Strategic Approach

Existing Buildings

Table 2. Circular Economy Design Approach for the existing building

Circular Economy Design Approach	Phase / Building / Area / Layer	Strategic Response
Retain & Retrofit	Existing buildings Plots B, E, J, I	Heyne Tillet Steel have carried out comprehensive assessments of the existing structures to determine potential reuse opportunities. Our intention is that ~86% of the existing site floor area will be retained & refurbished with only plots A & F, part B, C D, E & G proposed to be demolished. These plots offer low NIA, poor quality internal spaces or building fabric are car park decks or enable a new core (D & E). It is considered that all reasonable retention is being pursued as part of development proposals.
Repurpose	Existing buildings Plots A, F and part E	Individual materials or building elements may be reused on or offsite, pending further investigative work in the next design stage. Pre-demolition audits will also be completed on a rolling basis as the Site progresses to identifying material types on Site and opportunities for re-use.
Disassembly/ Deconstruct and Reuse	Existing buildings All plots	Wherever possible, disassembly will be prioritised over demolition so that building elements, original materials and components can be reused to maximise their lifespan. More detailed building surveys & pre-demolition audits are to be carried out in the next design stage and will investigate further reuse opportunities.
Demolish & Recycle	Existing buildings A & F, part B, C D, E & G	Existing concrete from the car park (Plot A) and existing buildings (Plot F) proposed to be demolished will be crushed and reused as piling mat/hardcore for the proposed development or elsewhere, where possible. More detailed building surveys & pre-demolition audits are to be carried out in the next design stage and will form the basis of further investigations into opportunities for material re-use. It is important to note that existing building demolition is proposed for only ~14% of the development floor area (GIA). These plots offer low NIA, poor quality space and building fabric, and feature ground floor car park decks. The remaining ~86% of the development floor area (GIA) is proposed to be retained, refurbished and in come instances extended. Non-hazardous materials removed from Site will be recycled where possible as a minimum. Opportunities for re-use off Site will be considered where possible. Our existing window re-use and recycling strategy (which forms part of a separate application for the Site) is provided as an example of our approach.

Strategic Approach

New Buildings

Table 3. Circular Economy Design Approach for the proposed building

<table>
<tr><th>Circular Economy Design Approach</th><th>Phase / Building / Area / Layer</th><th>Strategic Response</th></tr>
<tr><td>Building relocation</td><td>Existing buildings</td><td>The intention is that ~86% of the existing Site floor area (measured by GIA) will be retained with only plots A & F, part B, C D, E & G proposed to be demolished.

These plots offer low NIA, poor quality space and building fabric, and feature ground floor car park decks and are therefore not considered suitable for re-location. However, during disassembly/demolition, building elements, original materials and components will be reused or recycled on or off Site, where possible.</td></tr>
<tr><td>Component or material reuse</td><td>Existing buildings</td><td>Heyne Tillet Steel (HTS) have carried out comprehensive assessments of the existing structures to determine potential reuse opportunities. The intention is that ~86% of the existing site floor area (measured by GIA) will be retained with only plots A & F, part B, C D, E & G proposed to be demolished.

Where adding new structure as extensions to existing buildings an assessment of existing structural loading specific to each building has informed the location, form and construction materials of the extensions to minimise material use. This has not only reduced material use in the extensions themselves, but detailed calculations by HTS have also minimised any structural strengthening required allowing the existing structures to be retained and strengthened only where necessary.

Pre-demolition audits will also be completed on a rolling basis as the Site progresses to identifying material types on Site and opportunities for re-use.

Individual materials or building elements may be reused on or offsite, pending further investigative work in the next design stage.</td></tr>
<tr><td>Adaptability</td><td>Proposed buildings</td><td rowspan="2">The existing buildings at Highgate Studios are inherently designed to be adaptable and have proven flexibility given their previous industrial uses. Our intention is to continue to utilise Highgate Studios' highly adaptable design by retaining a much as is reasonably possible with minimal & sympathetic extensions.

For new builds & extensions the design intent is to provide a balance between longevity, future adaptability and maximum head heights and fire risk. Continuing the design philosophy of the original Highgate Studios. Material use has been optimised through detailed structural calculations by HTS during Stage 2 to limit material use whilst maximising head heights and limiting columns.

Examples of opportunities being considered are given in this report.</td></tr>
<tr><td>Flexibility</td><td>Proposed buildings</td></tr>
<tr><td>Replaceability</td><td>Proposed buildings</td><td rowspan="2">Examples of opportunities being considered are as follows:

• Designing extension structures with standardised construction materials to aid disassembly and future re-use or recycling.
• Mechanical and electrical systems that are easily accessible, including designing out false ceilings, ceiling access panels where necessary & accessible risers. Buried services to be kept to a minimum.
• Consider modular design incorporating elements in the building that can be added or removed in sections as needed, prevent unnecessary removal of other parts not requiring replacement.
• Choose materials that are readily available to make it easier to find replacements when needed
• Specify standardised fixtures and finishes so that replacements can still be easily found should a like-for-like product no longer be available.
• Create a material inventory for the Site so that components of the building can be identified and comparable replacements found.
• Avoid using glue and adhesives in the building design, as these can make it difficult to disassemble the building in the future.
• Label Components: Label each component of the building to make it easier to disassemble and recycle each part.
• The use of recyclable materials in the designs e.g. such as steel or aluminium making it easier to recycle the building materials at the end of its life.
• Educate the building users on the importance of disassembly and recycling, and provide information on how to properly disassemble and recycle the building materials.</td></tr>
<tr><td>Disassembly</td><td>Proposed buildings</td></tr>
</table>

Strategic Approach

New Buildings

Table 3. Circular Economy Design Approach for the proposed building

Circular Economy Design Approach	Phase / Building / Area / Layer	Strategic Response
Longevity	Proposed buildings	Examples of our approach and opportunities being considered are as follows: • Designing for the occupant: Performance based outcomes for daylight, ventilation and outdoor space ensure the building provides appropriate space for users and doesn't just design for compliance. • Green Spaces: Designing for green spaces, such as rooftop gardens or courtyards, can improve the building's environmental performance and increase its lifespan by reducing the urban heat island effect and help improve air quality. • Flexibility in Design: A building designed with flexibility in mind can adapt to different uses, occupants and changing needs over time. • Adaptive Reuse: Designing with adaptive reuse in mind can make it easier to repurpose the building in the future, reducing the need for demolition and new construction. • Durable Materials: High-quality, long-lasting materials that require minimal maintenance can reduce the need for replacements or repairs in the future. • Passive Design & Energy Efficiency: Designing for inherently low energy buildings can reduce the building's carbon footprint and operational costs , making it more adaptable to future changes. • Easy Maintenance: Ensuring that the building systems are easily accessible and maintainable can extend their lifespan and reduce repair and replacement costs. • Accessibility: Ensuring the building is accessible for all can maintain its usability over time and reduce the need for retrofitting.

Circular Economy Principles

CIRCULAR ECONOMY PRINCIPLES BY BUILDING LAYER

REPORTING FORMS

CIRCULAR ECONOMY NARRATIVE

Circular Economy Principles

By Building Layer The following Circular Economy Principles table considers where the Applicant seeks to go beyond standard practice.

Table 4. Circular Economy Design Principles by building layer

Design Principles	Site	Substructure	Super structure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Challenges	Who and When	Plan to prove and quantify
Module A - Product Sourcing and Construction Stage											
Designing out waste	As a minimum, construction, demolition and excavation waste policy targets will be met; A pre-demolition audit will be undertaken at detailed design stage; based on that reuse and recycling opportunities will be identified by the project team. The relevant contractors will be required to review the opportunities for reclamation of concrete, bricks and timber including, for use during construction and upcycling for community use. Early stage whole life carbon assessment of big ticket items to provide a outcome led / performance based direction of travel.	-86% of the existing site floor area will be retained including substructure. Minimise new excavation through the limited use of basements and ensuring the design of the development responds to the slope onsite. No topsoil from site to be sent to landfill, where possible, pending the findings of the pre-demolition audit. An assessment of structural loading specific to the proposed development to identify appropriate rooftops for extension based on the structural capacity of the existing buildings. Optimised superstructure for new buildings and extensions to limit the material use in the first instance and waste. Low carbon concrete shall be specified with a cement replacement of up to 70% in the sub-structure (See Structural engineer specifications)The Pavilion building is proposed to be constructed using a CLT frame limiting substructure material & excavation.	-86% of the existing site floor area will be retained with only A & F, part B, C D, E & G to be demolished. These plots offer low NIA, poor quality space and building fabric, and feature ground floor car park decks. It is considered that all reasonable retention has been pursued as part of the development proposals. Detailed structural calculations have limited materials use in the first instance in line with LETI 2020 targets. Low carbon concrete shall be specified for the Plots A & F RC frames with a cement replacement of up to 50% in the super-structure (See Structural engineer specifications) Extensions shall be constructed with prefabricated steel and pre-cast concrete slabs designed to standard sizes. The Pavilion building is proposed to be constructed using a CLT frame.	-86% of the existing site floor area will be retained including building skin. New buildings A&F have been designed with a repeating façade design that could enable a prefabricated wall panel construction pending further design development. Materials and building elements will be designed to minimise the off cuts and waste and will be designed for longevity & adaptablity pending further design development.	Systems & services will be designed to minimise material use wherever possible e.g. stacking similar zone types to reduce service runs. Opportunities for modular pre-fabricated design will be investigated.	Finishes limited to 'showrooms' only to limit waste by avoiding strip out of virgin material by new tenants. Exposed ceilings will reduce material use and therefore waste in the first instance Internal finishing materials with high recycled content and lower embodied carbon will be incorporated, examples might include: > Plasterboard specification with >30% recycled content and low product stage carbon emissions (A1-A3) > Use of screed options with >30% recycled content and product stage carbon emissions (A1-A3) in the range of 0.084-0.056 kg CO2e/ m2) > Carpets & underlay with >90% recycled content and low product stage carbon emissions (A1-A3)	Finishes limited to 'showrooms' only to limit waste by avoiding strip out of virgin material by new tenants. Opportunities will be explored further during detailed design.	Registering the scheme with Considerate Construction Scheme. This will require the scheme to monitor and report construction resource use. Resource Management Plan by the relevant contractor to identify options for mitigation and track waste generated on site	Site space constraints for storage, and proximity to residential buildings could limit viability of crushing concrete on site. On-site storage constraints are a major constraint and could impact opportunities for re-use on Site. Suitable and reasonable interest from external parties could affect re-use opportunities. The level of contamination and viability of onsite reuse of crushed aggregate from existing structures is unknown. Availability of GGBS and other recycled materials within the UK, although this has been considered and alternatives potentially available at the time of construction are being considered.. Changes to specification due to cost constraints and technical viability.	Structural engineer to confirm the final mix of concrete in line with GGBS & recycled content commitments. Identify structural elements that could be pre-fabricated. Incorporate these requirements within the employers requirements. Architect to actively review material selections, seek reductions in material use, specify within employers requirement with recycled content requirements when known. Design team to engage with contractors to establish a strategy for reuse and recycling of materials from existing buildings – RIBA 3+/S4. Relevant contractor to do site testing to determine how much demolition can be reused as recycled aggregate on site and reuse of any excavated soil for fill and landscaping Register the scheme with Considerate Construction Scheme.	On-going sustainability champion appointment including workshops, monitoring, assessment and reporting. Circular Economy Written evidence & Whole Life Carbon Assessment Detailed design specification [to be confirmed] Relevant contractor to update the Bill of Materials and Waste generated during demolition, excavation and construction As-built Circular Economy Written evidence & Whole Life Carbon Assessment

Circular Economy Principles

By Building Layer The following Circular Economy Principles table considers where the Applicant seeks to go beyond standard practice.

Table 4. Circular Economy Design Principles by building layer

Design Principles	Site	Substructure	Super structure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Challenges	Who and When	Plan to prove and quantify
Module B - In-Use Stage											
Designing out waste	Refuse stores provided with dedicated recycling volumes equal to waste, sized and with waste streams bespoke to the development.	n/a	n/a	The proposed development implements passive energy efficiency measures and will be served by ASHP. Passive design and energy efficiency measures exceed the London Plan requirements and a total reduction in regulated emission of over 35% compared to building regulations targets is predicted.	An outcome-led design approach has been adopted at an early stage to reduce in-use operational energy and emissions. At this stage strategic decisions have been based on design team experience. Performance based modelling at the next design stage will optimise the operational energy performance, and seek operational energy ratings, where possible. Proposals implement passive design & energy efficiency measures served by ASHP. Measures exceed London Plan requirements for both 'Be Lean' design & total regulated emissions. Water efficiency through low water use appliances targeting 12.5% reduction (BREEAM) Metering and monitoring (water & energy) via BMS will manage resource use efficiently, flag out of range values, and enable a quick response to leaks or unnecessary resource use. Hybrid VRF systems are proposed to limit the use of and leakage of refrigerant on Site.	-	-	The contractor will be required to set targets and monitor energy and water use during construction.	> In-use performance targets and benchmarks not being met	In line with the London Plan Be Seen requirement, operational performance will be tracked and reported on.	On-going sustainability champion appointment including workshops, monitoring, assessment and reporting As built specification to be confirmed upon Post-completion

Circular Economy Principles

By Building Layer The following Circular Economy Principles table considers where the Applicant seeks to go beyond standard practice.

Table 4. Circular Economy Design Principles by building layer

Design Principles	Site	Substructure	Super structure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Challenges	Who and When	Plan to prove and quantify
Module C - End-of-Life Stage											
Designing out waste			Extensions shall be constructed with prefabricated steel and pre-cast concrete slabs designed to standard sizes that can e disassembled and re-used in future.	A pre-fabricated facade could be designed for disassembly e.g. supported with bolted connections. The details for deconstruction are to be developed.	Accessible MEP services for maintenance and replacement. Mechanical, rather than adhesive fixing, to facilitate systems being demounted and re-used or recycled, where possible					Architect / Façade consultant/Structural Engineer/ to actively review material selections, seek opportunities and specify within employers requirement.	On-going sustainability champion appointment including workshops, monitoring, assessment and reporting. As-built Circular Economy Written evidence & Whole Life Carbon Assessment
Module D - Benefits and Loads Beyond the System Boundary											
Designing out waste	The project is located on previously developed land with no impact on virgin land.								Deciding what will happen to a building after it has been dismantled or demolished many years in the future is speculative. Whilst maximising opportunities for reuse, recovery or recycling is key to a successful circular economy, Module D emissions have been excluded from this assessment to avoid double counting savings where a future development might reuse, recover or recycle.		

Circular Economy Principles

By Building Layer The following Circular Economy Principles table considers where the Applicant seeks to go beyond standard practice.

Table 4. Circular Economy Design Principles by building layer

Design Principles	Site	Substructure	Super structure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Challenges	Who and When	Plan to prove and quantify
Designing for longevity	The proposed SUDs strategy to deliver green field run-off rates where possible. Drought resistant planting & rain gardens	An assessment of structural loading of the existing buildings ensuring there ongoing use and longevity. New structure has been designed in line with Eurocodes which give a minimum design life of 50 years for building structures. It is highly likely that the concrete frame would remain serviceable for a longer period of time than this, subject to regular inspections and maintenance.	Designing for longevity and adaptability was a key consideration when selecting suitable structural solutions. The structure has been designed in line with Eurocodes which give a minimum design life of 50 years for building structures. It is highly likely that the concrete frame would remain serviceable for a longer period of time than this, subject to regular inspections and maintenance.	Enhanced existing building fabric to reduce energy demand to provide a more resilient design that is more adaptable to future changes. New buildings and extensions designed to deliver passive design and energy efficiency beyond London Plan targets making them more adaptable to future changes. Green and brown roofs across the development help mitigate the urban heat island effect. Exposed building elements will be designed to limit degradation from environmental factors such as solar radiation, wind and temperature variations.	Ease of maintenance has been considered through the services design to prevent unnecessary waste or damage to materials. Design flexibility allows services to work with future tenant fitouts. Further opportunities to be explored as the design is developed during the next design stages.	Engagement with existing tenants where possible to ensure spaces are aligned with their current and known future needs. Further opportunities to be explored as the design is developed during the next design stages.	Further opportunities to be explored as the design is developed during the next design stages.	-	Changes to specification due to cost constraints and technical viability.	On-going sustainability champion appointment including design team workshops, monitoring, assessment and reporting	Landscape and surface water strategy for planning Detailed design drawings at Stage 4 and specification as installed. As built drawings, surface water run-off features installed & MEP system specification on Post-completion. Asset Maintenance plans.
Designing for adaptability or flexibility			Maintaining ~86% of the existing buildings (by GIA) already well designed for adaptability and flexibility. The proposed grid spacing, open plan design approach and non-load bearing walls offer greater internal flexibility for change of layouts.	New buildings A & F have been designed to provide generous daylight across each floorplates and provide flexibility for future tenant fit-outs	A key design consideration of services is flexibility of design, working with open floor plates as well as potential tenant fit-outs Spare capacity included in plant design to allow future adaptation e.g. increased ventilation rates, or responding to warmer climate scenarios. Smart Building Technology such as sensors and automation to allow easy adaptation and customisation	Including soundproofing materials in the building's design will help to reduce noise transfer between spaces, providing greater flexibility of space. Further opportunities to be explored as the design is developed during the next design stages.	Energy efficient internal equipment to minimise energy demand e.g. Lifts, lighting. Further opportunities to be explored as the design is developed during the next design stages.	-	as above.	On-going sustainability champion appointment including design team workshops, monitoring, assessment and reporting	Submission of as built drawings, surface water run-off features installed & MEP system specification on Post-completion by the development partner

Circular Economy Principles

By Building Layer The following Circular Economy Principles table considers where the Applicant seeks to go beyond standard practice.

Table 4. Circular Economy Design Principles by building layer

Design Principles	Site	Substructure	Super structure	Shell/Skin	Services	Space	Stuff	Construction Stuff	Challenges	Who and When	Plan to prove and quantify
Designing for disassembly	Prioritise disassembly of existing structures where possible. As the material pallet is developed a high priority will be given to highly recyclable content materials that could be reused in future.		Extensions shall be constructed with prefabricated steel and pre-cast concrete slabs designed to standard sizes and could be disassembled and re-used in future. The intention for Plots A & F is to design for longevity and adaptability over disassembly which requires a balance between efficient design and generous proportions and is in line with GLA decision tree.	A pre-fabricated facade could be designed for disassembly e.g. supported with bolted connections. The details for deconstruction are to be developed	Mechanical and electrical systems that are easily accessible, including designing out false ceilings, ceiling access panels where necessary & accessible risers. Buried services to be kept to a minimum, minimising adhesives in favour of mechanical fittings.	Further opportunities to be explored as the design is developed during the next design stages.	Further opportunities to be explored as the design is developed during the next design stages.		as above.	On-going sustainability champion appointment including design team workshops, monitoring, assessment and reporting	Circular Economy Written evidence & Whole Life Carbon Assessment Detailed design specification [to be confirmed] Relevant contractor to update the Bill of Materials and Waste generated during demolition, excavation and construction As-built Circular Economy Written evidence & Whole Life Carbon Assessment
Using systems, elements or materials that can be re-used and recycled.	Reuse of concrete rubble from plots A & F for re use as a base for new concrete, a backfill material, or use as an aggregate in new concrete mixes. Further details to be provided on completion of the pre-demolition audit and development of the Resource Management Plan at the next design stage,.	Reuse of concrete rubble from plots A & F for re use as a base for new concrete, a backfill material, or use as an aggregate in new concrete mixes.	Extensions shall be constructed with prefabricated steel and pre-cast concrete slabs using standard sizes and could be disassembled and re-used in future.	Further opportunities to be explored as the design is developed during the next design stages,.	Existing ductwork to be re-used where possible. Further opportunities to be explored as the design is developed during the next design stages,.	Further opportunities to be explored as the design is developed during the next design stages.	Further opportunities to be explored as the design is developed during the next design stages.	Reusable or recyclable materials for Site hording & temporary works where possible.	Availability of recycled materials within the UK. Changes to specification due to cost constraints and technical viability.	On-going sustainability champion appointment including design team workshops, monitoring, assessment and reporting	Circular Economy Written evidence & Whole Life Carbon Assessment Detailed design specification [to be confirmed] Relevant contractor to update the Bill of Materials and Waste generated during demolition, excavation and construction As-built Circular Economy Written evidence & Whole Life Carbon Assessment

Circular Economy Principles

Reporting forms

A Bill of Materials based the Site Whole Life Carbon Assessment is located in Appendix 01. The assessment captures the known materials types at this stage of the design and makes reasonable allowances for materials where not known. The Whole Life Carbon Assessment estimates the 'Circularity' of the design, by material. An example of a 'new build' (Plot F) and a extension (Plot E) can be found in Table 5 & 6.

At this point in time Circularity it estimated to be in the range of 30% - 35% for new buildings and up to 46% for the landscaping element, which have been assessed in isolation.

Product selections will be actively developed during the next design stages with the intention of enhancing Circularity.

In addition to this, a Resource Management Plan, will be produced and developed to inform the recycling and waste management processes during construction.

A Waste & Recycling Reporting Form (as per GLA's guidance for Circular Economy Statements) could not be completed at this stage, as the demolition or main contractors have not yet been appointed.

A Delivery & Servicing Management Plan provided by RGP in support of this application has been developed with consideration to the London Borough of Camden's Waste and Recycling Guidance.

Please refer to the separately submitted whole life carbon (WLC) assessment for more information about the assessment and the material selection to date.

Table 5. Plot F (new build) estimated circularity by key material type – output from OneClick LCA

Result category	Total kg	Virgin %	Materials Recovered %	Disposal %	Downcycling and use as energy %	Recycling and reuse as material %	Materials returned %	Circularity %
Concrete	9,223,444.49	94.39	5.61		100		50	27.8
Metal	447,423	4.9	95.1			100	100	97.55
Bricks and ceramics	204,647.01	100	0		100		50	25
Gypsum-based	211,393.23	99.91	0.09		94.5	5.5	52.75	26.42
Insulation	16,402.46	67.63	32.37	79.76	20.24		10.12	21.24
Glass								
Wood and biogenic	14,872.11	12.36	87.64		100		50	68.82
Earth masses and asphalt	543.76	100	0	100				0
Other materials	133,778	72.98	27.02	6.76	6.92	86.31	89.77	58.4

Table 6. Plot E (extension) estimated circularity by key material type – output from OneClick LCA

Result category	Total kg	Virgin %	Materials Recovered %	Disposal %	Downcycling and use as energy %	Recycling and reuse as material %	Materials returned %	Circularity %
Concrete	4,084,155.01	95.35	4.65		100		50	27.32
Metal	443,710.11	38.6	61.4			100	100	80.7
Bricks and ceramics	223,800.34	100	0		100		50	25
Gypsum-based	240,992.1	99.1	0.9		68.68	31.32	65.66	33.28
Insulation	32,435.88	51.94	48.06	97.74	2.26		1.13	24.6
Glass	74,340	100	0			100	100	50
Wood and biogenic	24,967.36	9.39	90.61		100		50	70.3
Earth masses and asphalt	815.64	100	0	100				0
Other materials	164,196.17	66.32	33.68	3.76	9.46	86.78	91.51	62.6

Implementation Strategy

POST-PLANNING AT DETAILED STAGE DESIGN

CONSTRUCTION

POST COMPLETION

Implementation Strategy

Post-planning At Detailed Stage Design

A Site Waste and Resource Management Plan (SWMP/RMP) will be prepared and will be implemented by the contractor including procedures and commitments to sort and divert waste from landfill, through either;

- Reusing the material on site (in-situ or for new applications)
- Reusing the material on other sites
- Salvaging or reclaiming the material for reuse
- Returning material to the supplier via a 'take-back' scheme
- Recovery of the material from site by an approved waste management contractor and recycled or sent for energy recovery.

Waste materials will be sorted into separate key waste groups, such as bricks, concrete, insulation, packaging, timber, electricals, plastics, glass, etc., according to the waste streams generated by the scope of the works either onsite or offsite through a licensed contractor for recovery.

A detailed SWMP will be produced by the construction contractors and will include the target benchmark for resource efficiency. It should also cover the following:

- Procedures and commitments for minimising non-hazardous waste in line with the benchmark
- Procedures for minimising hazardous waste
- Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
- Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on site or through a licensed external contractor
- The name or job title of the individual responsible for implementing the above

The plan should be in line with guidance provided by DEFRA, Building Research Establishment (BRE) and Waste & Resources Action Programme (WRAP). Where materials cannot be reused or recycled on-site, the contractor will identify opportunities for potential reuse off-site. Material and waste generated through construction will be stored safely and efficiently, prior either for reuse on site or removal. Any materials to be reclaimed / reused will be done so in accordance with the WRAP protocol.

The waste reports and records will be reviewed and audited periodically. They will be discussed with the Sustainability champion on site.

Implementation Strategy

Construction

The appointed construction Contractor will take appropriate measures on site to further reduce the environmental impact of the construction. They will adopt the following:

- The contractor will register with the Considerate Constructor's Scheme and aim to attain a high score in all categories
- Energy efficient equipment, services and construction methods will be adopted to reduce energy consumption.
- Water use will be minimised during operation, installation and construction processes
- Energy including fuel and water use will be recorded on site during the construction process
- Measures will be put in place to mitigate the potential for pollution from the Site to land, air or water including noise and dust
- The main contractor will operate as per the guidelines set by ISO 14001 Environmental Management System (or an equivalent standard) and encourage the same throughout the supply chain
- Strategic planning will be done in advance to minimise transport to and from the Site to reduce greenhouse gas emissions
- Carbon footprint of material transportation should be recorded through Key Performance Indicator (KPI) sheet provided by the Sustainability Consultant.
- The sustainable procurement plan will be used to ensure the sustainability requirements have been captured within the material specification.
- Within the inclusion of performance requirements, any deviation from the design that will impact material quantities will need to be approved by the relevant design consultant.

Post Completion

Following project completion, an update to the Detailed Circular Economy Statement will be prepared by the design team to reflect the as-built design.

This updated statement will detail progress against the targets and commitments, reporting on the outcomes and lessons learned.

End of Life Strategy

End of Life Strategy

The final Circular economy principle focuses on the end of the Proposed Development's lifetime.

Using systems, elements or materials that can be reused and recycled will ultimately help in ensuring that waste is avoided, or at least reduced.

For plots A & F the optimised RC concrete frame ensures longevity and adaptability for future uses with grid sizes and façades optimised for flexibility of use. Acoustics, fire and floor to ceiling heights were also a key factor in deciding the material type. There is limited opportunity for high-value reuse from the proposed construction type for A & F. However, the majority of the building materials, components and products can be recycled at the end of their useful life. This is shown in the Circularity diagram below for Plot F provided by the One Click LCA Building Circularity tool.

It is impossible to predict construction processes, reusable, and recycled value in 60(+) years, however, based on current practices, industry benchmarks applied by the One Click tool, and a material palette as defined in the WLC assessment, an estimation is produced by the tool.

A building's circularity is evaluated in terms of the mass of the recovered building material as compared to virgin material likely to be used in the building construction and the percentage of the material that can be returned to building construction at the end of life of the building.

Materials recovered (9.7%) represent the use of circular materials in the project. This is the share of recycled, reused or renewable materials of the total materials used. The design team will actively develop the materials palette during the next design stage to enhance this figure, where possible

Materials returned (52.9%) represents the end-of-life handling of materials that were used in the project. This is the share of materials that could be either recycled or reused as material at the end of life of the project.

92.6% of these materials are currently estimated to be recycled through downcycling (with value loss, such as reuse of concrete aggregates) or used as energy (such as wood or plastic products) incineration.

The Building Circularity score, (~31%), is the average from the materials recovered added up to the materials returned (i.e. (9.7%+52.9%)/2).

The design team will actively develop the materials palette during the next design stage to enhance Circularity across the development, where possible.

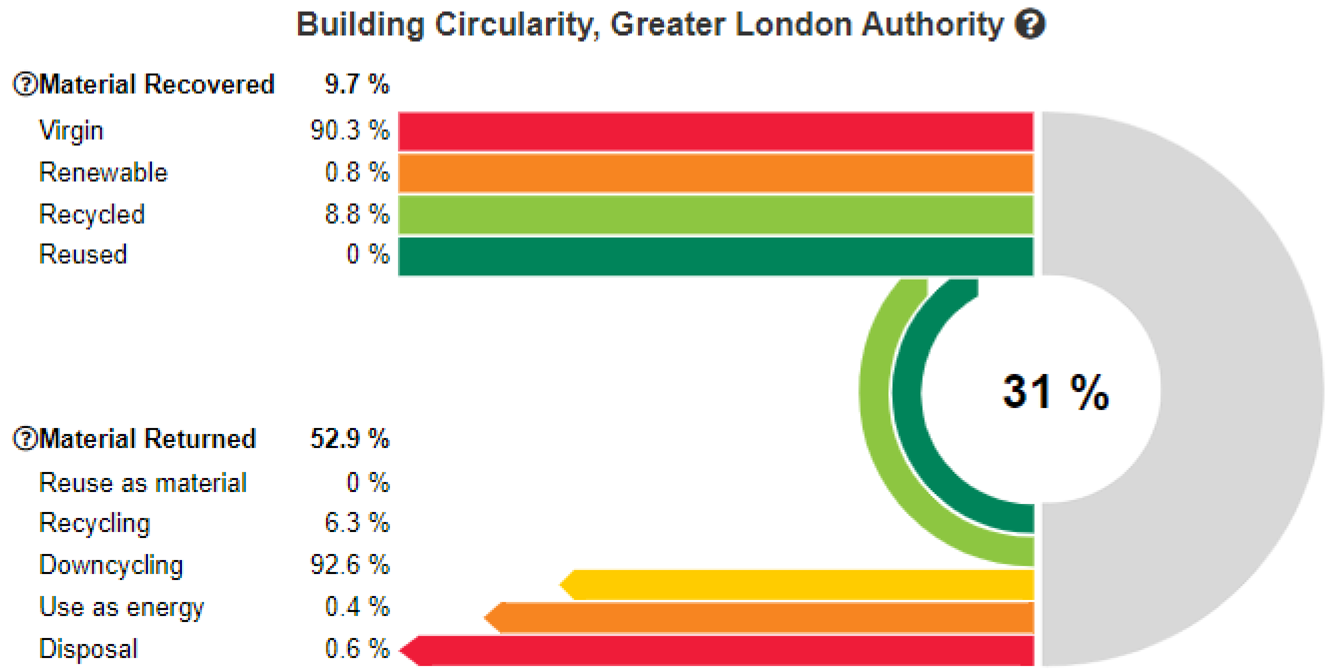
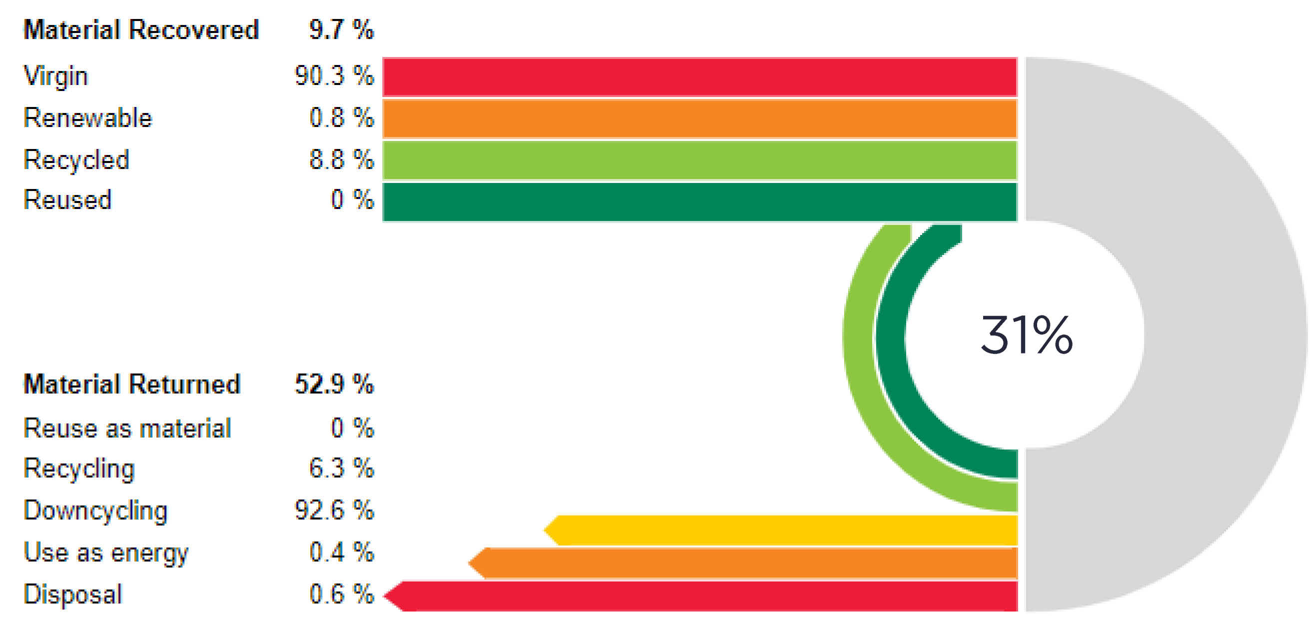


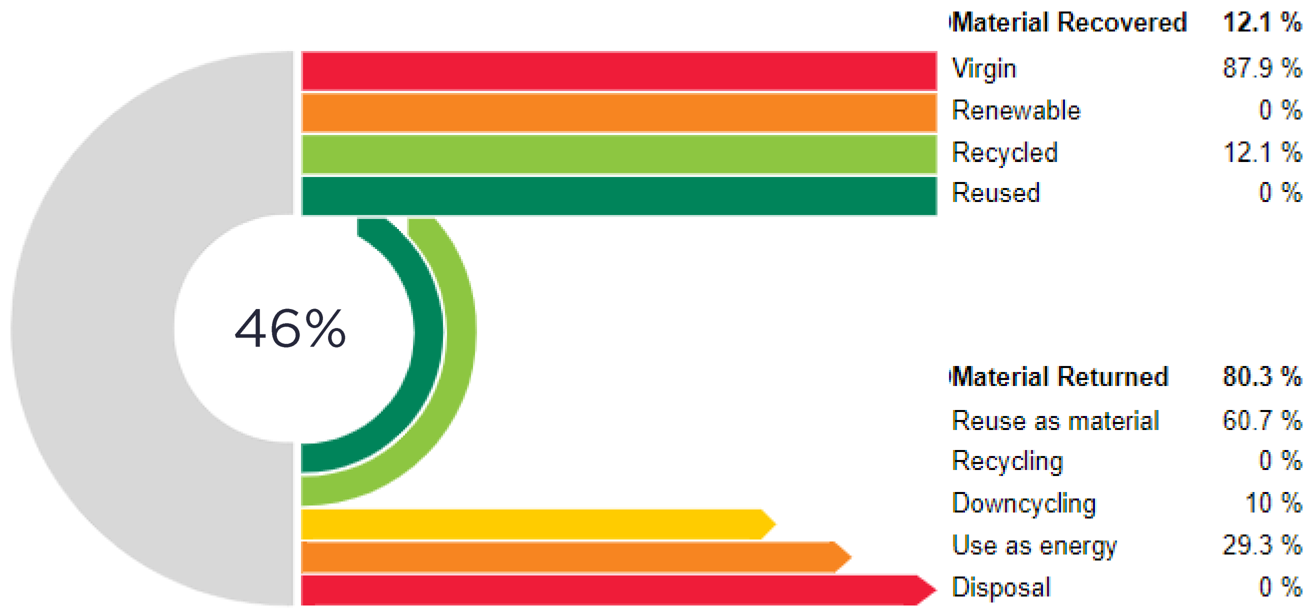
Figure 6. OneClickLCA Building Circularity tool results, Plot F (new build)

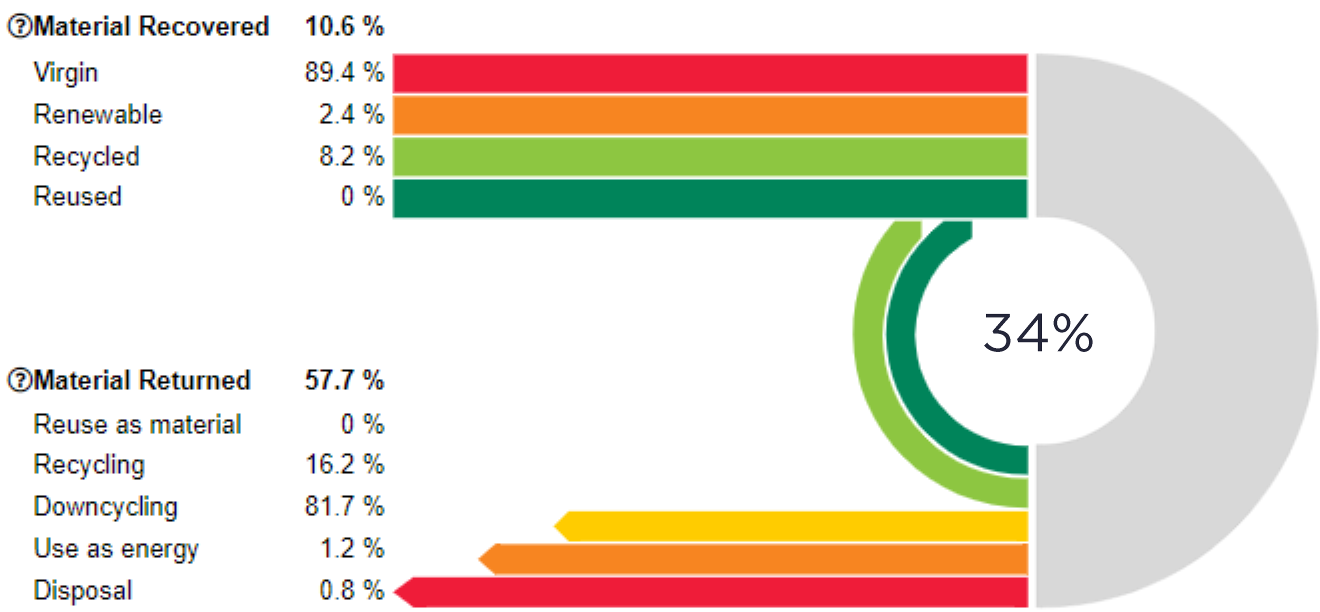
End of Life Strategy

Plot F (new build)
Estimated Building Circularity

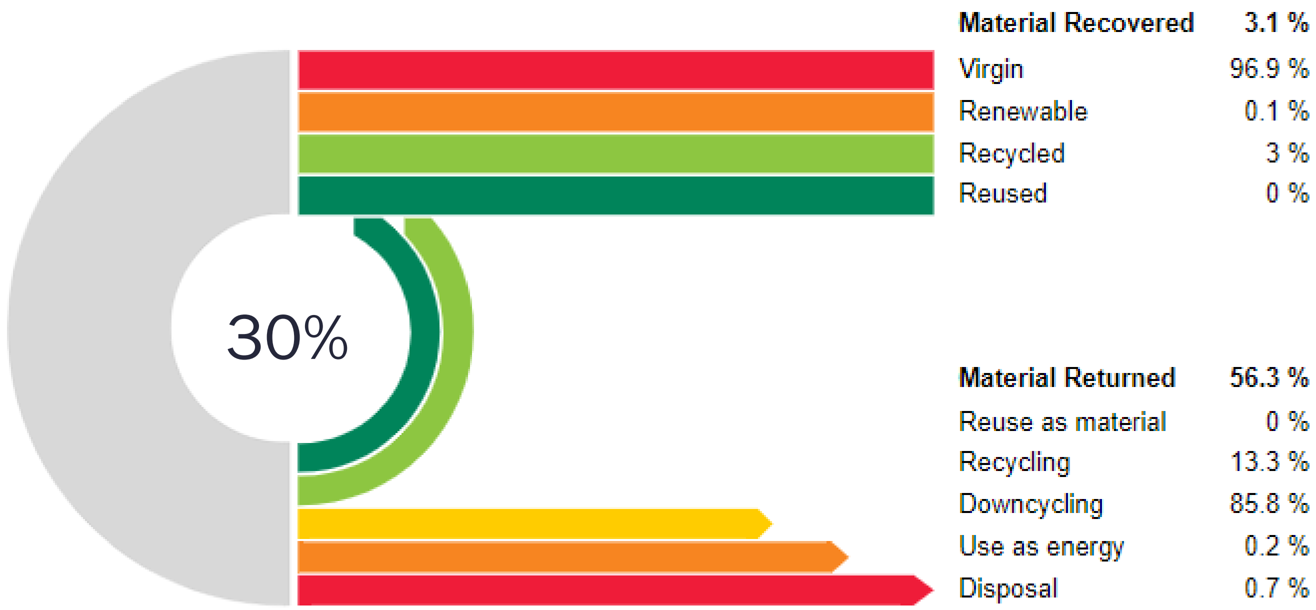


Landscaping
Estimated Circularity





Plot E (extension)
Estimated Building Circularity



Plot E (refurbishment)
Estimated Building Circularity

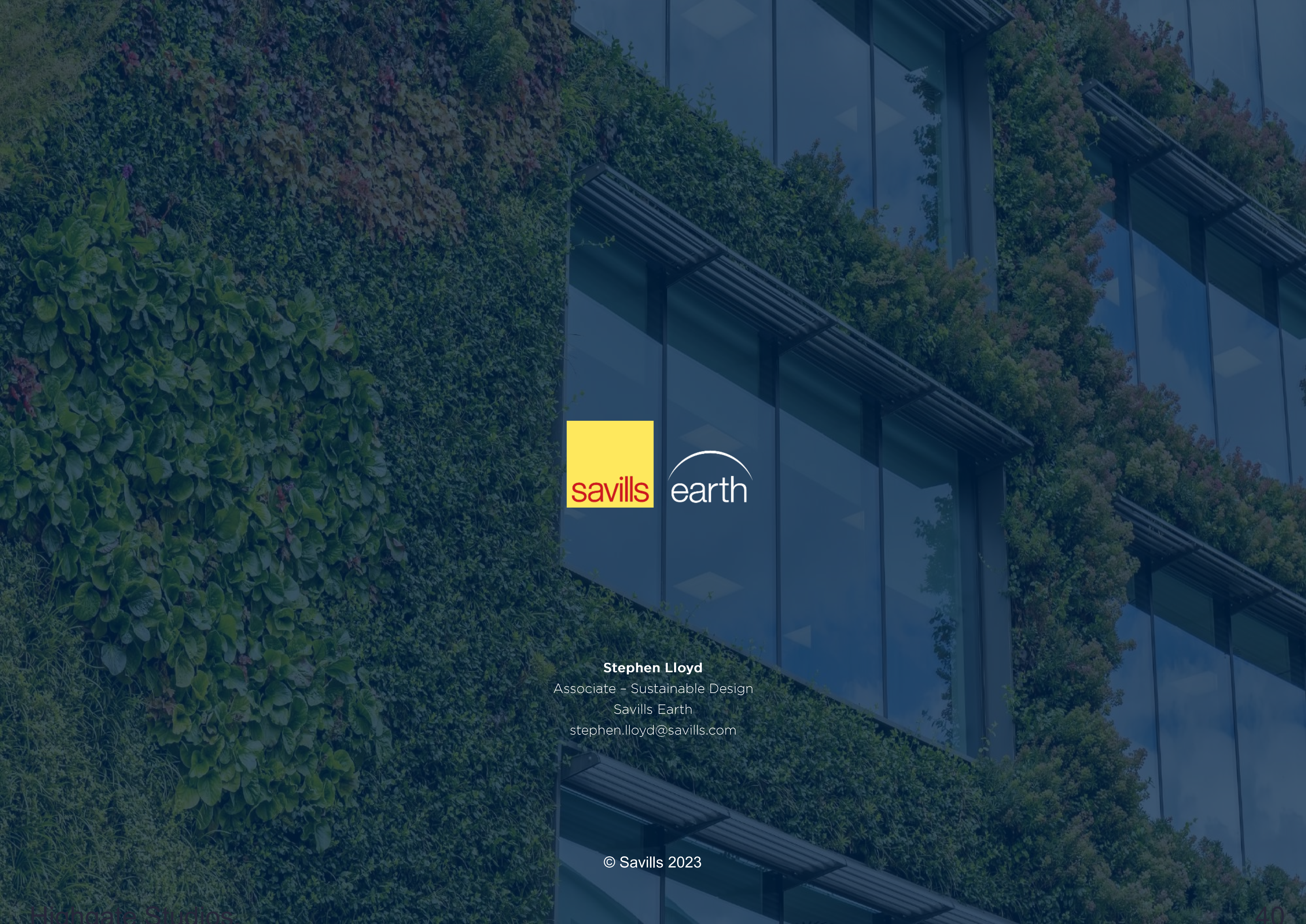
Appendix 01

BILL OF MATERIALS

Appendix 01 Bill of Materials

Table 6. OneClickLCA Bill of Materials

	Sum of Material quantity (Module A) kg	Material intensity (kg/m2)	Recycled content by value (%)	Reused content by value (%)	Estimated reusable materials (kg/m2)	Estimated recyclable materials (kg/m2)
1 Substructure	13,103,136	389	40	0	0	1118.8
2.1. Frame	3,023,797	90	44	0	0	602.1
2.2 Upper Floors	14,107,089	419	40	0	0	1425.6
2.3 Roof	966,548	29	6	0	0	146.4
2.4.1.Stair and ramp structures	1,057,405	31	5	0	0	90.6
2.5 Ext. Walls	16,546,187	492	14	0	0	1387.1
2.6 Windows & Ext. Doors	111,348	3	0	0	0	47.6
2.7.1.Walls and Partitions	1,081,610	32	1	0	0	197.5
2.8 Int. Doors	8,894	0	0	0	0	0.5
3 Finishes	543,991	16	0	0	0	437
4.Fittings, furnishings and equipment	5,703	0	0	0	0	0
5 Services (MEP)	379,827	11	0	0	0	354.9
8 External works	66,948	2	5	0	0	0.8



Stephen Lloyd
Associate – Sustainable Design
Savills Earth
stephen.lloyd@savills.com