ONE BATTERSEA BRIDGE

PRE-REDEVLOPMENT AND PRE-DEMOLITION AUDIT

April 2024

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PRE-REDEVELOPMENT AND PRE-DEMOLITION AUDIT

PROJECT NO. 23/185 DOC NO. D014

DATE: MARCH 2024

VERSION: 1.0

CLIENT: PROMONTORIA BATTERSEA LIMITED

Velocity Transport Planning Ltd

www.velocity-tp.com

DOCUMENT CONTROL SHEET

Document Reference

Project Title	One Battersea Bridge
Document Title	Pre-Redevelopment and Pre-Demolition Audit
Project Number	23/185
Document Number	D014
Revision No.	1.0
Document Date	MARCH 2024

Document Review

	Name	Date completed
Prepared By	Oliver James	28/03/24
Reviewed By	Peter Hambling	28/03/24
Authorised By	Lloyd Bush	28/03/24

Notes

The document reference number, revision number and date are given on the footer of each page
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1 PROJECT INTRODUCTION

1.1 INTRODUCTION

1.1.1 This Pre-Redevelopment Audit (PRA) and Pre-Demolition Audit (PDA) have been prepared by Velocity Transport Planning on behalf of Promontoria Battersea Limited, to support a planning application for the proposed redevelopment of the Glassmill, 1 Battersea Bridge Road (hereafter referred to as the 'Site') in the London Borough of Wandsworth (LBW).

1.1.2 The PRA is a tool for understanding whether elements of the existing building and materials can be retained, refurbished, or incorporated into the new development to any extent. The audit fully explores the available options for retention or refurbishment of structures, materials, and the fabric of the existing building.

1.1.3 The purpose of the PDA is to identify and quantify where the key materials and components are present within the existing building, and to further identify the potential recycling or reuse strategy for them.

1.1.4 The information in this report will help to demonstrate the benefits of recycling and re-use of Key Demolition Products (KDPs) based on economic value, the number of units and viability of deconstruction, as well as potential schemes for re-use and recycling of these materials.

1.1.5 The findings and values contained in this report represent the best estimate of the materials and components based on the information available for the structures within the scope of the project. Estimates were made using the following information (where available):

- Architectural Plans
- Site surveys; and
- Photographs.

1.2 COMPETENCY – PROJECT MANAGER

1.2.1 The project manager was Peter Hambling who is a Chartered Waste Manager working for the past 12 years within the resource and waste management industry. His background began in environmental compliance and his experience includes contract management, waste stream analysis, collection methodologies and infrastructure development. With experience working for a construction waste contractor, commercial waste contractor and within a local authority as well as development planning, he has comprehensive understanding of the subject matter.

1.3 AIMS AND OBJECTIVES

1.3.1 The PRA and the PDA will cover the following content:

- Provide brief overview of the existing building and it's condition;
- Identification and quantification of the key materials where present on the project;
- Potential applications and any related issues for the re-use and recycling of the key materials in accordance with the waste hierarchy;
- Identification of local re-processors or recyclers for recycling materials;
- Identification of overall recycling rate for all Key Demolition Products (KDPs);

- Identification of reuse targets where appropriate; and
- Identification of overall landfill diversion rate for all key materials.

1.4 PROJECT SCOPE

1.4.1 The scope of the project includes an assessment of an office building, consisting of ground and five additional storeys.

1.4.2 This PRA element of this report will look to understand whether elements of the existing building can be retained, refurbished, or incorporated into the proposed development.

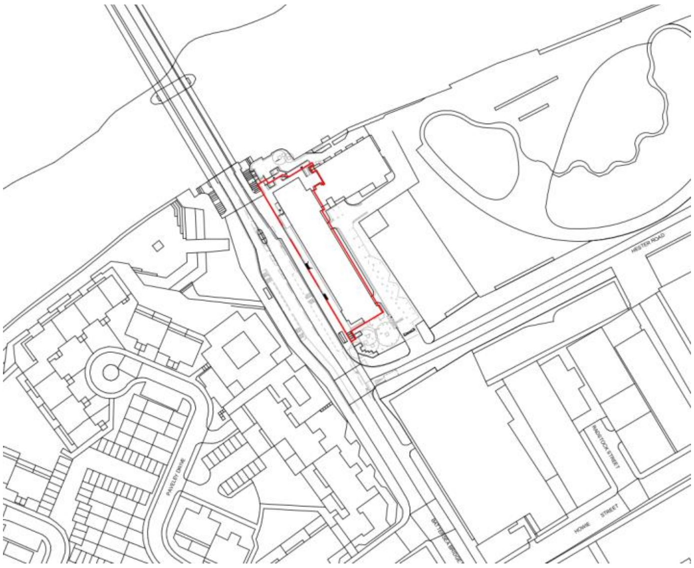
1.4.3 The PDA will subsequently identify materials and components associated with any demolition of the structure and categorise them in their regard to their position within the waste hierarchy.

1.5 SITE LOCATION

1.5.1 The site subject to this application comprises of the Glassmill, an office building located on the southeastern end of Battersea Bridge.

1.5.2 The site location is shown in **Figure 1-1** below.

Figure 1-1 Site Location



1.6 AUDIT METHODOLOGY

1.6.1 This audit is based on a non-intrusive survey methodology; a site visit was conducted on Friday 23rd February 2024 by the project team.

1.6.2 The office was still partially occupied on the day of the site visit, so a thorough inspection was made on the basement, third, fourth, and fifth floors.

1.6.3 Site plans were provided by the project architect, though detailed internal surveys were not available at the time of the audit.

1.6.4 Where details of construction methodology were not included on the plans, appropriate assumptions have been made to facilitate the audit results, based on industry knowledge.

1.6.5 The scope of the audit does not include any loose items or furniture but does include fittings such as kitchens and bathrooms where they were encountered during the site visit.

1.6.6 Where information is not available to inform the audit results, suitable assumptions have been made using relevant published material and prior knowledge based on industry experience.

1.6.7 Following the site visit and desktop study, the information was analysed to identify the principal material types present within the building. These materials were consolidated and established as the KDPs with total quantities provided in addition to recommendations for their reuse, recycling, or disposal. These recommendations are based on assumptions regarding material conditions and should be considered indicative, subject to refinement by the appointed demolition contractor.

1.7 HAZARDOUS MATERIALS

1.7.1 Due to the period in which the structure was completed, it is assumed asbestos may be present in a number of building components.

1.7.2 It is assumed that all Asbestos Containing Material (ACM) will be removed by an appropriately trained and licenced contractor in advance of the demolition works.

1.7.3 For the purposes of this PDA, the ACM on site has not been quantified by weight and will not be accounted for as an overall percentage of the demolition totals.

1.8 KEY DEFINITIONS

1.8.1 To inform the audit process and results, key definitions were established.

1.8.2 **Reclamation** is reuse of a material or product in the same form. An example of reclamation is the removal of carpet tiles from an office for reuse in another location.

1.8.3 **Recycling** is reprocessing of a material of product for an alternative use. An example of recycling is crushing of house bricks (on- or off-site) for use within secondary aggregate materials.

1.8.4 **Closed loop recycling** is the process by which a product is used, recycled, and then made into a new product again without losing any of its material properties. An example of materials suitable for closed loop recycling are aluminium cans, which can be reprocessed multiple times into the same product.

1.8.5 **Open loop recycling** is where the recycled materials are converted into both new raw materials and waste product. Typically, materials recycled through open-loop recycling go on to be used for purposes different from their former purpose. This means that the input into the recycling process is converted to a new raw material, which can be used as an input into another manufacturing process. An example of open loop recycling is plastic water bottles that are reprocessed to provide material for sleeping bags or fleece jackets.

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

1.8.7 **Embodied carbon** means all the CO_2 emitted in producing materials and is estimated from the energy used to extract and transport raw materials, as well as emissions from manufacturing processes. The embodied carbon of a building can include all the emissions from the construction materials, the building process, all the fixtures and fittings inside and the deconstruction or demolition process at the end of life.

1.8.8 **Whole Life-Cycle Carbon (WLC)** emissions are the carbon emissions resulting from the materials, construction, and the use of a building over its entire life, including its demolition and disposal.

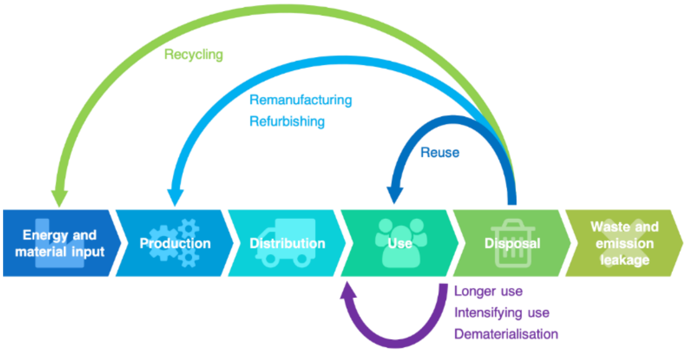
1.9 CIRCULAR ECONOMY

1.9.1 During the audit process, materials and components will be reviewed for their suitability for reuse or recycling, either on- or off-site.

1.9.2 The contractor responsible for the demolition process should approach it from the perspective of a circular economy, which gives priority to reuse of materials or components on-site over recycling.

1.9.3 **Figure 1-2** below shows a visual representation of the principles of a circular economy.

Figure 1-2 Circular Economy Process[1]



1.9.4 An integral part of this process is maintaining materials further up the waste hierarchy during the demolition process.

1.9.5 **Figure 1-3** below shows the waste hierarchy, which prioritises reuse over recycling.

[1] *Circular business models: A review (2020) M. Geissdoerfer et al.*

Figure 1-3 Waste Hierarchy

1.9.6 It is anticipated that some components or materials generated by the demolition process may be suitable for reuse or recycling, maintaining them further up the waste hierarchy.

1.9.7 The decision to reuse or recycle materials or components generated by the demolition process will typically need to consider the following:

- Removal process, including demounting or deconstructing;
- On-site safety;
- Short term storage of materials or components on-site;
- Long term storage of materials or components on- or off-site;
- Value of recovered materials or components;
- Availability of specialist contractors; and
- Volume or quantity of materials available.

1.9.8 Embodied carbon values will be calculated for the materials identified within this PDA and these should be considered within the context of WLC.

1.9.9 Energy is required to demolish a building, then remove, process, and dispose of waste materials generated by the process, with further CO_2 potentially released through associated chemical processes.

1.9.10 Building a new replacement requires more materials and energy, creating more embodied carbon.

1.9.11 Negative impacts associated with embodied carbon as part of the demolition process could potentially be mitigated and offset through the following measures:

- Reusing or recycling of building materials;
- Using construction products that are made from locally available raw materials, through energy efficient and low emission processes and by manufacturers local to the construction site;
- Transporting materials with low carbon vehicles;
- Designing the construction process to minimise waste and reuse or recycle products where possible;
- Using systems and products that have long life spans; and
- Designing the building to be able to change its use over time to minimise future refurbishments.

2 OVERVIEW OF EXISTING STRUCTURE

2.1 INTRODUCTION

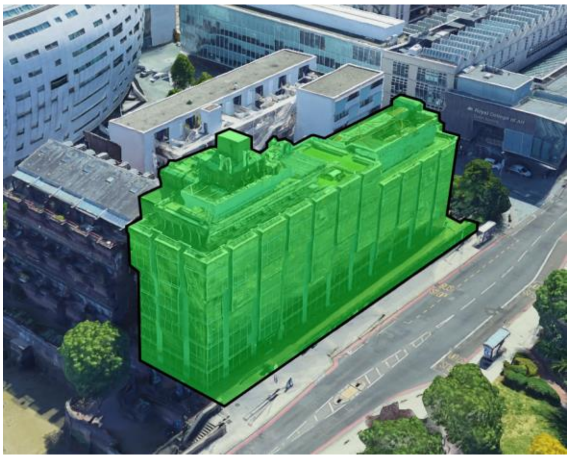
2.1.1 This section provides an overview of the existing structure on the development site.

2.2 EXISTING SITE AND CONTEXT

2.2.1 The Glassmill, 1 Battersea Bridge, was constructed in the 1980's and is located within the historic Ransomes Dock Area. The building is partially occupied, with some vacant floors assumed to have been through a recent fit-out. The site sits adjacent to Battersea Bridge and fronts onto the Thames Path, a popular walking and cycling route which runs along the southern end of the Thames. To the northeast quadrant of the office, there is an adjoining residential block known as Thameswalk Apartments.

2.2.2 **Figure 2-1** below shows the existing structure on site in green.

Figure 2-1 Site Plan



2.3 EXISTING STRUCTURE

2.3.1 The following section provides details of the existing structure on site, which consists of 1980's office building. The existing building consists of lower ground and ground floor levels plus five storeys of office space. The roof levels are partially occupied by plant space and telecommunications infrastructure. The main structure consists of a concrete frame, finished with double glazing on the north and west façades.

BUILDING EXTERIOR

FACADES

2.3.2 The west and west façades are clad in double glazing, punctuated with structural concrete columns. A brick wall partially covers the western façade due the level changes on site, which functions as part of the lower ground level wall.

2.3.3 Internal stair cores are visible from both the southern and northeastern facades of the building, which are finished with brickwork. The southern elevation is more muted, featuring a flat façade with conventional double glazing and the same concrete columns which support the rest of the structure.

2.3.4 **Figure 2-2** to **Figure 2-4** below show the façades of the existing structure on site.

Figure 2-2 Western Façade facing Battersea Bridge Road

Figure 2-3 Northern Façade facing the Thames Path

Figure 2-4 Southern and Eastern Facades

ROOF

2.3.5 The structure features a flat roof which can be split into two sections. The southern half of the building rises to four stories, with access to the roof available from the fourth and fifth levels.

2.3.6 The fifth level is a later extension to the original building and occupies the northern end of the structure and features access to a roof terrace, finished with basic landscaping.

2.3.7 Plant and service space is located on both sides of the roof, which are sheltered by steel fabricated walls.

2.3.8 **Figure 2-5** and **Figure 2-6** below show views from the current roof.

Figure 2-5 Level Five Extension – Southern Façade

Figure 2-6 Southern Roof Featuring Plant Space

BUILDING INTERIOR

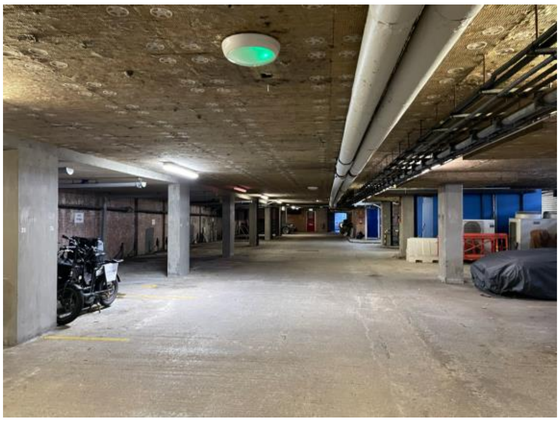
LOWER GROUND LEVEL

2.3.9 The basement level is only partially submerged due to level changes throughout the site.

2.3.10 The exposed brick areas from the exterior are visible from inside the basement, which currently functions as a car park. Structural columns support the concrete slab above with fibrous insulation present underneath the ceiling.

2.3.11 **Figure 2-7** Below shows a view of the current lower ground level.

Figure 2-7 View of Lower Ground Level



RECEPTION AND COMMUNAL AREAS

2.3.12 The ground level communal areas in include the reception, as well as access to the lift core and stair cores.

2.3.13 The reception and commercial areas have undergone recent refurbishment. The ceiling is partially exposed, revealing the concrete slab and elements of the ceiling MEP.

2.3.14 **Figure 2-9** and **Figure 2-9** below show examples of the ground communal areas and example internal stair core

Figure 2-8 Ground Level Reception Area

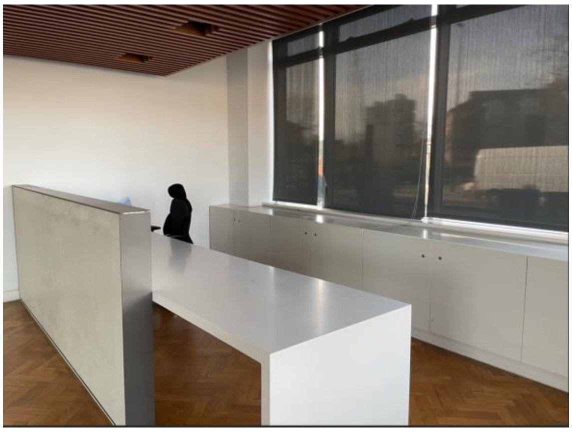
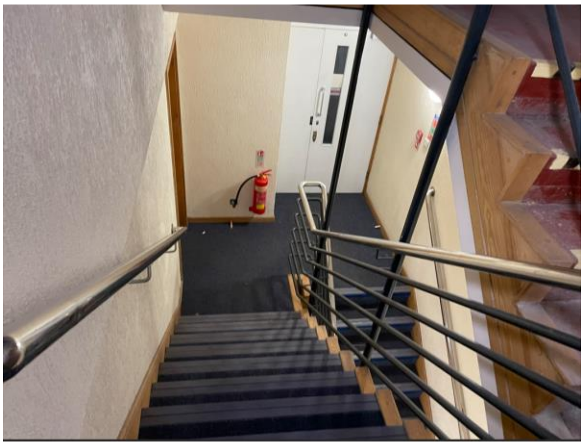


Figure 2-9 Ground Level Communal Area

Figure 2-10 Example Internal Stair Core



OFFICE FLOORS

2.3.15 The office floors showcased predominantly open-plan office layouts, each exhibiting varying levels of finishing reflective of their previous occupants.

2.3.16 As expected for a building of this nature, tenanted office areas included the following:

- Room partitioning;
- Kitchenettes;
- Flooring;
- Lighting; and
- Suspended ceilings with associated services

2.3.17 **Figure 2-11** to **Figure 2-15** below show photographs from some of the vacant office areas within the building.

Figure 2-11 Main Office Floor, Level 3

Figure 2-12 Office Corridor, Level 4

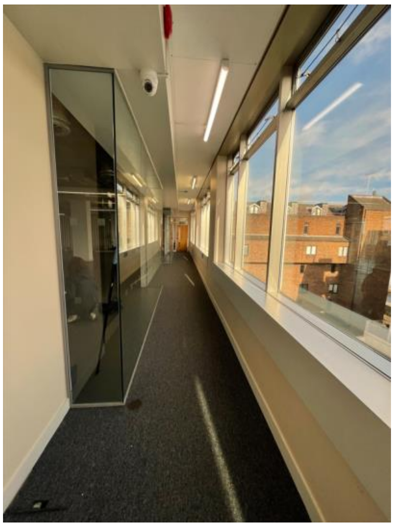


Figure 2-13 Main Office Floor, Level 4

Figure 2-14 Example Office Space, Level 5

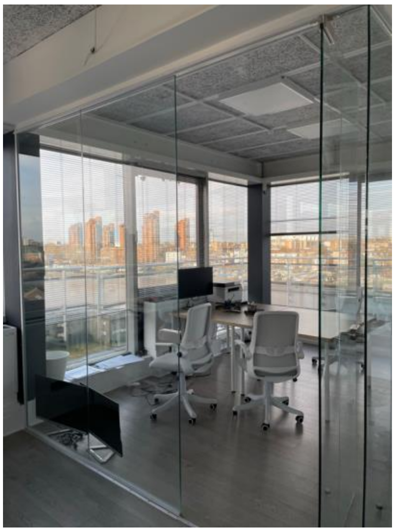


Figure 2-15 Example Kitchenette, Level 3

3 PRE-REDEVELOPMENT CONSIDERATIONS

3.1 EXISTING SITE ANALYSIS

3.1.1 As part of the assessment consideration was given at a high level for the suitability of the existing structures on site to be retrofitted or elements reused as part of any new development proposals.

3.2 DEVELOPMENT BRIEF

3.2.1 The development brief includes delivery of residential homes, improved public realm, enhanced access and meeting all relevant contemporary design standards, including:

- Significant contribution towards the borough's housing target through the provision of high-quality homes in a range of unit sizes;
- Provision of high-quality flexible workspace;
- Provision of free-to-access community space;
- Activation of ground floor facing the Thames Path;
- Upgrades along the Thames Path, delivering public realm and enhanced pedestrian and cycle access;
- Target net zero in construction and operation;
- Provision of cycle facilities; and
- Significant Community Infrastructure Levy and Section 106 Contributions to assist with the provision of infrastructure improvements in the Borough.

3.3 SCENARIOS

3.3.1 The following section outlines the overarching principles and considerations for three different scenarios of redevelopment proposals, to be taken into account with the local policy context.

3.3.2 Three broad scenarios were considered to fulfil the project brief:

- **Light refurbishment**: reuse of the existing structures on site in their current form with cosmetic enhancements and additional minor repairs to the fabric of the building as necessary. No significant structural changes, but full strip out and replacement or upgrade of individual elements such as glazing and Mechanical, Electrical and Plant (MEP) systems where feasible to facilitate any proposed change of use.
- **Refurbishment and extension:** reuse of the existing structures on site with horizontal or vertical extension. Improvements may include removal of existing features to facilitate addition of new elements. Refurbishment work as per light refurbishment scenario.
- **Redevelopment:** full demolition of structures to ground level to facilitate construction of a new building.

3.3.4 A number of factors were considered as part of the scenario review, including the following:

- Proposed development use;
- Spatial capacity;
- Building structure and capacity;
- Whole life carbon; and
- Scenario considerations.

3.3.5 The following sections outline the overarching principles to be considered for each of these factors.

3.4 PROPOSED DEVELOPMENT USE

3.4.1 The proposed development falls within the remit of LBW's Riverside Strategy (PM9)[2], which promotes residential-led development to provide new housing, with a mix of small-scale commercial uses. The proposed development will seek to deliver new homes across a block up to 38 storeys in height.

3.4.2 The London Plan[3] identifies LBW's 10-year housing target (2019/20-2028/29) as 19,500 homes. This is based on the Strategic Housing Land Availability Assessment (SHLAA)[4] (2017) which shows LBW as having one of the highest targets when compared to the other London boroughs.

3.4.3 The proposed development would seek to work towards the 10-year target for net housing completions. Further, the redevelopment of the site would seek to deliver high quality environments for residential occupiers to meet their needs, in accordance with all prevailing policy and contemporary standards.

3.4.4 The project brief would seek to fully develop the useable space on site with reduction of parking provision due to the proximity to public transport services.

3.4.5 The significance of better connectivity with the Thames Path is a crucial factor which would justify the removal of the existing structure on site. Much of the structure was constructed with dead frontage, which would conflict with producing a cohesive development which integrate with the surrounding context.

3.4.6 Consideration for retrofitting the existing structure should be weighed up against the needs of future inhabitants and the benefits that densification of the site could bring.

3.4.7 Further, the redevelopment of the Site would seek to deliver high quality environments for occupiers to meet their needs, in accordance with all prevailing legislation and contemporary standards.

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[2] Wandsworth Local Plan 2023-2038, *https://www.wandsworth.gov.uk/media/large/adopted_local_plan.pdf* (2023)

[3] The London Plan, *https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf* (2021)

[4] The London Strategic Housing Land Availability Assessment, https://www.london.gov.uk/sites/default/files/2017_london_strategic_housing_land_availability_assessment.pdf (2017)

3.5 SPATIAL CAPACITY

3.5.1 The existing building consists of a six-storey structure with flat roofs for plant space. The building currently provides 4,880sqm GIA of office space in addition to a basement car park and surrounding hardstanding associated with access to the Thames Path.

3.5.2 A retrofit study was conducted by the project architects, Farrells, in 2023, which explored refurbishment of the existing structure for the provision of new residential homes. The narrow profile of the existing structure, in contrast to the broader footprint typical of contemporary office buildings, renders the site more suitable for dwellings that prioritize natural light and ventilation. Nevertheless, the study determined that the current structure underutilizes the site's potential, limiting the number of residential units required in the design brief.

3.5.3 A light refurbishment scenario would not be sufficient to make the alterations required for better access and permeability through to the Thames Path. Signification alterations would be required, which would likely impede on the existing structure.

3.5.4 To meet the development brief, it will be necessary to densify the quantum of residential offerings on-site to facilitate the provision of high-quality housing and public realm.

3.6 BUILDING STRUCTURE AND LOAD CAPACITY

3.6.1 Despite the original construction intended office use, most levels primarily feature an open-plan layout, with only the central columns exposed. This layout facilitates the installation of party walls to partition the potential residential units.

3.6.2 One of the major barriers would be the existing floor plates, which have not been constructed to accommodate residential configurations. It is likely the floorplates would have to undergo significant modification to allow for kitchens and bathrooms to be installed in each residential unit.

3.6.3 The loadbearing capacity of the building has not been formally assessed at this stage, but it appears that the structural form would not be suitable to accommodate additional load set out in the development brief.

3.6.4 Whilst no distinct cracks or signs of degradation of the superstructure were witnessed during the audit, the strength of structure would be difficult to ascertain to a sufficient extent to support proposals for additional load as part of a retrofit design.

3.6.5 Significant additional load on the existing foundations would likely cause overstress of the soils and associated structural movement.

3.6.6 Requirement A3 of the Building Regulations 2010 requires buildings to be constructed so that in the event of an accident the building will not suffer collapse to an extent disproportionate to the cause.

3.6.7 Given the method of construction and unknown capabilities of the existing building superstructure and foundations it is considered extremely unlikely that extension of the building is possible in a manner that would satisfy the desired residential quantum and meet the needs of the future occupiers.

3.7 WHOLE LIFE CARBON

3.7.1 The emissions attributed to a building across its lifetime are commonly split into *operational* and *embodied*.

3.7.2 Operational carbon emissions are those associated with the energy required to run a building for lighting, power, heating, cooling, ventilation, and water services).

3.7.3 Embodied carbon emissions are those associated with all the non-operational aspects of a building including from the extraction, manufacture and assembly of materials and components, repair, maintenance, and refurbishment, as well as end of life activities).

3.7.4 Strategies to reduce the whole life carbon emissions of buildings include:

- Assessing the need for the construction of new buildings versus repurposing existing ones;
- Adapting the design of a building to reduce the quantity of material used while maximising operational efficiency;
- Selecting alternative materials and construction products that have lower embodied carbon emissions; and
- Utilising materials that are durable, require minimum maintenance and can be dismantled, reused, or recycled.

3.7.5 The light refurbishment scenario would be unlikely to meet the target within the development brief for operational energy; retention of the poor thermal envelope of the building would limit the opportunity to move away from a traditional heating system to a lower carbon alternative, such as Air Source Heat Pumps (ASHP).

3.7.6 A deep retrofit or extension can save significant levels of embodied carbon compared to a new build but will typically require further structural works during the lifetime of the building. This would require a full review of the on-site MEP to future-proof the building.

3.7.7 If it were feasible to retrofit the existing building, the extent of the works necessary to bring them up to modern standards would be so significant it is anticipated that any whole-life carbon savings would be negligible.

3.7.8 As well as potentially limiting the quality and design aspirations of the development proposals, a retrofit structures would provide fewer opportunities to reduce operational carbon emissions.

3.8 SCENARIO CONSIDERATIONS

3.8.1 The following section considers the feasibility of each scenario in relation to the factors discussed above.

SCENARIO 1 - LIGHT REFURBISHMENT

3.8.2 Light refurbishment of the scheme would not meet the access requirements for the Thames Path or residential density specified in the design brief, potentially impacting the scheme viability from a financial and policy perspective.

3.8.3 It is assumed more extensive refurbishment would be required to bring the structures in line with configurations expected of residential dwellings as well as meeting environmental aspirations.

3.8.4 In addition, the structure would likely require a deeper retrofit to bring up to modern environmental standards. A light refurbishment strategy may not be sufficient to replace the traditional heating systems with modern insulation and heat pumps. The MEP/HVAC requirements for each residential unit would require extensive alterations to the floorplates.

3.8.5 This scenario is therefore considered not feasible for the existing site.

SCENARIO 2 - REFURBISHMENT AND EXTENSION

3.8.6 It is anticipated that the ability to increase densification of housing through the construction of additional storeys on the existing building cannot be accommodated. The additional load required would likely be limited due to the unknown structures, which will not have the foundational substructures to facilitate the required extension in floor area. Horizontal extension to the building is not feasible, due to the spatial contains of the site.

3.8.7 Through extensive refurbishment could bring the existing structure up to contemporary environmental standards, the required works would likely result in negligible embodied carbon savings and constrain the development aspirations.

3.8.8 The scenario is therefore considered impractical in order to meet criteria within the design brief.

SCENARIO 3 - REDEVELOPMENT

3.8.9 Due to the constraints on scenarios 1 and 2, it can be concluded that the complete demolition of the existing structure is likely the most feasible option to meet the design brief.

3.8.10 The arrangement and the structural capacity of the current building is deemed not compatible with the aspirations of the scheme. It is anticipated the extent of works required to bring the existing structure up to desired environmental standards would bring negligible whole life carbon savings, making Scenario 3 the best option moving forwards. Demolition and reconstruction of the site would provide the required housing density while also achieving the permeability needed to improve access to the Thames Path.

3.9 CONCLUSION

The current structure on the site is deemed unsuitable for modification to align with the development aspirations of creating high-quality housing. The potential for retrofitting or repurposing structural elements is highly constrained, leading to the conclusion that the most viable path forward involves the comprehensive demolition of all existing structures.

4 DEMOLITION PROPOSALS

4.1 OPPORTUNITIES FOR REDEVELOPMENT

4.1.1 Further to the existing site analysis in **Chapter 3**, it is suggested that full demolition of the existing structure is the most appropriate action to facilitate redevelopment of the Site.

4.2 EXTENT OF DEMOLITION

4.2.1 The demolition proposals include the complete demolition of the entire structure comprising six storeys of office space.

4.2.2 Deconstructing the existing structure due for demolition to reclaim components or materials (rather than traditional demolition) is considered unfeasible due to the low-quality nature of the building materials.

4.2.3 The build quality and construction method are anticipated to be such that demounting specific elements for reuse will be more difficult than a standard building type.

4.2.4 Further, the existing building is constructed in a manner that does not facilitate repurposing specific elements or reclamation of materials, with demolition considered the only viable option.

4.2.5 The development proposals comparatively represent significant improvements in terms of energy efficiency, future climate adaptation and overall quality for residents.

4.2.6 The new development proposals will represent a move towards methods of construction that incorporate circular economy principles.

4.2.7 On-site works would include complete demolition of the existing structure to facilitate the construction of the proposed development, comprising of a residential-led development with a partial elevation reaching up to 37 storeys.

5 PRE-DEMOLITION AUDIT RESULTS

5.1 REUSE AND RECLAMATION POTENTIAL

5.1.1 As per the objectives for the PDA, during the on-site audit opportunities for reclamation of the materials were considered.

5.1.2 This section will outline any potential opportunities identified for reuse of material on site, as well as the limitation associated.

LIMITATIONS

5.1.3 Given the structure and composition of the buildings within the scope of the PDA, it is anticipated that the opportunities for reuse are extremely limited. The following limitations have been considered as part of assessing whether any elements of the structures are suitable for reuse:

- It was not possible to survey the entire building;
- The materials used as part of the construction of the building are predominantly low quality in nature;
- Due to the period during which many of the structures were constructed, it is anticipated that a proportion of the materials on site may contain asbestos;
- Structures have not been built for disassembly – extracting potentially reusable elements is not feasible in many instances;
- Fire performance of existing doors cannot be ascertained and are likely to have been trimmed and repaired rendering them unsuitable for potential reuse; and
- It is unlikely that windows and glazing will meet current thermal or sound insulation standards.

OPPORTUNITIES FOR REUSE

BRICKS

5.1.4 The basement and stair cores comprise of typical brick facades. There may be a value to some of these bricks if recovered as part of the demolition process due to their uniformity across the site.

5.1.5 Though dependent on the exact demolition methodology, it is anticipated that due to the location of the brickwork on much of the external façades, it could be possible to recover the bricks for reuse.

5.1.6 **Figure 5-1** below shows the external brickwork across the building façades.

Figure 5-1 External Brickwork

KITCHENETTES

5.1.7 It is anticipated that the kitchenettes could be removed off-site, assuming relative uniformity across each of the building.

5.1.8 Due to the standard nature of fixed kitchen components, it is a straightforward process to demount each element without damaging the structural integrity or material finish.

5.1.9 **Figure 5-2** below shows several examples of kitchenette present on each of the office floors surveyed.

Figure 5-2 Example Kitchens On-Site

5.1.10 Though it is not considered feasible to reuse on-site as part of the new development, it is anticipated that the demolition contractor could list the kitchen on a reuse platform such as Globechain[5] for a smaller-scale project locally.

[5] https://globechain.com/

GLASS PARTITIONS

5.1.11 Some of the floors visited have undergone recent refurbishment and feature glass partitioning to subdivide office spaces and meeting rooms.

5.1.12 Though glass partitioning is often made to bespoke specifications, it could be possible that the original supplier offers a take-back service, where the glass is either recycled or used on another fit-out.

5.1.13 **Figure 5-3** below shows examples of glass portioning present across the office floors surveyed.

Figure 5-3 Example Glass Partitioning

GLASS PANELS FROM THE FAÇADE

5.1.14 A significant amount of double glazing makes up the façade of the existing building.

5.1.15 The uniform nature and quantity of the glazing may provide the opportunity for reuse on another project.

5.1.16 **Figure 5-4** below shows examples of the double glazing which make up much of the façade of the current building.

Figure 5-4 Example Facade Double Glazing

5.1.17 Though reuse should be a primary consideration, the construction methodology of hermetically sealed insulating glass makes separation of components and reshaping less feasible. Contemporary thermal performance and solar control standards also make older glazing a less attractive option when considering operational emissions for a new development.

LIGHTING FROM REFURBISHED OFFICE AREAS

5.1.18 Some of the office floors have recently undergone refurbishment and feature high quality LED lighting which can be reused on other projects.

5.1.19 The standard nature of lighting makes it simple to dismount each unit and place on a reuse platform such as Globechain for another project.

5.1.20 **Figure 5-5** below shows examples of the LED strip lights installed on the recently refurbished floors of the building.

Figure 5-5 Example LED Strip Lighting

5.2 OVERALL VOLUMES OF WASTE PRODUCED FROM DEMOLITION

5.2.1 Where elements of the structure are not suitable for reuse, the materials generated by the demolition process have been estimated and separated by type.

5.2.2 The tonnage of recyclable material present within the existing structure has been calculated based on best-practice recycling rates for each of the material types.

Table 5-1 below shows the estimated weight of materials generated by the demolition process.

Table 5-1 Summary of Demolition Waste Generated

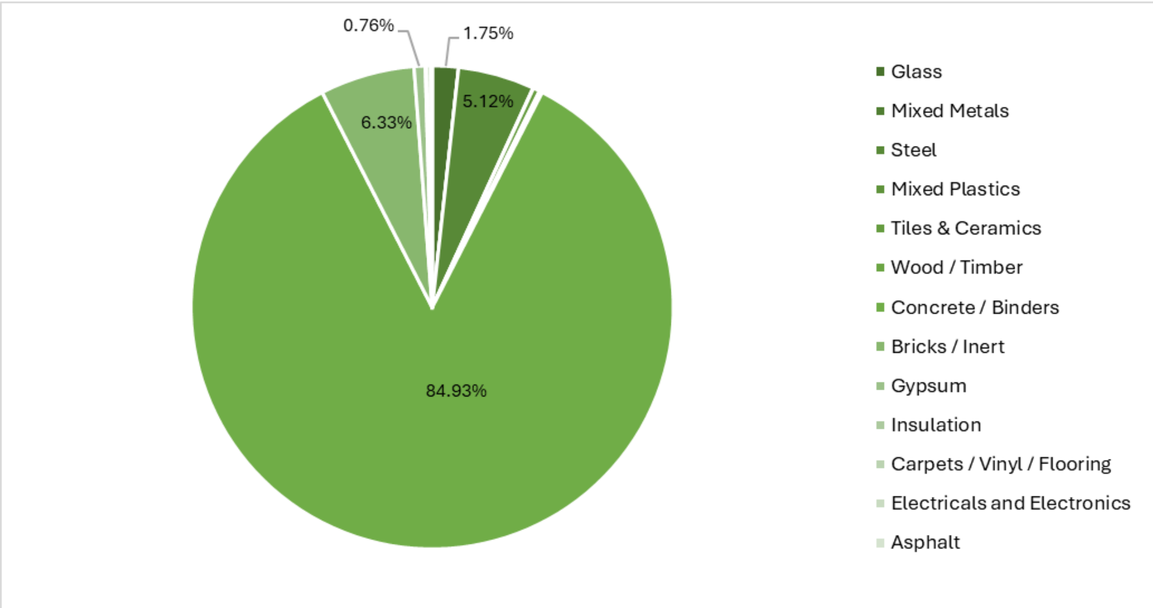
Material	Best Practice Recycling Rate (%)	Tonnes	% By Weight	Recycled Material (Tonnes)	Material for Disposal (Tonnes)
Glass	100	57.8	1.7	57.8	0.0
Mixed Metals	100	0.1	0.0	0.1	0.0
Steel	100	170.2	5.1	169.1	0.0
Mixed Plastics	95	0.9	0.0	0.9	0.0
Tiles & Ceramics	100	14.5	0.4	14.5	0.0
Wood / Timber	95	6.5	0.2	6.2	0.3
Concrete / Binders	100	2,806.8	84.9	2,806.8	0.0
Bricks	100	209.2	6.3	209.2	0.0
Gypsum	95	25.1	0.8	23.8	1.3
Insulation	95	2.7	0.1	2.6	0.1
Carpets / Vinyl / Flooring	95	9.5	0.3	9.0	0.5
Electricals and Electronics	90	2.7	0.1	2.4	0.3
Asphalt	100	0.0	0.0	0.0	0.0
Total		**3,306.0**	**100.0**	**3,302.5**	**2.5**

5.2.3 For the purposes of the audit, it is assumed that all recycling would be considered as per best practice off-site, and all unrecyclable material would be diverted from landfill.

5.2.4 The overall recycling rate for the demolition waste generated onsite is there considered **98.82%.**

5.2.5 **Figure 5-6** below shows the percentage of each waste stream by weight, as per **Table 5-1**.

Figure 5-6 Waste Streams by Weight (%)



5.3 EMBODIED CARBON CALCULATIONS

5.3.1 The embodied carbon for the demolition of the site has been calculated using data the ICE Database[6], assumptions of which can be found in **Table 5-2** below.

Table 5-2 Energy Consumed to Make Building Material

Material	kg/CO_2e	Assumption
Glass	1.44	General
Mixed Metals	1.99	Steel Rebar
Mixed Plastics	3.1	PVC General
Tiles & Ceramics	0.24	General
Wood / Timber	0.493	Timber - Average of all Data - No Carbon Storage
Concrete / Binders	0.103	General
Bricks	0.21	General
Gypsum	0.39	Plasterboard
Insulation	1.28	Mineral Wool Insulation
Carpets / Vinyl / Flooring	3.19	Vinyl
Electricals and Electronics	2.73	Steel - Finished Cold-Rolled Coil
Asphalt	0.08	Relevant EPD Sourced

5.3.2 Applying the tonnage of demolition waste summarised in **Table 5-1** to the metrics detailed in Table 5-2, **Table 5-3** produces the estimated embodied carbon arisings for the site.

Table 5-3 Embodied Carbon Arisings

Material	Volume (m3)	Tonnes	CO2 Equiv (t)	% Weight	% Embodied Carbon
Glass	23.1	57.8	83.2	1.7	10.2
Mixed Metals	0.1	0.1	0.3	0.0	0.1
Steel	21.8	170.2	338.8	5.2	41.5
Mixed Plastics	0.7	0.9	2.9	0.0	0.4
Tiles & Ceramics	8.1	14.5	3.5	0.4	0.4
Wood / Timber	16.4	6.5	3.2	0.2	0.4
Concrete / Binders	1,403.4	2,806.8	289.1	84.9	35.4
Bricks	130.7	209.2	43.9	6.3	5.4
Gypsum	41.8	25.1	9.8	0.8	1.2
Insulation	27.2	2.7	3.5	0.1	0.4
Carpets / Vinyl / Flooring	7.3	9.5	30.1	0.3	3.7
Electricals and Electronics	4.4	2.7	7.2	0.1	0.9
Asphalt	0.0	0.0	0.0	0.0	0.0
Total	**1,685.0**	**3,306.0**	**815.5**	**100.0**	**100.0**

[6] https://circularecology.com/embodied-carbon-footprint-database.html

5.3.3 The total carbon emissions associated with the construction of the entire building studied was determined to be approximately **815.5 tCO2e**.

5.3.4 This figure reflects the embodied carbon generated were the existing structures to be constructed today using the materials identified by the PDA.

6 KEY DEMOLITION PRODUCTS

6.1 IDENTIFICATION OF KEY DEMOLITION PRODUCTS

6.1.1 This section of the report discusses the KDPs that have been identified for the site following analysis of the PDA findings. The KDPs present on site represent an estimated 94.16% of all waste occurring on site.

6.1.2 Inert materials, mixed metals and glass were found to make up the majority of demolition waste on-site.

6.2 BEST PRACTICE METHODOLOGIES

6.2.1 There are some general methods of good practice to be considered during any demolition project looking to maximise the reuse and recycling of materials. These measures include the following:

- Agree targets for reclamation and recycling as part of the demolition management plan;
- During the demolition phase, details of the actual materials arising, and the waste management methods used should be recorded to compare actual with forecast and to assess performance against the targets set.
- Following completion of the project, any barriers to achieving the targets should be reviewed to ensure that in future projects these barriers can be overcome.
- Early promotion of available materials for reclamation through appropriate channels, particularly community projects;
- Contact local architectural salvage contractors to discuss if there are items they would be interested in reclaiming;
- Provide space on site for reclaimed materials in addition to segregated containers per waste stream;
- Use resources such as SalvoWeb[7] or Globechain[8] that provide a directory of business dealing with salvaged items;
- Provide separate containers per waste stream on site to maximise recycling rates;
- Ensure demolition operatives are appropriately trained to recognise materials and understand how to segregate them correctly;
- Where it is not possible to recycle materials due to their composition, seek a commercial waste contractor who diverts waste from landfill and sends residual waste for energy recovery.

[7] https://www.salvoweb.com/

[8] https://globechain.com/

6.3 INERT MATERIALS

6.3.1 The predominant KDP on site has been identified as inert materials, representing **91.7**% of the total material on site. The inert materials are a group of materials that are handled and processed in the same manner during demolition and subsequent processing.

6.3.2 The inert materials generated by the demolition process are located within the following elements on site:

- Structural building frame;
- Internal walls;
- External walls; and
- Hard landscaping.

6.3.3 **Table 6-1** below shows examples of inert materials present on site.

Figure 6-1 KDP Example - Inert

6.3.4 **Table 6-1** below summarises the quantities of these materials on site generated by the demolition process, categorised by European Waste Catalogue (EWC) code.

Table 6-1 Quantity of Inert Materials

Material	EWC Code	Tonnage	Recommended Processing (%)	
			Reclamation	Recycling
Bricks	17 01 02	209.2	0	100
Tiles and Ceramics	17 01 03	14.5	0	100
Concrete / Hardcore	17 01 07	2,806.8	0	100
Total		**3,030.5**	**0**	**100**

RECOMMENDATIONS

6.3.5 Inert materials are the predominant KDP generated by the demolition process on site. The potential for reclamation of inert materials is relatively low due to their use, composition, and material qualities.

6.3.6 It is possible to reclaim bricks for reuse within another structure, though for this to be feasible the bricks are required to be of high quality to justify the resource and space required to recover them on site.

6.3.7 It is expected that all the inert materials generated by the demolition process will be recycled to form secondary aggregate either on- or off-site.

6.3.8 Inert materials are processed using a crusher which reduces their fraction size.

6.3.9 **Figure 6-2** shows an example crusher being loaded with inert materials.

Figure 6-2 Example Crusher

6.3.10 Crushed materials could be used for engineered fill on- or off-site, and at is expected that the material would be processed in accordance with prevailing guidance to ensure the secondary aggregate meets all requirements with regard to material properties.

6.3.11 The most efficient method of processing the materials would be to phase the demolition to allow space for on-site crushing, though this may not be possible due to the small footprint of the site and the proximity to neighbouring residential properties.

6.3.12 Crushing the inert materials on site would reduce the number of vehicle movements associated with the demolition process. If the material is being used on-site as engineered fill, the requirement for imported material is decreased, and if it is being transferred for use off-site the volume of the material is reduced when loaded.

6.3.13 On-site crushing would be subject to the demolition contractor obtaining a permit from the relevant authority, to ensure operations would not adversely impact the environment with noise or dust generated.

6.3.14 If it is not possible to crush the inert materials on site, they would be transferred an appropriately licenced nearby facility for processing and subsequent use.

6.3.15 It is anticipated that crushed inert material would be transported in 32-tonne tipper lorries.

6.3.16 **Figure 6-3** below shows a 32-tonne tipper lorry being loaded with crushed concrete.

Figure 6-3 Example 32-Tonne Tipper Lorry

6.3.17 The landfill diversion rate for the inert materials on site would be anticipated to be **100%.**

6.4 METALS (FERROUS/NON-FERROUS)

6.4.1 The second KDP on site has been identified as mixed metals, with use across all structures for a number of purposes, representing **5.1**% of the total material on site.

6.4.2 The metals generated by the demolition process are located within the following elements on site:

- Structural building frame;
- Doors and windows;
- Walls;
- Stair banisters; and
- Ceiling.

6.4.3 **Figure 6-4** below shows an example of metals present on site.

Figure 6-4 KDP Example – Metal

6.4.4 **Table 6-2** below summarises the quantities of metals on site generated by the demolition process, including the EWC code.

Table 6-2 Quantity of Metals

Material	EWC Code	Tonnage	Recommended Processing (%)	
			Reclamation	Recycling
Mixed Metals	17 04 07	0.1	0	100
Steel	17 04 05	169.1	0	100
Total		**169.2**	**0**	**100**

RECOMMENDATIONS

6.4.5 Metal is the second most prevalent material expected to be generated by the demolition process. A number of metal types are to be found within the structures, fixtures, and fittings.

6.4.6 Reuse of structural metal (such as rebar within reinforced concrete) is not possible due to the manner in which it is extracted.

6.4.7 Whilst there is a minor potential that some of the metals within the external areas such as fencing could be reused, this is considered unlikely due to logistical constraints. Reuse of these elements would likely require designated locations to transfer directly to at the time of demolition.

6.4.8 It is recommended that segregated containers for metal generated by the demolition process are used to ensure that all waste metal is captured.

6.4.9 Scrap metal is usually stored in skips or roll-on roll-off containers on site for before transfer to an appropriately licenced facility.

6.4.10 An example 40yd^3 container is shown in **Figure 6-5** below.

Figure 6-5 Example 40yd^3 Roll-On Roll-Off Container

6.4.11 Scrap metal has a value by weight and will generate a rebate based on the quality of the material.

6.4.12 The landfill diversion rate for the metals on site would be anticipated to be **100%.**

6.5 GLASS

6.5.1 The third most common KDP on site has been identified as glass, representing **1.7%** of the total material on site by weight.

6.5.2 The glass waste generated by the demolition process are located within the following elements on site:

- Internal glass partitioning.
- Internal and external doors; and
- External glazing.

6.5.3 **Figure 6-6** below shows examples of glass present on site.

Figure 6-6 KDP Example – Glass

6.5.4 **Table 6-1** below summarises the quantities of these materials on site generated by the demolition process, categorised by European Waste Catalogue (EWC) code.

Table 6-3 Quantity of Glass Materials

Material	EWC Code	Tonnage	Recommended Processing (%)	
			Reclamation	Recycling
Glass	17 02 02	57.8	0	95
Total		**57.8**	**0**	**95**

RECOMMENDATIONS

6.5.5 Due to the dimensions of the glass panels, it is not anticipated that the windows could be easily used in their current form. The facilities available for recycling of building glass can limit the opportunities to recycle this material. The Verde SW1[9] project demonstrates that façade glass can be recycled into new glazing.

6.5.6 In some instances, glazing units can be difficult to recycle due to the chemical composition of the glass varying between uses, and manufacturing process, which can impact the quality of the recyclate.

6.5.7 Glass recycling is notoriously challenging due to the purity of the feedstock required and the presence of unknown contaminants within glass generated by the demolition process.

6.5.8 Embedding sustainable principles throughout the project and early engagement with contractor, demolition contractor and processor will be necessary to maximise recovery of this material. Further measures to improve the outcome include detailing specific methodologies within the demolition tender and nominating a recycling champion to prevent contamination on-site.

[9] https://ukgbc.org/wp-content/uploads/2018/09/VerdeSW1CaseStudy_FINALISSUE1.pdf

6.5.9 Due to the number of windows due to be removed from site, it is anticipated that the glass will be recyclable by a specialist licenced contractor as there will be sufficient volume of uniform material available. A specialist contractor like Saint-Gobain can conduct testing for contaminants, such as laminates within double glazing, to determine the most effective recycling strategy.

6.5.10 To maximise the potential recycling rate of the glass (and minimise contamination) it is recommended that each glazing unit is removed from the building site to a factory environment for disassembly to provide the quality control required.

6.5.11 The building glass can be remelted for use in new glass products such as containers, or any material unsuitable for remelting could be used in secondary aggregate products or construction of roads.

6.5.12 The potential recyclability of building glass is high, as it can be recycled within a closed loop system indefinitely, but practical and logistical constraints can provide limitations to achieving diversion from landfill.

6.5.13 On that basis, the landfill diversion rate for the glass on site would therefore be anticipated to be in a range of **65 - 95%**.

6.6 LOCAL LICENCED WASTE CARRIERS

6.6.1 **Table 6-4** below details a selection of licenced waste carriers local to the site that could be contracted to facilitate removal of waste materials.

Table 6-4 Local Waste Carriers

Waste Contractor	Waste Carrier Licence	Address	Contact	Distance (Miles)	EWC Codes
O'Donovan Waste Disposal	CBDU116673	Alperton Lane, Wembley, HA0 1DX	0208 801 9561	8.0	17 – Construction and Demolition Waste (01-09)
777 Demolition & Haulage Co. Ltd	CBDU126931	11 Coomber Way, Croydon, Surrey, CR0 4TQ	0208 689 6861	8.0	
Norris Greenwich	CBDU89511	Station Approach, Orpington, BR5 2NB	01689 806420	15.6	
Powerday PLC	CBDU123332	Belinda Road, Brixton, SW9 7DT	0208 960 4646	3.9	

6.6.2 Materials would be transferred from site to suitably licenced waste facilities for reprocessing or onward to transfer to specialist contractors.

7 SUMMARY AND CONCLUSIONS

7.1 SUMMARY

7.1.1 The purpose of the PRA is to understand whether the existing building, structures and materials can be retained, refurbished, or incorporated into the new development to any extent. The audit fully explores the available options for retention or refurbishment of structures, materials, and the fabric of existing building.

7.1.2 The purpose of the PDA is to identify and quantify where the key materials and components are present within the existing building, and to further identify the potential recycling or reuse strategy for them.

7.1.3 The information in this report demonstrates the benefits of recycling and re-use of the KDPs based on economic value, the number of units and viability of deconstruction, as well as potential schemes for re-use and recycling of these materials.

7.1.4 The scope of the project includes the existing office building occupying 1 Battersea Bridge Road, due for demolition as part of the redevelopment of the site, located within the administrative boundary of LBW.

7.1.5 The two KDPs on site identified are as follows:

- Inert Materials;
- Metals; and
- Glass.

7.1.6 The three KDPs present on site represent an estimated **98.6**% of all waste occurring on site.

7.1.7 The landfill diversion rate for the KDPs on site would be anticipated to be **100%.**

7.1.8 There are a number of waste carriers within the local area licenced to carry waste materials from site.

7.2 CONCLUSION

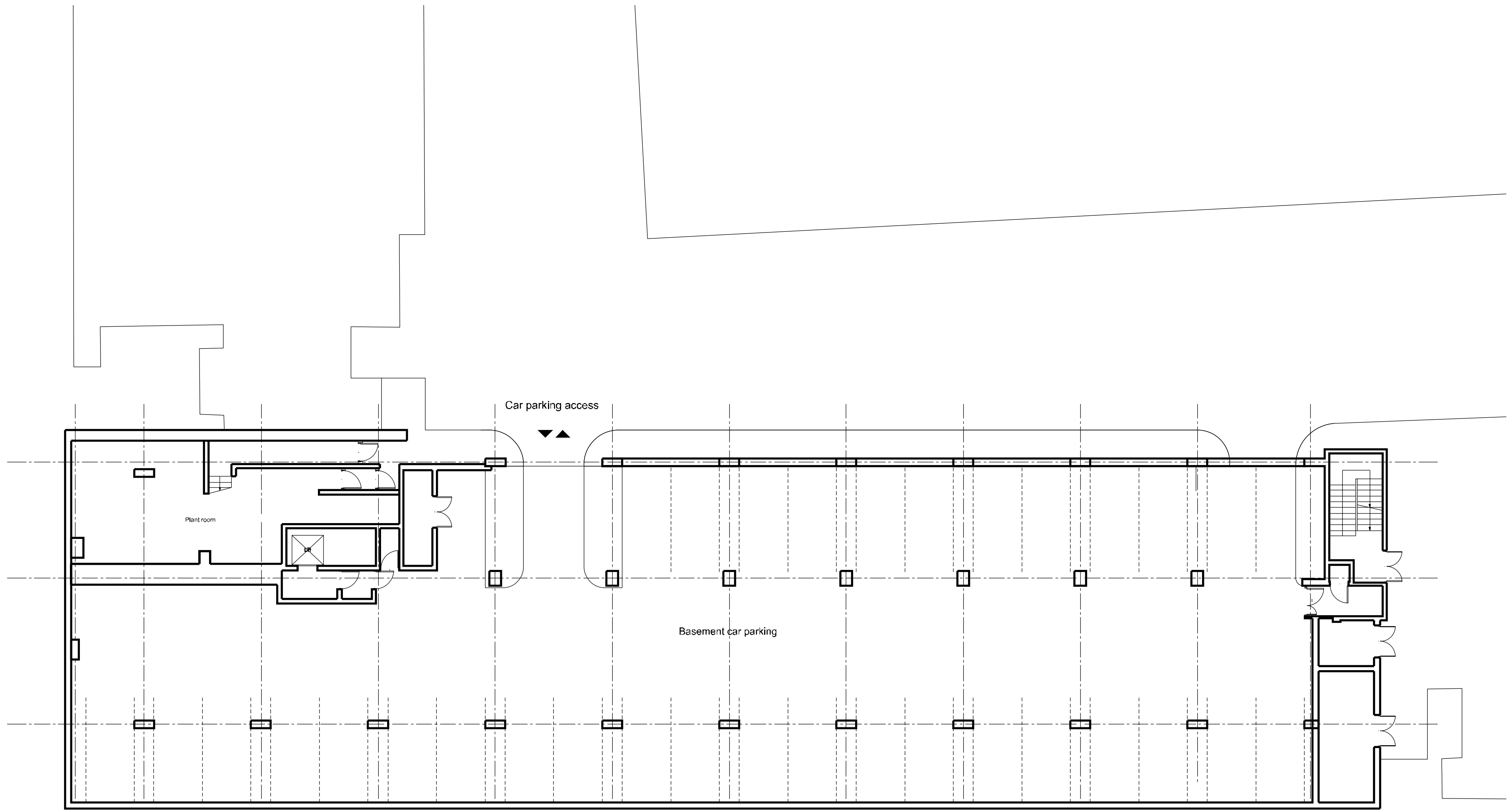
7.2.1 This Pre-Redevelopment and Pre-Demolition Audit has taken into account the need to lessen the overall impact of waste generation through the reclamation and recycling of materials from the demolition phase of the building.

7.2.2 This Pre-Redevelopment and Pre-Demolition Audit has been prepared to demonstrate compliance with Policy SI 7 of the London Plan (2021).

7.2.3 The proposals set out in this strategy meet the requirements of relevant waste policy and follow applicable guidance.

APPENDIX A

INFORMATION SOURCES



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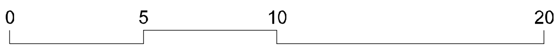

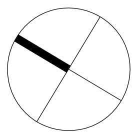

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Amendment	Date

The Glassmill
1 Battersea Bridge Rd, London

Existing Basement Floor Plan

Job/Drawing No: 1905/SK50
Amendment:

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Date: 07.02.2018
Drawn: FCBS London

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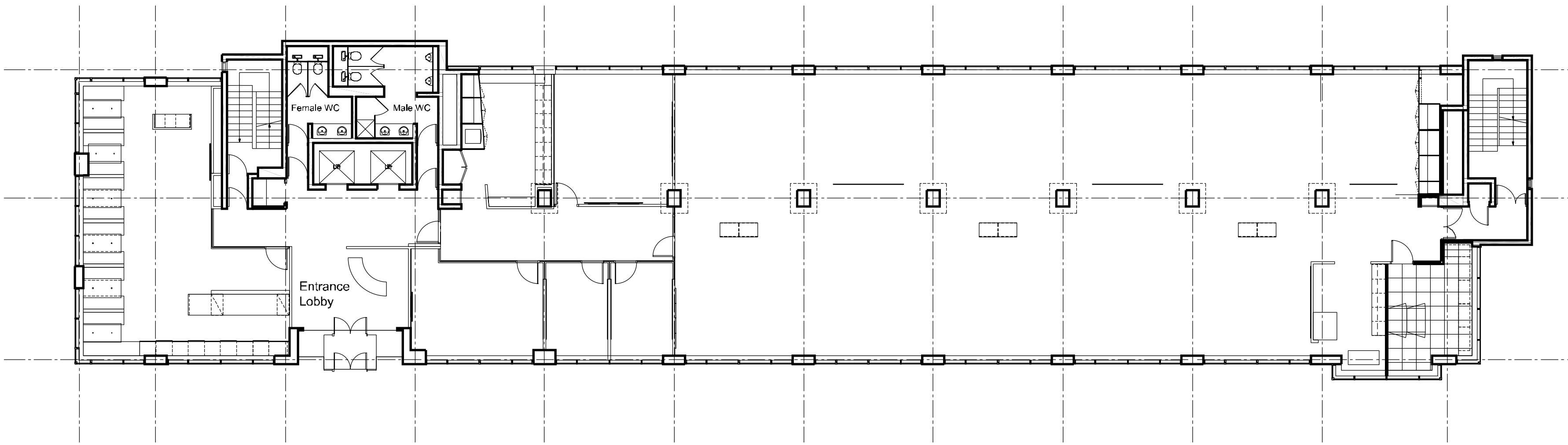

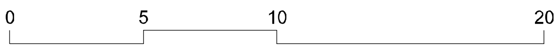

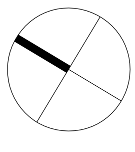

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The Glassmill
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Existing Ground Floor Plan

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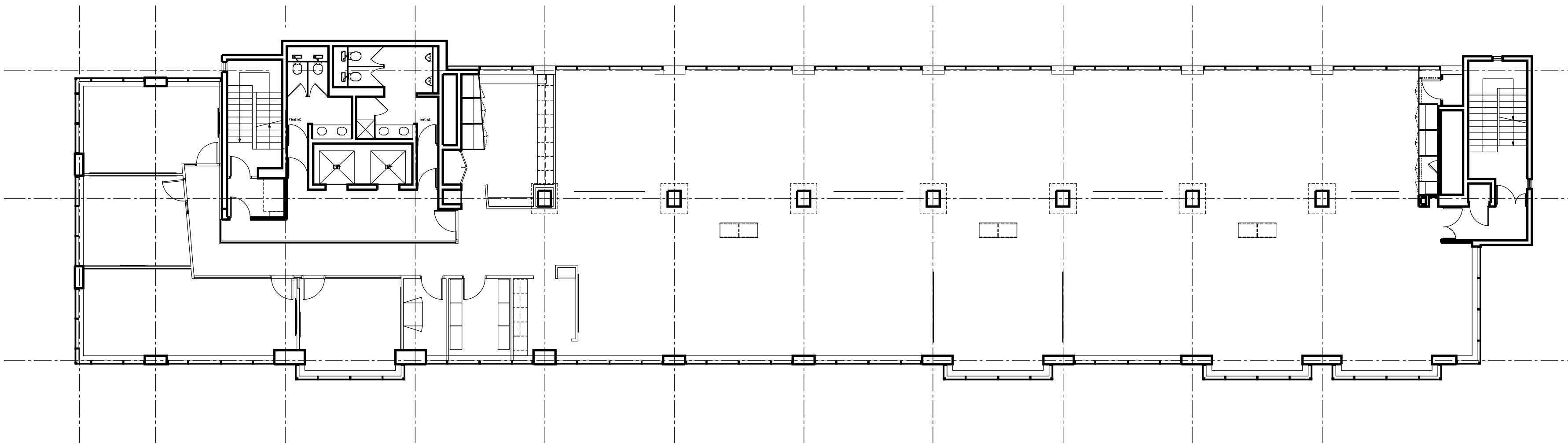

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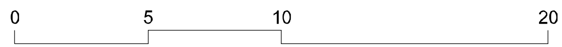

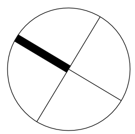

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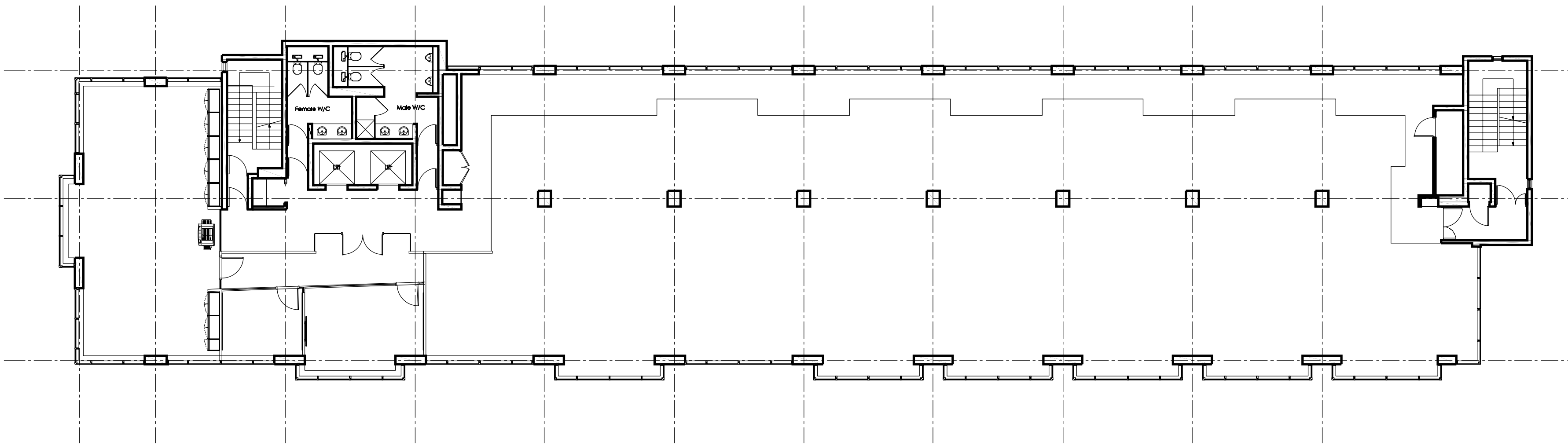

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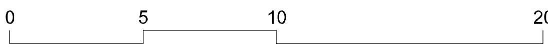

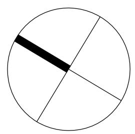

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Existing Second Floor Plan

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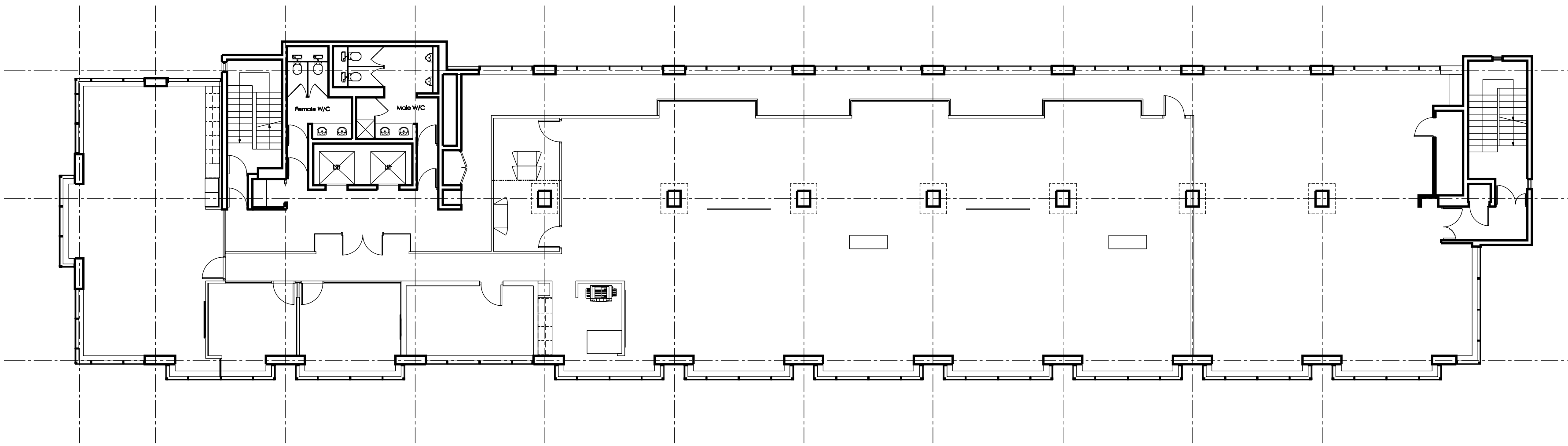

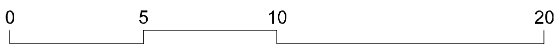

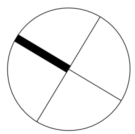

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Amendment	Date

The Glassmill
1 Battersea Bridge Rd, London

Existing Third Floor Plan

Job/Drawing No: 1905/SK54
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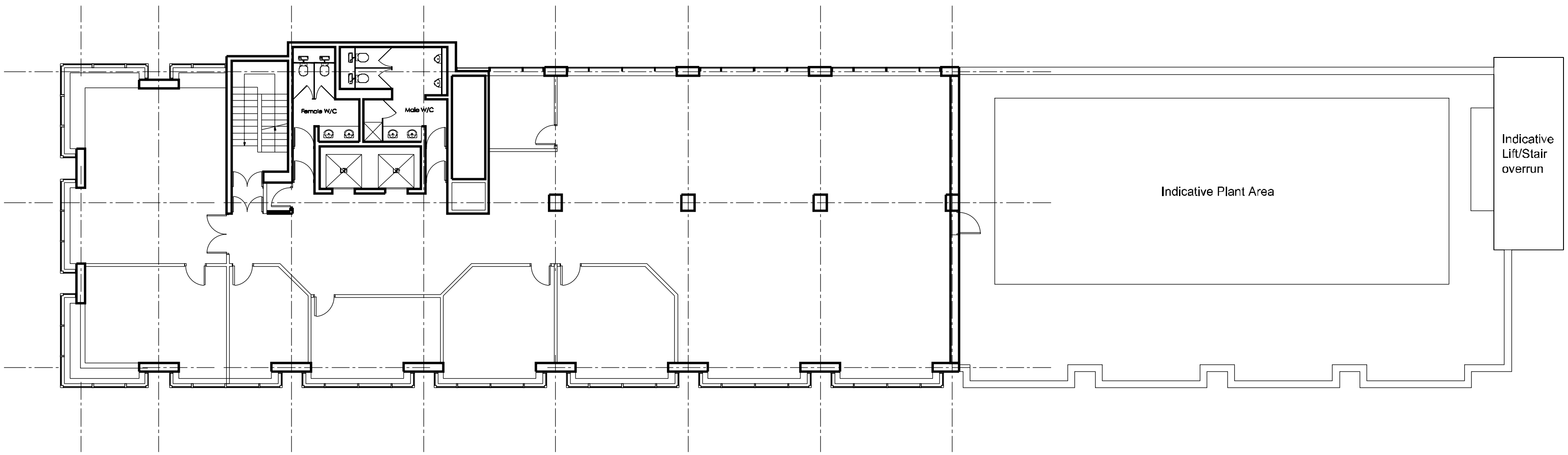

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Amendment	Date

The Glassmill
1 Battersea Bridge Rd, London

Existing Fourth Floor Plan

Job/Drawing No 1905/SK55
Amendment

Scale 1:100 (1:200 @ A3)
Date 22.02.2018
Drawn FCBS London

Do not scale
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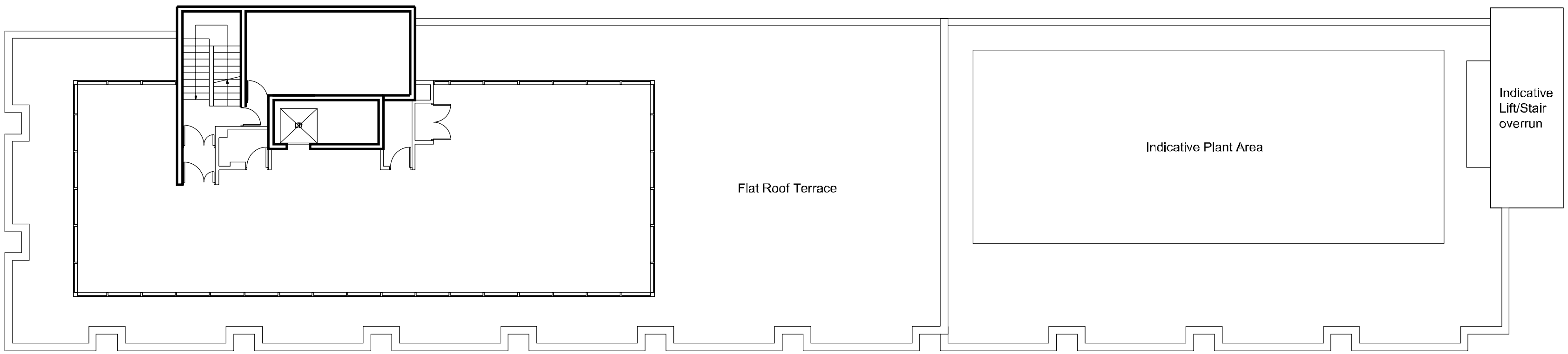
Original printed at A1



General note:
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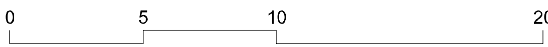

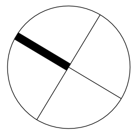

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Amendment	Date

The Glassmill
1 Battersea Bridge Rd, London

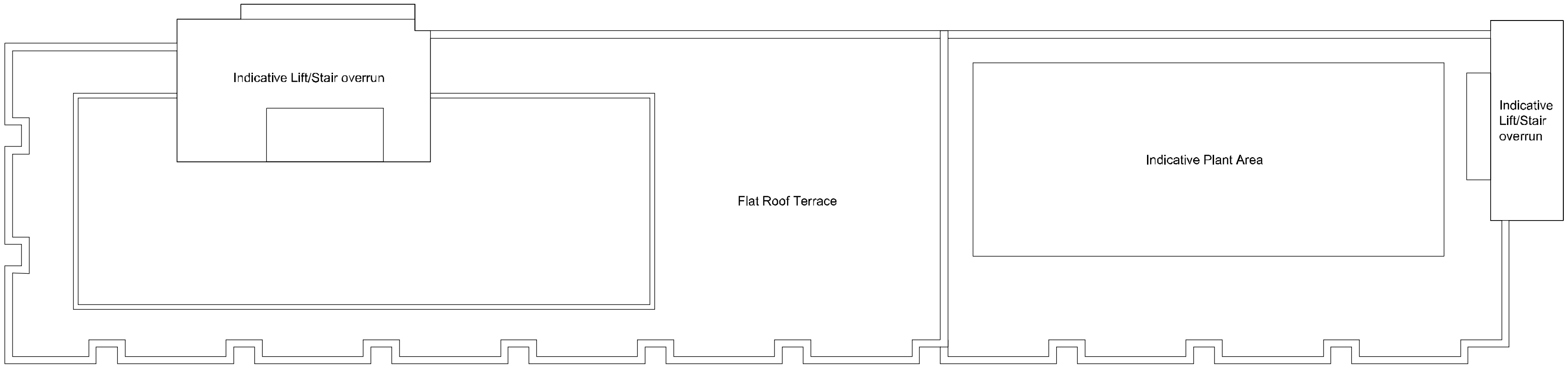
Existing Fifth Floor Plan

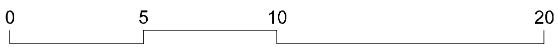
Job/Drawing No: 1905/SK56
Amendment:

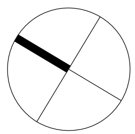
Scale 1:100 (1:200 @ A3)
Date 22.02.2018
Drawn FCBS London

Do not scale
All dimensions to be checked on site

Original printed at A1







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Amendment	Date

The Glassmill
1 Battersea Bridge Rd, London

Existing Roof Plan

Job/Drawing No 1905/SK57

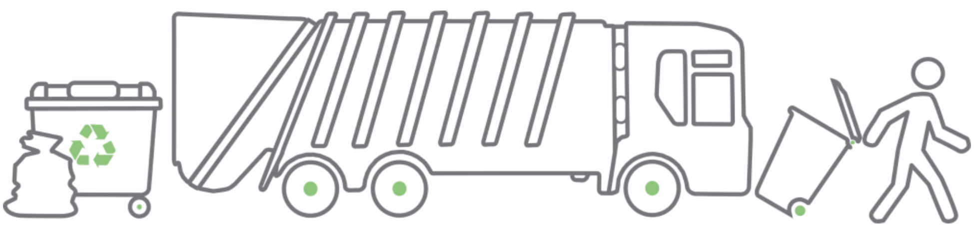
Amendment

Scale 1:100 (1:200 @ A3)
Date 07.02.2018
Drawn FCBS London

Do not scale

All dimensions to be checked on site

Original printed at A1



VELOCITY