; Regulation 18 July 2015;
- LBH, Haringey's Local Plan: Strategic Plan 2013-2026;
- LBH, Haringey Unitary Development Plan Saved Policies (Post Local Plan Adoption): Adopted July 2006 Policies Saved March 2013;

- LBH, Sustainable Design and Construction: Supplementary Planning Documents Adopted March 2013; and LBH, Development Management DPD: Pre-submission version January 2016.

MANAGEMENT OF RESIDENTIAL AND COMMERCIAL WASTE

INTRODUCTION

This section provides the outline strategy which will be adopted to manage the waste arisings from the Proposed Development of Berol House and 2 Berol Yard once operational.

Residential waste and commercial waste will be stored separately.

WASTE MANAGEMENT SERVICES PROVIDED BY LBH

The current waste management services that are provided by and on behalf of LBH to estates are as follows:

LBH waste management services

Refuse	Shared wheeled bin collected weekly
Recycling	Shared wheeled bin collected weekly
Food waste	Shared wheeled bin collected weekly
Bulky waste	Chargeable collection service
Bring Sites	Locations in the borough
Reuse and Recycling Centres	Tottenham – Park View Road

Source: LBH website.

GENERATION OF RESIDENTIAL WASTE

The waste generation volumes for the Proposed Development were calculated using LBH's Sustainable Construction and Design SPD Appendices (March 2013) guidance document. These were as follows:

- For refuse, one 1,100 litre Eurobin per six dwellings.
- For dry recycling, one 1,100 litre Eurobin per 10 dwellings; and
- For food waste, one 360 litre bin per 40 dwellings.

The dimensions of a typical 1,100 litre Eurobin and 360 litre wheeled bin are as follows:

Bin type (Litres)	Width (mm)	Depth (mm)	Height (mm)
1,100	1,260	985	1370
360	620	885	1100

The waste storage capacities were used to determine the weekly residential waste storage requirements, which have been summarised in the table below.

Following a detailed assessment of the Proposed Development, due to the significant design restraints of the ground floor it is not considered possible to provide sufficient waste storage facilities to store a week's waste generation as it would result in very large bin stores.

In order to maintain the viability of the scheme, it has therefore been assumed that waste collections would be made **twice a week**, which enables more commercial space on the ground floor and frontages and a more reasonable number of bins for each collection, which would also mean refuse vehicles are not required to spend long periods of time collecting from one development.

The twice weekly residential waste storage requirements have been summarised below:

No. of units	Refuse	Recycling	Food waste
210	(1,100 L bin)	(1,100 L bin)	(360 L bin)
Ratio units/bin	6	10	35
1 collection/week	35 bins	21 bins	6 bins
2 collections per week	18 bins	11 bins	3 bins

STORAGE OF RESIDENTIAL WASTE

Note that this section refers only to 2 Berol Yard as there is no residential accommodation in Berol House

Within Individual Apartments

In the first instance, residents would segregate and store their refuse and recycling through the use of internal compartmentalised waste storage. This would promote the segregation of refuse and recyclable materials at source.

An example of a suitable segregated waste bin is shown below:



Food waste would be segregated in black kitchen caddies provided by LBH



Communal Bin Stores

Residents will be responsible for manually transporting their waste down to communal bin stores on the ground floor.

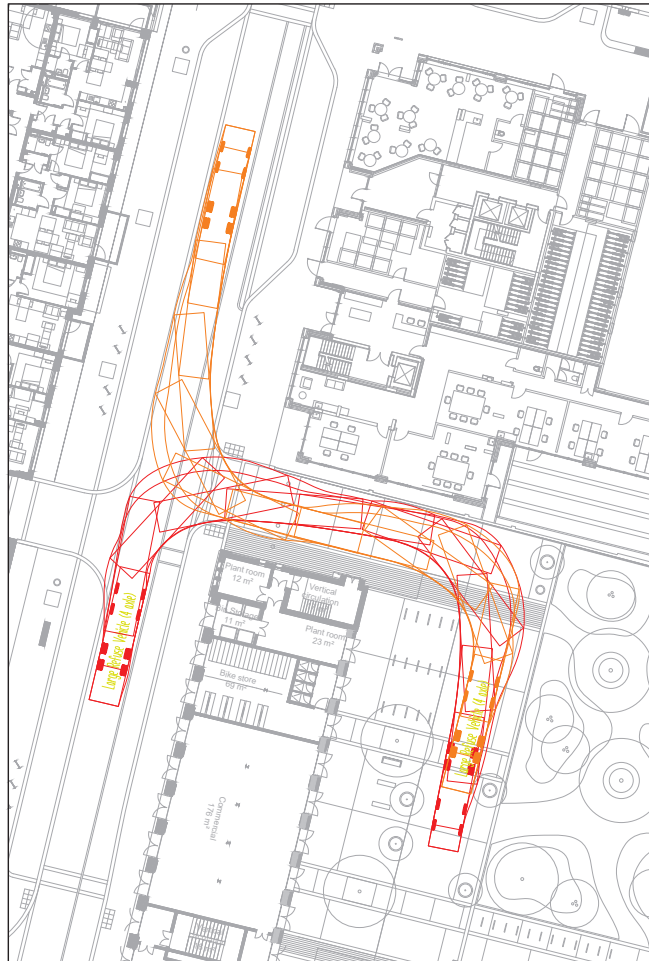
Communal bin stores will be adequately ventilated and lit (with PIR fittings) for residents to use 24/7. They will have floor drainage and water point to allow for easy cleaning. Gullies will have a sealed trap.

Residents would deposit their refuse, recycling and food waste in dedicated wheeled bins in the communal bin store which is located on the ground floor as indicated below:

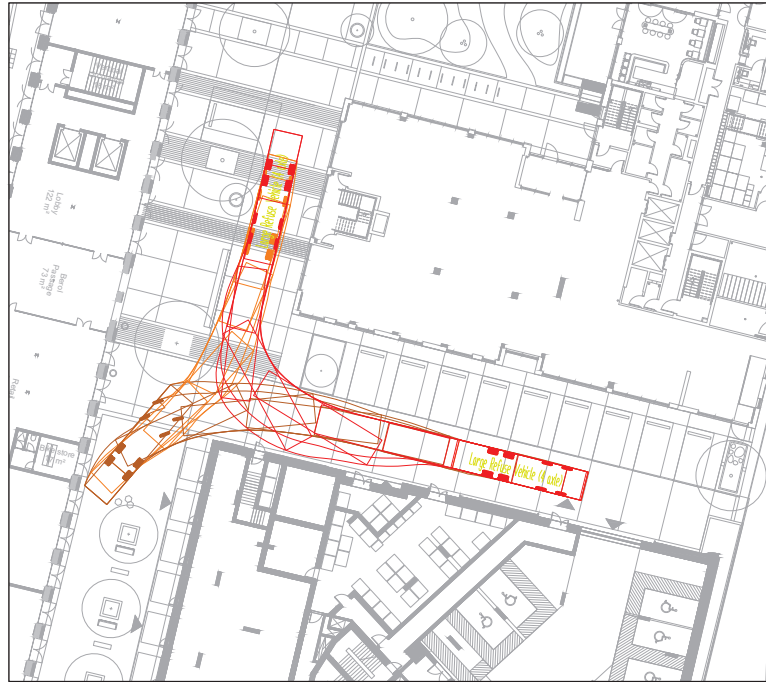
COLLECTION OF HOUSEHOLD WASTE

The Refuse Collection Vehicles (RCVs) will access the communal bin store from Gessner Lane via Ashley Road access to Berol Walk. This allows collection within a 10m drag distance.

The anticipated swept paths of these vehicles are illustrated below (also see appendix 1: WSP plan reference 70094918-SK007 & 008 - Large vehicle tracking swept path analysis):



Swept path tracking showing large refuse vehicle access from Ashley Road into Berol Yard



Swept path tracking showing large refuse vehicle access to bin stores in 2 Berol Yard

Roads and access ways to be used by RCVs will be able to withstand load bearing of up to 26 tonnes and will provide clear headroom of 4.75m.

For bulky waste (furniture etc.), it has been assumed that residents will make arrangements with LBH for collection and temporarily store the waste in an agreed location at ground floor level.

STORAGE AND COLLECTION OF COMMERCIAL WASTE

Commercial waste and recycling will be collected by a private waste contractor for the whole life of the development. There will be separate collection points for each of Berol House (in Ashley Road) and 2 Berol Yard (in Gessner Walk).

2 Berol Yard

It is proposed that each commercial tenant will provide a suitable waste storage area within their own demise as part of their fit-out, which will include provision for the segregation of refuse, recyclables and food waste (if applicable).

In addition a dedicated commercial waste bin storage area is located on the ground floor, to allow RCVs to collect the waste as arranged directly by the commercial tenants. The tenants will be responsible for depositing their waste in the commercial bin store.

An area of approx. 14 sqm has been made for the provision of 6 bins (min 1 per tenant).

It should be noted that the waste storage area is located away from the main entrance to the building.

The waste bin storage arrangements for both residential and commercial are shown on the plan below:



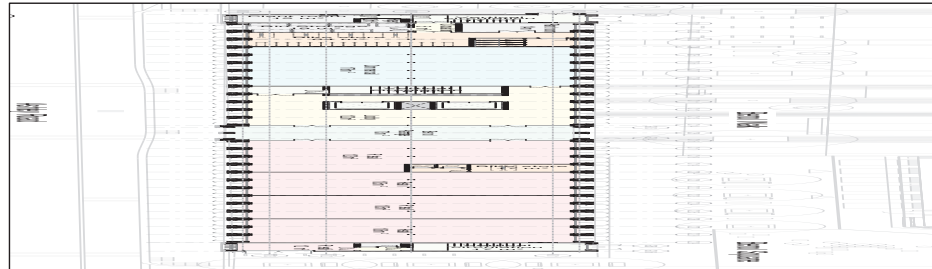
Berol House

All occupiers of Berol House are commercial tenants. Each commercial tenant will provide a suitable waste storage area within their own demise.

In addition a dedicated commercial waste bin storage area is located on the ground floor to allow RCVs to collect the waste as arranged directly by the commercial tenants. The tenants will be responsible for depositing their waste in the commercial bin store.

An area of approx. 19 sqm has been made for the provision of 7 no. 1,100 L bins.

These arrangements are shown on the plan below (also see Appendix 1: JMP-XX-DR-A-3000_proposed_level 00).



SUMMARY AND CONCLUSIONS

SUMMARY

It has been assumed that residential waste collections would be made twice a week, with residents depositing their refuse, recycling and food waste into dedicated containers in communal bin stores.

The bin stores can be directly accessed by RCVs within 10m of collection points.

For commercial waste, it is proposed that each commercial tenant will provide a suitable waste storage area within their own demise as part of their fit-out, which will include provision for the segregation of refuse, recyclables and food waste (if applicable).

CONCLUSION

This Waste Management Strategy has taken into account the need to lessen the overall impact of waste generation through separation of recyclables and food waste during the operational phase.

The Proposed Development meets the requirements of relevant waste policy and follows applicable guidance.

Appendices

1. Plans

GF Berol House: 2042-JMP-XX-00-DR-A-3000_proposed_level 00.pdf

GF 2 Berol Yard: Allies & Morrison – GF Plan GA 22049_06_100

WSP plans reference: 70094918-SK007 & 008 - Large vehicle tracking swept path analysis

Appendix D

**LEAN DESIGN OPTIONS & DESIGNING
FOR DISASSEMBLY**



19 October 2022
Ref: 2778-01

2 Berol Yard - Lean Design & Design for Disassembly Strategy

Heyne Tillett Steel (HTS) are appointed as Structural and Civil engineers for the proposed development at 2 Berol Yard. The development includes a 32-storey residential tower with commercial space at ground & mezz levels. There is also a two storey RC podium alongside and a six-storey residential block spanning across the London Underground Limited (LUL) tunnels below. This document sets out the HTS approach to lean design and design for disassembly.

Lean Design

The approach taken in the structural design is to reduce the quantity of materials used in the project wherever possible. This has many benefits, including weight (efficient foundations), cost, embodied carbon, and improved floor to ceiling heights (by limiting the structural zone). For fire compartmentation and resistance reasons, as well as its acoustic properties a reinforced concrete frame has been selected for the tower structure. To reduce material usage and provide economic slabs, columns are provided at relatively close centres and have been coordinated to sit in walls between flats where possible. This allows a slab thickness of 225mm, providing an efficient, structurally stiff building with inherent fire resistance, removing the need for additional fire protection boarding.

Imposed load reduction has been used to design efficient columns, walls and foundations. This statistical approach is based on the principle that all floors in the building will not be fully loaded at the same time, which allows for efficiency in design and a reduction in material usage.

The building structure will be designed with the industry design life of 50 years (as per the British Standards and Eurocodes).

Design for Disassembly

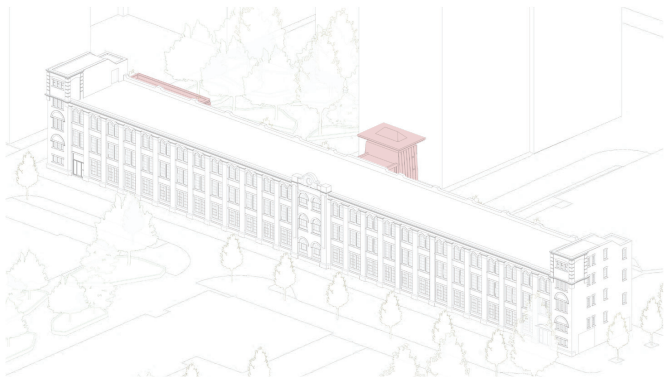
Reinforced Concrete structures are relatively difficult to disassemble but given the height and residential use of the development it remains the best overall choice for the superstructure. RC structures are robust and can well exceed the design life, offsetting the initial impact or demolition difficulty. The concrete waste from demolition can be recycled as aggregate, engineered fill material or for site uses such as piling mats. There are also pioneering projects re-using sections of cut reinforced concrete slabs as pre-cast planks on other projects.

Columns and wall elements could be pre-cast and brought to site for installation. These elements are then typically integrated into the structure with a section of cast-in situ concrete. Although time consuming, it is possible for these to be broken out and reused. It is likely that other areas of the development are better suited to modularisation and reuse. These include riser and plant assemblies or façade elements.

Given the size of the development, it is likely that all parties (engineers, architects, sub-contractors) will produce and issue 3D model information. This would then be archived as part of the O&M documentation so that materials and manufacturers are known, making the disassembly and reuse easier.

1.1 Lean design appraisal

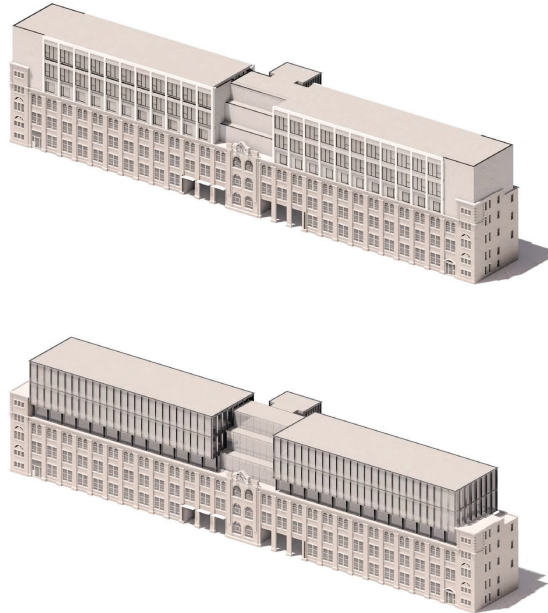
The following section describes the design process iterations that have led to the final concept design, the options that have been evaluated and taken or left behind with the intention of producing an efficient, sustainable and logic design for Berol House.



26/05/2022

Retention of the existing locally listed building

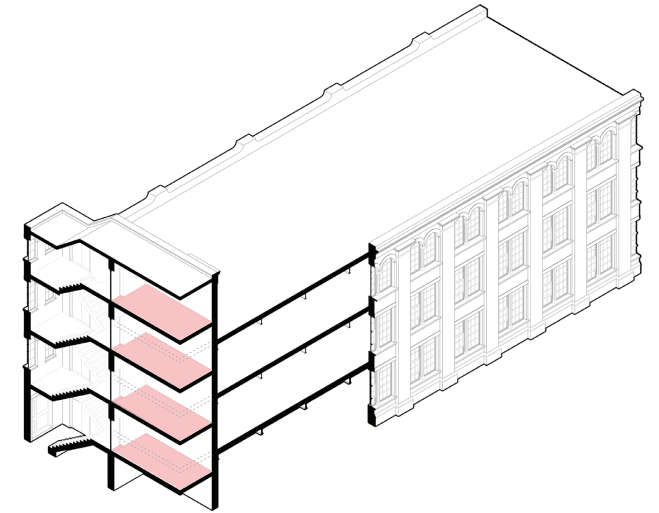
The main adaptive reuse strategy adopted for the intervention in the iconic industrial factory of Berol House is the maximum retention of the existing building. It is proposed to maintain the structure, the façade and other constructive elements, seeking to recover the original aesthetics through the restoration and minimal demolitions, like the later added staircase on the rear facade, in order to enhance the historic character of the building.



01/06/2022

Massing

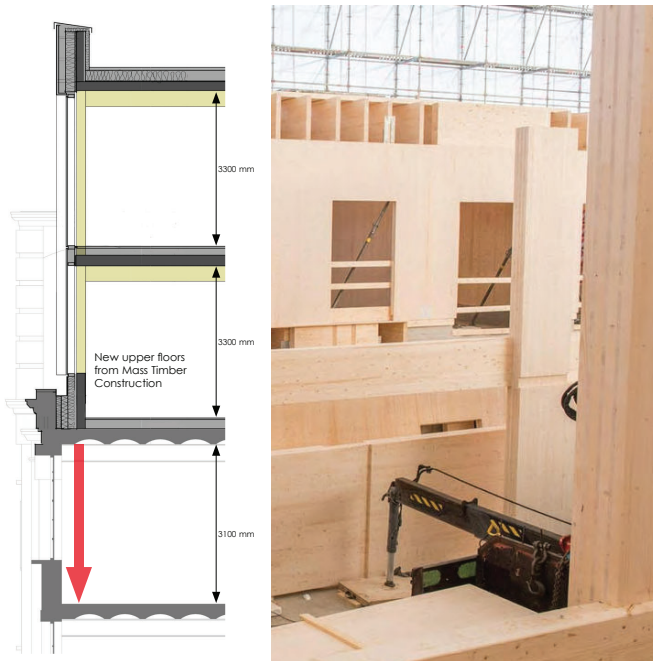
Different strategies were explored for the massing of the extension over Berol House, seeking to maximise the uplift while sensitively creating a balance between the existing building and its historical and architectural value, and the new intervention.



14/06/2022

Retaining the existing stairs in the gable ends.

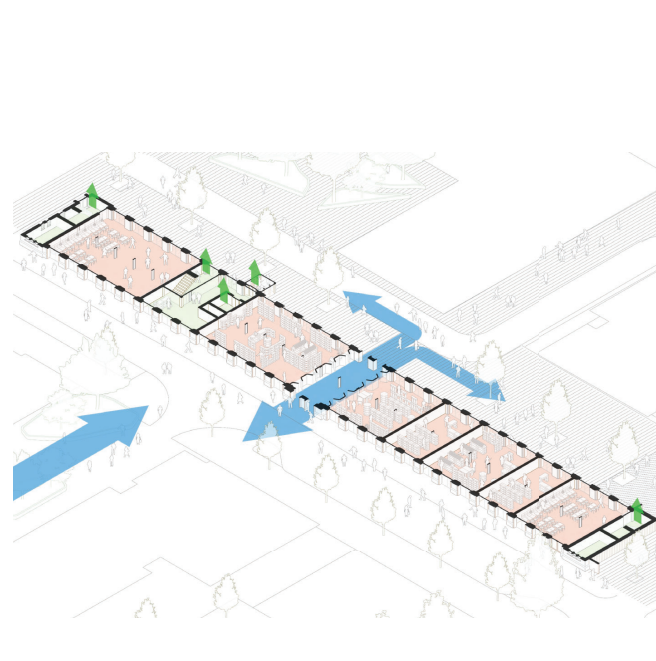
The existing stairs and levels in the gable ends were proposed to be kept. This was due to the major impact on the existing building to realign the intermediate floors, as well the desire to retain as much of the existing building as possible in the creation of a highly flexible commercial building at the heart of the new residential neighbourhood. They will be utilised as ancillary spaces for the building to support the office functions.



21/06/2022

Mass timber structural strategy proposed

Mass timber was proposed for its numerous benefits and sustainable credentials. It can allow quicker, cleaner assembly, as well as being lighter and less carbon-intensive than traditional construction materials.



21/07/2022

Ground floor layouts

The design of the ground floor seeks to activate the building within its immediate public realm. It is proposed to connect Ashley road with Berol Square through a permeable ground floor dedicated to retail and commercial spaces. The final layout seeks to link both sides of the building through active frontages and a public passage.



01/08/2022

Facade studies

The design of the facade has undergone various iterations throughout the design process. This is hugely impacted by the rhythm and seriality of the existing building. Daylight/sunlight studies have been carried out which have informed the amendments to the proportions and size of the glazed openings. The final design takes into account an efficient overheating strategy and the use of natural light and ventilation.

1.2 Lean design appraisal

Design for disassembly

The proposal has been designed to promote the dismantling and recycling strategies for its components, reducing the material demand and extending the use of the materials involved long after the building's useful life.

The repeating and modular proportions of the existing building promotes the standardisation and serialisation of the components of the new build intervention. The design for the three-storey extension on top of the existing structure is based on a typical 3270mm wide bay that repeats along the 100m length of the building, ensuring modularity is a key element in the design proposal, which favours the future disassembly and reuse of the components.

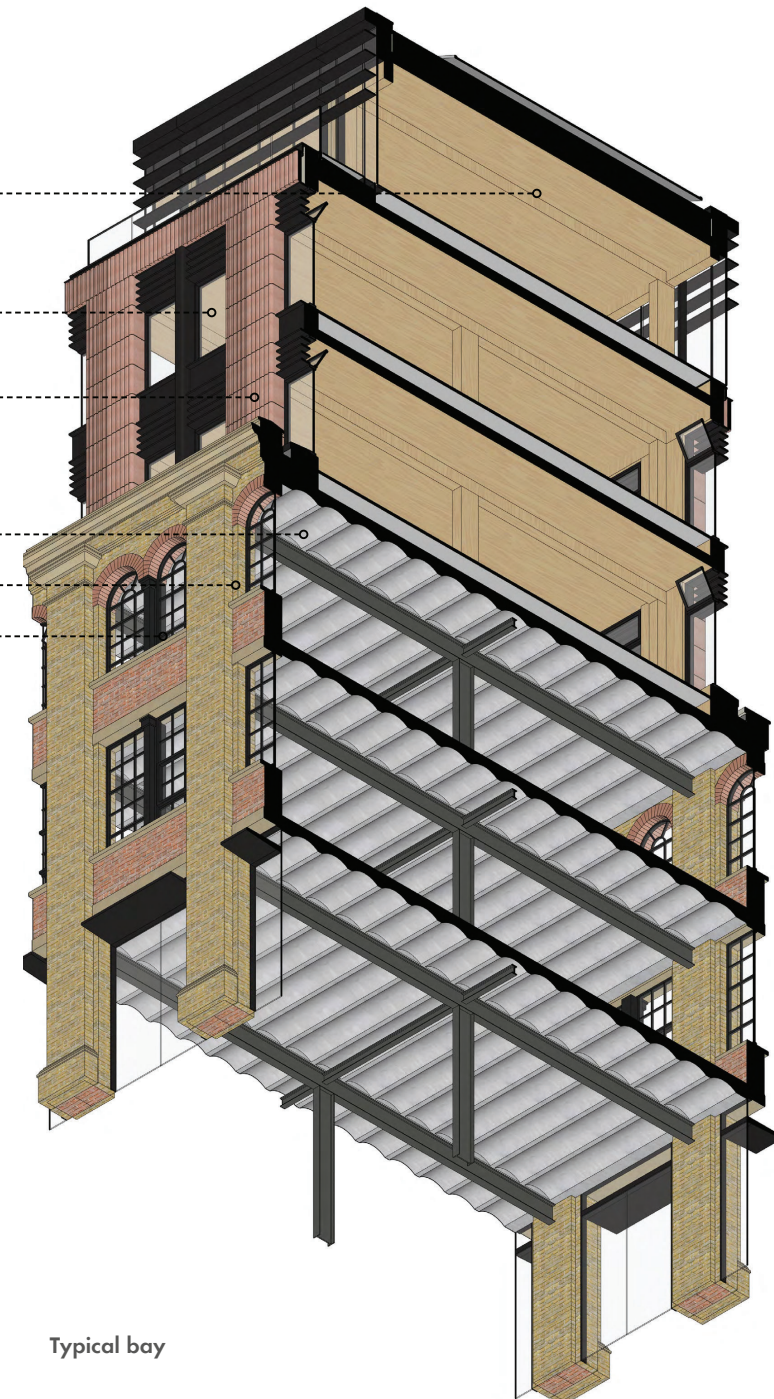
A hybrid structure is proposed for the building. Primarily mass timber construction for the extension and steel where required within the existing building. This sustainable approach to the extension lends itself to a potentially lighter weight structure, the opportunity to maximise spans for internal flexibility, reduces the quantum of internal finishes where the timber can be left exposed and ultimately can be designed for end of life allowing for disassembly and reuse at end of the building's useful life.

The storage of the proposal information can be encouraged through the use of BIM technologies and Materials Passports, allowing for future disassembly an end-of-life strategy.

The building structure will be designed to the 50-year industry life standard (following British Standards and Eurocodes).



- Mass timber structure
- Modular facade composition
- Reusable sustainable materials
- Exploitation of the existing structure
- Retention of the existing building
- Restoration of the original aesthetic



Typical bay



WSP House
70 Chancery Lane
London
WC2A 1AF

wsp.com