Circular Economy Statement

Hyde Park, Hayes

Prepared for Columbia Threadneedle Investments

Report No. 12421-WCL-ZZ-ZZ-RP-Y-0005

Revision 03

17 October 2025

Contents

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01	14/05/2025	Preliminary Issue for Comment	EH	KV
02	19/06/2025	Updated following pre-app	EH	KV
03	08/10/2025	Following GLA memo comments	EH	KV

Executive Summary

This Circular Economy Statement has been prepared by Whitecode Consulting Ltd on behalf of Columbia Threadneedle Investments ('the Applicant') in support of an application for outline planning permission for the redevelopment of Hyde Park, Hayes ('the Site') within London Borough of Hillingdon ('LBH').

The description of the development is as follows:

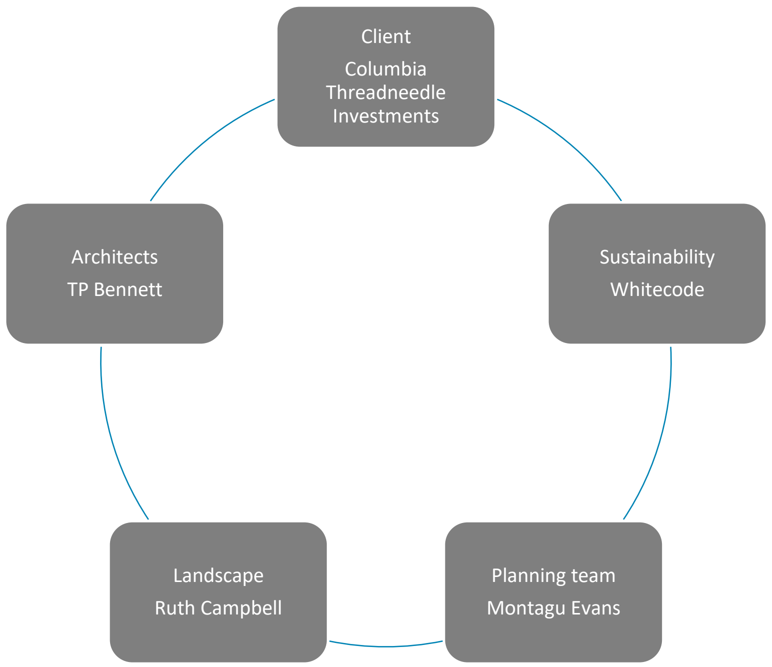
Outline planning permission (with all matters reserved excluding access) for demolition of existing buildings (above basement level) and delivery of residential development (Class C3), flexible residential / commercial floorspace, new public realm, landscaping, play space, car parking, cycle parking and associated works

The total site area is 2.47ha.

The purpose of this document is to show the scheme meets the requirements of Policy SI7 of the London Plan 'Reducing waste and supporting the Circular Economy' and the following circular principles

- 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 wate to landfill by 2026
- meet or exceed the municipal waste recycling target of 65% by 2030
- meet or exceed the targets for each of the following waste and material streams
    - construction and demolition – 95% reuse/recycling/recovery
    - excavation – 95% beneficial use
- design developments with adequate, flexible, easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (card, paper, mixed plastics, metals, glass) and food.

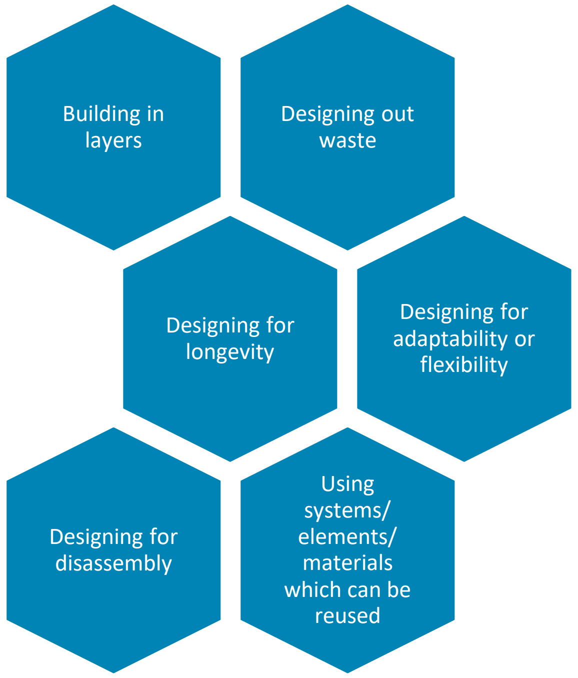
The design team has met and discussed the strategy at whole life-cycle carbon (WLC) and circular economy workshops which took place in November 2024 and continued through design development to ensure the principles were intrinsic to the scheme. The team have had further circular economy workshops to discuss the reports required to support this statement at pre-commencement stage. It is important that circular economy principles are embedded at the start of the project and throughout the RIBA stages to fully realise the benefits of this approach. The organisations engaged in the development, design and delivery of this scheme are shown below:



This report promotes circular economy outcomes and aims to be net-zero waste by demonstrating:

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

There are six principles that support the circular economy and underpin the overall circular economy methodology, GLA Circular Economy Guidance March 2022.



The report and GLA circular economy template show how the development at Hyde Park, Hayes will be achieving this. The report shows the strategic targets presented in GLA Table 1, the detailed commitments and strategies are covered in GLA Table 2 and explored in further detail in the circular economy narrative.

The key to the success of circular economy principles is to ensure the effective implementation of the strategies into the design drawings and specifications. This will be achieved by completing the required supporting documents, regular review of the circular economy statement at each RIBA stage through workshops and the integration with the BREEAM requirements and the BREEAM AP on site.

As the document supports an Outline Planning Application. The strategy has been developed in line with the Outline Planning application guidance requirements for applications of this type and the Outline planning application stage tab of the supporting GLA CE template in order to meet the requirements of London Plan Policy SI7 'Reducing waste and supporting the circular economy' within the context of the constraints applicable at the Site. A condition will be attached to an approval of a 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.

The proposed development lies in the London Borough of Hillingdon. The London Borough of Hillingdon Local Plan Part 1 sets out the overall level and broad locations of growth up to 2026. It comprises a spatial vision and strategy, strategic objectives, core policies and a monitoring and implementation framework with clear objectives for achieving delivery.

- SO8: Protect and enhance biodiversity to support the necessary changes to adapt to climate change. Where possible, encourage the development of wildlife corridors.
- SO10: Improve and protect air and water quality, reduce adverse impacts from noise including the safeguarding of quiet areas and reduce the impacts of contaminated land.
- SO11: Address the impacts of climate change and minimise emissions of carbon and local air quality pollutants from new development and transport.

These policies are supported by more detailed policies and allocations set out in the Local Plan Part 2 as follows.

- Policy DMEI2: Reducing Carbon Emissions
- Policy DMEI3: Decentralised energy

Tackling climate change will also require a move towards more sustainable energy sources and the local plan seeks to support the development of decentralised energy systems, including the use of low-carbon and renewable technologies and the greater utilisation of energy generated from waste.

1. Introduction

1.1 Existing site

Hyde Park, Hayes consists of a 10-acre mixed use commercial campus located within the Hillington area of Middlesex. The site is located between Millington Rd, approximately 0.4 miles South West of Hayes and Harlington train station and approximately 2.8 miles North East of Heathrow Airport.

The footprint of the area within the extent of the audit is approximately 5.58 acres/22,600m2.

HPH2

Estimated to have been constructed circa 2010, the building primarily consists of structural concrete construction, with cassette profile metal wall panels and façade windows/doors. Internally the 2-storey building is predominantly made up of open plan offices and communal staircases & lobbies.

HPH5

Estimated to have been constructed in 2014, the building primarily consists of a structural concrete frame and masonry/composite floor slab and profile steel decking construction, with cassette profile metal wall panels and façade windows/doors. Internally the 4-storey building is predominantly made up of open plan offices with communal staircases, lobbies and a basement car park.

Multi-Storey Car Park (MSCP)

Estimated to have been constructed circa 2000, the building primarily consists of structural concrete construction with cassette profile metal wall panels. Internally the 4-storey building is predominantly made up of vehicle parking bays and communal staircases.

1.2 Proposed site

The Description of the development is as follows:

Outline planning permission (with all matters reserved excluding access) for demolition of existing buildings (above basement level) and delivery of residential development (Class C3), flexible residential / commercial floorspace, new public realm, landscaping, play space, car parking, cycle parking and associated works

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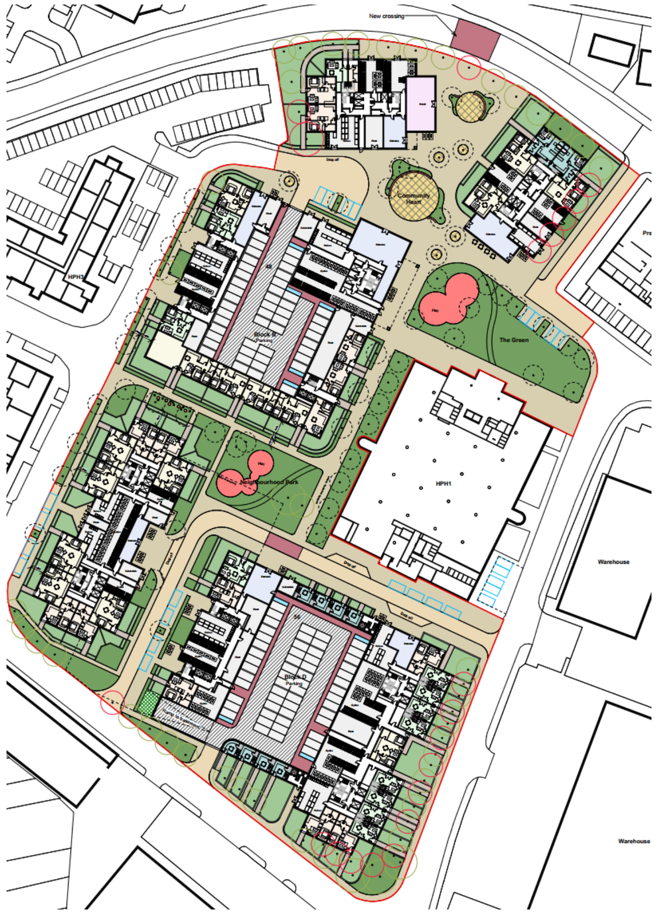
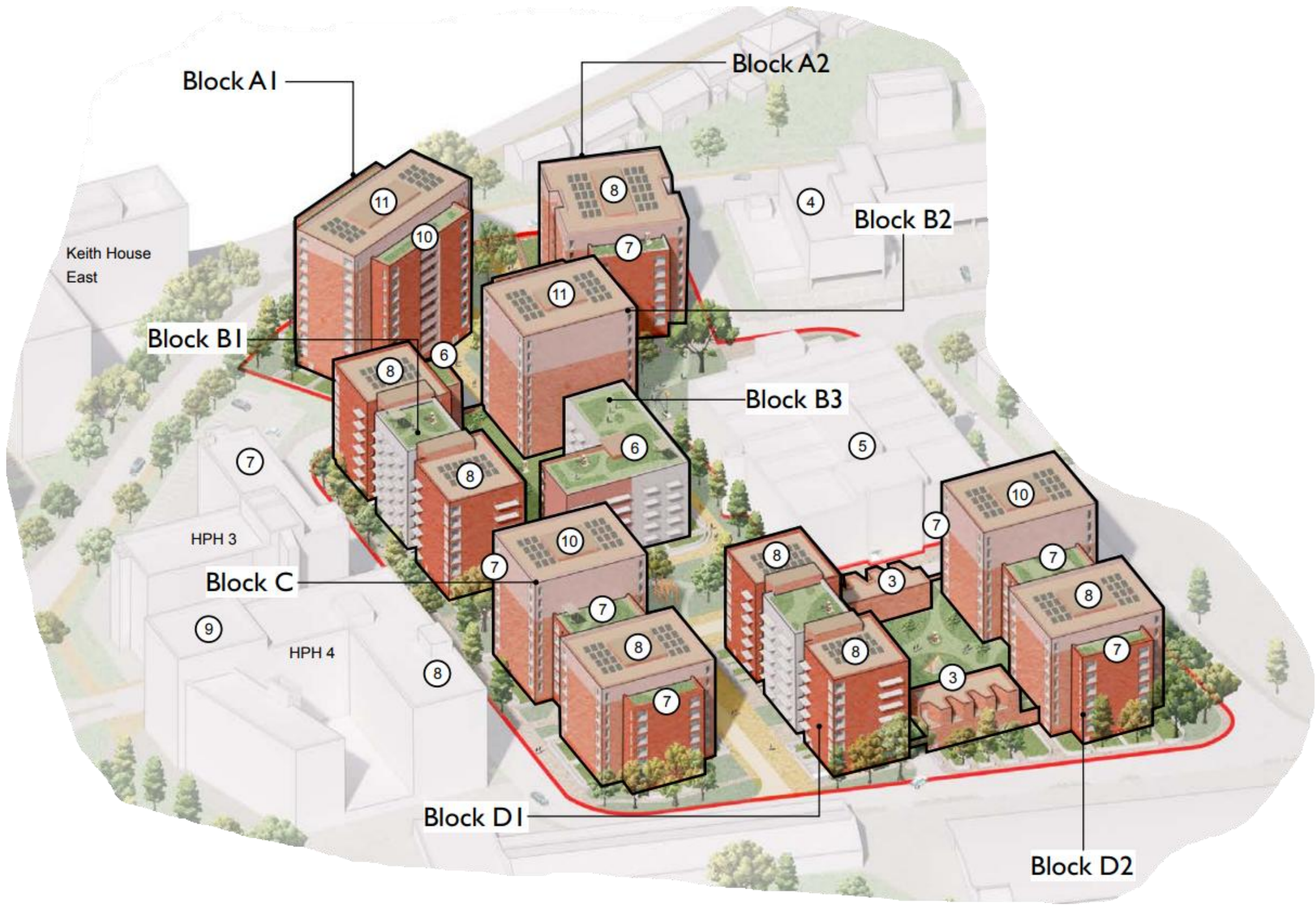


Figure 1.1: Proposed site plan

The proposed accommodation schedule is as follows:

- Use Class C3 around 61,810m^2 GIA
- Use Class E up to 150m^2

The images below show the indicative massing of the scheme.



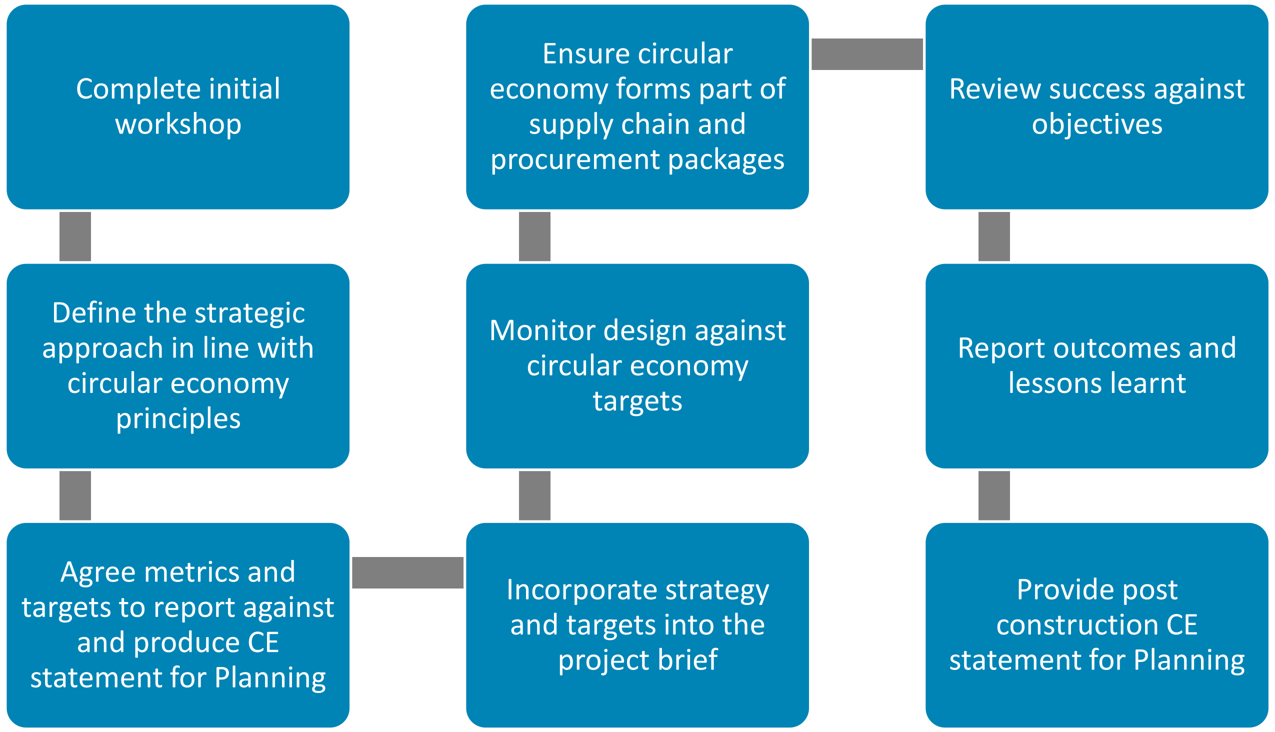
1.3 Method statement

The circular economy statement summarises the principles of circular economy and how the design team have worked collaboratively from the outset to ensure an integrated approach. A circular economy workshop was held in November 2024 and included the following members of the design team. Further follow up sessions were completed where necessary, including pre-commencement meetings to further discuss the evidence required.

- Columbia Threadneedle – client
- TP Bennett – architects
- Ruth Campbell – landscape architects
- Whitecode – sustainability
- Montagu Evans – planning

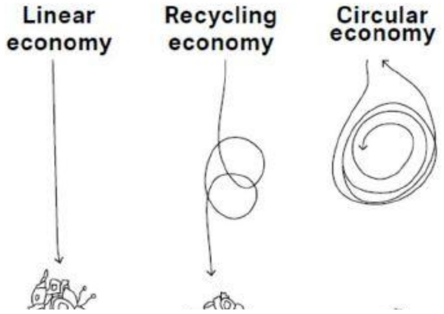
The aim of the workshop was to introduce the team to circular economy principles, assign responsibilities and set up strategic targets for the RIBA stages. The potential for reuse and recycling across all disciplines was discussed and documented.

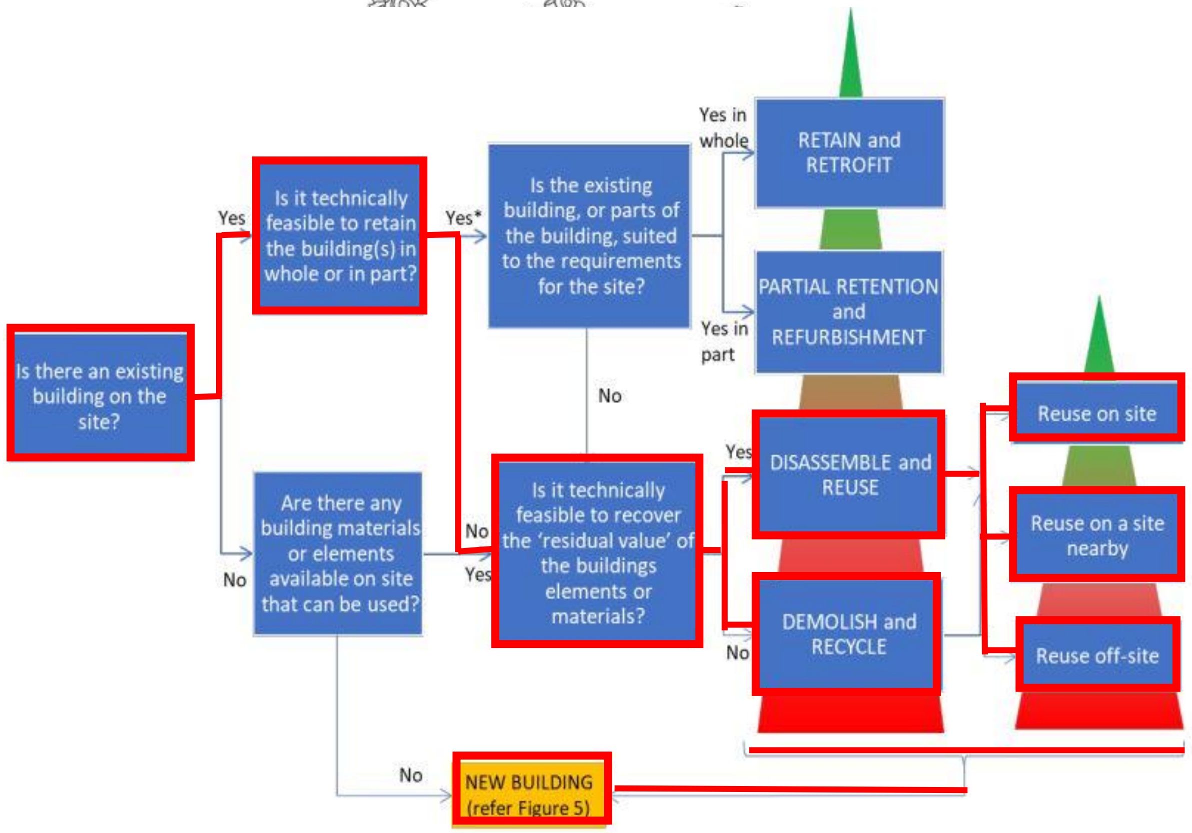
The key steps shown below will be followed to ensure successful implementation of the circular economy principles throughout the project.



1.4 Circular economy aspirations

Circular economy is a holistic economic model which aims to move away from the linear based model of "take, waste and make" to one where everything is engineered to be constantly reused or recycled through a regenerative cycle. The concept of circular economy also requires the construction industry to go beyond the reduce, reuse and recycle and aims to maximise total material resources efficiency.





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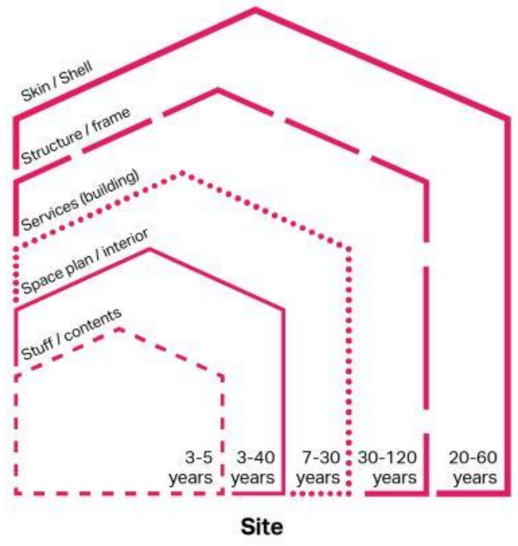
removable whilst maintaining their value, where possible. This is especially important for layers that may need more frequent replacement, such as building services and internal fit-outs.

2. Existing building approach



The design team have used the circular economy design approach for existing buildings to inform the design process for the development, alongside the pre-development, pre-demolition and whole-life cycle carbon assessment.

There has been a pre-demolition audit completed by Sweco inline with the pre-demolition audit requirements for Circular Economy.

The decision tree (from GLA Circular Economy guidance figure 4) was discussed at an early stage and was completed as below:

To follow the approach set out in Figure 3 (London Plan Policy D3 Figure 3.2), retaining existing built structures totally or partially should be prioritised before considering substantial demolition, as this is typically the lowest carbon option.

Local planning authorities should be involved in this process from an early stage, along with other stakeholders. A dialogue is strongly encouraged early on between CE statement authors and local planning authorities on the retention or demolition of existing buildings and making the best use of land.

Is there an existing building on site? --- YES The site at HPH consist of HPH2, HPH5 and the multi-storey car park

Is it technically feasible to retain the building(s) in whole or part? --- NO

This has been confirmed in the pre-refurbishment and pre-demolition audits.

Is it technically feasible to recover the 'residual value' of the building's elements or materials? --- YES

In general, the components arising from the demolition are unlikely fit the purpose of the new scheme. However, the majority of the materials from the demolition are likely to be recycled. This could be achieved through using crushed concrete aggregate as a sub base, repurposing bricks and concrete pavers and reusing existing primary steelwork elements in the new development or elsewhere.

In terms of the approach to the existing structure inline with the circular economy decision tree, there will be a combined approach:

DISASSEMBLE AND REUSE

→ NEW BUILD

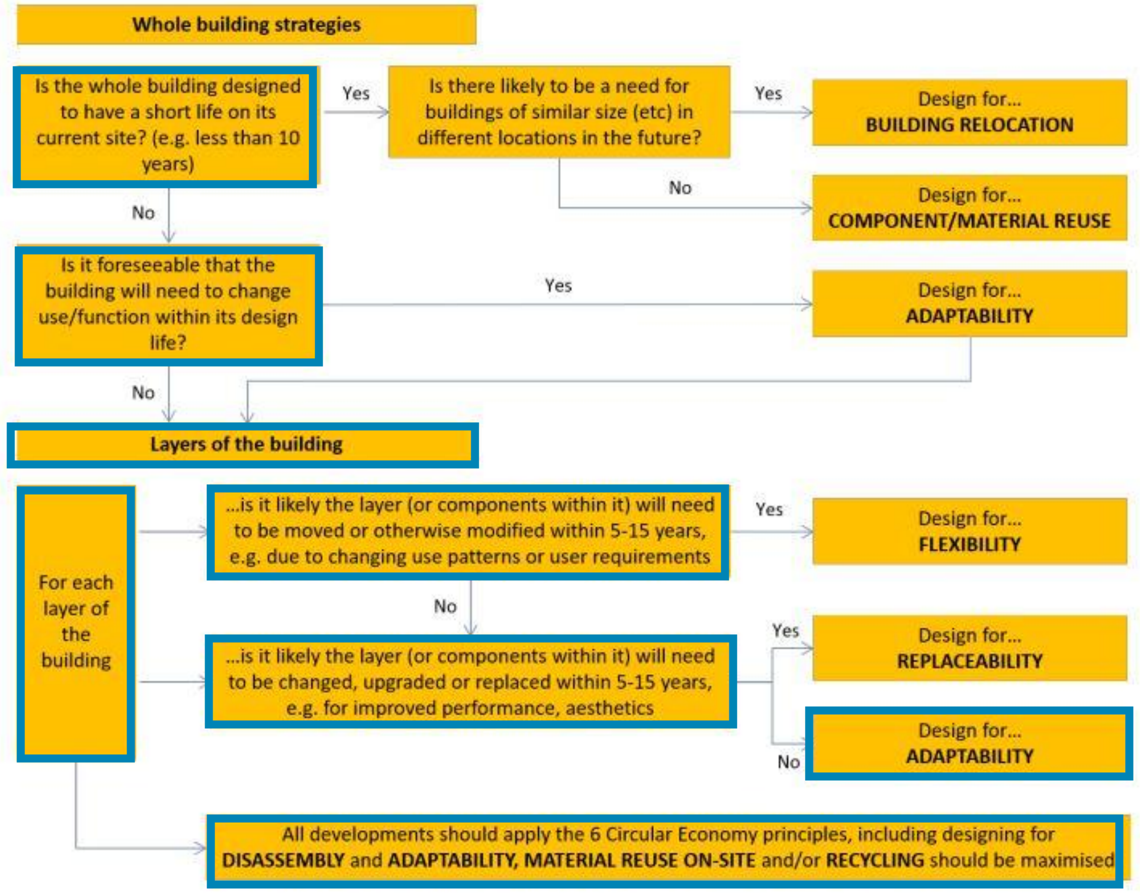
DEMOLISH AND RECYCLE

3. Strategic approach

3.1. Strategic approach

In order to implement circular economy principles in the most effective way, the high-level strategic opportunities should be investigated as early in the design development process as possible.

The GLA have provided a Circular Economy decision tree in their Circular Economy Statement Guidance (March 2022), which is used to determine the most appropriate circular economy strategy. This is dependent on the existing site condition and proposed end use for the development. It will also be affected by any existing buildings to remain on site and the predicted lifespan of the buildings.



The strategic approach is shown in Table 3.1. This was fully discussed in the circular economy workshop along with the reports required to accompany the statement including pre-demolition audit, sustainable procurement plan, bill of materials, waste strategy. At each RIBA stage the circular economy strategy will be reviewed, with opportunities to increase material efficiency identified throughout construction. Lessons learnt will be reviewed at handover and deconstruction plans handed to the facilities management team.

Aspect	Phase/building area	Steering approach	Explanation	Target	Supporting analysis/ studies/ surveys/audits
Designing out waste **Module A: Product Sourcing and Construction Stage**	All areas	Ahead of construction, and at detailed application stage the appointed contractor/developer will have developed a Resource Management Plan in consultation with the design team, this quantifies the amount of waste being generated and methods for reducing waste	Policy SI7 (B3 and B5): 'Opportunities for managing as much waste as possible on site' & 'How much waste the proposal is expected to generate, and how and where the waste will be handled'	7.5 tonnes/100m^2 GIFA Maximise material recovery inline with waste hierarchy Return of any unused materials such as plasterboard to be returned to the manufacturer	Resource management plan to be provided at reserved matters stage
	All areas	Reviewing opportunities to divert 95% of waste from landfill with the contractor	Policy SI7 (B3): 'Opportunities for managing as much waste as possible on site'	95% diversion of waste from landfill	Resource management plan to be provided
Designing out waste **Module B: In-Use Stage**	All areas	Waste management strategy to include separation of waste streams for recycling	Policy SI7 (B4): 'Adequate and easily accessible storage to support recycling and reuse'	65% municipal waste to be recycled by 2030	Waste management figures have been provided by waste consultant
Designing for longevity, adaptability/flexibility and disassembly	All areas	Engage with design team regarding material efficiency and designing for disassembly in the circular economy workshop	Policy SI7 (B2): 'How the proposals design and construction will enable building materials, components and products to be disassembled and re-used at the end of their useful life'	Incorporate material efficiency and disassembly into the design	Circular economy workshop and minutes End of life plan BREEAM reports Wst06, Mat06

Table 3.1: Strategic approach

4. Circular economy commitments

4.1. Circular economy commitments

The strategic approach is shown in Table 3.1, this is a high-level assessment of the circular economy strategy. As this is a detailed planning application, these guiding principles have been developed from strategy to action, investigating the feasibility of each of the requirements and how to maximise the opportunities on site.

There are nine circular economy principles which were set out in the executive summary, and these are applied to each building layer as follows:

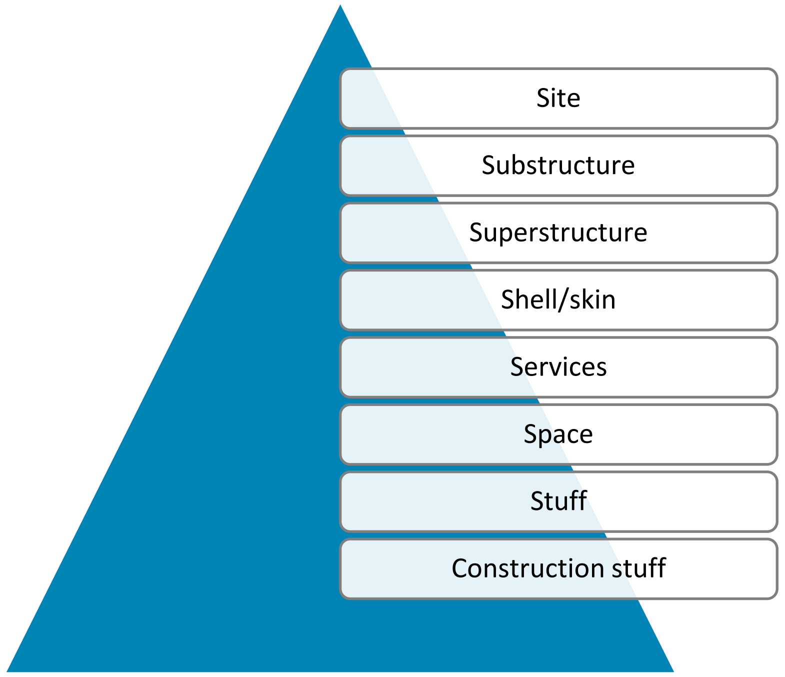


Table 4.1 which shows the key commitments has been completed inline with the circular economy guidance document. The commitments focus on those which hold the greatest opportunities that go above and beyond standard practice wherever possible. This table is a working document which will be continually reviewed and updated throughout the design development, construction phase and fully implemented through to occupation and use.

	Site	Substructure	Super-structure	Shell/skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions	Plan to prove and quantify
CIRCULAR ECONOMY DESIGN PRINCIPLES BY BUILDING LAYER												
Designing for longevity	The design of the building has been focused around building in layers to ensure elements with longer life spans can be use to their full life span potential.	Concrete structure designed for longevity with high recycled content	Maximise ceiling to floor to provide good daylighting and longevity	Buildings to be designed for longevity with robust shell/skin	Plant rooms to key incoming utilities located on facade with simple routes to wider connections. Long life LED lighting has been installed			To be investigated at detailed design stage			Review of the CE at each stage of the design stage, this will be supported by BREEAM assessment for commercial but should be extended to the residential elements	BREEAM reports Climate change strategy (Wst05) Design for disassembly and adaptation (Wst06)
Designing for adaptability or flexibility	Residential part of the scheme, realistic adaptability would be residential led (hotel or similar)	Commercial spaces designed as flexible	Ceiling heights to enable adaptability of uses, core layouts to allow flexibility	External façade can be removed and replaced if required	Access hatches to all shower room risers provided where possible in communal corridors for ease of access, maintenance and repair Rooftop plant designed to be modular for access within building lifts.	Core layouts considered to allow flexibility	Non-adhesive floor coverings could be used to allow easy adaptability Non-structural partitions allow for future adaptability of layouts		At each layer the reusability, adaptability and flexibility has been considered	Adaptable parts of design may be lost through design development	Review at each stage by architect, structural engineers	Linked with BREEAM assessment, to be completed at concept and technical design stage Review of future adaptability report
Designing for disassembly			Various layers of the building can be stripped from the rainscreen façade. Upgrades/ Replacement strategy can be tailored to anticipated life span of building elements.	Considered unitised façade for easy disassembly "	Modular plant design, so individual parts can be removed and replaced without affecting the entire system. Allowing accessible connections Detailed documentation	Non structural partitions allow for easy disassembly	Utilise non-fixed furniture where possible to minimise impact on finishes during updated fitout.	Considered fixing methods throughout the build to ensure ease of maintenance and replacement.	Explored the use of modular and pre-fabricated where possible	Cost implications and subject to feasibility	To be explored with the contractor	"BREEAM reports Climate change strategy (Wst05) Design for disassembly and adaptation (Wst06)"
Using systems, elements or materials that can be re-used and recycled	Make use of recycled aggregates from existing hardstanding onsite in planting sub-bases	All substructure could be reused/recycled when crushed Concrete crushed and used as aggregate Reinforcement within frame recycled."	Ceiling heights to enable adaptability of uses, core layouts to allow flexibility Reinforcement within frame recycled.	Potential to demount and reuse façade elements Windows, doors, shutters, and metal panels to be fixed to aid disassembly and re-use.	Metal services could be recycled to form new products. Services in good condition could be dismantled and reused."	Fit out and finishes to specification	Loose furniture to be selected for reuse.	Raised floors, carpet and ceiling tiles to be recycle-able.	Consider use of materials which support high recycling rates in use or at end-of-life	Cost implications and subject to feasibility	Design team to review material selection at each stage	Schedule of materials which can be reused/recycled

	Site	Substructure	Super-structure	Shell/skin	Services	Space	Stuff	Construction stuff	Summary	Challenges	Counter-actions	Plan to prove and quantify
DESIGNING OUT WASTE (BY BUILDING LAYER)												
Module A Product Sourcing and Construction Stage	Excavation waste used on site or reused offsite Recycled aggregate in planting sub base	Substructure RC assumed to contain 14% limestone Reinforcement used in UK reinforced concrete utilises 98% recycled scrap stock as feedstock. Propose that the piling mat is formed from crushed concrete/brickwork from the existing building.	Recycled steel content in superstructure Precast columns with GGBS. Columns assumed to contain 14% limestone - Improvements to be explored through detailed design development	Modular systems to be investigated Recycled aluminium to be used in windows and doors where possible.	Intention to make use of modular elements – Service risers, shower room pods, to reduce on-site waste and carbon emissions. Ductwork and pipework material volumes will be minimised through space efficient design Rooftops ultilised for plant to minimise basement structure quantities.	Pre-fab bathrooms pods and utility cupboards to be explored. Recycled products and content to be prioiritised for use in the detailed design such as carpets and raised floors. Furniture and fittings to be sourced locally where possible.	Utilise non-fixed furniture where possible to minimise impact on finishes during updated fitout. Robust fitout materials to minimise frequency of repair/ replacement.	Shower room pods to be used in all studios to reduce on-site waste. Minimising material usage during construction works will be imposed on the sub-contractor during the Tender stages. Accurately forecasting the number of materials needed, using larger pack sizes to reduce the amount of packaging.	Reducing waste through selection of materials containing recycled content, reduced volumes of materials and pre-fabricated elements	Cost implications and subject to feasibility Ensuring optimal structural design through detailed design stages. Maximising cement replacement without impacting programme (e.g. affecting curing times) Prioritising sustainable materials may present cost/ viability challenges.	Regular review of construction waste with the contractor during construction and detailed design, run CE workshops to ensure waste minimisation where possible Optimisation of structure at detailed design Client to consider GGBS content within structure	Lean design options EPD certificates to be sought for comparison tests between material choice options. Review of BREEAM credits to be achieved. Reporting of actual waste against forecast waste within the Site Waste Management Plan.
Module B In-Use Stage	Operational waste and recycling management plan Water consumption and energy use on site to be monitored, recorded, and measured against expected use. Above expected usage to be investigated with the aim of reducing potential waste. emissions			The building forms have been designed to maximise floor area against facade area to maximise thermal performance, keeping form factor as low as possible within the site	Long life LED light fittings. Access hatches to all shower room risers provided where possible in communal corridors for ease of access, maintenance and repair. Ductwork and pipework material volumes will be minimised through space efficient design	Energy and water meters will be monitored by the building owners as a managed facility.	Implementation of the Operational Waste Management Plan Using fewer finishes with high-churn rate, modular carpet, vinyl and ceramic tiles used where possible		Reducing waste through careful implementation of operational waste management plan	Limited opportunity for incorporation in prefabricated units Regular data review for energy and water consumption will need to be considered. Local authority constraints to waste collection	OWMP to be followed, once detailed design are on board, Operators/ landlords to develop strategies for analysing post-occupancy data. Smart systems to be considered.	Operational waste management plan Continuous reduction in energy and water use, recorded year on year. Compliance with Wst03 BREEAM
Module C End-Of-Life Stage	Design for disassembly to be provided for the whole site	Substructure will be crushed to aggregate and recycled	Steelwork connections will be designed as bolted to enable disassembly. Reinforcement within frame recycled.	Brickwork used on the residential buildings has the potential to be reclaimed and reused.	Standardisation will be utilised where possible to minimize waste and increase recyclability potential Modular standardised construction of bathroom pods.	Raised floors, carpet, and ceiling tiles to be recycled	Bathroom pods, fittings, and furniture to be designed or specified where practical to allow for re-use	Using systems, elements or materials that can be re-used and recycled.	Maximising potential for recycling at end of life by using easily disassembled parts where possible	Consideration of appropriate re-use/ recycling to be undertaken at the appropriate time.	Architect, MEP consultant and structural engineer to specify and design for re-use at the next stage.	Material passports will be used where possible at the next stage of detailed design to aid re-use. Review at As Built stage and review of circular economy
Module D Benefits and Loads beyond the system boundary stage	Aggregates and external works can reused on site for future projects	As per Using systems, elements or materials that can be re-used and recycled.	Reuse of steel frame in future projects		Standardised components have a potential to be reused elsewhere, some refrigerant can be reused						Provide space for future improvement to the waste service	Operational waste plan Compliance with Wst03 BREEAM

4.2. Bill of materials

A bill of materials has been provided below to demonstrate the design team has considered opportunities to conserve natural resources by applying lean design principles and sourcing materials responsibly. It estimates the quantity of materials used in each 'layer' of the building, the material intensity and targets the minimum amount of recycled content. The information has been based on estimations from the whole life carbon assessment completed for Hyde Park, Hayes. Due to limited information at outline stage, appropriate assumptions have been made based on the size and massing of the proposed scheme.

Element	TOTAL kg CO_2e	Materials Intensity kg/m2 GIA	Recycled content by value %	End of Life Strategy
Substructure	11,512,046	188	1.7	BAU
Superstructure: frame	8,408,978	137	2.2	Concrete crushed to aggregate Steel recycling
Superstructure: upper floors	33,677,322	549	1.19	Concrete crushed to aggregate Steel recycling
Superstructure: roof	3,002,396	49	0.18	Concrete crushed to aggregate Steel recycling
Superstructure: stairs and ramps	1,610,969	26	0.24	Concrete crushed to aggregate Steel recycling
Superstructure: external walls	7,259,449	118	14.08	Concrete crushed to aggregate Steel recycling Insulation BAU incineration
Superstructure: internal walls	6,859,171	112	1.51	Concrete crushed to aggregate Steel recycling
Superstructure: windows and external doors	305,669	5	0	Aluminium and Glass recycling
Superstructure: internal doors	335,691	5	0	BAU incineration
Finishes	1,308,682	21	0.27	BAU landfill
Services	992,610	16	0.042	100% recycled
External works	389,864	6	0	100% recycled
Total	75,662,848	1,234	21.4	

This has been taken from One Click LCA, which has also been used to complete the whole life cycle carbon assessment. Please note the total will not exactly match the WLC due to lack of space to accurately represent the services in the CE spreadsheet, as per GLA guidance the materials making the most contribution have been included.

The calculations completed show a total recycled content by value of 21.4%. This was calculated using One Click LCA.

4.1. Recycling and waste reporting

Layer	Waste estimate	% reused or recycled onsite	% reused or recycled offsite	% not reused or recycled % to landfill (or other)	Source of information
Excavation Waste	No new basements formed, minimal excavation estimated 2,500 tonnes	0%	95%	0% 0%	GLA requirements, confirmed via email from applicant
Demolition Waste	34,266 tonnes	Maximise opportunity	95%	≤5% 0%	Pre-demolition audit (Sweco) page 4
Construction Waste	7.5 tonnes/100m^2 for residential giving a total of 4,365 tonnes	95% of waste will be reused or recycled offsite as a minimum. To be included in the resource management plan, this will maximise the reuse and recycling of construction waste		≤5% ≤5%	BREEAM Wst01 targets Applicant to use Smartwaste benchmarks
Municipal Waste	Annual waste General waste: 120 tonnes Mixed recycling: 91 tonnes Food waste: 33 tonnes TOTAL = 245 tonnes	0%	65%	N/A ≤35%	BS 5906:2005 Waste management in buildings GLA requirements

Table 4.1: Recycling and waste reporting

Table 4.1 (above) provides details on the total amount of waste/material generated during excavation, construction and operation.

There will be demolition of the existing buildings on site. It is proposed that excavation waste will be reused on site under the piling machine and used for piling platform, where possible. All remaining excavation waste will be reused offsite.

There is currently no resource waste management plan, this will be produced at detailed application stage, there is a commitment to achieve 7.5 tonnes/100m^2 of floor area for residential areas. The municipal waste will meet the

GLA requirement of 65% recycling by 2030, with an operational waste plan to be provided which highlights the key waste produced on site. All waste will be managed in accordance with the waste hierarchy.

The following documents will be provided at detailed application stage:

-Resource waste management plan

-Design for longevity and adaptability – scenario modelling

-Lean design options appraisal

5. Circular economy narrative

This section summarises the previously presented tables and the approach which will be taken during construction and operation to ensure the circular economy principles are met.

Each of the areas will be addressed and the following sections included, this was discussed with the design team at the Circular Economy workshop:

5.1. Designing for disassembly/ reusability/ recoverability/ longevity/ adaptability/ flexibility

Approach

During the Circular Economy and Whole Life-cycle Carbon workshop the design team discussed the potential for the different buildings at Hyde Park, Hayes, to be demountable at the end of its useful life. As well as the reusability, recoverability, longevity, adaptability and flexibility of the proposals.

Longevity, adaptability, flexibility

This is a long-life new development with an expected life of over 60 years, therefore must be designed for longevity to ensure the built asset allows for challenging climatic conditions. The materials will be protected from degradation from environmental conditions in line with the requirements under BREEAM Mat05, as well as robust design such as kick plates, stair nosing and wall protection in communal areas. The concrete frame of the buildings are designed for longevity rather than disassembly, with that in mind, the building will have generous proportions and a readiness for alternative technologies.

An adaptation to climate change report will be provided, which requires the development to incorporate measures to mitigate impacts of extreme weather conditions arising from climate change over the lifetime of the assets.

Non-structural internal walls within the residential apartments allow for future flexibility of layouts. The commercial units will be designed to have flexible end uses to adapt to the commercial climate at the time, incorporating high floor to ceiling heights.

The site will be designed to enable future connection to a potential district heat network, this allows flexibility in the heating system. Central plant is mechanically fixed to allow easy disassembly.

Disassembly, reusability, recoverability

A deconstruction plan will be developed during detailed design stage to demonstrate how the materials used in the buildings could be reused.

Where mortar is required, the design team have discussed the use of lime-based mortar to ease disassembly at the end of the building's life. This will also carry through to the landscaping plan so that as many surfaces as possible are recoverable.

Central plant will be mechanically fixed, so it is easy to disassemble. Non-structural partitions are also able to be disassembled. Any fixtures and fittings will not be glued down. Materials with planned short shelf life will be prioritised to be selected with manufacturers with take back schemes or procured through a service agreement. Key elements of plant will be capable of being disassembled for replacement. This can be achieved through modular plant design, so individual parts can be removed and replaced without affecting the entire system. Allowing accessible connections which can be disassembled without specialist tools, with clear labelling so they are easily identifiable. Detailed documentation will be provided to give instructions for disassembly.

Targets

Disassembly and adaptability for each building element

Deconstruction plan to be developed.

Potential challenges

Site and construction constraints may limit the potential for disassembly. It may not be considered effectively at each stage and be lost from the specification.

Counteractions

Ensure that the recommendations and decisions are incorporated into the design and through the procurement process. To be checked throughout design development.

Plans for implementation

A disassembly and adaptability plan for the entire site will be developed and reviewed throughout the RIBA stages.

5.2. Designing out waste by building layer

Approach

During the initial Circular Economy and Whole Life-cycle Carbon workshop the potential waste streams were discussed from all sources and then opportunity to design out waste throughout.

Module A: Product Sourcing and Construction stage

The demolition waste on site has been reduced through the completion of a pre-demolition audit for building on site (HPH2 and HPH 5) as well as the multi-storey car park. The aim will be to reduce the waste to landfill, and reuse as much possible on site. If there is excavation associated with any basement, the excavation waste will be reused on site as part of the piling machine base where possible and the rest will be reused offsite.

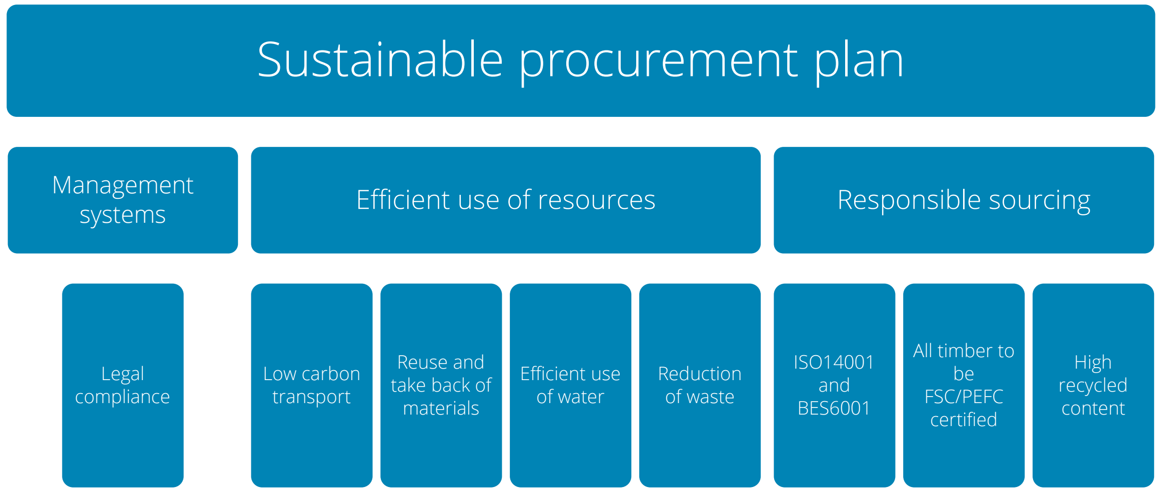
The existing buildings are low-to medium rise buildings, they are unable to be extended due to load capacity, layout constraints and construction type.

Consideration of direct reuse of materials has been considered, there are limited options for the type of material which are present in the existing building on site. For example, hardcore/concrete has to be crushed or broken up to be removed, however where this is not removed it from site, it will recycled and reused on site. This has a positive impact as materials do not need to be brought onto site. Bricks and blocks are treated the same, once they have been demolished, the most efficient use for them is to use them on site. This is achieved by crushing the material and forming the piling mat. The remaining items are all reuse/reclaim for direct use on the site. Primary steelwork elements can be used in the new development.

The applicants at detailed application stage will be sourcing their materials inline with their Sustainable Procurement Plan, this must be used by the design team to guide specification towards sustainable construction products. It is also a requirement of BREEAM to provide this plan at concept stage.

The plan itself meets the following requirements:

- Include sustainability aims, objectives and strategic targets to guide procurement activities
- Have a requirement for assessing the potential to procure construction products locally
- Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan



Targets

Sustainable procurement plan to be implemented at concept stage and carried through to completion.

Potential challenges

Sustainable procurement plan is not followed, and non-compliant materials are procured and installed.

Counteractions

The design team will need to ensure the sustainable procurement plan is embedded throughout the specification at each stage. When products are selected, they should be checked against the plan, the BREEAM Accredited Professional (AP) will also be assisting to ensure the sustainable procurement plan is adhered to.

Plans for implementation

The sustainable procurement plan has been introduced to the design team at concept stage, regular meetings will take place with the design team, and this is a great way to reinforce the use of the sustainable procurement plan for all design and purchasing decisions.

Designing out construction waste

Through the resource waste management plan and onsite targets for construction waste, as well as the minimal use of materials. Pre-fabricated elements have been considered to minimise waste.

Targets

Whole site construction waste target

7.5 tonnes/100m^2 GIFA residential

Less than 5% non-hazardous construction waste to landfill

Potential challenges

Site and unforeseen construction issues may cause an increase in site waste during the construction period.

Counteractions

Checks throughout construction on waste will be completed to align with the targets and address any issues which arise.

Plans for implementation

Above requirements to be included in the drawings and specification. The close link with GLA targets will ensure the design team are engaged through workshops and site visits. All data will be presented at As Built stage.

Designing out industrial waste

No industrial waste is anticipated.

Module B: In use stage

There will be space within the bin stores which is dedicated and clearly labelled for recycling. Waste segregation will be carried out by the residents through provision of kitchen bins. All commercial units will also have segregated recycling. Segregation of food waste and appropriate management will also be investigated with the local authority. There will be separate collection of dry recyclables (at least paper, card, mixed plastics, metal and glass) in communal recycling bins as provided by Hillingdon. Hillingdon provide recycling collection in communal recycling bins, they also provide communal waste containers to most apartment schemes. The co-mingled recycling collection includes glass, plastic, cardboard and paper which is then sorted post collection and recycled.

Local landfill sites have been contacted through Hillingdon, currently no responses have been received, written confirmation that they can receive the waste will be obtained. All operational waste will be managed inline with the waste hierarchy.

At detailed application stage there will be an estimation of the operational waste that the proposal is expected to generate, this will be provided prior to commencement. They will also will investigate consolidated, smart logistics and community-led waste minimisation schemes to ensure that operational waste is effectively managed and reduced.

The applicant commits to meet or exceed London Plan Policy SI7 municipal waste recycling target of 65% (by weight/tonnage) by 2030 or business waste recycling target of 75% (by weight/tonnage) by 2030.

The operational waste will be monitored to ensure the targets below can be met. Operational performance will be managed by the waste reporting figures from the designated waste and recycling provider in Hillingdon, and reported annually.

Targets

Zero biodegradable or recyclable waste to landfill by 2026

65% recycling rate by 2030

Potential challenges

Engagement with the occupants to meet the above targets.

Counteractions

Promotion of recycling in home user guides is recommended. Recycling competitions by block could be set up to encourage residents to recycle more of their waste.

Plans for implementation

Follow the operational waste management plan and ensure this is accessible for all end users to access in an appropriate form, including commercial unit tenants who may have a lot of a specific type of waste. This will ensure a high rate of recycling. Operational performance will be managed by the waste reporting figures from the designated waste and recycling provider in Hillingdon and reported annually.

6. Plan for implementation

Each item addressed in section 5 has its own plans for implementation but to ensure the successful implementation of the circular economy statement, there are some short- and long-term goals which are important to highlight to the design team. This should form part of contractual commitments.

Plan for implementation	
Short term	Longer term
Tracker of commitments made in the Circular Economy report to be reviewed on a monthly basis through the design period	During construction to report against all waste targets
All contractor tender packages to have Circular Economy requirements included	Evidence to be provided which show commitments have been included in the buildings
Additional studies to be undertaken and submitted	Engagement with the local landfill sites
Start looking at potential material sources which comply with the Circular Economy report	As Built report compiled for the GLA

At RIBA Stages 4-7 the circular economy statement will be revisited to assess compliance with targets and reporting outcomes and lessons learned using the following:

- As Built design drawings and information
- As Built WLC results
- Waste reporting e.g. Smart Waste

7. Building Circularity

As part of the WLC assessment the building circularity was also assessed using the One Click LCA software. The Building Circularity tool allows tracking, quantifying and optimizing the circularity of materials sourced and used during the building life-cycle, as well as the circularity at the end of life. It allows getting a holistic picture, as well as a detailed breakdown per material type. It also supports applying Design for Disassembly and Design for Adaptability principles.

	Total material (kg)	Recycled materials (kg)
TOTAL (kg)	75,662,848	4,434,193
Material intensity (kg/m^{2}GIA)	1,234	220

This tool includes the assessment of recycled, renewable or reused contents for each of the elements. These elements can also be categorised under design for disassembly or design for adaptability. Each material type also has an end of life process attached to it. This is a useful tool that can be used by the design team to carefully track the materials and their circularity.

8. End of life strategy

This section describes the strategy for how the proposal's design and construction will reduce material demands and enable building material, components and products to be disassembled and reused at the end of their usual life.

The WLC assessment has categorised end of life scenarios for each element of the building, GLA's table 2 also notes how each building layer will be designed for circularity.

The residual value of materials will be maximised at end of life by prioritising materials with ease of disassembly.

End of life scenarios have been considered for the following materials and discussed with the design team in the circular economy workshop:

Concrete – concrete can be crushed and used as aggregate for new concrete, road base, or backfill material, large concrete elements can be reused in new construction. The team is also targeting maximising reuse through design by considering precast elements that can be disassembled and reused in new projects and reversible connections

Aluminium – aluminium is highly recyclable and can be melted down and reused with minimal loss of quality, implement design joints which can be quickly and efficiently disassembled without damaging the aluminium. Apply surface treatments that preserve the material's integrity during its lifecycle, ensuring it can be reused in the same or similar capacity

Windows – glass from windows can be recycled into new glass products, while metal frames (aluminium, steel) can be melted down and reused. Implement modular window designs that allow for easy removal and reinstallation.

The disassembly instructions for the building will be provided as part of the handover pack. All material information will be stored in the BIM model to facilitate disassembly and identify any key challenges.

An end of life/deconstruction plan will be developed during the design stage, taking into account optimum reuse and recyclability of materials, and be reassessed at As Built stage.

9. Post completion report and lessons learnt

As described throughout the circular economy statement, the success of building circularity is dependent on continually checking the design and construction of the development is inline with the targets set out in the key principles and also the plans for implementation.

Initially RMA stage reporting will be secured via condition to update the strategy provided at Outline Application Stage.

At post construction stage the report will be revisited and state the actual outcomes achieved, with updated versions of Tables 1 and 2, the recycling and waste reporting form and the bill of materials.

This will also include lessons learnt from the circular economy report in a way which will help future development understand how best to achieve the London Plan policy objectives.

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