BATTERSEA PARK ROAD

DETAILED CIRCULAR ECONOMY STATEMENT

FOR

WATKIN JONES GROUP

adw DEVELOPMENTS

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Version Control

Issue	Document Name	Revision No.	Date of Issue	Description	Reviewed By
1	Battersea Park Road – Detailed Circular Economy Statement	v1.01	28th March 2022	Circular Economy Statement in compliance with the London Plan policy SI7	Watkin Jones
2	Battersea Park Road – Detailed Circular Economy Statement	v1.02	29th April 2022	Circular Economy Statement in compliance with the London Plan policy SI7	Watkin Jones
3	Battersea Park Road – Detailed Circular Economy Statement	v1.03	7th July 2022	Circular Economy Statement in compliance with the London Plan policy SI7- revised following feedback from GLA	Watkin Jones
4	Battersea Park Road – Detailed Circular Economy Statement	v1.04	30th March 2023	Circular Economy Statement in compliance with the London Plan policy SI7 for revised scheme	Watkin Jones
5	Battersea Park Road – Detailed Circular Economy Statement	v1.05	11th April 2023	Updated Project Description	Watkin Jones
6	Battersea Park Road – Detailed Circular Economy Statement	v1.06	12th January 2024	Updated Report, referencing current Local Planning guidance	Watkin Jones
7	Battersea Park Road – Detailed Circular Economy Statement	v1.07	12th July 2024	Updated Report, responding to GLA comments	Watkin Jones

8	Battersea Park Road – Detailed Circular Economy Statement	v1.08	1st August 2024	Updated Report, responding to LBW comments.	Watkin Jones

Content

Executive Summary

The purpose of this substituted report is to accompany a revised scheme which has been submitted to provide the demolition of existing building and construction of three new buildings, together comprising Residential (Use Class C3) and Student Accommodation (Sui Generis) along with Commercial, Business and Service (Use Class E) and/or Local Community and Learning (Class F) floorspace. Associated works include hard and soft landscaping, car parking and new vehicular access / servicing, and other ancillary works.

The purpose of this Detailed Circular Economy Statement to provide an overarching response to all matters which have been raised by LBW, statutory consultees, councillors and other stakeholders, and proposes the following principal amendments to the live application ref: 2022/1835:

- Reduction in height of Building 1 from 14 to 12 storeys, reduction in footprint, and reconfiguration to reduce privacy and overlooking concerns and improving daylight to neighbouring buildings
- Introduction of second stair core into Buildings 1 & 2
- Reduction in student bedrooms from 779 to 762
- Reduction in residential dwellings from 81 to 55
- Increase in community floorspace
- Increased student internal amenity space
- Changes to landscaping, play space and public realm
- Increase in bio-diversity net gain and Urban Greening Factor
- Amendments to Sleaford Street including a change from bay parking to parallel parking
- Retention of all trees along Battersea Park Road and new planting
- along Sleaford Street and New Covent Garden Market Access Road
- Redesign of facade to adapt to environmental conditions including improvements in fabric efficiency to increase carbon savings and reduce overheating
- Additional PV to further increase carbon savings

Key members of the project team are Watkin Jones (Developer); Glen Howells (Architect); Atelier 10 (Sustainability Consultant), Montagu Evans (Planning Consultant).

This detailed Circular Economy Statement (CES) has been prepared based on the London Plan Policy SI7 on the proposed scheme at Battersea Park Road in Nine Elms, London (hereafter referred to as the 'scheme'). This detailed statement presents the strategic approaches and commitments through which the scheme will retain its constituent materials at their highest value (throughout the design, build, operation, and disassembly), and how the materials will be reused and recycled to adhere to the principles of a circular economy. The CES has been prepared in support of the full planning application for the scheme. The GLA CE Excel Template has been filled in, and this Statement provides accompanying information.

The intended aim/outcome of this statement is to:

- Identify potential strategies and approaches that enable the scheme to be 'circular'.
- Present quantitative targets for material use, waste management, reuse and recycling to facilitate evidence-based performance.
- Identify opportunities for the application of circular economy principles through the whole life cycle promoting whole-life efficiencies in the scheme.

The developer, Watkin Jones is the leading developer, builder, and third-party manager of new homes for rent across the UK and Ireland and are committed to reducing waste to landfill and carbon emissions.

Key circular economy commitments, targets and opportunities for this scheme are:

- To divert 95% of non-hazardous demolition waste from landfill, with retention onsite where possible and reuse.
- To divert 95% of non-hazardous excavation waste from landfill, with retention onsite where possible.
- To divert 95% of construction (new build) waste from landfill with an emphasis on reuse and high value recycling where possible.
- Proportion of materials with a reused or recycled content to be at least 20%.
- Other materials to be responsibly sourced as per the Sustainable Procurement Policy.
- To maximise the recycling of operational waste from the student accommodation and commercial spaces.
- Municipal waste recycling target of 65% by 2030 (by tonnage).
- Business waste recycling target of 75% by 2030 (by tonnage).

There is also a requirement to achieve BREEAM Outstanding for the 2018 New Construction scheme and Home Quality Mark Rating 4*. This includes achieving several material and waste credits, which are Mat06 (material efficiency), Wst01 (construction waste management), Wst06 (design for disassembly and adaptability); Man03 (responsible construction practices) and Mat03 (responsible sourcing of materials). Targets include achieving 3.2 tonnes/100m^2 of internal floor area for construction waste arising for the development.

The scheme plans to accommodate a layered perspective of a building for a circular economy: site, structure, shell/skin, services, and space.

Key processes include:

Pre-demolition Audit: this covers the estimated quantities arising from both the refurbishment and demolition activities and identify opportunities for reuse within the new design, other reuse opportunities and upcycling wherever possible.

Resource Management Plan/Construction Environmental Management Plan: will be followed for the excavation and construction activities, which will identify and implement areas for reduction of waste, reuse and upcycling and diversion of waste material to recycling facilities, as well as ensuring the reporting of quantities and waste destinations and Duty of Care commitments.

Specification of materials: the scheme will aim to source the main material from responsible sources including those from reused and recycled sources. Use of reused and recycled material will promote a circular economy approach to material management.

Soil (materials) management plan: as part of the management of soils on site a materials management plan will be written to assure the adequate management of contaminated and non-contaminated soils and retention on site where possible.

Adaptability and Flexibility: the scheme will be designed to include adaptability and flexibility through the design of the buildings.

Deconstruction Information: Key drawings will be detailed with deconstruction information, and disassembly information for products.

Operational Waste Management Plan: a Plan has been generated with the amounts of waste likely to be generated by types including recyclables and the need for bin types, segregation, storage and collection.

End of life plan: as part of the O&M manual, an end-of-life plan will be written including relevant information on products and materials and construction details.

1 Introduction

This detailed Circular Economy Statement (CES) has been prepared based on the London Plan Policy SI7 on the proposed scheme at Battersea Park Road, Nine Elms (hereafter referred to as the 'scheme' by ADW Developments). This involves the demolition of existing building and construction of three new buildings, together comprising Residential (Use Class C3) and Student Accommodation (Sui Generis) along with Commercial, Business and Service (Use Class E) and/or Local Community and Learning (Class F) floorspace. Associated works include hard and soft landscaping, car parking and new vehicular access / servicing, and other ancillary works. This detailed statement presents the approaches, strategies, and opportunities through which the scheme will retain its constituent materials at their highest value (throughout design, build, operation, and disassembly), and how the materials can be reused and recycled to adhere to the principles of a circular economy.

The intended aim/outcome of this statement is to:

- Identify potential strategies and approaches that enabler the development to be 'circular'.
- Provide quantitative targets for material use, recycled content, recycling, and diversion of waste from landfill to facilitate evidence-based performance.
- Identify opportunities for the application of circular economy principles, promoting whole-life efficiencies in the scheme.

This CES supports the detailed planning application, and as such is the 'detailed circular economy statement' in accordance with the GLA's Circular Economy Statement Guidance Consultation Draft. Note, the GLA Circular Economy Statement has also been developed in alignment with the March 2022 guidance. This Statement accompanies the excel circular economy template which has been filled out for detailed application stage.

1.1 Description of the Development

The scheme is for the demolition of existing building and construction of three new buildings, together comprising Residential (Use Class C3) and Student Accommodation (Sui Generis) along with Commercial, Business and Service (Use Class E) and/or Local Community and Learning (Class F) floorspace. Associated works include hard and soft landscaping, car parking and new vehicular access / servicing, and other ancillary works.

The proposal is for three buildings: Building 1 – Affordable Residential; Building 2 – Student Accommodation; Building 3 – Student Accommodation.

The scheme is located at 41-49 (Bookers) and 49-59 (BMW) Battersea Park Road, Wandsworth ISW8 5AL. The 0.81ha site is located on the western end of the Vauxhall Nine Elms Opportunity Areas (VNEB) and is within the Central Activities Zone (CAZ). The site is bound by Sleaford Street to the east, the A3205 Battersea Park Road to the north, the New Covent Garden Market access road to the east, and the Battersea Power Station affordable housing and the railway tracks to the south.

An image of the three proposed buildings is shown below:

The proposed ground floor plan is shown below.

The northern part of the site fronting Battersea Park Road is currently occupied by Booker Cash & Carry which is a retail warehouse club totalling 3,209m² (GIA) (Class B8) (see the photograph below). The southern part of the site, adjacent to the railway line, was occupied by a BMW service centre totalling 1,224m² (GIA) (this has been demolished).

1.2 Policy

The detailed CES has been written in response to **The London Plan 2021, Policy SI 7 Reducing Waste and Supporting the Circular Economy.**

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

1) promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible
2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026
4) meet or exceed the municipal waste recycling target of 65 per cent by 2030
5) meet or exceed the targets for each of the following waste and material streams:
    a) construction and demolition – 95 per cent reuse/recycling/recovery
    b) excavation – 95 per cent beneficial use
6) design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.

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

1) how all materials arising from demolition and remediation works will be re-used and/or recycled
2) how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life
3) opportunities for managing as much waste as possible on site
4) adequate and easily accessible storage space and collection systems to support recycling and re-use
5) how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
6) how performance will be monitored and reported.

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

This detailed aligns with the GLA Circular Economy Guidance from March 2022 and the completion of the accompanying CE Excel Template.

The local plan in force for the area comprises of the **Wandsworth Local Plan 2023-2028.** The **Wandsworth Local Plan 2023-2028, Policy LP13** Circular Economy, Recycling and Waste Management (Strategic Policy) sets out the Council's Circular Strategy. It states,

A. Wandsworth will meet its identified waste needs, including apportionment targets, (see Table 15.5), support the circular economy and contribute towards London's recycling and net self-sufficiency targets by safeguarding existing waste sites and identifying suitable areas for new recycling and waste management facilities to meet the capacity gap.

B. Circular Economy Statements will be required for all referable applications which set out how the proposed development promotes circular economy outcomes and the aim for net zero waste.
C. Developers will be expected to reuse, recycle, or recover 95% of construction and demolition waste and find beneficial uses for 95% of excavation waste.
D. The following waste sites are safeguarded for waste use:

Site Name	Address	Size (ha)	Facility Type
Biffa Waste Services	45 Pensbury Place, London SW8 4TR	0.18	Vehicle depot
Cringle Dock WTS (Cory)	Cringle Dock SWTS, Cringle Street, Battersea, London, SW11 8BX	1.13	Transfer
EMR	Private Sidings, Pensbury Place, Wandsworth, London, SW8 4TP	0.79	Recycling
Pensbury Place Transfer Station (Cory)	Pensbury Place Transfer Station 661-679 Pensbury Place Battersea, SW8 4TP	0.79	Transfer
Smugglers Way waste facilities (WRWA/Cory)	Smugglers Way, Wandsworth, London SW18 1EG	3.4	Recycling and Transfer
Wandsworth Transfer Station (Suez)	British Rail Goods Yard, Pensbury Place, Wandsworth, London SW8 4TR	0.17	Recycling and Transfer
The Willows MRF	Cappagh Public Works Ltd, The Willows Materials Recycling Facility, Riverside Road, London SW17 0BA	0.57	Recycling

E. Waste sites will only be released for other uses if compensatory capacity is provided within Wandsworth or, if the borough's waste needs have been met, elsewhere in London. Compensatory provision should be at or above the same level of the waste hierarchy of that which is lost and meet or exceed the maximum achievable throughput of the site over the last five years.
F. New waste capacity to close Wandsworth's capacity gap is directed towards existing facilities, safeguarded wharves, and SIL and LSIAs. Applications for waste facilities outside of these areas will need to demonstrate that it is not feasible to develop the proposed facility in one of these preferred locations. Sites which support sustainable transport options such as rail and water are supported.
G. Development on sites adjacent to existing waste sites that may prejudice use for waste management purposes will not be permitted unless satisfactory mitigation measures can be provided, in line with the Agent of Change principle.
H. Applications for waste management facilities, including those replacing, consolidating or expanding existing sites, will be required to demonstrate that the proposal optimises the waste management capacity of the site.
I. Applications for waste facilities which include additional recycling capacity are welcomed and opportunities to co-locate complementary activities, such as manufacturing using recycled waste, will be supported.
J. Applications for new waste facilities will be assessed against criteria in the National Planning Policy for Waste, the London Plan and Wandsworth's Local Plan policies.
K. Wandsworth will continue to co-operate with waste planning authorities in areas which receive significant waste exports from the borough to address any cross-boundary waste issues.

Other relevant **Wandsworth Local Plan 2023-2028 policies include:**

- LP10 Responding to the Climate Crisis (Strategic Policy)

- LP11 Energy Infrastructure
- LP12 Water and Flooding (Strategic Policy)
- LP14 Air Quality, Pollution and Managing Impacts of Development

These have been grouped together under a common section **- 'Section 15' Tackling Climate Change,** within the **Wandsworth Local Plan 2023-2028. Policy LP13** Circular Economy, Recycling and Waste Management (Strategic Policy), also belongs to this section.

1.3 Circular Economy Aspirations

The scheme will address circular economy principles, including the aspects of responsible sourcing and the environmental impact of construction materials. The scheme aspires to the adherence to the principles of circular economy, from the reuse of materials arising from excavation works and to the new construction design. The project team will work together to reduce waste, maximise material efficiency, design for longevity and flexibility and reuse and recycle material waste arisings from all stages of the scheme. The project team are committed to:

- Optimise design for longevity, flexibility, adaptability, standardisation.
- Ensure each building element is serviceable and maintainable.
- Due consideration to disassembly, deconstruction, and end of life recoverability
- Use of durable materials and products
- Increase the use of reused and recycled content.
- Use of materials that can easily be reused or upcycled at the end of their life.
- Use of low carbon and non-toxic materials.
- Maintain materials at their highest value.

There is also a requirement for BREEAM 2018 New Construction on the project and Home Quality Mark.

2 Circular Economy Goals and Strategic Approach

The following table presents the scheme's circular economy strategic approach, based on the structure prescribed under the Circular Economy Statement Guidance, Draft October 2020 published by the Greater London Authority.

Aspect	Phase / Building / Area	Steering Approach	Explanation	Target	Supporting processes
Circular economy approach for the new development	All levels	Design for adaptability and end of life	The structural design will consider long term adaptability and deconstruction and ultimately reuse through the standardisation of frame elements and internal configurations.		Design and specification stages
	All levels	Reduce	Lean design elements will be incorporated within the specification.		Design and specification stages

	All levels	Sourcing or materials	Materials will be responsible sourced using appropriate schemes.		Design and specification stages
	Construction	Reduce, reuse, recycle	Waste will be reduced through offsite manufacture and good practice on site; reuse and recycling (upcycling) of construction waste will be prioritised.	$3.4m^3/100m^2$	Design and specification stages Resource Management Plan – Construction Environmental Management Plan
Circular economy approach for the existing site	Demolition	Reuse and recycling	Reuse of inert materials on site, where feasible; reuse and recycling of other materials e.g. steel frames and cladding	Divert 95% of non-hazardous demolition waste from landfill	Design and specification stages Resource Management Plan – Construction Environmental Management Plan
	Groundworks	Reuse	Beneficial reuse of excavation waste on and offsite.	Divert 95% of non-hazardous excavation waste from landfill	Materials management Plan/ Cut and fill assessment
Circular economy approach for municipal waste during operation	All areas	Minimise operational waste	Operational policies will include adequate space and handling of residual and commercial waste to enable segregation and recycling of waste where possible.	Aim to divert at least 33% of waste from landfill	Operational waste plan

3 Supporting information

Design Approaches

Key actions are shown in the accompanying CE excel template. Supporting information is provided.

Pre-demolition and redevelopment audit

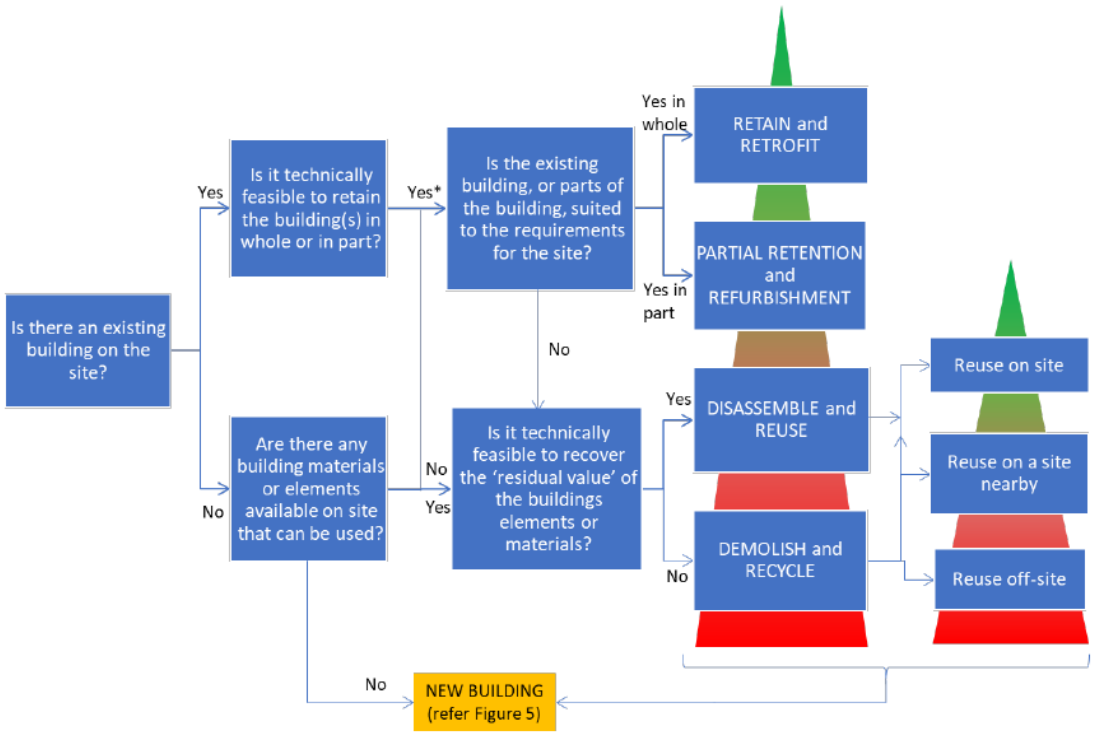
There is one building on site, the Bookers Warehouse; the pre-demolition audit is in Appendix A. The building is not suitable for reuse in its current form to meet the needs of the new development. This is due to its layout, form and type of structure. It would be difficult to extend the building vertically for the intended use.

An estimated 4,050 tonnes (2,049m^3) of materials will arise from the demolition. This is made up of Concrete (83%), Brick (10%), Metals (6%), Gypsum (0.2%), and Insulation (0.2%), with smaller amounts of Timber, Ceramic, Plastics and Carpet. For the concrete (with most from the floor slab, block walls and concrete columns), recommendations are to turn into Recycled Concrete Aggregate or Recycled Aggregate. For brick, which is used for the external walls, it is recommended that this is crushed as Recycled Aggregate. There may be some reuse potential for some of the metal, such as the metal wall cladding, roof frame and roller shutters. The plasterboard ceiling tiles could be reused in a similar project elsewhere; the rest of the plasterboard is suitable for recycling. Other items for potential reuse include: mineral fibre ceiling tiles, carpet tiles, LED lighting, destratification fans, industrial space heaters, air conditioning units and walk in fridge/freezers. A target of 99% diversion from landfill is recommended, note 95% is required. This is largely recycling (98% and 1% reuse). This does not include any hazardous waste which will need to be dealt with accordingly, if and when identified.

Note, the pre-demolition audit was commissioned and written before the publication of the March 2022 GLA Circular Economy Statement.

Based on the GLA decision tree for existing buildings, shown below is:

- Disassemble and reuse (certain elements), most likely on a new site.
- Demolish and recycle, which some will be onsite (hardcore) and off site.



Main opportunities for reuse include:

- Metal wall cladding
- Roof frame
- Roller shutters.
- Ceiling tiles
- Carpet tiles
- LED lighting
- Destratification fans
- Industrial space heaters
- Air conditioning units
- Walk in fridge/freezers

Globechain, or a similar platform will be used, which is marketplace for distributing items to charities, businesses and individuals for. for reuse and recycling for the demolition contractor are in Appendix C.

Designing out waste

The quantities of materials used are being assessed in the various stages of the whole life carbon assessment. The assessment is being used to identify opportunities for reducing embodied carbon and as such the overall amount of materials used. This is focusing the core elements where the mass is likely to be most from including the RC frame and slab, precast concrete panels, windows and internal blockwork, partitions and drylining. The structural materials by mass and related embodied carbon is largely concentrated in the building's floor slabs, attributing 51%, as well as foundations and substructure,

attributing 25%. The upfront embodied carbon is estimated to be 609 $kgCO_2/m^2$ GIA for Building 1 and for Building 2 and 3, 618 609 $kgCO_2/m^2$ GIA.

This weighting reflects the building's following characteristics:

- Reinforced concrete flat slab construction which is carbon intensive but provides reduced floor to floor height, inherent fire, water, noise, and vibration resistance, as well as quick and cost-effective construction.
- Piled foundations, required for a building of this scale.

The design approach is encompassing lean design principles. Durability is a key consideration in the specification of materials and components especially in vulnerable/high trafficked areas and in the co-living units. Long term maintenance and associated accessibility is key to the design process with the developer having a long-term interest. The level of the finishes is minimised in communal and core areas. Key areas of investigation for the structure include:

- More efficient structural grids in plots 2 and 3, allowing structural slabs to reduce 25mm in thickness, whilst plot 1 has reduced in scale allowing for fewer foundation piles.
- The use of a heavy precast concrete cladding system has increased the amount of structure required and therefore the amount of material and embodied carbon However, these façade systems are in themselves low carbon compared to alternative façade types.
- Investigation of a shallow floor solution
- Post tensioned slab design feasible with upstand beams to support façade.
- Limit concrete strength

Design for longevity, flexibility, adaptability, and end of life

The new buildings will be designed to have a long design life. The structural elements have a stated design life of 60 years before first maintenance. The design will aim to implement the 'building in layers' approach, to allow different elements to be removable from the main structure. There is some limitation in the disassembly of the reinforced concrete frame at the end of life. However, the façade system should be demountable.

A key element of the design process is designing for longevity and long-term maintenance and ensuring units are accessible. In the future, the student accommodation could be adapted to full residential use; the column layout allows for future flexibility. Some areas have been developed to be co-working and shared spaces allowing for future flexibility in their usage. Consideration will be given to the future service provision and the access to these areas.

Durability will be considered including for protection measures to prevent damage to vulnerable parts of the buildings, e.g. protection from the effects of high pedestrian traffic in main entrance and thoroughfares. Convenient access to the roof and facade will be provided for cost-effective cleaning, replacement, and repair. The roof and facade will be designed to prevent water damage, ingress and detrimental ponding. The use of durable specifications will reduce the need of mid-life renovations and help the structure last longer, reducing life-cycle material usage. Specifying for the durability of the fixtures and fittings is also important as the residential units include these items.

Recycled content

It is currently proposed to specify 20% for recycled content for the structural steel, 75% for rebar and 20% (GGBS/BFS for the concrete) with 100% recycled crushed aggregate in the external works and piling activities. An approximation has been made for other materials, namely gypsum at 25% and aluminium at 35%. However, these materials account for less than 5% for recycled content by value. Decisions on the amount of recycled content required will depend on product availability, cost and technical performance. The table below shows the minimum standards required for key materials; however, exemplar standard will be sought wherever possible.

Material	**Minimum Standard**	**Exemplar Standard**
Concrete (excluding rebar)	20% recycled content	Up to a maximum of 30% recycled content
Softwood	Sustainable Forestry Initiatives PEFC, FSC	100% FSC certified
Hardwood	Sustainable Forestry Initiatives PEFC, FSC	100% FSC certified
Joinery	Sustainable Forestry Initiatives PEFC, FSC	100% FSC certified
Steel Rebar	97% recycled content	
Structural Steel	25% recycled content	
Metal - Aluminium	30% recycled content	40% recycled content
Ceiling and Wall - Plasterboard	25% recycled content	50% recycled content

An estimate has been provided of recycled content by value for each of the work packages. A detailed breakdown is in Appendix A. This is shown in the next table.

% **RECYCLED CONTENT BY VALUE CALCULATION**			
Category	**Material Cost**	**% Recycled Content**	**Value of % Recycled Content**
Substructure	3,500,000	35%	1,225,000
Superstructure: Frame	12,000,000	27%	3,240,000
Superstructure: Upper Floors	100,000	24%	24,000
Superstructure: Roof		17%	
Superstructure: Stairs and Ramps	1,100,000	24%	264,000
Superstructure: External Walls	22,500,000	16%	3,600,000
Superstructure: Windows and External Doors	6,000,000	25%	1,500,000
Superstructure: Internal Walls and Partitions	8,500,000	18%	1,530,000
Superstructure: Internal Doors	2,000,000	10%	200,000
Finishes	2,500,000	14%	350,000
Fittings, furnishings & equipment (FFE)	4,000,000	35%	1,400,000
Services (MEP)	16,500,000	14%	2,310,000
External works	1,800,000	12%	216,000
	80,500,000		15,859,000
Value of % Recycled Content (Project Level)			**20%**

End of life scenarios

End of Life (EoL) scenarios have been developed for some of the key materials (note some materials are assumed at this design stage). These are as follows:

- Steel – closed loop recycling
- Concrete and aggregate – crushing for aggregates
- Plastics – a mix of Efw and landfill
- Timber – recycling and a mix of Efw and landfill
- Services – recycling, reuse where there is some service life within the product remaining
- Glass – closed loop recycling
- External works – reuse of paving etc, recycling as aggregate

As part of the design process, suppliers are being asked for the end-of-life routes for the key materials, and if there is a takeback scheme. This data is being collected within the project information and end of life plan. During design workshops, the end-of-life routes are being discussed for these materials, and the potential for them to be improved either through design considerations and/or alternative materials is being explored. Where relevant and useful, plans will include disassembly instructions e.g. for fittings

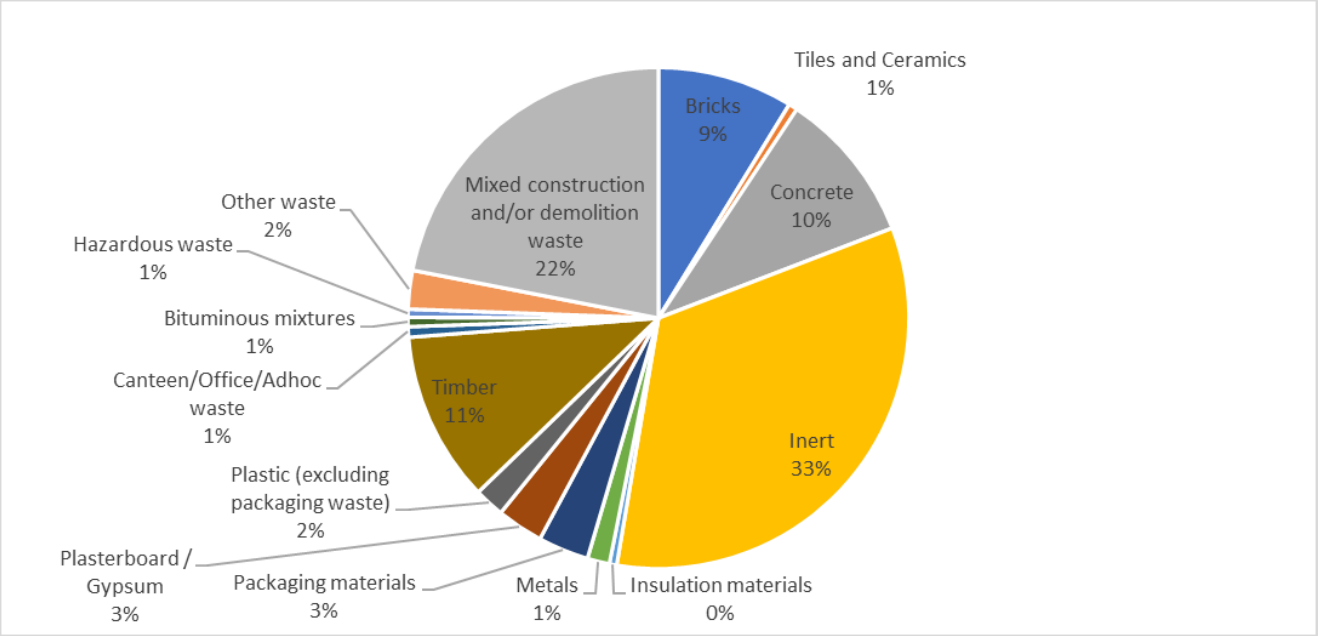
Excavation waste

There is likely to be excavation waste arising from the site strip and reducing levels (estimated to be around 8,775m^3). There will also be some excavation waste related to piling activities - 5,034m^3. Appendix B has more details of the arisings; in total there is an estimated 14,355m^3; equivalent to 17,226 tonnes. No sampling of the soil has yet occurred; currently it is assumed to be non-hazardous. It is likely that most of the excavation waste cannot be reused on site due to a lowering of levels. If it can't be reused onsite then it will be sent offsite using the CL:AiRE Definition of Waste Code of Practice (DoW CoP).

Construction waste

Construction waste will arise from the new construction elements and external works. The contractor will be responsible for developing and implementing Resource Management Plan, which will outline clear reuse and recycling routes for the materials arisings with the aim of waste being used at is highest value. Duty of Care requirements will also be recorded as part of the Resource Management Plan. The plan will include adequate storage of materials and reusable packaging systems. Where possible, takeback schemes will be used for a) surplus materials and b) packaging. The target of 95% diversion of non-hazardous waste from landfill will be included in the employer requirements for the contractor. Targets proposed are 5% reuse (offsite), 90% recycle (offsite), 2% landfill and 3% (other management).

For BREEAM requirements, there is the intention to obtain the waste arising benchmark of 3.2 tonnes/100m^2 for the scheme. The expected proportion of waste materials, using BRE's SmartWaste benchmark figures is shown below; the total amount of waste expected is around 1,178 tonnes. the expected proportion of waste materials, using BRE's SmartWaste benchmark figures.



The contractor will be obliged to produce a Resource Management Plan and will be required to include the following:

- Opportunities for minimising waste from the construction phases and a record of actions undertaken and their outcomes
- Forecast of waste types arisings and how these can be reduced, reused, recycled
- How this waste will be recorded
- Commitments for Duty of Care Legislation and any other relevant legislation
- Requirements for on site activities e.g. segregation
- Implementation of the plan i.e. how often updated and capturing of actions and feedback, training and communication
- Actual v forecast performance for arisings and management routes
- Lessons learnt for future projects

Operational waste

Operational waste generation by types and volumes has been established which will influence the number, type and location of bins for storage and safe routes for collection. An operation waste management plan has been written encompassing the requirements for the buildings; this will endeavour to set up the waste management systems to be able to recycle up to 40% of waste generated. The strategy includes the use separate bins for dry recyclables and general waste. Separate food collection is viable also. Design measures include:

- Each residential unit will be allocated space for two containers, one for dry mixed recyclables and one for refuse;
- Smaller countertop caddies will also be provided for food wastes, should the Council request separate food waste collections in future. These should be used in conjunction with biodegradable caddy liners;
- Communal bin stores are provided at Ground level in each building for residents to deposit their wastes and recyclables;

- These are fully accessible and located within 30m of the closest lift and stair core;
- Signage will be provided within the communal bin stores to help residents use the correct bins to deposit recyclables and refuse;
- Separate bulky waste stores are provided for the residential building and student accommodation at Ground Floor level for larger household items, as well as bulky items that require specialist collection;
- These are not accessible to residents and will be managed by site operatives on receipt of evidence that a bulky waste collection has been booked; and
- Communal bin stores have been positioned within 10m of a delivery bay, where feasible to allow direct access for waste operatives on collection days.

The following amounts of waste are expected:

- Building 1 will generate an estimated 12,100 litres (c 9m^3) of household waste per week. This equates to approximately 102 tonnes (416m^3) of household waste per year
- The student accommodation buildings (Buildings 2 and 3) will generate an estimated 89,154 litres (c89m^3) of waste per week. This equates to approximately 1,134 tonnes (4,628m^3) of household waste per year.
- The commercial uses are anticipated to generate an estimated 10,225 litres (10.2m^3) of commercial waste per week. This equates to approximately 112 tonnes (532m^3) of commercial waste per year.

Site management will be responsible for monitoring the effectiveness with which residents are using the communal waste storage facilities. High-profile signage will be provided to discourage the deposit of recyclables in refuse containers and to encourage the correct use of the recycling service provided. To encourage and promote recycling, site management will prepare information packs for new residents on the recycling facilities provided along with encouragement to use them. Site management will also keep residents and tenants informed of local arrangements for re-using and recycling unwanted furniture, electronic and electrical equipment, and other potentially recyclable items.

There is a commitment to meet

- Municipal waste recycling target of 65% by 2030 (by tonnage).
- Business waste recycling target of 75% by 2030 (by tonnage).

4 Plans for implementation

End of Life Plan

The building will be designed with longevity and end of life in mind. This includes assessing the opportunities for deconstruction at end of (first) life for the major components and elements, ensuring that it is not overly complicated, expensive or induces risks disproportionate to the project. The drawings will be detailed with deconstruction information and the O&M/Building User manual shall include details of the materials to aid with the ability for each material to be repurposed for reuse in future applications. This will include material quantities, certificates of responsible sourcing, any treatments used, strength/tolerance information, predicted lifespan, links to EPDs and carbon/LCA information, instructions for design for disassembly and recommended routes at end of life.

Actions
Short to medium term actions include:

- Integration of circular economy aspects into the demolition contract and external works
- Requirements for the main contractor are included in the employer requirements.
- Ensure that a minimum of 20% of recycled content for the materials is specified for the main elements and wherever possible aim higher.
- Investigate percentage for GGBS cement replacement.
- Ongoing review of the specification for more circular economy opportunities

Evidence will be required from the main contractor including demolition contractor, groundwork contractor on waste management performance, as well as the specification of products and materials and will be reported as required.

5 Conclusion

This statement has been prepared through collaboration between a multi-disciplinary design team that includes suitably qualified architects, circular economy experts and sustainability experts. The strategies evaluated in this statement have been designed with the aim of instilling the principles of a circular economy into the scheme, which should help minimise the waste generated from the scheme and the materials used throughout its life cycle.

6 Acknowledgements

In preparing this report we acknowledge use of the following sources:

- Circular Economy Statement Guidance, October 2020: https://consult.london.gov.uk/circular-economy-statements

- Circular Economy Statement Guidance, March 2022: https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg_0.pdf

7 Disclaimer

Appendix A – Recycled content figures

BLOCK A

NRM	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
0.1	Demolition: Toxic/Hazardous/Contaminated Material Treatment				
0.2	Major Demolition Works				
0.3	Temporary Support to Adjacent Structures				
0.4	Specialist Ground Works				
1	Substructure	Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	50	720,384.00	360,192.00
		Bulk Aggregates Sands and Soils | Sand | Unspecified		86,376.19	-
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand	0	1,980.00	-
		Cementitious Binders | Portland Cement | Unspecified	0	3,469.27	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 30% BFS	30	2,126,528.00	637,958.40
		Concrete | Unreinforced | Portland Cement Blends | 20 MPa		16,378.53	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa		11,646.17	-
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		19,375.00	-
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	71,412.86	69,270.47
		Insulation | Blankets and Batts | 80% Recycled Polyester Batts | Unspecified		273.68	-
		Insulation | Blankets and Batts | Mineral Wool | Blanket | Unspecified		1,866.00	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	221.03	77.36
		Plastics | General | Unspecified		206.01	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		188.92	-
		Roofing | Membranes | Polyester bitumen		18,660.00	-
		Timber | Sustainably Sourced | Plywood | Unspecified		1,509.57	-
				3,080,475.23	**1,067,498.23**
					34.65
2.1	Superstructure: Frame	Asphalt and Bitumen | Asphalt hot mix | 4.50% primary bitumen (20% RAP)	20	4.20	0.84
		Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)		272.16	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	536,400.00	107,280.00
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa		626.36	-
		Ferrous Metals | Steel | General | Unspecified	20	1.00	0.20
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	56,900.00	55,193.00
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		0.24	-
		Resins and Adhesives | Mastic Sealant		1.17	-
				594,205.13	**162,508.69**
					27.35
2.2	Superstructure: Upper Floors	Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	3,170,720.00	634,144.00
		Ferrous Metals | Steel | Accessories | Unspecified	20	2,214.72	442.94
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	8,188.31	1,637.66
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	179,550.00	174,163.50
				3,360,673.03	**810,388.11**
					24.11
2.3	Superstructure: Roof	Asphalt and Bitumen | Asphalt hot mix | 5.50% primary bitumen, (0% RAP)		5,000.00	-
		Asphalt and Bitumen | Bitumen, rubberised 40% rubber		3,843.96	-
		Bulk Aggregates Sands and Soils | Soil | Unspecified		50,000.00	-
		Carpets and Floor Coverings | Underlay | Felt		31.25	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	33,376.00	6,675.20
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	9,971.00	1,994.20
		Ferrous Metals | Steel | Hot Rolled | Unspecified	20	1.10	0.22
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	23,280.00	22,581.60
		Ferrous Metals | Steel | Stainless | Unspecified	20	2,812.88	562.58
		Gases | Refrigerants | R-744 (CO_2)		(720.23)	-
		Glazing | Glass and Films | Flat Glass		25,447.50	-
		Insulation | Rigid Foams and Boards | Polystyrene | Unspecified EPS		3,509.80	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	7,822.75	2,737.96
		Plastics | High Density Polyethylene (HDPE) | Unspecified		675.00	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		625.00	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		113.61	-
		Plastics | Polyvinyl Chloride (PVC) | Unspecified		2,208.36	-
		Resins and Adhesives | Urea Formaldehyde		17.55	-
		Timber | Sustainably Sourced | Plywood | Unspecified		576.08	-
		Timber | Sustainably Sourced | Softwood | Unspecified		1,181.47	-
				169,773.08	**34,551.76**
					20.35
2.4	Superstructure: Stairs and Ramps	Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	83,440.00	16,688.00
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	95	4,725.00	4,488.75
		Ferrous Metals | Steel | Stainless | Unspecified	20	248.06	49.61
				88,413.06	**21,246.71**
					24.03

NRM	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
					-
2.5	Superstructure: External Walls	Asphalt and Bitumen | Asphalt hot mix | 4.50% primary bitumen (20% RAP)	20	33.22	6.64
		Bricks, Blocks and Pavers | Clay Bricks and Pavers | Unspecified		538,311.64	-
		Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	2,154.94	538.73
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		113,374.42	-
		Concrete | Reinforced | 1.0% Reinforcement | Portland Cement Blends | 30 MPa		7,046.07	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	715,200.00	143,040.00
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa		4,959.42	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa		1,679.13	-
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		3,315.39	-
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	23.14	4.63
		Ferrous Metals | Steel | General | Unspecified	20	36.83	7.37
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	36,000.00	34,920.00
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		1.94	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	19.77	6.92
		Paints and Finishes | Water Based | 1 Coat		2.01	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | Unspecified Sheets	15	248.53	37.28
		Plaster and Mineral Derived Products | Fibre Cement | Compressed 1750kg/m3		50,450.37	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		743.40	-
		Resins and Adhesives | Mastic Sealant		9.26	-
		Rock and Stone | Cut or Split | Limestone		1,571.20	-
				1,475,180.68	**178,561.57**
					12.10
2.6	Superstructure: Windows and Extern	Ferrous Metals | Steel | General | Unspecified	20	37.15	7.43
		Ferrous Metals | Steel | Stainless | Unspecified	20	3.00	0.60
		Glazing | Windows | Aluminium Framed | No Thermal Break | Single Glaze | Domestic 50% Opening	30	170.40	51.12
		Glazing | Windows | Aluminium Framed | Thermal Break | Double Glaze | Commercial Fixed	30	36.00	10.80
		Metals (Non-Ferous) | Aluminium Extruded	35	38.88	13.61
		Paints and Finishes | Unspecified | 1 Coat		0.20	-
		Paints and Finishes | Unspecified | 3 Coats		371.25	-
		Plastics | General | Unspecified		2.76	-
		Rubber | Synthetic		2.00	-
		Timber | Sustainably Sourced | Medium Density Fibreboard (MDF) | Unspecified	20	11,137.50	2,227.50
				11,799.14	**2,311.06**
					19.59
2.7	Superstructure: Internal Walls and F	Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		25,120.00	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa	20	104,800.64	20,960.13
		Concrete | Unreinforced | Portland Cement Blends | Unspecified	20	206,926.00	41,385.20
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	1,444.40	288.88
		Ferrous Metals | Steel | General | Unspecified	20	584.04	116.81
		Metals (Non-Ferous) | Aluminium Unspecified	35	502.40	175.84
		Paints and Finishes | Water Based | 1 Coat		125.60	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | Unspecified Sheets	15	15,511.60	2,326.74
		Plaster and Mineral Derived Products | Fibre Cement | Compressed 1750kg/m3		8,400.00	-
				363,414.68	**65,253.60**
					17.96
2.8	Superstructure: Internal Doors				-
					-
					-
					-
3	Finishes	Bulk Aggregates Sands and Soils | Sand | Unspecified	20	529,625.60	105,925.12
		Carpets and Floor Coverings | Underlay | Rubber		4,728.80	-
		Cementitious Binders | Portland Cement | Unspecified		109,944.60	-
		Ceramics | Porcelain Sanitary Products | Bath		5,330.00	-
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.56mm	15	71.22	10.68
		Ferrous Metals | Steel | General | Unspecified	20	33.83	6.77
		Ferrous Metals | Steel | Stainless | Unspecified		1,090.00	-
		Glazing | Glass and Films | Flat Glass		1,968.00	-
		Metals (Non-Ferous) | Copper Unspecified		507.74	-
		Paints and Finishes | Unspecified | 1 Coat		316.64	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plaster | Unspecified	15	4,233.60	635.04
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | 12mm Sheets	15	627.00	94.05
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		106.37	-
		Timber | Sustainably Sourced | General | Unspecified		53,823.75	-
		Timber | Sustainably Sourced | Hardwood | Unspecified		57,632.25	-
				770,039.39	**106,671.66**
					13.85
4	Fittings, furnishings & equipment (FI	Metals (Non-Ferous) | Aluminium Unspecified	35	5.40	1.89
		Paints and Finishes | Solvent Based | 1 Coat		0.20	-
				5.60	**15.74**
					281.12
5	Services (MEP)	Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	5,138.01	1,284.50
		Ceramics | Porcelain Sanitary Products | Bath		5,330.00	-
		Concrete | Prefabricated Components | Precast Concrete Panels	20	12,123.21	2,424.64
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		13.00	-
		Ferrous Metals | Steel | Coated Sheet | Galvanised (zinc coated)	15	75.33	11.30
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.43mm	15	196.10	29.41
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.56mm	15	104.73	15.71
		Ferrous Metals | Steel | General | Unspecified	20	1,134.44	226.89
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	1,289.26	1,250.59
		Ferrous Metals | Steel | Stainless | Unspecified	20	1,030.64	206.13
		Finished Products | Electrical Goods | Electric Motors | Unspecified	20	190.00	38.00
		Finished Products | Electrical Goods | Electronics | Electronics For Control Unit	20	72.32	14.46
		Finished Products | Electrical Goods | Solar Inverters | Solar Inverter Generic	20	3.00	0.60
		Finished Products | Electrical Goods | Solar PV Panels | Monocystalline		56.60	-
		Gases | Refrigerants | R-410A (Puron, AZ-20)		3.06	-
		Glazing | Glass and Films | Flat Glass		2,072.05	-
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		3.50	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	76.68	26.84
		Metals (Non-Ferous) | Copper Unspecified		4,794.30	-
		Metals (Non-Ferous) | Titanium		11.00	-
		Plastics | ABS | Unspecified		72.00	-
		Plastics | General | Unspecified		3,602.44	-
		Plastics | Nylon | Unspecified		6.50	-
		Plastics | Polypropylene | Injection Moulding		18.50	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		431.52	-
		Resins and Adhesives | Urea Formaldehyde		25.00	-
		Rubber | Synthetic		278.69	-
				38,151.88	5,529.07
					14.49

BLOCK A

NRM	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
6	Prefabricated Buildings and Building Units				-
7	Work to Existing Building				-
8	External works	Asphalt and Bitumen | Asphalt hot mix | 4.50% primary bitumen (20% RAP)	20	290.58	58.12
		Asphalt and Bitumen | Asphalt hot mix | 5.50% primary bitumen, (0% RAP)		172.59	-
		Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	383,827.15	95,956.79
		Bulk Aggregates Sands and Soils | Sand | Unspecified		107,141.57	-
		Bulk Aggregates Sands and Soils | Soil | Unspecified		267,129.83	-
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		1,832.57	-
		Cementitious Binders | Mortars and Renders | Adhesive Mortar (Tiling)		6,174.84	-
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa	20	125,886.97	25,177.39
		Ferrous Metals | Iron | Unspecified		890.43	-
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.43mm	15	37.50	5.63
		Ferrous Metals | Steel | General | Unspecified	20	4.49	0.90
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	2,345.68	2,275.31
		Finished Products | Electrical Goods | Light Fittings | Flourescent Globes		25.25	-
		Glazing | Glass and Films | Flat Glass		18.75	-
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		10.07	-
		Plastics | General | Unspecified		0.36	-
		Plastics | Polyurethane | Unspecified		174.22	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		165.49	-
		Resins and Adhesives | Epoxy Resin		299.39	-
		Resins and Adhesives | Mastic Sealant		48.13	-
		Rock and Stone | Cut or Split | Limestone		40,843.55	-
		Rock and Stone | Cut or Split | Slate		57,753.58	-
		Rock and Stone | Polished | Granite / Basalt / Marble		27,383.87	-
		Roofing | Membranes | Polyester bitumen		1,250.17	-
		Rubber | Synthetic		731.73	-
				1,024,438.76	**123,474.13**
					12.05

BLOCK B/C

	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
0.1	Demolition: Toxic/Hazardous/Contaminated Material Treatment				
0.2	Major Demolition Works				
0.3	Temporary Support to Adjacent Structures				
0.4	Specialist Ground Works				
1	Substructure	Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	50	2,759,904	1,379,952
		Bulk Aggregates Sands and Soils | Sand | Unspecified		347,699	-
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		3,960	-
		Cementitious Binders | Portland Cement | Unspecified		18,541	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 30% BFS	30	7,869,584	2,360,875
		Concrete | Unreinforced | Portland Cement Blends | 20 MPa		75,591	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa		53,750	-
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		38,750	-
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	244,478	237,143
		Insulation | Blankets and Batts | 80% Recycled Polyester Batts | Unspecified		1,015	-
		Insulation | Blankets and Batts | Mineral Wool | Blanket | Unspecified		6,921	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	786	275
		Plastics | General | Unspecified		764	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		671	-
		Roofing | Membranes | Polyester bitumen		76,410	-
		Timber | Sustainably Sourced | Plywood | Unspecified		6,503	-
				11,505,327	**3,978,246**
					35
2.1	Superstructure: Frame	Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	1,942,960	388,592
		Ferrous Metals | Steel | General | Unspecified	20	1	0
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	201,300	195,261
					-
					-
					-
					-
					-
				2,144,261	**583,888**
					27
2.2	Superstructure: Upper Floors	Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	13,600,720	2,720,144
		Ferrous Metals | Steel | Accessories | Unspecified	20	10,221	2,044
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	37,791	7,558
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	732,125	710,161
				14,380,858	3,439,908
					24
2.3	Superstructure: Roof	Asphalt and Bitumen | Bitumen, rubberised 40% rubber		13,800	-
		Bulk Aggregates Sands and Soils | Soil | Unspecified		86,000	-
		Carpets and Floor Coverings | Underlay | Felt		54	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	1,442,320	288,464
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa		49,988	-
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	23,828	4,766
		Ferrous Metals | Steel | Hot Rolled | Unspecified	20	3	1
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	76,425	74,132
		Ferrous Metals | Steel | Stainless | Unspecified	20	86,035	17,207
		Gases | Refrigerants | R-744 (CO_2)		(1,239)	-
		Glazing | Glass and Films | Flat Glass		916,110	-
		Insulation | Rigid Foams and Boards | Polystyrene | Unspecified EPS		8,988	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	241,681	84,588
		Plastics | High Density Polyethylene (HDPE) | Unspecified		1,161	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		1,075	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		22	-
		Plastics | Polyvinyl Chloride (PVC) | Unspecified		2,322	-
		Plastics | Polyvinyl Chloride (PVC) | Unspecified		3,082	-
		Resins and Adhesives | Urea Formaldehyde		632	-
		Timber | Sustainably Sourced | Plywood | Unspecified		20,739	-
		Timber | Sustainably Sourced | Softwood | Unspecified		42,533	-
				3,015,556	**469,158**
					16
2.4	Superstructure: Stairs and Ra	Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	576,928	115,386
		Ferrous Metals | Steel | General | Unspecified	20	665	133
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	32,670	31,690
		Ferrous Metals | Steel | Stainless | Unspecified		149	-
				610,412	**147,224**
					24
2.5	Superstructure: External Wall	Asphalt and Bitumen | Asphalt hot mix | 4.50% primary bitumen (20% RAP)	20	93	
		Bricks, Blocks and Pavers | Clay Bricks and Pavers | Unspecified		27,758	-
		Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	6,010	1,502
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		24,526	-
		Concrete | Reinforced | 1.0% Reinforcement | Portland Cement Blends | 30 MPa		14,921	-
		Concrete | Unreinforced | Blast Furnace Slag Blends | 40 MPa | 20% BFS	20	5,852,720	1,170,544
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa		13,831	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa		7,750	-
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		15,301	-
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	20	107	21
		Ferrous Metals | Steel | General | Unspecified	20	280	56
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	294,600	285,762
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		5	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	62	22
		Paints and Finishes | Water Based | 1 Coat		9	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | Unspecified Sheets	15	1,147	172
		Plaster and Mineral Derived Products | Fibre Cement | Compressed 1750kg/m3		227,978	-
		Plastics | High Density Polyethylene (HDPE) | Unspecified		123	-
		Resins and Adhesives | Mastic Sealant		26	-
		Rock and Stone | Cut or Split | Limestone		33,026	-
				6,520,272	**1,458,080**
					22

BLOCK B/C

NRM	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
2.6	Superstructure: Windows and	Ferrous Metals | Steel | General | Unspecified	20	39	8
		Ferrous Metals | Steel | Stainless | Unspecified	20	4	1
		Glazing | Windows | Aluminium Framed | No Thermal Break | Single Glaze | Domestic 50% Opening	30	170	51
		Glazing | Windows | Aluminium Framed | Thermal Break | Double Glaze | Commercial Fixed	30	27,036	8,111
		Metals (Non-Ferous) | Aluminium Extruded	35	39	14
		Paints and Finishes | Unspecified | 1 Coat		1	-
		Paints and Finishes | Unspecified | 3 Coats		393	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | 12mm Sheets		46	-
		Plastics | General | Unspecified		3	-
		Rubber | Synthetic		2	-
				27,733	**8,184**
					30
		Timber | Sustainably Sourced | Medium Density Fibreboard (MDF) | Unspecified		11,797	-
2.7	Superstructure: Internal Walls	Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		60,000	-
		Concrete | Unreinforced | Portland Cement Blends | 40 MPa	20	250,320	50,064
		Concrete | Unreinforced | Portland Cement Blends | Unspecified	20	494,250	98,850
		Ferrous Metals | Steel | Galvanised Structural | Unspecified	10	3,450	345
		Ferrous Metals | Steel | General | Unspecified	20	1,395	279
		Metals (Non-Ferous) | Aluminium Unspecified	35	1,200	420
		Paints and Finishes | Water Based | 1 Coat		300	-
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plaster | Unspecified	15	5,600	840
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plasterboard | Unspecified Sheets	15	37,050	5,558
				865,362	**156,356**
					18
2.8	Superstructure: Internal Door	Ferrous Metals | Steel | General | Unspecified	20	51,675	10,335
		Ferrous Metals | Steel | Stainless | Unspecified	20	3,634	727
		Paints and Finishes | Unspecified | 1 Coat		1,374	-
		Timber | Sustainably Sourced | General | Unspecified		54,510	-
				111,193	**11,062**
					10
3	Finishes	Bulk Aggregates Sands and Soils | Sand | Unspecified	20	2,538,816	507,763
		Carpets and Floor Coverings | Underlay | Rubber		22,668	-
		Cementitious Binders | Portland Cement | Unspecified		527,031	-
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.56mm		1,384	-
		Ferrous Metals | Steel | General | Unspecified	15	57	9
		Paints and Finishes | Unspecified | 1 Coat	20	200	40
		Plaster and Mineral Derived Products | 100% Primary Gypsum | Plaster | Unspecified	15	11,200	1,680
		Plaster and Mineral Derived Products | Fibre Cement | Compressed 1750kg/m3		25,424	-
		Timber | Sustainably Sourced | Hardwood | Unspecified		276,266	-
		Timber | Sustainably Sourced | Medium Density Fibreboard (MDF) | Unspecified		65,087	-
				3,468,132	**509,492**
					15
					-
					-
					-
4	Fittings, furnishings & equipm	Metals (Non-Ferous) | Aluminium Unspecified	35	11	4
					35
5	Services (MEP)	Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	23,713	5,928
		Ceramics | Porcelain Sanitary Products | Bath		48,685	-
		Concrete | Prefabricated Components | Precast Concrete Panels	20	55,952	11,190
		Concrete | Unreinforced | Portland Cement Blends | Unspecified		26	-
		Ferrous Metals | Steel | Coated Sheet | Galvanised (zinc coated)	15	348	52
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.43mm	15	905	136
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.56mm	15	105	16
		Ferrous Metals | Steel | General | Unspecified	20	3,028	606
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	5,950	5,772
		Ferrous Metals | Steel | Stainless | Unspecified	20	3,231	646
		Finished Products | Electrical Goods | Electric Motors | Unspecified		107	-
		Finished Products | Electrical Goods | Electronics | Electronics For Control Unit		311	-
		Finished Products | Electrical Goods | Solar Inverters | Solar Inverter Generic		3	-
		Finished Products | Electrical Goods | Solar PV Panels | Monocystalline		57	-
		Gases | Refrigerants | R-410A (Puron, AZ-20)		3	-
		Glazing | Glass and Films | Flat Glass		18,441	-
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		4	-
		Metals (Non-Ferous) | Aluminium Unspecified	35	140	49
		Metals (Non-Ferous) | Copper Unspecified		24,227	-
		Metals (Non-Ferous) | Titanium		22	-
		Plant Based Products (non Timber) | Paper | General		2	-
		Plastics | General | Unspecified		16,677	-
		Plastics | Nylon | Unspecified		30	-
		Plastics | Polypropylene | Injection Moulding		27	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		4,873	-
		Resins and Adhesives | Urea Formaldehyde		115	-
		Rubber | Synthetic		1,231	-
				208,211	24,395
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Battersea Park Road

Detailed Circular Economy Statement

BLOCK B/C

NRM	Cateogory	Material	% Recycled Content	Mass of raw materials (kg)	Recyled content by mass
6	Prefabricated Buildings and Building Units				-
7	Work to Existing Building				-
8	External works	Asphalt and Bitumen | Asphalt hot mix | 4.50% primary bitumen (20% RAP)	20	1,341	268
		Asphalt and Bitumen | Asphalt hot mix | 5.50% primary bitumen, (0% RAP)		797	-
		Bulk Aggregates Sands and Soils | Aggregate | Gravel (High quallity e.g. blasted crushed and screened)	25	1,771,457	442,864
		Bulk Aggregates Sands and Soils | Sand | Unspecified		494,485	-
		Bulk Aggregates Sands and Soils | Soil | Unspecified		1,232,870	-
		Cementitious Binders | Mortars and Renders | 1 cement : 4 sand		8,458	-
		Cementitious Binders | Mortars and Renders | Adhesive Mortar (Tiling)		28,498	-
		Concrete | Unreinforced | Portland Cement Blends | 25 MPa	20	580,999	116,200
		Ferrous Metals | Iron | Unspecified		4,610	-
		Ferrous Metals | Steel | Coated Sheet | Zinc Coated & Coloured Sheet 0.43mm	15	38	6
		Ferrous Metals | Steel | General | Unspecified	20	21	4
		Ferrous Metals | Steel | Reinforcement bar | Unspecified	97	10,826	10,501
		Finished Products | Electrical Goods | Light Fittings | Flourescent Globes		25	-
		Glazing | Glass and Films | Flat Glass		19	-
		Insulation | Rigid Foams and Boards | Polyethylene | Polyethylene		46	-
		Plastics | General | Unspecified		2	-
		Plastics | Polyurethane | Unspecified		804	-
		Plastics | Polyvinyl Chloride (PVC) | PVC Pipe		879	-
		Resins and Adhesives | Epoxy Resin		1,382	-
		Resins and Adhesives | Mastic Sealant		222	-
		Rock and Stone | Cut or Split | Limestone		188,503	-
		Rock and Stone | Cut or Split | Slate		266,547	-
		Rock and Stone | Polished | Granite / Basalt / Marble		126,383	-
		Roofing | Membranes | Polyester bitumen		5,770	-
		Rubber | Synthetic		3,377	-
				4,728,358	**569,843**
					12

Appendix B - Estimated Excavation waste quantities:

BTR Building

Activity	Quantity (m^3)
Reducing level	184
Trenches for ground beams	30
Pile cap pits	283
Pile mat	463
Total	**960**

PBSA Building

Activity	Quantity (m^3)
Reducing level	709
Trenches for ground beams	366
Pile cap pits	1,709
Pile mat	2,579
Total	**5,363**

Both buildings

Activity	Quantity (m^3)
Site strip ((for both buildings)	6,709
Pit for attenuation	150
Reducing level for courtyard	1,173
Total	**8,032**

(End of Appendix B – Pre-Demolition Audit)

Appendix C – Proposed Requirements for the demolition contractor

A Pre-Demolition Audit has been undertaken for scheme by ADW Developments which has identified opportunities to reduce the waste arising from the demolition process by reclaiming buildings, elements, components and materials for reuse. This document sets out what is required from the Demolition Contractor to implement these recommendations.

The demolition contractor should review the findings from the Pre Demolition Audit report, notably the recommendations for each material.

The contractor should:

- Audit and record the components, products and materials that can be reused based on the information provided in the Pre Demolition Audit
- Engage with third parties who specialise in reclamation of component, products and materials to identify the items to be salvaged for reuse.
- Provide evidence of the correspondence with the recommended third parties that the potential for reuse has been discussed and agreed or provide the reasons why this has not been pursued.
- Carefully collect, disassemble, protect and store elements of the building that are to be reused
- Allocate a team to disassemble the identified items and materials for reuse.
- Allow for the time required to disassemble items in the programme.
- Ensure that all products and materials identified for reuse are recovered intact, are not contaminated by other materials, and are stored securely.
- Provide detailed records of the items reclaimed and salvaged along with the destination of the items.

The project may use the services of a specialist reuse organisation for a number of internal elements and products to be reused. These items are listed as (to be confirmed):

The contractor should assist the specialist reuse organisation by liaising with them on the requirements for removal, storage and collection. The specialist reuse organisation, if used will provide appropriate advice.

- Roof frame
- Roller shutters.
- Ceiling tiles
- Carpet tiles
- LED lighting
- Destratification fans
- Industrial space heaters
- Air conditioning units
- Walk in fridge/freezers

Appendix D - Report Authors

Katherine Adams

Katherine has worked in the area of construction resource efficiency for nearly 20 years, mostly at BRE, where she has been instrumental in shaping the construction industry to achieve high levels of diversion of waste from landfill and reducing waste. She has much experience of pre-demolition audits, having undertaken and reviewed many for various clients, which has involved the development of a robust methodology. She has been responsible for developing waste reporting, including the online system Smartwaste. She enjoys working closely with many elements of the industry, at both a sector and project level. She has recently finished a PhD at Loughborough University looking how circular economy can be embedded in the building sector and continues to assist BRE and other organisations such as the Alliance for Sustainable Building Products.

Anthony Waterman

Anthony is an expert in Construction Economics and Resource Efficiency with over 18 years professional experience. His experience includes providing consultancy to help project teams design for efficient waste management and responsible sourcing of construction material, key aspects in enabling Circular Economy compliance. Anthony currently sits on the ISO TC59, a working group responsible for the development of high-profile international standards developed to assess performance of buildings and other constructed assets.

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