Mendick Waring Limited

Welling FC

Circular Economy Report

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1 Executive Summary

MWL has been appointed by Woolwich Road limited ('the Applicant') to produce a Circular Economy Statement in support of the planning submission for the proposed a mixed-use residential development which partly refurbishes and partly rebuilds the Park View Road stadium for Welling United Football Club in the London Borough of Bexley DA16.

The development is located in Welling to the east of the town centre, within the London Borough of Bexley and will deliver 104 residential flats, a new stadium (with associated support accommodation) for Welling United FC, a 3G all-weather pitch, and commercial space fronting Park View Road.

This Circular Economy Statement should be read alongside the Design and Access Statement prepared by Create Architects and the Whole Life Cycle Assessment report produced by MWL, which are submitted as standalone documents.

Organisations involved in the design and delivery of the proposed Development

A multi-disciplinary team has been involved in the design of the proposed Development as outlined below:

- Architect: Create Design
- Structural Engineers: Woolwich Road Limited
- MEP Engineers: MWL
- Sustainability Consultants: MWL

During regular design meetings the above team, along with the greater project team, have met and incorporated circular economy principles into the strategy throughout, particularly in relation to the actions taken to reduce carbon found in the Whole Life Cycle Carbon Report by MWL.

Table 1 summarises the design approach across the development.

Circular Economy Strategic Approach

The strategic approach for the proposed Development is to prioritise flexibility, waste reduction, and off-site construction, and to incorporate circular design principles into Stage 3. The design team has worked in conjunction with ambitious carbon targets to incorporate circular economy strategies into all decision-making processes.

A number of workshops have been held with the design team to further engagement around circular economy principles and ensure that they are at the forefront of decision making in further design stages.

It is understood that the site and the use class come with restraints, and the team has worked to push these constraints where possible to allow for a flexible building that is easily upgradeable and reusable. Even though this development is predominantly residential led and, the circular economy strategy of the development is strongly tied to the BREEAM guidelines, including but not limited to:

- Man 01 – Project brief and Design
- Wst 01 – Construction waste management
- Mat 01 – Life cycle impacts
- Mat 03 – Responsible sourcing of materials
- Mat 05 – Designing for durability and resilience
- Mat 06 – Material Efficiency

It should be noted that even though the BREEAM scheme has been tailored to non-domestic buildings, its principles are considered a useful base for any types of developments.

Table 1: Circular Economy strategic approach

Circular Economy Design Approach	Phase/Building /Area/Layer	Strategic Response
Building relocation	N/A	The buildings' location has been selected to align with the existing layouts of the football stadium. It also corresponds to the site's restrictions as the footprint for the residential enabling development is restricted due to the substantially landlocked nature of the site.
Component or material reuse	Substructure Superstructure	The building elements are designed and will be detailed for disassembly to make future

	Shell/Skin Services	reuse possible. Regular dimensions are prioritised across the development to further add to reusability of components. The principle of longevity has been incorporated into the design so that any future reuse of components on site or elsewhere is as long-lived as possible. Measures considered are: -Concrete will have 25% GGBS as a minimum -Part of the stadium structure considered to be in good condition is being retained. Materials occurring by the demolition of other existing structures will be reviewed for maximising the opportunities for reuse and recycle. -Façade brickwork will aim to have a minimum 60% recycled content This will be reviewed at later design stages by the design team.
Adaptability	Superstructure Shell/Skin Services Space Stuff	Standardisation of residential units and services. Prefabrication of elements where possible.
Flexibility	Substructure Superstructure Shell/Skin Services Space	The proposed development host a number of uses.
Replaceability	Substructure Superstructure Shell/Skin Services Space Stuff	The design is considerate of accessibility requirements, particularly for building services, which have been designed to minimise the number of interventions required for replacement and maintenance. During the design phase this conversation was framed through the lens of reducing Stage B4 life-cycle emissions as much as possible.
Disassembly	Superstructure Shell/Skin Space Stuff	To reduce end-of-life carbon emissions and ensure that Stage D life-cycle benefits could be realised, the team has designed elements for disassembly: -Modular construction of façade panels allow for ease of disassembly. - Prefabrication of elements where possible.
Longevity	Shell/Skin Space Stuff	All components are designed to be protected, assembled and maintained such that they are long lasting. Additionally, the design philosophy is based on a light-weight and durable materials and systems to avoid strain on the structure and to also avoid superfluous elements that may be discarded well before their expected end-of-life. Using durable materials such as brick, concrete and aluminium ensures longevity and reduces the need for replacement.

Summary of Circular Economy Commitments

To enable the effective implementation of Circular Economy principles, performance targets and key commitments have been defined for the primary metrics set by the GLA's Circular Economy Guidance document (March 2022). These targets and commitments will be reviewed and may be adjusted as appropriate during the detailed design to respond to the specific requirements of each element and ensure that current best practice is being followed and opportunities to innovate are maximised. Table 2 summarises the key circular economy commitments.

Table 2: Circular Economy strategic approach

	Phase/ Building Area	Steering Approach	Notes
Circular Economy Approach for the Development	Sub-structure	New	A new substructure is provided. The use of demolition materials from the existing structure for the subgrade of the temporary pilling mat will be explored.
	Super-structure	New / Partially retained	The design of the structural frame has been optimised to balance flexibility and material use. Concrete with a high GGBS percentage will be specified: • Foundations: 70% • Slabs: 50% • Columns and beams: 50% The façade design is still at a preliminary stage however the option of pre-fabricated façade panels, bathroom pods and kitchen units could be employed and will be explored at the next design stage. Glazing which may require replacement has been designed to module sizes that allows ease of replacement internally via the residential lifts. Low maintenance facade materials with long lifespans are being selected to minimise need for replacement. Part of the superstructure of the Park View Road stadium for Welling Unite Football Club will be retained as it is considered in good condition.
	Skin	New	
	Space	New - Design for adaptability	
Circular Economy Approach for Municipal Waste during operation	All areas	Enable recycling and diversion of waste	Adequate space for storing and separation for waste streams has been integrated in the design, to include waste facilities at appropriate location and size to suit the needs of the Development during operation.

Circular Economy Commitments and Stage D carbon emissions

Although stage D emissions are not reported in the final totals under the GLA guidance, the impact of stage D emissions have been treated as very real throughout design development. This has driven decisions making around key items, particularly in the structure. The merits of many design decisions lean strongly on the teams' ability to consider a design-for-disassembly mindset which enables stage D carbon savings.

- Use of Steel: The steel used in the building's structure will be recycled upon the site's demolition.
- Consideration of brick in the façade: Brick is the main element of the proposed façade of the new residential block. Details in the façade are still being explored, brick playing a role in the decision-making process. Standard brick dimensions have been considered throughout the project.
- Design of building services: Prefabrication and modularity will be integrated into the services design to minimise waste and emissions associated with the disposal of carbon intensive MEP components.

Table 3: Summary of key Circular Economy Commitments

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction Temporary elements
Minimising the quantities of materials used	N/A	The use of materials occurring from the demolition of the existing structure in the temporary pilling mat and the use of concrete with high GGBS will result in a saving in the foundations. In particular a 70% percentage of GGBS in the substructure will be targeted.	The structural grid has been designed to enable the reduction in the tonnage of materials (concrete and steel for rebars) for the proposals. A concrete frame was selected for its structural efficiencies and has been optimised against a flexible space plan. The structural frame of the background will aim to have a minimum of 50% GGBS.	Potential for using precast façade panels is in review and will be confirmed in the following design stages.	The servicing strategy in the apartments will consider the standardisation of building services components and the potential to recover and recycle each element after the service life period.	Structural grid has been adjusted to minimise the numbers of columns and the size of the beams.	To be developed in the next stage. Standardisation for bathroom pods and kitchens will be explored at later design stages.	To be developed at later stages. Design team is investigating use of prefabricated items to reduce waste on-site

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction Temporary elements
Minimising the quantities of other resources used (energy, water, land)	N/A	Improved construction resource efficiency and regular monitoring of construction energy and water usage.	Improved construction resource efficiency and regular monitoring of construction energy and water usage.	Façade design considers a fabric-first approach improve energy performance	Services designed with energy efficiency at the forefront.	N/A	N/A	Monitor energy and water use during construction (to be detailed in next stages)
Specifying and sourcing materials responsibly and sustainably	Prioritise materials that are responsibly sourced (BREEAM Mat 03 – Responsible sourcing of materials). Prioritise materials with one of the following: EPDs, ISO14001, BES6001, FSC, PEFC. Prioritise materials with high recycled content. All timber and timber-based products used in this Development will be legally harvested and traded timber.							
Designing for reusability / recoverability / longevity / adaptability / flexibility	N/A	Structural design has been simplified to provide future flexibility for alternate uses.	Structural grid has been adjusted to maximise the opportunity for reuse of the existing steel beams The use of concrete frame reduces any opportunities for disassembly	The strength of the existing bricks and mortar is being examined by a specialist to determine to ability of reclaiming and reusing the existing bricks on the new facade. Depending on the reclamation percentage initial	The rear wall of the bathrooms could potentially be prefabricated to include toilet cisterns and plumbing connections. Where possible, material part sizes will be selected to be modular to assist	The building layout allows a simplified building services strategy with standardised components.	To be developed in the next stage	Sustainable Procurement will be produced by the contractor.

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction Temporary elements
			however enhances the teams' intention for longevity considering the projects nature.	studies indicate there may be enough bricks for the rear façade Brick on a pre-cast panel will be explored as a façade option. This can be manufactured off site and craned into place on site. Low maintenance facade materials with long lifespans are being selected to minimise need for replacement	with plant replacement. MEP items such as prefabricated risers and prefabricated pump and pressurisation skids can be used.			
Designing out construction, demolition, excavation, industrial and municipal waste arising	The reuse of materials occurring from the demolition will be explored to ensure waste during demolition is minimized		Consideration for elements that can fabricated off site, minimising waste, and offcuts.	Prefabrication of façade will improve program and reduce time (hence waste) on site. This will be reviewed by the design team and the contractor in	Most of the MEP systems are designed to be independent to ensure that these are accessible and can be maintained and replaced.	Use of products from manufactures who offer take-back schemes to be explored in later stages	Standardising the range of products and finishes will be explored over all floors to encourage the reuse of offcuts. Floors are designed to be serviced	

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction Temporary elements
				the following design stages			independently to allow future flexibility	
Demolition waste (how waste from demolition of the layers will be managed)	Excavation waste will be diverted from landfill and will be utilised off-site. To be discussed with contractor at later stages. This will be reported in the Contractor's Site Waste management plan A pre-demolition audit will be conducted to identify any opportunities for reuse and to consider how the diversion from landfill can be maximised	A majority of this will happen in the coming work stages. Not at this stage.	A pre-demolition audit will be undertaken to maximise the opportunities for material reuse, recovery and recycling.	Not at this stage.	None of the materials from demolition can be reused in the design. Most of the equipment has reached its end of life and should be recycled instead - if possible.			Site Waste Management Plan (SWMP) to be discussed with contractor at later stage.

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction Temporary elements
Excavation waste	Aim to limit excavation waste and divert from landfill. This will fall under the scope of the demolition contractor.							
Construction waste	The Development aims to limit construction waste. Modern methods of construction to reduce waste will be reviewed with the client, design team and main contractor at the next design stage. A site waste management plan will be implemented for this project to identify waste streams and re-use, recycling and reduction targets.							
Municipal and industrial waste	N/A	N/A	N/A	N/A	All the MEP equipment on site is proposed to be stripped out. A large quantity of the stripped-out equipment can be recycled. An audit into what equipment can be recycled would be beneficial.	Provide adequate space for general and recyclable waste.		

2 Introduction

This report has been produced for Woolwich Road Limited ('the Applicant') to support of the planning submission for the proposed a mixed-use residential development which partly refurbishes and partly rebuilds the Park View Road stadium for Welling United Football Club in the London Borough of Bexley DA16.

The development is located in Welling to the east of the town centre, within the London Borough of Bexley and will deliver 104 residential flats, a new stadium (with associated support accommodation) for Welling United FC, a 3G all-weather pitch, and commercial space fronting Park View Road.

This Circular Economy Statement should be read alongside the Design and Access Statement prepared by Create Architects and the Whole Life Cycle Assessment report produced by MWL, which are submitted as standalone documents.

London Plan's Policy SI 7 defines a Circular Economy design approach 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.

Currently, the construction industry utilises a linear approach, following the 'take-make-use-dispose' model, where raw materials are extracted, then transformed into products, transported, installed, used and at their end-of-life stage they are disposed as waste. Circular economy moves away from this current linear model to a model where resources are kept in use, their value is retained and materials can be reused, recycled or remanufactured.

2.1 Method Statement

This Circular Economy Statement has been developed in response to the planning policy requirements set by the London Plan, Policy SI7 and follows the methodology stipulated by the GLA's Guidance on Circular Economy Statements (see section 3.2).

2.2 Consultation

During regular design meetings the above team, along with the greater project team, have met and incorporated circular economy principles into the strategy throughout, particularly in relation to the actions taken to reduce carbon found in the Whole Life Cycle Carbon Report by MWL.

A workshop has been held with the design team to further engagement around circular economy principles and ensure that they are at the forefront of decision making in further design stages. Additionally, the team has been engaged through a Request for Information (RFI) to provide information regarding current ambitions for integrating circular economy principles into the development. The information collected has been incorporated into this report.

2.3 Circular Economy Aspirations

The strategic approach for the proposed Development is to prioritise flexibility, waste reduction, and off-site construction, and to incorporate circular design principles into Stage 3. The design team has worked in conjunction with ambitious carbon targets to incorporate circular economy strategies into all decision-making processes.

The key pillars of the design development which demonstrate the Circular Economy aspirations of the Development are outlined below:

- Lean approach to building design with materials minimised wherever possible in balance with flexible space, embodied carbon, program, and operational energy considerations
- Design prioritises use of materials that can be reused from other existing sites and that can also be reused at the end of life of this development
- Design of building services: Prefabrication and modularity will be considered for into the services design to minimise waste and emissions associated with the disposal of carbon intensive MEP components
- Potential prefabrication of the following building elements:
    - Façade
    - Kitchens
    - Bathrooms
- Specify materials with recycled content and aim to specify materials from manufacturers who offer take-back schemes.
- Consider layers off the building to be designed to be independent, to allow for future replacement and maintenance to minimise waste
- Reduce resources including energy, water and land.

- Design for durability, longevity and flexibility, to keep building elements and materials in use for longer and enable flexible fit-out arrangements without significant alterations and waste generation.
- Prioritise materials that are responsibly and sustainably sourced.

The Circular economy aspirations of the proposed Development are also aligned with the Whole Life Cycle Assessment produced for the proposed Development, which is submitted in support of this planning application as a standalone document.

Figure 1. Proposed development

3 Planning Policy Requirements

This Circular Economy Statement has been prepared for the proposed Development, in accordance with the planning policy requirements stipulated by the planning policy documents outlined below:

- London Plan, published in March 2021
- GLA Guidance on Circular Economy Statements, March 2022.

3.1 London plan, March 2021

The new London Plan aims to promote circular economy principles and sets policy requirements to enable a transition towards a circular approach in the built environment.

Policy SI 7 Reducing waste and supporting the circular economy, aims to:

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

Policy SI 7 requires referable applications to promote circular economy outcomes and aim to be net zero-waste.

A Circular Economy Statement should be submitted, to demonstrate:

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

3.2 GLA Guidance on Circular Economy Statements, March 2022

The Guidance on Circular Economy Statements, was published by GLA in March 2022, provides the structure and minimum content that a Circular Economy Statement should cover to fully address the requirements of the Policy SI 7 of the London Plan.

This document provides guidance for Circular Economy Statements to ensure that applicants seeking planning permission for major schemes:

- Consider strategies to facilitate the transition towards a circular built environment
- Report against numerical targets that will facilitate monitoring of waste and recycling; and
- Recognise opportunities to benefit from greater efficiencies that can help to save resources, materials, and have economic benefits.

Post-Planning Updates to the Circular economy Statement should be provided at RIBA stages 5 and 7 to present the progress in meeting the targets and commitment during the construction phase. The need for updates will be determined during the application process.

Objective	Targets

Achieve performance targets set by Policy SI 7 of the London Plan	• Non-hazardous waste to be diverted from landfill targeting the following minimum rates:
	  ○ Demolition = 95% by tonnage
	  ○ Construction = 95% by tonnage
	• Municipal waste: meet or exceed the 65% recycling target by 2030.
	• Recycle content: Aim to specify materials with a 20% recycle content as a minimum, where feasible and available to the market.

4 Circular Economy Goals and strategic approach

The Circular Economy Targets for the development are outlined in Table 4 below. In addition to these commitments and the Developments Circular Economy Aspirations, the development will also:

- Manage operational waste in line with the waste hierarchy (see figure 3)
- Meet or exceed the business waste recycling target of 75% (by weight/tonnage) by 2030

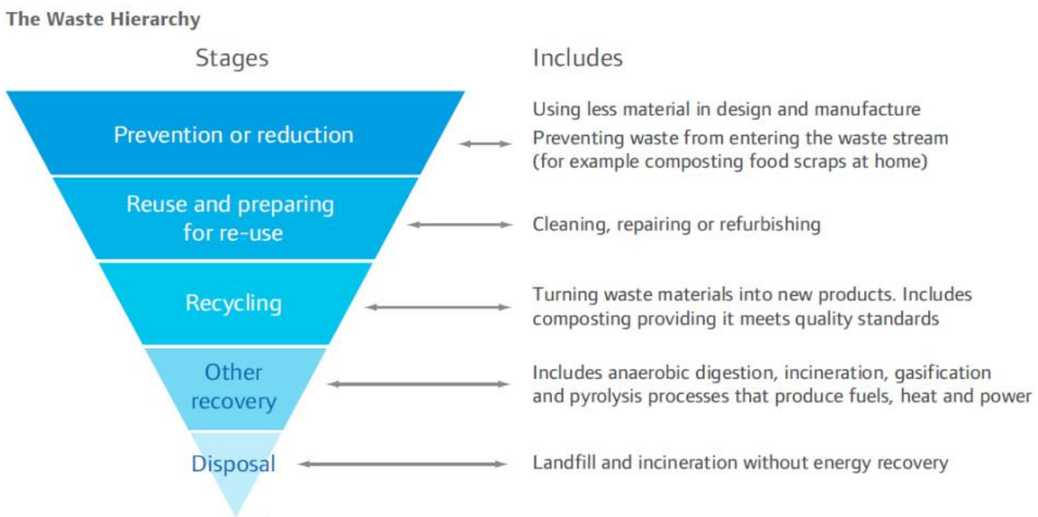

Figure 2: The Waste Hierarchy – London Assembly Waste Management

The strategic approach for the proposed Development is to demolish part of the existing structures, and constructing a new building residential block towards Park View Road, with the aim to maximise the reuse of resources on-site and off-site. The Development's strategic approach to implement Circular Economy principles is illustrated in table 4.

Table 4: Circular economy targets and commitments

Circular economy targets for existing and new development	Policy Requirement	Target Aiming For (%)	Policy Met?	Explanation (How will performance against this metric be secured through design, implementation and monitoring?)
Demolition waste materials (non-hazardous)	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	95%	Yes	Pre-demolition audit will be produced, communicated and coordinated with the demolition contractor
Excavation waste materials	Minimum of 95% diverted from landfill for beneficial reuse.	95%	Yes	The excavation waste requirements and targeted will be passed onto the relevant contractor, further details to be confirmed in Stage 3 & 4.
Construction waste materials	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	95%	Yes	The construction waste requirements and targeted will be passed onto the relevant contractor, further details to be confirmed in Stage 3 & 4
Municipal waste	Minimum 65% recycling rate by 2030.	65%	Yes	Municipal waste storage details can be found in paragraph 8.3 of the DAS.
Recycled content	Minimum 20% of the building material elements to be comprised of recycled or reused content.	20%	Yes	Recycled content requirements to be detailed in tender documentation and throughout procurement phase. Further details to be confirmed in Stage 3 & 4
Reserved Matters Reporting	A condition will be attached to an approval of a	It is accepted that the Reserved matters		Timeframe and Responsible party to be confirmed.

	referable outline planning permission, securing the submission of a CE Statement as a reserved matter. Applications for reserved matters will be required to review and address the information provided at outline stage and update any default values used as far as possible.	reporting will be conditioned	

To maximise the circular economy principles a pre-demolition audit will be carried out to identify options for reuse or recycling of existing materials and divert resources from landfill. The strategic approach for the new development is detailed in Table 5.

Table 5: Circular economy strategic approach

	Phase/ Building Area	Steering Approach	Notes
Circular Economy Approach for the Development	Skin	New skin	A robust low maintenance brickwork facade is being utilised which should not require regular access for maintenance.
Circular Economy Approach for the Development	Sub-structure	New sub-structure	High percentage of GGBS will be specified for the substructure concrete.
	Super-structure	Design for longevity, adaptability	Building elements and spatial configuration have been designed to maximise flexibility and adaptability.
	Skin	Design for longevity, adaptability	
	Space	Design for adaptability and flexibility	
Circular Economy Approach for Municipal Waste during operation	All areas	Enable recycling and diversion of waste from landfill during operation	Adequate space for storing and separation for waste streams has been integrated in the design, to include waste facilities at appropriate location and size to suit the needs of the Development during operation.

5 Circular Economy commitments

5.1 Key Commitments

The design team explored several options to maximise opportunities for implementation of circular economy principles in the design proposals, considering each building layer. Table 6 presents the Circular Economy Commitments Reporting template, which outlines the key circular economy principles and commitments that have been incorporated in the design of each building layer.

Table 6: Circular Economy Commitments Reporting template

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
Section A: Conserve Resources												
Minimising the quantities of materials used	Redevelopment of an existing site, with part of the existing structures being retained.		GGBS up to 70% by weight may be used for replacement cement, provided the required concrete cube strength is not compromised. The use of recycled aggregates is permitted provided they comply with BS 8500-2:2006.	Specification of durable materials, such as brick and anodised aluminium which require less maintenance and replacement with the aim to reduce material usage in later stages of the building's life cycle. The design will aim to specify materials with recycled	A similar strategy will be serving each flat. A standardised solution will enhance the opportunities for offsite fabrication and reduction of waste.		No part of the current scope.		Design for durability. Aim to specify materials with high recycled content.	Optimise materials efficiency. Specify materials with high recycled content.	The architects, structural engineers and MEP engineers to explore further options for materials with high recycled content in the next design stages.	Review in RIBA stages 3 and 4.

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
				content which will be explored in more detail at the next project stages. The brick bonding pattern will be designed to avoid brick cuts and hence waste.								
Minimising the quantities of other resources used (energy, water, land)		N/A	N/A	High performance building envelope to reduce energy demand.	Design for energy efficiency. Efficient water fittings	Internal space configuration maximises the access to daylight in the main areas of each apartment reducing the need for artificial lighting	N/A	Redevelopment of an existing site	**Highly efficient building envelope and building services systems to reduce energy demand.** **Efficient water fittings to reduce water consumption.** **Monitor construction stage activities.**	Assess whole life cycle impacts of the proposed design.	The architect and structural engineer to develop specifications in line with the LCA which is carried out for the development for compliance with the RICS PS methodology and the draft GLA Guidance on Whole life cycle	Review in RIBA stage 4

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
											assessments (March 2022).	
Specifying and sourcing materials responsibly and sustainably	The proposed Development will aim to prioritise materials that are responsibly sourced,. This will be further explored in the next design stages, when materials specifications will be developed further. Prioritise materials with one of the following: EPDs, ISO14001, BES6001, FSC, PEFC. Prioritise materials with high recycled content (see Bill of Materials template). The requirement for responsible sourcing of materials should also be included in the main contractor's responsibilities at construction stage. The team will also develop a Sustainable Procurement Plan. All timber and timber-based products used in this Development will be legally harvested and traded timber.									Aiming for higher recycled content may limit supply chain.	The design team to engage with the supply chain in RIBA stages 3 and 4.	Review in RIBA stages 3 and 4. Early engagement with the supply chain.
Section B:DESIGN TO ELIMINATE WASTE (AND FOR EASE OF MAINTENANCE)												
Designing for reusability / recoverability / longevity / adaptability / flexibility	N/A	N/A	N/A	The proposed facades have been designed for durability, allowing a long lifespan. Specification of materials from manufacturers who provide a take-back scheme will be explored in the next design stages.	Systems with appropriate capacity to satisfy the needs of different future needs.	The development will be delivered to a Cat A standard, with the fit-out being carried out by the future tenants. For elements provided the specification will seek to prioritise materials from manufacturers	N/A.	Sustainable Procurement Plan which the contractor will be required to produce	The proposed design aims for longevity and durability	Enable recoverability or recyclability of the specified materials.	The architect, structural engineer and MEP engineer to engage with the supply chain to explore the use of the recyclable/ reusable materials. Plant and façade replacement strategies also	Review in RIBA stages 3 and 4. Early engagement with the supply chain.

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
						who provide a take-back scheme will be explored in the next design stages.					to be developed.	
Designing out construction, demolition, excavation, industrial and municipal waste arising	-					Aim to utilise products from manufactures who offer take-back schemes. Explore opportunities for pre-fabrication in the next design stages.	N/A	-	**Explore options for materials take-back scheme arrangements with manufacturers.**	Maximise opportunities for prefabrication of additional elements. Identify manufacturers which offer take-back schemes.	The design team to further explore options for incorporating prefabricated elements in the next design stages and engage with the supply chain to identify manufacturers that offer take-back schemes.	Review during RIBA stage 3 and 4. Early engagement with the supply chain.
SECTION C: MANAGE WASTE												
Demolition waste (how waste from demolition of the layers	Excavation waste will be diverted from landfill and will be utilised off-site. The	Demolition waste will be diverted from landfill and will be utilised off-site.	Potential to reuse existing crushed concrete as recycled aggregates.	Potential for reuse or recycling. Undertake a Pre-	Limited potential for reuse as the existing services have	Potential for reuse or recycling. Undertake a Pre-Demolition Audit		Site Waste Management Plan (SWMP) will be produced by the contractor.	**Pre-demolition audit will be undertaken, targeting diversion from landfill to meet**	Achieve the targeted rates for diversion of demolition materials from landfill.	Demolition contractor to carry out works in accordance with the Pre-	The demolition contractor to record waste generation

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
will be managed)	contractor will be required to co-ordinate this.	Potential to reuse existing crushed concrete as recycled aggregates.		Demolition Audit	reached their end-of-life stage. Undertake a Pre-Demolition Audit				**the following rates:** **95% by tonnage**		Demolition Audit.	during this period and enable
Excavation waste (how waste from excavation will be managed)	Aim to limit excavation waste and divert from landfill. This will fall under the scope of the demolition contractor.									Identify opportunities for reuse of excavation waste.	The contractor to explore options to utilise excavation waste off-site.	The contractor to record waste generation during excavation works.
Construction waste (how waste arising from construction of the layers will be reused or recycled)	The Development aims to limit construction waste by adopting modern construction methods. A site Waste Management Plan will be produced.								**Limit the amount of construction waste.**	Set targets for construction waste generation.	The contractor to monitor construction waste generation throughout the construction phase.	The contractor to monitor construction waste generation throughout the construction phase.
Municipal and industrial waste (how the design will support operational	N/A	N/A	N/A	N/A	N/A	The design incorporates adequate space for general and recyclable			**Appropriately sized refuse storage to enable recycling and best practise**	Predict the waste streams which will be generated during the	The architect to implement best practice guidelines for provision of recycling	Review during RIBA stage 3 and 4.

	Site	Substructure	Super-Structure	Shell / Skin	Services	Space	Non-fitted elements	Construction – temporary structures	Summary	Challenges	Counter Actions + Who + When	Plan to Prove and Quantify
waste management)						waste and allow for segregation of the various waste streams and enable future tenants to recycle waste generated during the building's operation.			**waste management.**	building's operation.	storage space to enable future occupiers to recycle waste.	

5.2 Bill of Materials

Table 5 below presents the Bill of Materials template, which demonstrates the material intensity, recycled and reused content of each building layer.

Table 7: Bill of Materials template

Layer	Element	Material quantity (tonnes)	Material intensity (kg/m² Gross Internal Area	Recycled content (% by value)	Reused content (% by value)	Resource
Structure	Foundation	Residential block 510m3 C25 concrete and 24,300kg rebar WFC 229m3 C25 concrete and 7,350 kg rebar	Unknown as project has been designed to RIBA Stage 2 only. Subject to design development with the client and design team.	TBC (Target is >20% over the development)	N/A	Quantity Surveyor
	Floors	Residential block 1,995m3 C25 concrete and 79,800kg rebar WFC 33m³ C25 concrete and 600kg rebar/ 15m³ timber		TBC (Target is >20% over the development)	N/A	Quantity Surveyor
	Roof	Residential block 340m³ C25 concrete 14,000kg rebar WFC 1Tonne steel 10m3 timber		TBC (Target is >20% over the development)	N/A	Quantity Surveyor
	Structural frame (Concrete)	Residential block 700m³ C25 concrete and 28000kg rebar WFC 70m3 C25 concrete and 2100kg rebar 2Tonne steel		TBC (Target is >20% over the development)	N/A	Quantity Surveyor
	Structural frame (core)	N/A		N/A	N/A	N/A
Shell/Skin	Cladding	Unknown as project has been designed to RIBA		-	N/A	N/A

	Windows	Stage 2 only. Subject to design development with the client and design team.			N/A	N/A
	Curtain walling				N/A	N/A
Space	Partitions			-	N/A	N/A
	Ceilings			-	N/A	N/A
	Floor Finishes			-	N/A	N/A

5.3 Circular Economy Narrative

Implementation of Circular economy principles into the proposed Development has been explored by the design team. The Development involves the construction of a new building which aspires to enable its use for longer, offering flexible and adaptable space, which has been designed in accordance with the needs of the occupiers but can also accommodate other uses in the future, without the need for major alterations and significant waste generation.

The Circular Economy strategy for the proposed Development is outlined below (also summarised in the Key Commitments template in section 5 of the report).

- Minimising quantities of materials and resources
  - The proposed Development will aim to minimise waste generated during the construction process through the implementation of the waste hierarchy (reduce, reuse, recycle, recover).
  - The structural design will incorporate use of GGBS (up to 70% by weight) used for cement replacement, provided the required concrete cube strength is not compromised. Recycled aggregates will also be used, in accordance with BS 8500-2:2006
  - Durable materials, that require less maintenance and replacement to reduce materials used in later stages of the building's life cycle will be specified.
  - The design will aim to specify materials with recycled content. This will be explored at the next stages, when the design and specification of materials will be developed in further detail.
  - The brick bonding pattern will be designed to avoid brick cuts and hence waste.
  - The various layers of the building (i.e. building components with different lifespan) will be designed to be independent to allow for future replacement and maintenance without creating waste.
  - The specification will include a standardised range of products and finishes over all floors to encourage the reuse of offcuts.
- Minimising other resources used

The proposed Development will be designed and constructed to reduce the use of resources other than materials, including land, energy and water.

  - The proposed scheme involves the redevelopment of a previously developed site, thus prevents urban sprawl and the use of greenfield land.
  - The energy strategy for the proposed Development has been designed as an all-electric solution and has prioritised measures for energy demand reduction in line with the Mayor's energy hierarchy. The proposed energy strategy is described in detail in the Energy Statement, which has been submitted in support of this planning application as a stand-alone document, combines energy efficiency measures and low and zero carbon technologies to reduce the energy consumption of the Development.
  - The proposed Development will reduce potable water demand through the specification of efficient water fittings and water leakage detection systems.
  - The Development also aims to reduce unregulated water demand, incorporating efficient irrigation system and plants with low water demand.
- Specify and source materials and other resources responsibly and sustainably

The proposed Development will aim to source materials responsibly and sustainably as follows:

  - All timber and timber-based products used in the Development will be legally harvested and traded timber
  - New materials with responsible sourcing certificates will be prioritised, where available to the market
  - A sustainable procurement plan will be produced during Concept Design Stage to ensure materials are sourced sustainably and responsibly
  - Procurement of local materials will be prioritised, where feasible
- Design for longevity, adaptability or flexibility and reusability or recoverability
  - The proposed design will provide adequate protection of exposed elements of the building to minimise the frequency of replacement and maximise materials optimisation.
  - Materials specified in areas with high pedestrian traffic (such as the main entrance, circulation areas) and areas with vehicular access will be durable and will incorporate adequate measures to protect materials from damage.
  - The steel used in the structure can be recycled, if future design alterations occur. Similarly, the concrete has the potential of being re-used as it can be utilised as recycled aggregates.
  - The proposed design allows access to building services for maintenance and replacement without generating waste. A plant replacement strategy will be developed.

The proposed Development will maximise the use of existing resources and materials, where feasible and will minimise waste generated during the demolition and construction process through the implementation of the waste hierarchy (prevent, reuse, recycle, recover, dispose). The proposed design will also enable sustainable management of operational waste, providing dedicated, clearly labelled, accessible and of appropriate

capacity storage spaces for non-recyclable and recyclable waste generated by the building's occupants.

The proposed design proposals have incorporated measures to address the principles of circular economy related to waste management as outlined below:

- Design out construction, demolition, excavation and municipal waste arising
  - Demolition waste will be sustainably managed in line with the pre-demolition audit produced for the Development, to ensure opportunities for reuse or recycling of existing materials are maximised.
  - The super structure will consist of recyclable materials (i.e. steel and concrete), designing out waste to landfill at the end of life stage.
  - The amount of municipal waste generation will be related with the activities of the future tenants, as such it is not controlled by the design proposals. The proposed design provides dedicated space is for the segregation and storage of operational general and recyclable waste volumes generated by the building occupants' and activities during operation.
- Manage demolition waste
  - A pre-demolition audit of the existing buildings on-site will be carried out. This audit will identigy existing materials that can be reused or recycled of-site and concluded that determine the percentage of demolition materials which will be diverted from landfill, aiming for diversion rates of 90% by volume or 95% by tonnage, as a minimum.
- Manage construction waste
  - The construction waste will be sorted into separate key waste groups either on-site or through a licensed contractor for recovery.
  - A Resource Management Plan (RMP) will be developed and implemented according to best practice with the aim to reduce and manage the construction site waste effectively.
  - Construction waste will be reduced and diverted from landfill where technically and economically feasible, to meet the targets set by Policy SI 7 of the London Plan 2021 and the Circular Economy Guidance (March 2022). Non-hazardous construction waste will be diverted from landfill. The diversion from landfill rates should be as a minimum:
    - Demolition waste = 95% by tonnage
    - Construction waste = 95% by tonnage
- Manage municipal waste
  - The proposed Development will also adhere to an operational waste management plan which will include estimates of volumes and types of waste that will be generated during operation. The operational waste management plan will include proposed means for waste separation, recycling, movement within the development and their storage, locations and sizes of storage areas, access for waste and recycling collections, measures to keep all waste off-street, any arrangements for collection and disposal of special waste, use of compactors and baler (if applicable) and any on-site equipment to process waste. Adequate, dedicated, clearly labelled, accessible and of appropriate capacity storage spaces for non-recyclable and recyclable waste generated by the building's occupants will be provided at the ground floor level of the development to enable adequate management of operational waste.

5.4 Plans for Implementation

This section outlines the plans for implementing the proposed Circular Economy strategy for the proposed Development.

- Specific plans for short- and medium-term targets

The short-term and medium-term targets of implementing the proposed Circular Economy strategy relate to actions to be undertaken during the current stage (RIBA stage 2) and next design stages (RIBA stages 3 and 4), including the following:

Table 8: Implementation plan for short-term and medium-term targets

Action	Responsible party	Timeframe	Monitoring/verification mechanism
Develop a Sustainable Procurement Plan.	Project manager / Architect/ Contractor	Prior to the commencement of RIBA Stage 4	Report progress prior to the commencement of RIBA stage 3.
Liaise with specialist contractors to sustainably manage excavation waste, if on-site reuse is not possible.	Project manager	RIBA Stages 3	Report progress at the end of RIBA stage 3.
Liaise with specialist pre-cast concrete contractors to determine the percentage of recycled	Structural engineers	RIBA Stages 3	Report progress at the end of RIBA stage 3.

content of the pre-cast concrete slabs.			
Engage with the supply chain to identify materials with responsible sourcing certificates.	Architects Structural Engineers	RIBA Stages 3 and 4	Report progress at the end of RIBA stage 3 and stage 4.
Engage with the supply chain to identify materials with recyclable content as per the targets set in the Bill of Materials, or better.	Architects Structural Engineers	RIBA Stages 3 and 4	Report progress at the end of RIBA stage 3 and stage 4.
Explore options for maximising the employment of off-site manufacturing and prefabrication.	Architects Structural Engineers MEP engineers	RIBA Stages 3 and 4	Report progress at the end of RIBA stage 3 and stage 4.
Engage with the supply chain to identify manufacturers who offer take-back schemes.	Architects MEP engineers	RIBA Stages 3 and 4	Report progress at the end of RIBA stage 3 and stage 4.
Produce tender documentation for the main contractor that include detailed requirements for the circular economy performance metrics.	Architects Structural Engineers MEP engineers	RIBA stage 4	Report progress at the end stage 4.

5.5 Programme / method for longer-term targets

The long-term targets of implementing the proposed Circular Economy strategy relate to actions to be undertaken during the during the construction and operational phase of the Development, including the following:

Table 9: Implementation plan for long-term targets

Action	Responsible party	Timeframe	Monitoring/verification mechanism
Develop a Site Waste Management Plan.	Contractor	Before commencement of works on-site	Report
Achieve the targets set for waste generation during demolition in line with the Pre-Demolition Audit.	Strip-out contractor	Demolition phase	Monthly reporting of performance against metrics targets.
Achieve the targets set for waste generation during construction and diversion of waste from landfill.	Main contractor	Construction phase	Monthly reporting of performance against metrics targets.
Produce documentation for the building users to explain the design strategy related to Circular Economy to enable them to operate the building effectively and reduce waste during operation.	Main contractor	Handover period	Include this requirement in the tender documentation.

5.6 End-of-life strategy

In line with Circular Economy principles, the proposed design intends to extend the lifetime of the Proposed Development through careful design and specification and enable flexibility, adaptability and recyclability, based on the measures listed in the previous sections. bThe end-of-life strategy scenarios for the proposed Development, which are outlined, have also been captured in the Whole Life Cycle Assessment (WLCA), which has been produced for the Development by MWL and has been submitted in support of this planning application as a standalone document.

5.7 Recycling and Waste Metrics

Table 10 presents the Recycling and Waste Metrics template, which demonstrates the targets set for the proposed Development.

Table 10: Recycling and Waste Metrics template

Category	**Total Estimate**	**Of which:**			**Source of Information**
	t/m² Gross Internal Area (GIA)	**% Reused or Recycled On-Site**	**% Reused or Recycled Off-Site**	**% Not reused or Recycled max**	
				% to Landfill / **% To other management (e.g. incineration)**	
Excavation waste	The amount of excavation waste will be determined in RIBA stage 3.	Aim for 95% diversion of waste from landfill as per Policy SI 7 of the London Plan.		5% target	
Demolition waste	(density of materials is currently unknown and as a result weight cannot be determined with the current level of information. Tonnage of demolition materials will be determined in the next design stages as more information is available)		100%		Pre-Demolition Audit
Construction waste	7.5 $m^3/100m^2$ or 6.5 tonnes/$100m^2$	Aim for 95% diversion of waste from landfill as per Policy SI 7 of the London Plan 2021. This will be defined further when the Site Waste Management Plan will be produced by the contractor.		5% target	Site Waste Management Plan will be produced by the contractor.
	Tonnes/Annum	**% Reused On or Off Site**	**% Recycled or Composted, On or Off Site**	**% Not reused or Recycled max**	
				% to Landfill / **% to Landfill**	
Municipal waste	To be determined in the next design stages.	*65%*		Target: maximum 35% and **no** recyclable or compostable waste to landfill	

6 Conclusions

This Circular Economy Statement was produced in support of the planning application submitted for the proposed Development.

This report demonstrated how Circular Economy principles have been embedded in the design strategy for the proposed development aiming to maximise opportunities for design for longevity, adaptability and flexibility, in line with Policy SI 7 of the London Plan and following the GLA's draft Guidance on Circular Economy Statements.

The key circular economy aspirations of the proposed Development are summarised below:

- Optimise materials used in the sub-structure and super structure. Design for durability and adaptability, by reducing the number of columns in the floor plate to maximise flexibility.
- Specify materials with recycled content and aim to specify materials from manufacturers who offer take-back schemes.
- Reduce resources other than materials and including energy, water and land, as the proposed scheme utilises a pre-developed site.
- Design for durability, longevity and flexibility, to keep building elements and materials in use for longer and enable flexible fit-out arrangements without significant alterations and waste generation.
- Prioritise materials that are responsibly and sustainably sourced.
- Manage waste sustainably and at the highest value, including demolition, construction and municipal waste.

The Circular economy aspirations of the proposed Development are also aligned with the Whole Life Cycle Assessment produced for the proposed Development, which is submitted in support of this planning application as a standalone document.