



Circular Economy Statement

Artisan Gun Making Workshop Relocation: Ashby Farm
Holland & Holland

P01 13/03/2026



ScotchPartners

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Contents

1	Executive Summary.....	5
2	Introduction.....	7
2.1	Development Description.....	7
2.2	Overall Sustainability Objectives and Aspirations.....	8
2.3	The London Plan Policy.....	9
2.4	The London Borough of Hillingdon Local Plan Part 1 (2016) and Part 2 (2020).....	9
2.5	This Statement.....	9
2.6	Method Statement.....	10
3	Circular Economy Goals and Strategic Approach.....	12
3.1	Strategic Approaches.....	12
3.2	Circular Economy Approach for the Existing Site.....	18
3.2.1	Pre-Redevelopment Audit.....	19
3.2.2	Pre-Demolition Audit.....	20
3.2.3	Diversion of Demolition Waste from Landfill.....	23
3.3	Circular Economy Approach for the New Development.....	23
3.3.1	Outline Site Waste Management Plan.....	25
3.3.2	Operational Waste Management Strategy.....	27
3.3.3	Material Efficiency.....	28
3.3.4	Minimise Construction Waste.....	29
3.3.5	Design for Adaptability and Disassembly.....	29
3.3.6	Sustainable Procurement of Materials.....	30
4	Reporting.....	33
4.1	Bill of Materials and Whole Life Carbon Assessment.....	33
4.2	End-of-Life Strategy.....	34
4.3	Plans for Implementation.....	35
4.4	Reporting Outcomes – Post Completion Report.....	36
4.5	Lessons Learned.....	36
5	Conclusion.....	37
6	APPENDICES.....	39
6.1	APPENDIX A – Pre-Redevelopment Audit (Velocity).....	40
6.2	APPENDIX B – Pre-Demolition Audit (Velocity).....	41
6.3	APPENDIX C – Outline Site Waste Management Plan (Velocity).....	42
6.4	APPENDIX D – Operational Waste Management Strategy (Velocity).....	43
6.5	APPENDIX E – Bill of Materials (One Click - Scotch Partners).....	44
6.6	APPENDIX F - Circular Economy Design Approaches (Team Input).....	45
6.7	APPENDIX G – CES Data Document (Velocity).....	46

6.8 APPENDIX H – Sustainable Procurement Plan (Scotch Partners) 47

1 Executive Summary

Scotch Partners has been instructed by Holland & Holland (hereby referred to as 'the Applicant') to produce a Circular Economy Statement to support the detailed planning application submitted by 'the Applicant' to the Council for the redevelopment of the land at Ashby Farm, Northwood, London HA62ST.

This report supports the Applicants request for the "Demolition of the existing site buildings (with central timber framed barn retained), removal of existing hardstanding and menage area and the redevelopment of the site to provide a new high quality workshop facility including associated access improvements, parking, hard and soft landscaping, sustainable drainage and ecological enhancements."

Principles of Design

Six fundamental principles underpin the structure and content of this Circular Economy Statement, as assessed by the design team:

1. Component or material reuse and recycle
2. Designing for adaptability
3. Designing for flexibility
4. Designing for replaceability
5. Designing for disassembly;
6. Designing for longevity.

Strategies

Additional guiding strategies include:

- Building in layers
- Designing out waste

The scheme is GLA referable therefore this statement has followed the structure outlined in the London Plan Guidance, Circular Economy Statements, GLA, March 2022. The statement will be reviewed and updated in future design stages.

To meet the Mayor of London's Net Zero Carbon aspirations and to align with the London Plan Policy, the proposed development has been designed to consider the key policies relating to sustainable design and construction, focusing primarily on the following documents:

- The London Plan (2021)
- National Planning Policy Framework (NPPF)
- GLA Circular Economy Statements (2022)
- Hillingdon Local Plan Part 1 (2016) and Part 2 (2020)

Key Design Approaches

The following key design approaches and targets have been identified by the design team:

- Ensuring that a rate of 20% recycled content and recyclability of materials is considered and delivered during procurement in line with the WLCA and circularity assessment on One Click.

- Diverting a minimum of 95% of demolition, construction and excavation waste from landfill.
- Substructure and superstructure concrete frame can use cement replacement recycled products such as GGBS and limestone fines.
- Regular foundations, and loadings, allow for flexible future uses. Foundations and concrete superstructure designed for a life of 50+ years.
- Timber can be used for superstructure, if appropriate sizes are found, strength graded and treated.
- Ensure that recycled content and recyclability is considered and delivered during procurement.
- Explore materials/products that offer an end-of-life takeback/recycling scheme.
- Partitions are mostly non-structural, therefore providing flexibility for adapting layouts.
- Internal floorplates are relatively clear and allow for future flexibility.
- Timber structure is relatively transparent and can be flexible for new small openings.
- Plant will be specified from manufacturers that make space parts/components available for a reasonable time even after the item has been discontinued allowing for component change rather than a system replacement.
- Brickwork façade can be added to or partially demolished easily.
- Design all systems to use standardised components, allowing for easy replacement when required.
- Provide accessible risers and clear labelling to allow tracing and removal of cables, pipes and ducts.
- Design all systems to be fully accessible and maintainable, thereby allowing for disassembly and removal of parts without any knock-on effect to other systems.
- Minimise the use of fixings/adhesives that cannot be disassembled.
- Limited number of window types in scheme to simplify replacement.
- Specify systems with long life expectancy to prolong the operation of active components.
- Doors and wall finish appropriate for environment specified (kick plates to doors in heavy use areas).
- Durable products to be specified against spills /wear and tear.

Sustainability Workshops & Wider Design Influence

Sustainability workshops have been undertaken with the team to identify practical approaches for circular economy, and a Pre-Demolition Audit and Pre-Redevelopment Audit has been produced by Velocity which highlights existing materials that can be recycled or reused on-site and off-site.

A Whole Life Carbon Assessment (WLCA), Outline Site Waste Management Plan (OSWMP), Operational Waste Management Strategy (OWMS) and Design and Access Statement (DAS) have also influenced the approaches for design to adhere to.

2 Introduction

2.1 Development Description

This Circular Economy Statement (CES) has been prepared in support of the detailed planning application submitted by the Applicant to The London Borough of Hillingdon for the redevelopment of the land at Ashby Farm. The proposed Artisan Gun Making Facility will be in the region of 1,416m² GIA while the full site area within the planning redline boundary is: 24,900m² (2.49 hectares).

The planning application seeks approval for the “Demolition of the existing site buildings (with central timber framed barn retained), removal of existing hardstanding and menage area and the redevelopment of the site to provide a new high quality workshop facility including associated access improvements, parking, hard and soft landscaping, sustainable drainage and ecological enhancements.”

The site is to be redeveloped to provide a new state of the art gun making facility suitable for continuing the Holland & Holland brand traditions and skills throughout the 21st century. The aim is to build an exemplary facility for staff, clients and visitors that embodies the brand ethos which is driven by heritage and nature conservation. The Applicant wishes to respond to the existing agricultural / industrial vernacular of buildings onsite to produce a scheme which will be both modern and encompass the traditional values of the brand. The scheme should take its inspiration from the arrangement, scale, and massing of the current farmyard buildings.

The proposed scheme will be a net zero carbon, low energy facility with proven sustainability credentials such as BREEAM. Sustainability will be a core driver for the scheme from the offset with emphasis on SUDs drainage strategies (including an attenuation pond), recycling of existing materials onsite, employee wellbeing focusing around natural daylight in workshop areas, natural ventilation, views of nature, and the incorporation of sustainable technologies such as solar panels.

The site will be landscaped appropriately with limited formal landscaping complemented by broader landscape remediation works. Attention will be given to existing issues with poor surface water drainage and how this may be ameliorated via incorporation of SUDs technologies.

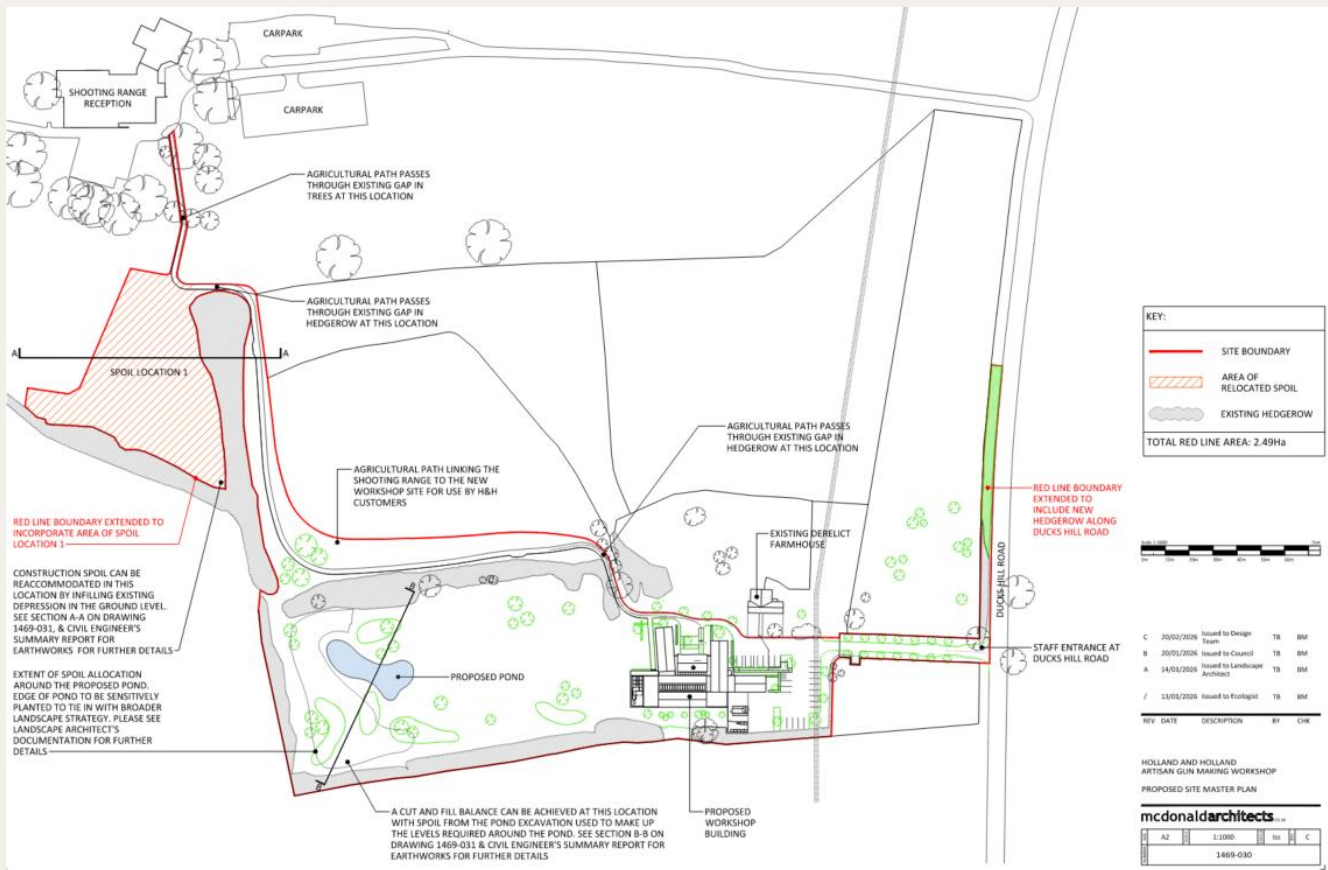


Figure 1 – Site Boundary for Ashby Farm (McDonald Architects)

2.2 Overall Sustainability Objectives and Aspirations

The Mayor of London has declared a ‘Climate Emergency’ and has aspirations for London to become a Net Zero Carbon city by 2030.

The Applicant and the project team have fully embraced the sustainability and Net Zero Carbon objectives of the London Borough of Hillingdon. They are keen for the proposed development to fully support these objectives and minimise environmental impact over the buildings’ life cycle. The intention of the scheme is to act in support of the London Borough of Hillingdon’s sustainability aspirations & commitments for the coming years.

The proposed development has been designed to also consider the key policies relating to sustainable design and construction, focusing primarily on the following documents:

- The London Plan, 2021
- National Planning Policy Framework (NPPF)
- GLA Circular Economy Statements, March 2022
- GLA Whole Life-Cycle Carbon Assessments, March 2022
- Hillingdon Local Plan Part 1 (2016) and Part 2 (2020)

This Statement forms part of a suite of sustainability documents that collectively demonstrate how the development proposals have responded to both the Council and the Applicant’s sustainability objectives, and its performance against mandatory and voluntary

sustainability targets. As such, this document should be read in parallel with the following reports submitted with the planning application:

- Sustainability Statement produced by Scotch Partners
- Whole Life Carbon Assessment (WLCA) produced by Scotch Partners
- Whole Life Carbon GLA Spreadsheet produced by Scotch Partners
- Design and Access Strategy (DAS) produced by McDonald Architects
- Pre-Redevelopment Audit produced by Velocity (Appendix A)
- Pre-Demolition Audit produced by Velocity (Appendix B)
- Outline Site Waste Management Plan (OSWMP) produced by Velocity (Appendix C)
- Operational Waste Management Strategy (OWMS) produced by Velocity (Appendix D)
- Circular Economy Statement Data produced by Velocity (Appendix G)
- Sustainable Procurement Plan produced by Scotch Partners (Appendix H)

2.3 The London Plan Policy

“The London Plan Policy SI 7 defines a circular economy (CE) 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.’ It is a move away from the current linear economic model, where materials are mined, manufactured, used and thrown away.”

This report has been produced in line with the Circular Economy principles detailed in the London Plan Guidance Circular Economy Statements (March 2022).

2.4 The London Borough of Hillingdon Local Plan Part 1 (2016) and Part 2 (2020)

The London Borough of Hillingdon (LBH) Plan Part 1 and Part 2 work in conjunction to guide new developments in coordination with the vision of Hillingdon Council for the future of the borough. Part 1 is designed to set out the spatial vision and framework for delivery, while Part 2 focuses on Development Management Policies. Both parts support the long-term delivery and objectives of new developments, in which sustainability is at the forefront of future growth. This sustainability strategy aims to overview the council policies as they apply to the development and ensure that the site contributes to growth in the borough.

To satisfy the objectives of both Part 1 and Part 2, new developments are required to incorporate energy efficiency through low or zero carbon sources, minimising waste production during construction, and increases in site biodiversity to not only support the local area, but the region as whole. All of these methods have the ultimate goal of impacting the area beyond the site boundaries and will assist in the national targets of reducing carbon emissions and climate change.

2.5 This Statement

This report outlines the Circular Economy strategy for the Site during Planning Stage, as the design approaches RIBA Stage 3 and as agreed with the design team and the Applicant. The purpose of this Circular Economy Statement is to address relevant planning policy regarding the transition away from the traditional single use, or “take-make-dispose” economic model to a circular model aimed at reducing waste and keeping elements in the cycle. The end goal is to retain the value of materials and resources indefinitely, with no residual waste at all. For this to happen, there needs to be transformational change in the

way the industry operates. This includes changing the way we think about designing, building, operating, and deconstructing buildings.

This statement has followed the structure outlined in London Plan Guidance, Circular Economy Statements, GLA, March 2022. The statement will be reviewed and updated in future design stages.

2.6 Method Statement

Throughout RIBA Stage 2, dedicated cross-disciplinary Sustainability workshops have taken place, providing a strategic briefing on the topic of circular economy, and discussing best approaches for the Development, including discussion of how the development can go above and beyond GLA requirements. Attendees at these meetings included representation from the following teams:

- Client (Holland and Holland)
- Architects (McDonald Architects)
- Structural engineers (MHA Structural Design)
- M&E consultants (Environmental Engineering Partnerships)
- Sustainability (Scotch Partners)



Figure 2 - Circular Economy Cycle

It has been agreed that further workshops will be held throughout the design process to continue to consider Circular Economy principles and further embed these into the design.

This Circular Economy Statement outlines the details in which the development can design and plan circular economy principles for the Site. In order to do this, the Site will aim to consider the full life cycle of the building and its components. The Site will do this by following the core principles throughout the design process. The aim is for the following to be achieved by the Site:

- The design will minimise materials used on site, through designing out waste and reuse where possible.
- The development will reduce and minimise the use of energy and natural resources where possible.
- Procurement of materials and other resources will be done responsibly and sustainably, with local products prioritised where possible to reduce transport to and from site.
- The development will be designed to maximise its life cycle where possible. The development will also design to be as adaptable or flexible as possible and optimise the chances of reusability and recoverability.
- The Site will aim to minimise all construction, demolition and excavation waste through continued work to increase reuse.
- Continued discussion of use of smart waste minimisation schemes will aim to minimise municipal waste throughout the development.

The DEFRA 2011 Waste Hierarchy (Figure 3) will be considered at each RIBA Stage to ensure that reuse, recycling and recovery opportunities are optimised.

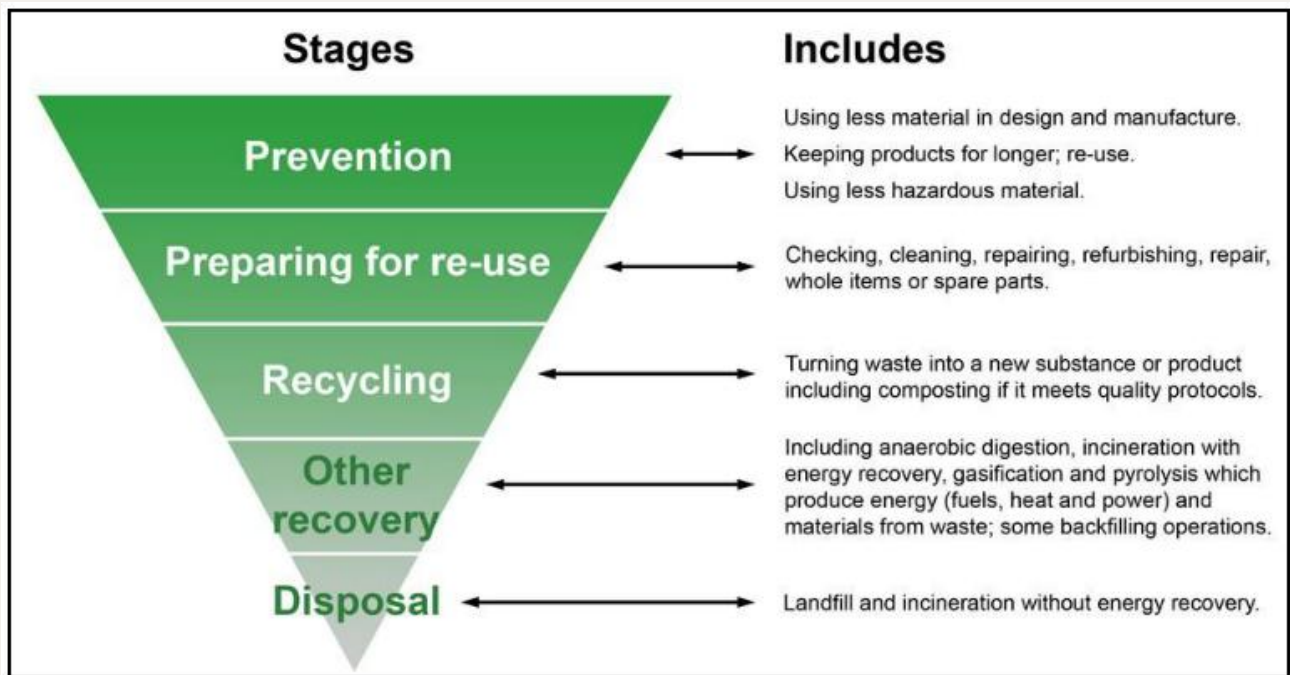


Figure 3 - The DEFRA 2011 Waste Hierarchy

3 Circular Economy Goals and Strategic Approach

3.1 Strategic Approaches

This section aims to identify the high-level strategy and approaches to the circular economy.

The following steering options were at the forefront of considerations regarding strategic approaches for the proposed development:

- **Retention and prevention:** Exploration of retaining existing structure and materials and their suitability to the proposed development.
- **Demolish and recycle:** Where retention is not occurring, demolished elements should be converted into new materials or objects to be used on the site or at another site. Storage space and collection systems should be provided to support recycling and reuse.
- **Longevity:** Long-term needs of the development must be considered at all stages of design. This includes ensuring durability and resilience of the development so that it can be adaptable to future changes and technologies.
- **Adaptability:** Present and future needs must be considered, and the development must be able to be altered for future periodic remodelling. Such remodelling is likely to involve planning, building control and wet trades.
- **Flexibility:** The development design must consider future changes and reconfigurations. Such reconfigurations are likely to be pre-agreed and will not involve wet trades or any waste.
- **End-of-life reuse:** Building materials, components and products should be chosen to enable disassembly and re-use at the end of their useful life.

It's important that when assessing whether existing buildings are suited to the requirements for the site, an analysis of the options for retaining the existing buildings should be undertaken. The edited GLA decision tree below shows the recommended design strategy at this stage, based on findings from the Pre-Redevelopment Audit and the Pre-Demolition Audit. Due to multiple structural and environmental factors, the design team has determined that the most feasible and optimal design for the project is to pursue a 'Demolish and Recycle' pathway. There are timber beams from one of the derelict barns that will be repurposed on-site and made-good to contribute to the design intentions of the site.

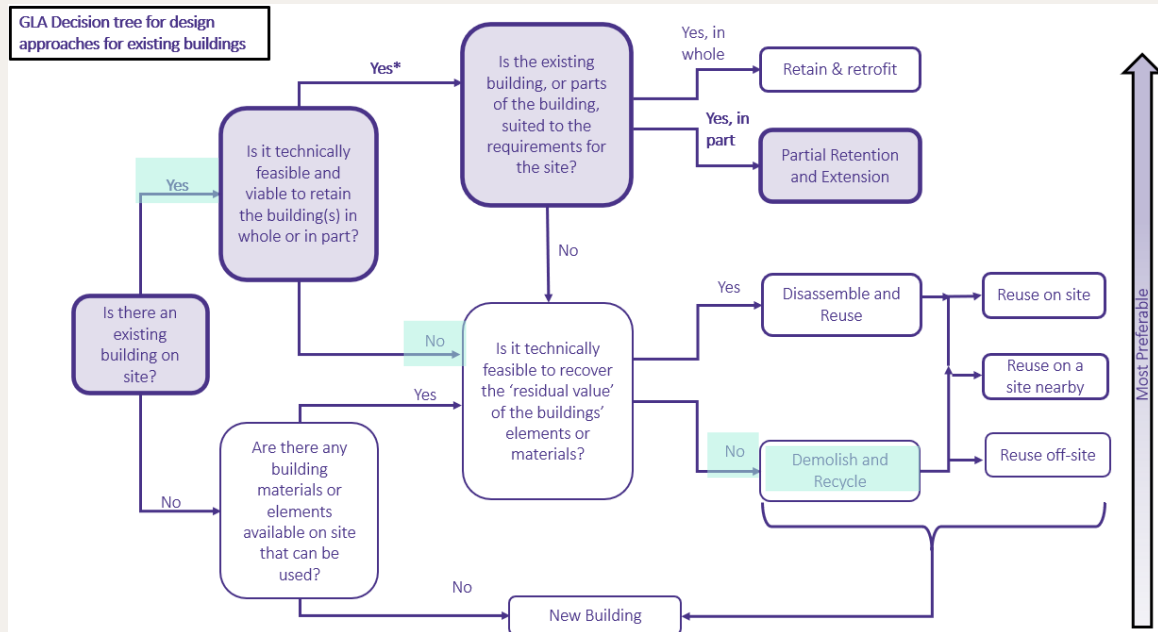


Figure 4 - GLA CE Guidance: Decision Tree for Design Approaches for Existing Structures/Buildings
 Following the GLA’s guidance, it has been identified that the key approach should be designing for disassembly and adaptability, and material reuse on-site and/or recycling.

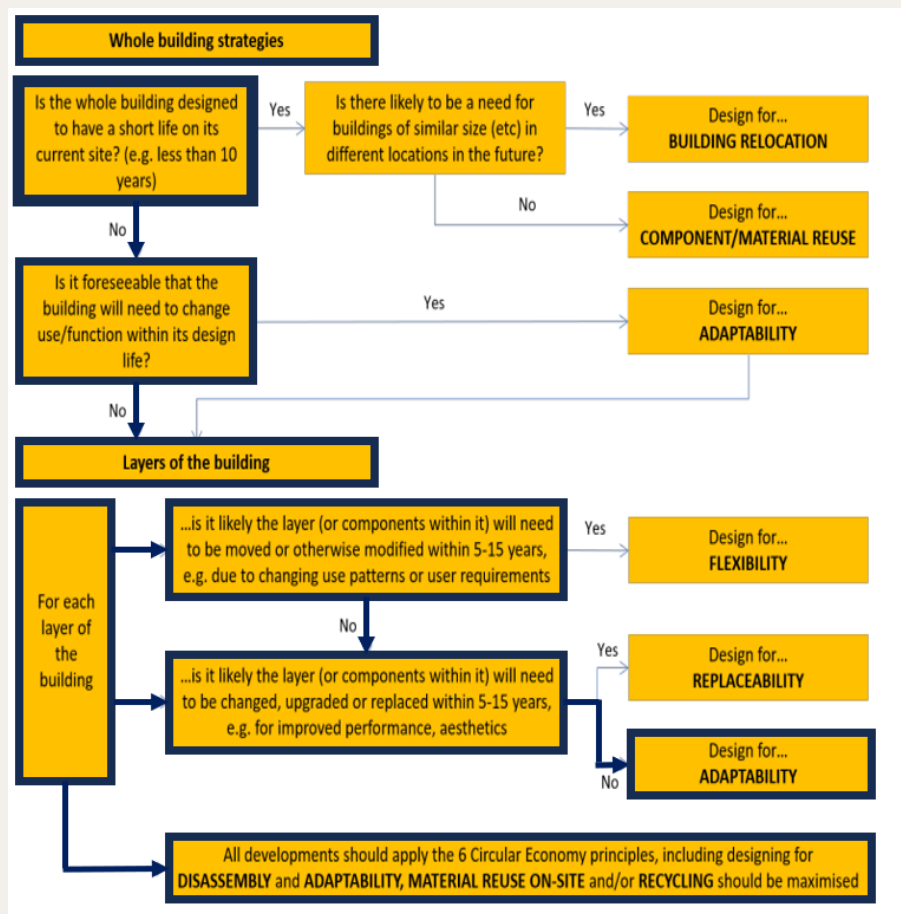


Figure 5 - GLA CE Guidance: Decision Tree for Design Approaches for New Buildings

The following project circular economy targets have been established for the site. These have been coordinated in line with the GLA and London Borough of Ealing's policies, BREEAM requirements, and engagement with the project team. These have also been supported with findings from the below documents:

- Pre-Redevelopment Audit by Velocity (Section 6.1 Appendix A)
- Pre-Demolition Audit by Velocity (Section 6.2 Appendix B)
- Outline Site Waste Management Plan by Velocity (Section 6.3 Appendix C)
- Operational Waste Management Strategy by Velocity (Section 6.4 Appendix D)
- Whole Life Carbon Assessment by Scotch Partners – One Click Bill of Materials (Section 6.5 Appendix E)
- Circular Economy Design Approaches (Section 6.6 Appendix F)
- CES Data Document by Velocity (Section 6.7 Appendix G)
- Sustainable Procurement Plan by Scotch Partners (Section 6.8 Appendix H)

Table 1 - Circular Economy Targets for Ashby Farm

Focus Area	Key Performance Indicator	London Plan Target	Project Target	How will performance against this metric be secured through design, implementation and monitoring?
Demolition waste materials (non-hazardous)	Diversion from landfill for reuse, recycling or recovery.	95%	95%	<p>The Pre-Demolition audit carried out by Velocity has been reviewed and the various demolition protocols and waste hierarchy will be followed. If feasible, a strategy of re-use on site will be pursued. Where materials cannot be recycled or re-used on site, the Principal Contractor will identify opportunities for potential re-use of materials off-site. The applicant will refer to the London Waste Map to consider opportunities for using local sites to manage materials and waste. A Site Waste Management Plan will be produced and implemented. The Principal Contractor will include information on the pre-demolition audit in the Final SWMP. The demolition contractor will put procedures in place for segregating and storing demolition waste prior to collection by a licenced waste contractor.</p> <p>The demolition contractor will be required to report the waste consumption against the BREEAM Wst01 requirements.</p>
Excavation waste materials	Minimum of 95% diverted from landfill for beneficial reuse.	95%	95%	<p>There will be excavation works associated with the construction of foundations. An Outline Site Waste Management Plan (OSWMP) was prepared by Velocity. A Site Waste Management Plan documenting measures to reduce construction, demolition and excavation waste will be produced and implemented by the contractor post-planning. The contractor for below grounds work will put procedures in place for segregating and storing excavation waste prior to collection by a licenced waste contractor. Subject to chemical and physical testing for requirements, excavated materials can be used for material infill at suitably licenced facilities.</p> <p>Any clean excavated material that cannot be reused on-site will be removed by licensed waste carriers and sent for reuse at another local development site, recycled into secondary aggregate or sent for disposal at appropriately licensed facilities (these are expected to be inert waste landfill sites). Any potential re-use of materials should be undertaken under a Materials Management Plan in line with the CL:AIRE Code of Practice.</p>

				Inert materials will be reported against the targets in line with BREEAM credit Wst01.
Construction waste materials	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	95%	95%	<p>An Outline Site Waste Management Plan (OSWMP) was prepared by Velocity. A Site Waste Management Plan (SWMP) will be prepared for the proposed development by the contractor post-planning.</p> <p>Construction waste will be separated into recyclable waste streams before removal from site for reuse or disposal. A range of measures will be investigated to facilitate the minimisation of waste generation. The volume/tonnage of waste generated (or sent off site) as well as the percentage or volume/tonnage reused, recycled or disposed will be recorded throughout the construction phase. The Principal Contractor will provide a monthly report to the Client on the progress of the Waste Management Strategy. Monthly reporting of all construction waste data throughout the project checked against what would be expected based on the stage of the project, invoices, etc., to validate completeness of waste reporting data.</p>
Recycled Content	Minimum 20% of the building material elements to be comprised of recycled or reused content.	20%	20%	<p>Following a Whole Life Carbon Assessment, 18% of the Development's building materials comprise of recycled content. Recycled content requirements will be detailed in designer specifications and Contractor Employer Requirements.</p>
Operational Waste	Minimum 65% Recycling rate by 2030	65%	65%	<p>Dedicated waste facilities accommodating recycling and residual waste bins will be provided for the proposed development. The development will be designed with adequate, flexible and easily accessible storage space and will support the separate collection of dry recyclables. Space will also be provided to allow for storage of food waste prior to collection. This will demonstrate how the development has taken into account sustainable methods for waste and recycling management during its operation in order to meet requirements from the London Plan and LBH policies and all applicable legal requirements. Commercial areas will include segregated waste bins which will support the separate collection of</p>

				<p>residual waste, dry mixed recyclables (e.g. plastics, metals, glass, mixed paper, card and cartons etc.), and food waste. Commercial tenants will be required to transport their waste to the external commercial waste store and segregate the waste into the appropriately labelled bins. The commercial waste store will accommodate sufficient storage for residual waste, dry mixed recyclables and food waste. Residual waste and recycling will be stored in 1,100-Litre Eurobins with food waste stored 240-litre wheeled bins. The waste store is large enough for the volume of waste produced, so the ratio of recycling bins can be altered in the future to allow tenants to meet the GLA's target of a 65% municipal recycling rate as performance improves.</p>
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3.2 Circular Economy Approach for the Existing Site

Table 2 below, demonstrates the different options, devised by the design team, for the development's Circular Economy strategy of the existing buildings in line with the GLA's reporting spreadsheet. For more detail, refer to the Circular Economy Design Approaches (Section 6.6 Appendix F), the Pre-Redevelopment Audit by Velocity (Section 6.1 Appendix A) and Pre-Demolition Audit by Velocity (Section 6.2 Appendix B).

Table 2 - GLA Circular Economy Design Approach for the Existing Building

Approach Options	Definition
Circular Economy Approaches for Existing Structures	
Retain and retrofit	A Pre-Redevelopment Audit has been undertaken by Velocity. The audit confirms that the existing site is currently an agricultural farm and equestrian centre with a range of stables, farm buildings and temporary structures. The audit confirms that the existing structures on site are of low quality and not considered well suited for alteration to meet the development brief to provide a gun manufacturing facility.
Partial retention and refurbishment	<p>The Pre-Redevelopment Audit by Velocity analysed two refurbishment scenarios and concluded:</p> <ol style="list-style-type: none"> 1. Light refurbishment: <ul style="list-style-type: none"> • Does not meet targets stated in development brief. • This scenario offers no increase in GIA and a limited lifespan of existing buildings. • Existing layouts unsuitable for the commercial use stated in the development brief. 2. Refurbishment and Extension: <ul style="list-style-type: none"> • Existing large stable structures were not designed for modern commercial or industrial use. • Significant structural intervention required to meet current building and safety standards. • Retained layout limits flexibility for efficient operations and future adaptability. • Structural condition may restrict integration of modern MEP and sustainability systems. • High refurbishment costs may outweigh operational and carbon benefits.
Disassemble and reuse	<p>The Pre-Redevelopment Audit by Velocity states that the existing structures on site are of low quality and not considered well suited for disassembly and reuse to meet the development brief to provide a gun manufacturing facility. While it is not possible to disassemble and reuse all structures on-site due to their derelict condition, one of the barns on-site will be retained with the timber frame restored and made good to act as a feature within the workshop.</p> <p>The Pre-Demolition Audit confirms the following key demolition materials which make up 99.3% of all waste occurring on the site can be recycled and re-used:</p>

	<ul style="list-style-type: none"> • Inert materials • Wood/timber <p>Metal</p>
Demolish and recycle	<p>The Pre-Redevelopment Audit identified the below opportunities related to a full demolition and re-use/recycle scenario:</p> <ul style="list-style-type: none"> • No risk associated with retention of existing structural elements. • Enables more comprehensive design, unconstrained by existing structure. • Allows for a purpose-built facility tailored to meet all development brief targets. • Optimises operational performance through modern construction and systems. <p>While it is not possible to retain all structures on-site due to their derelict condition, one of the barns on-site will be retained with the timber frame restored and made good to act as a feature within the workshop.</p> <p>The Pre-Demolition Audit confirms the following key demolition materials which make up 99.3% of all waste occurring on the site can be recycled and re-used:</p> <ul style="list-style-type: none"> • Inert materials • Wood/timber • Metal

3.2.1 Pre-Redevelopment Audit

A Pre-Redevelopment Audit (PRA) has been undertaken by Velocity in line with GLA requirements, see APPENDIX A – Pre-Redevelopment Audit (Velocity). The purpose of the PRA is to understand whether existing buildings, structures and materials can be retained, refurbished, or incorporated into the new development to any extent. The audit fully explores the available options for retention or refurbishment of structures, materials, and the fabric of existing buildings.

Three scenarios were considered to fulfil the development brief:

- Scenario 1: Light Refurbishment
- Scenario 2: Refurbishment and Extension
- Scenario 3: Full Redevelopment

While retention of existing structures can offer short-term embodied carbon savings, the poor condition, limited flexibility, and non-compliance of the current buildings mean that Scenarios 1 and 2 are not feasible options in achieving the objectives of the development brief.

Overall, Scenario 3, Full Redevelopment, represents the most appropriate option moving forward. It delivers the required functional capacity and operational performance, while aligning with circular economy principles through design for efficiency, disassembly, and future reuse. Despite higher upfront embodied carbon, it provides the most resilient and sustainable solution consistent with the strategic aspirations of the development brief and the policy expectations for whole-life carbon performance.

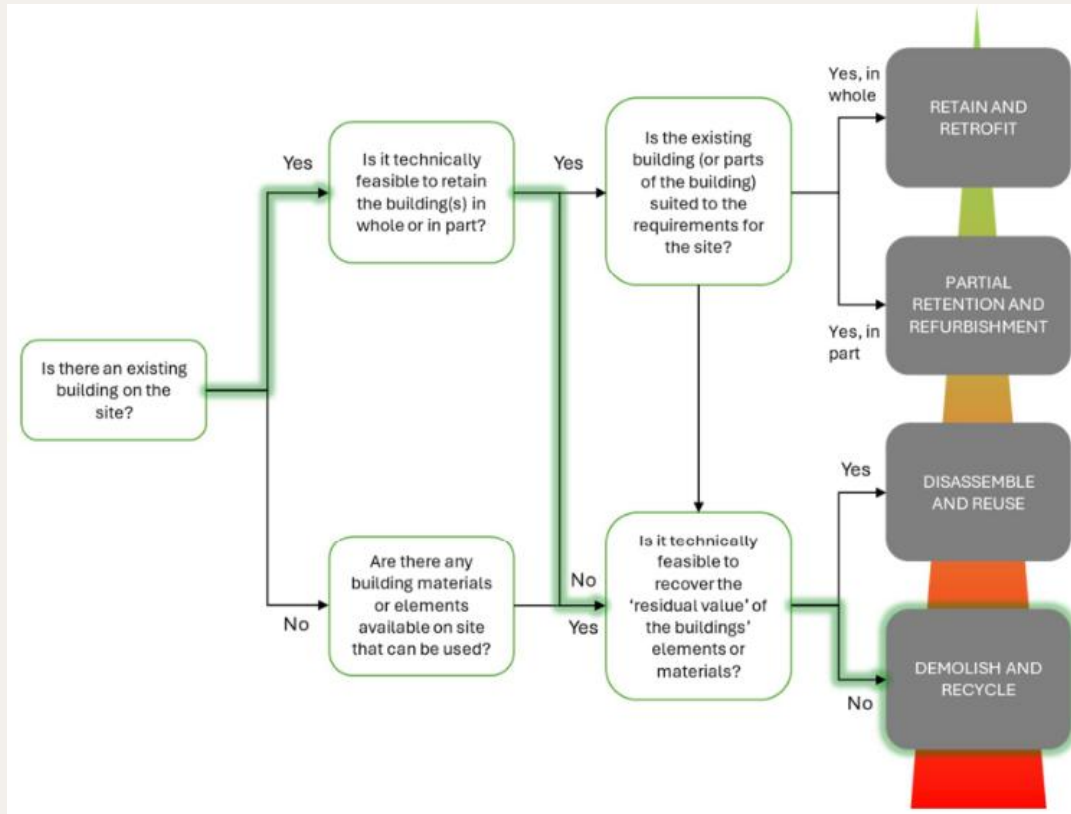


Figure 6 – Decision Tree Outcome (Pre-Redevelopment Audit by Velocity)

The existing structures on site are of low quality and not considered well suited for alteration to meet the development brief to provide a gun manufacturing facility. Further, the opportunities to retrofit or reuse structural elements of the existing building is extremely limited due to the structural composition. Full redevelopment is considered to be optimal, with the most benefits of the three options. An emphasis on on-site reuse will be promoted so materials can be retained in order to maintain the site specific aesthetic of the new building and ensure brand continuity.

For more information refer to APPENDIX A – Pre-Redevelopment Audit (Velocity).

3.2.2 Pre-Demolition Audit

A Pre-Demolition Audit (PDA) has been undertaken by Velocity in line with BREEAM criteria and GLA requirements, see APPENDIX B – Pre-Demolition Audit (Velocity). Velocity is a third-party independent specialist with expertise in reclamation of components and materials and experience in preparing pre-demolition reports.

The PDA proposes that all structures in the scope of the audit should be demolished (including all hardstanding). Although this advice was provided in the PDA, one out of the three historic barns onsite is being partially retained as part of the proposed scheme.



Figure 7 – Extent of the Demolition Proposal (Pre-Demolition Audit by Velocity)

The PDA summarises that there is approximately 183m³ (335.5 tonnes) of demolition materials generated on Site, consisting predominantly of:

- 82.3% (by weight) of concrete/binders
- 9% (by weight) of steel
- 3.9% (by weight) wood/timber
- 1.9% (by weight) of asphalt
- 1.1% (by weight) of mixed metals
- 1.1% (by weight) of bricks/inert
- 0.3% (by weight) of glass
- 0.2% (by weight) of mixed plastics

The key demolition products (KDPs) identified on-site are inert materials, metals and wood/timber. The three KDPs present represent an estimated 99.3% of all waste occurring on the Site. The landfill diversion rate for the KDPs on site would be anticipated to be 100%.

The table below displays the quantities of materials that are present per element group and their predicted disposal profile. Of the total weight (tonnes) approximately 99.79% (334.8 tonnes) of the total non-hazardous materials can be sent for recycling, and 2.35% (7.9 tonnes) of the total mass of materials potential for reuse.

Material	Best Practice Recycling Rate (%)	Potential Reuse Rate (%)	Tonnes	% By Weight	Recycled Material (Tonnes)	Potential Reused Material (Tonnes)	Material for Disposal (Tonnes)
Glass	100	1	1.1	0.3	1.1	0	0
Mixed Metals	100	5	3.8	1.1	3.8	0.2	0
Steel	100	20	30.2	9	30.2	6	0
Mixed Plastics	95	1	0.8	0.2	0.8	0	0
Wood / Timber	95	5	13.2	3.9	12.5	0.7	0.7
Concrete / Binders	100	0	276	82.3	276	0	0
Bricks / Inert	100	25	3.8	1.1	3.8	0.9	0
Gypsum	95	0	0	0	0	0	0
Insulation	95	0	0	0	0	0	0
Electricals and Electronics	90	0	0.1	0	0	0	0
Asphalt	100	0	6.5	1.9	6.5	0	0
Totals*			335.5	100	334.8	7.9	0.7

*Totals may not sum due to rounding

Figure 8 – Summary of Demolition Waste Generated (Pre-Demolition Audit by Velocity)

The following table explains the recommendations for diverting waste from landfill for the existing materials across the Site.

Table 3 - Recommendations for Diverting the Existing Materials from Landfill (Pre-Demolition Audit by Velocity)

Key materials	Opportunities for recycling/reuse
Inert Materials (slabs, hardstanding and paving)	<p>Inert materials are the predominant KDP generated by the demolition process on the Site. The potential for reclamation of inert materials is relatively low due to their use, composition, and material qualities. It is expected that all the inert materials generated by the demolition process will be recycled to form secondary aggregate either on- or off-site. Inert materials are processed using a crusher which reduces their fraction size.</p> <p>Crushed materials could be used for engineered fill on- or off-site, and it is expected that the material would be processed in accordance with prevailing guidance to ensure the secondary aggregate meets all requirements with regard to material properties. The most efficient method of processing the materials would be to phase the demolition to allow space for on-site crushing, with consideration for the proximity to neighbouring residential properties. If it is not possible to crush the inert materials on site, they would be transferred to an appropriately licensed nearby facility for processing and subsequent use.</p>
Metals (access gates, roofing and facades)	<p>It is recommended that segregated containers for metal generated by the demolition process are used to ensure that all waste metal is captured. Scrap metal is usually stored in skips or roll-on roll-off containers on site before transfer to an appropriately licensed facility. Scrap metal has a value by weight and will generate a rebate based on the quality of the material.</p>

Key materials	Opportunities for recycling/reuse
Wood/timber (stable facades, roof rafters/ joists and doors)	It is possible to reclaim wood for reuse within another structure, though for this to be feasible the wood is required to be of high quality to justify the resource and space required to recover them on site. Reclaimed wood materials should be sent to reclaim retailers or re-use community schemes. Wooden products not able to be reclaimed should go to a wood reprocessor for chipping to be used in biomass boilers or other suitable energy schemes.

For more information refer to APPENDIX B – Pre-Demolition Audit (Velocity).

3.2.3 Diversion of Demolition Waste from Landfill

Non-hazardous demolition waste to be diverted from landfill through reuse, recycling, and recovery will be targeted. Actions to avoid waste being disposed of in landfill include:

- Reusing the material on-site
- Reusing the material off-site
- Community reuse and recycling
- Salvaging or reclaiming the material for reuse
- Returning material to the supplier via a ‘take-back’ schemes
- Direct recycling of materials via a specialist material reprocessor or recycler
- Recovery of the material from site by an approved waste management contractor and recycled or sent for energy recovery
- Utilising waste in exempt or permitted applications (not landfill).

3.3 Circular Economy Approach for the New Development

Table 4 below, demonstrates the different options, devised by the design team, for the development’s Circular Economy strategy of the new building in line with the GLA’s reporting spreadsheet. For more detail, refer to the Circular Economy Design Approaches (Section 6.6 Appendix F) and the Pre-Demolition Audit by Velocity (Section 6.2 Appendix B).

Table 4 - GLA Circular Economy Design Approaches for the New Building

Approach Options	Definition
Circular Economy Approaches for New Buildings	
Building relocation	N/A as the Applicant confirmed that building is not anticipated to be relocated.
Component of material reuse	<ul style="list-style-type: none"> • Retaining structural frame of 1no historic barn as part of proposals. Will be investigating possibility of recycling and re-using elsewhere/ selling structural frames of barns which will not be retained as part of proposals. • External works can be regraded, keeping the material on site. • Substructure can use cement replacement recycled products such as GGBS and limestone fines.

	<ul style="list-style-type: none"> • Superstructure concrete frame can use cement replacement recycled products such as GGBS and limestone fines. • Timber can be used for superstructure, if appropriate sizes are found, strength graded and treated. • Ensure that recycled content and recyclability is considered and delivered during procurement • Explore materials/products that offer an end-of-life takeback/recycling scheme
Adaptability	<ul style="list-style-type: none"> • Substructure for the Machine Room Area designed for a minimum ground floor live load of 6kN/m², which is high and will allow many appropriate future re-use possibilities. Other areas designed for live load of 2.5kN/m², which still has many other uses. • Regular foundations, and loadings, allow for flexible future uses. • Reinforced Concrete substructure designed for a life of 50+ years. • The first floor of the superstructure has been designed for a minimum live load of 2.5kN/m², which still has many other uses (e.g. residential or office). • Partitions are mostly non-structural, therefore providing flexibility for adapting layouts. • Internal floorplates are relatively clear and allow for future flexibility. • Timber structure is relatively transparent and can be flexible for new small openings.
Flexibility	<ul style="list-style-type: none"> • All systems are designed to be modular to allow for localised changes should they be required without having an impact on the whole building. • Strategic points of isolation will allow for future shut-down and minimal abortive install, should the requirement arise. • Plant will be specified from manufacturers that make space parts/components available for a reasonable time even after the item has been discontinued allowing for component change rather than a system replacement. • Structural frame allows for non-load bearing internal walls which allows for reconfiguration. • Open plan design. • Modular design of internal spaces and furniture where possible. • Internal furniture not fixed to allow for reconfiguration. • Assess availability of the product that needs replacing.
Replaceability	<ul style="list-style-type: none"> • Brickwork façade can be added to or partially demolished easily. • Modular design of internal spaces (3m grid). • Non-destructive access for replacement of services. • Structural frame allows for non-load bearing internal walls which allows for reconfiguration. • Open plan design. • Modular design of internal spaces and furniture where possible. • Internal furniture not fixed to allow for reconfiguration.
Disassembly	<ul style="list-style-type: none"> • Reinforced concrete construction is inherently robust and so difficult to dismantle. Can be crushed and recycled.

	<ul style="list-style-type: none"> • Timber frame can be disassembled, but with some cutting at connections. • Specify materials that are easy to be disassembled-hand fixed-timber cladding, metal cladding. • Design all systems to use standardised components, allowing for easy replacement when required. • Provide accessible risers and clear labelling to allow tracing and removal of cables, pipes and ducts. • Design all systems to be fully accessible and maintainable, thereby allowing for disassembly and removal of parts without any knock-on effect to other systems. • Minimise the use of fixings/adhesives that cannot be disassembled.
<p>Longevity</p>	<ul style="list-style-type: none"> • Limited number of window types in scheme to simplify replacement. • Hand-laid brickwork replaceable. • Reinforced Concrete substructure designed for a life of 50+ years. • Using cement GGBS cement replacement with appropriate reinforcement cover will allow the concrete structure to be durable beyond the design life of 50 years. • Superstructure designed for a life of 50+ years. • Elements of the timber frame can be replaced if needed, due to say long-term water ingress onto a rafter causing rot. • Using cement GGBS cement replacement with appropriate reinforcement cover will allow the concrete structure to be durable beyond the design life of 50 years. • Timber structure is used in an internal environment and if kept dry will last in excess of the design life. • High durability masonry finish specified. • Plantrooms, risers, access panels etc to be design to enable easy access to carry out maintenance, prolong the life expectancy and premature replacements. • Design BEMS system to allow for the systems to operate only when the building is in use and to indicate faults. • Specify systems with long life expectancy to prolong the operation of active components. • Doors and wall finishes will appropriate for environment specified (kick plates to doors in heavy use areas). • Durable products to be specified against spills /wear and tear.

3.3.1 Outline Site Waste Management Plan

A pre-construction Outline Site Waste Management Plan (OSWMP) has been developed for the Site by Velocity to forecast how much waste will be produced by the project during demolition, groundworks and construction and identify waste diversion targets (APPENDIX C – Outline Site Waste Management Plan (Velocity)).

The OSWMP outlines an estimated 91 tonnes of waste may arise from the construction phase of the proposed development equating to 6.42 tonnes per 100 m² of floor area. The key waste groups are:

Table 5 - Key Waste Groups Detailed in the OSWMP

Phase	Waste Generated
Demolition Waste	<ul style="list-style-type: none"> • Concrete/binders: 276 tonnes • Steel: 30.2 tonnes • Wood/timber: 13.2 tonnes • Asphalt: 6.5 tonnes • Mixed metals: 3.8 tonnes • Bricks/inert: 3.8 tonnes • Glass: 1.1 tonnes • Mixed plastics: 0.8 tonnes • Electricals and Electronics: 0.1 tonnes
Excavation Waste	<ul style="list-style-type: none"> • Total: 5,376 tonnes
Construction Waste	<ul style="list-style-type: none"> • Packaging: 23 tonnes • Wood/timber: 18 tonnes • Miscellaneous: 13 tonnes • Plastics: 12 tonnes • Bricks (inert): 10 tonnes • Concrete/cement: 6 tonnes • Metals: 3 tonnes • Tiles and ceramics: 3 tonnes • Insulation: 3 tonnes • Plasterboard: 3 tonnes

To ensure a high percentage of waste is diverted, the following targets have been set:

- Recycling/reuse/recovery target: minimum of 95%
- Waste to landfill target: maximum of 5%

The actions required to achieve the waste minimisation targets are:

- Segregating demolition waste on-site to improve recycling and reuse.
- Reusing demolition materials, like hardcore, in construction.
- Encouraging subcontractors to order efficiently to minimize surplus materials.
- Where it is not possible to reuse or recycle construction waste, contractors will be expected to seek disposal routes that divert material from landfill, such as Energy from Waste (EfW), as Refuse Derived Fuel (RDF) or Solid Recovered Fuel (SRF).

The Principal Contractor will be required to monitor the achievement of the waste targets and compare the forecast data against the actual waste quantities upon project completion within an updated SWMP - this will need to be completed within 3 months of the construction completion date. It is encouraged that regular updates are made during the project to track actual waste generation and lessons learned will be documented for future projects, comparing forecasts with actual outcomes.

The applicant is committed to exploring community recycling initiatives that enable reclaimed materials from un-used construction materials to be donated to other users via a brokerage system. Further consideration at later design stages is required regarding the

available space and appropriate management for use of schemes such as SalvoWeb or GlobeChain. Future exploration will consider partnerships for management of the scheme offsite, to overcome the potential issue of space.

For more information refer to APPENDIX C – Outline Site Waste Management Plan (Velocity).

3.3.2 Operational Waste Management Strategy

The Operational Waste Management Strategy (OWMS) for the Site has been prepared in accordance with LBH’s refuse guidance and the BS 5906:2005 methodology. More specifically, commercial waste recycling rates are calculated based on the metrics provided by BS5906:2005 Waste Management in Buildings – Code of Practice, while facilities have been designed in accordance with LBH requirements stated in their guidance. The waste store is designed to allow the operator to meet the relevant recycling rate targets.

Commercial waste streams will include:

- Residual waste;
- Dry Mixed Recycling (DMR);
- Food waste;
- Waste Electrical and Electronic Equipment (WEEE); and
- Special waste.

Currently most commercial contractors do not segregate DMR into individual waste streams (card, paper, mixed plastics, or metals) and it is assumed that these materials will be collected as a co-mingled waste stream. It is assumed that as part of the procurement process, a zero waste to landfill collection contract will be sought for the residual waste.

A total of 80 tonnes of municipal waste is estimated to be generated by the Proposed Development per annum once operational based on the storage capacity and proposed collection frequencies. It is anticipated that the volume of waste generated will be significantly less than estimated as the calculation assumes 100% fill levels of all containers on site.

Individual waste streams will be transported to suitably licensed facilities for processing at a Materials Recycling Facility (MRF), Energy from Waste (EfW) or Anaerobic Digestion (AD) facility or bulking and onward transfer at a Waste Transfer Station (WTS).

Description	Weekly Waste Metric	Waste Composition
Industrial Unit	volume arising per m ² of floor area (5l) × floor area	<ul style="list-style-type: none"> • 25% Residual Waste • 70% DMR • 5% Food Waste

Figure 9 – Commercial Waste Metrics (OWMS by Velocity)

Premise	Weekly Waste Generation (Litres)			Total
	Residual Waste	DMR	Food Waste	
Gun Making Facility	1,770	4,956	354	7,080

Figure 10 – Estimated Weekly Commercial Waste Generation (OWMS by Velocity)

As per the Guidance, the waste storage facilities must include provisions for the segregation of waste streams. Residual waste and DMR will be stored in 1,100-litre Eurobins and food waste will be stored in 240-litre wheeled bins. The waste storage requirements for the Proposed Development are summarised below according to the specified collection frequency.

Frequency	Number of Containers			Total
	1,100-Litre Eurobins		240-Litre Wheeled Bins	
	Residual Waste	DMR	Food Waste	
Weekly	2	5	2	9
Twice-Weekly	1	3	1	5

Figure 11 – Waste Storage Requirements (OWMS by Velocity)

Container	Dimensions (mm)			Source
	Height	Width	Depth	
1,100-Litre Eurobin	1,370	1,260	985	The Guidance
240-Litre Wheeled Bin	1,070	580	740	

Figure 12 – Container Dimensions (OWMS by Velocity)

The waste facilities will include the following:

- A suitable water point in close proximity to allow washing down;
- All surfaces sealed with a suitable wash proof finish (vinyl, tiles etc.);
- All surfaces easy to clean;
- Suitable floor drain; and
- Suitable lighting and ventilation.

A commercial waste contractor will be appointed to service the Proposed Development once operational on an agreed schedule. On nominated collection days, the RCV will enter the Proposed Development traversing through the staff car park area to the Service Area stopping adjacent to the waste store. The waste collection operatives will access the bins from the commercial waste store directly and wheel them to the waiting RCV. As per BS5906:2005 the path between the collection vehicle and the commercial waste store will be:

- Minimum width 2 metres;
- Free from kerbs or steps;
- Solid foundation; and
- Suitably paved with a smooth continuous finish.

Once the bins have been emptied, the collection operatives will return them to the commercial waste store.

For more information refer to APPENDIX D – Operational Waste Management Strategy (Velocity).

3.3.3 Material Efficiency

In line with the BREEAM credit Mat O6 - Material Efficiency, at the end of each RIBA stage the project team must convene to examine opportunities to implement appropriate measures to ensure that the amount of materials used in the construction of the

development are optimised and therefore reduce the amount of construction waste arising from site.

In line with the BS 8895 Designing for material efficiency in building projects, the project team will identify opportunities to improve materials efficiency by:

- Reducing the quantity of materials used, where this does not adversely impact on other aspects of resource efficiency, such as improving energy efficiency.
- Reducing the quantity of materials wasted during the construction process by designing out waste and planning for effective project waste management wherever possible.
- Designing for effective project waste management, which includes reducing, reusing, recycling and recovering waste material as appropriate; and
- Using more recycled materials and mainstream products containing higher levels of recycled material including material not necessarily sourced from construction and demolition waste, for example, mineral extraction or post-consumer waste.

3.3.4 Minimise Construction Waste

The Site aims to meet the construction waste resource efficiency benchmark of $\leq 13.3 \text{ m}^3$ or ≤ 11.1 tonnes per 100 m^2 Gross internal floor area in line with the BREEAM New Construction v6.1 credit Wst01.

The Principal Contractor will be required to ensure construction waste is minimised as far as possible. Some measures which could be adopted to reduce construction waste generated on site include:

- Setting and reporting against waste reduction targets in Site Waste Management Plan.
- Include waste minimisation initiatives and targets in tenders or contracts, and engagement with the supply chain.
- Just in time delivery of materials to prevent spoilage.
- Recording material delivered onsite and dispatched.

The applicant is committed to exploring community recycling initiatives that enable reclaimed materials from un-used construction materials to be donated to other users via a brokerage system. Examples to be explored include Globe Chain.

Further consideration at later design stages is required regarding the available space and appropriate management for use of schemes such as Globe Chain. Future exploration will consider partnerships for management of the scheme offsite, to overcome the potential issue of space.

3.3.5 Design for Adaptability and Disassembly

A Design for Disassembly and Functional Adaptability study has been undertaken during Stage 2 to identify opportunities for accommodating future changes of use to the building over its lifespan.

The aim of the Design for Disassembly and Functional Adaptability study is to identify ways to reduce waste and cost associated with future refurbishment or fit-out works and ultimately in demolition, to improve the lifetime value of the materials and reduce costs

and disruption associated with the need for future adaptation, demolition and strip-out, thereby reducing the associated waste and costs. The study has been designed to comply with BREEAM credit issue Wst 06.

Some potential design options that were explored include:

- Most partitions are non-structural, allowing for future adaptation.
- The ventilation and heating/cooling strategy will allow flexibility in the event of future changes to the building layout. Systems are zoned and modular, enabling internal spaces to be reconfigured without the need for significant alterations to core building services.
- The proposed location of MEP plant has been designed to allow safe and convenient access for future maintenance and replacement.
- On-site renewable energy generation will be provided via photovoltaic panels.
- Surface water will be managed through a soakaway, and foul water will be treated via a septic tank.

3.3.6 Sustainable Procurement of Materials

A Sustainable Procurement Plan (SPP) has been developed in line with BS ISO 20400:2017 Sustainable Procurement Guidance and the BREEAM New Construction v6.1 Mat03 requirements. The SPP sets out a clear framework for the responsible sourcing of construction products to guide procurement throughout the project and guide all involved in the specification and procurement of construction products.

The following responsible sourcing principles are embedded within the SPP:

- Accountability – Taking accountability for the impacts of the supply chains on society, the environment, and the economy, with a life cycle perspective on goods and services
- Transparency – Being transparent in procurement decisions and activities and encouraging suppliers to be transparent
- Ethical Behaviour – Behaving with integrity and avoiding corruption throughout the supply chain
- Full and fair opportunity – All suppliers should be given full and fair opportunity to compete
- Respect for stakeholder interests – Respect, consider and respond to the interests of stakeholders impacted by its procurement activities
- Respect for the rule of law and international norms of behaviour – An organisation should strive to be aware of any violations throughout its supply chains. It should actively encourage its suppliers to abide by these rules and assess and address compliance as situations require
- Respect for human rights – An organisation should respect internationally recognised human rights
- Innovative solutions – Seek solutions to address its sustainability objectives and encourage innovative procurement practices to promote more sustainable outcomes throughout the entire supply chain
- Focus on needs – Buy only what is needed and seek more sustainable alternatives

- Integration – Ensuring that sustainability is integrated into all existing procurement practices to maximise sustainable outcomes
- Analysis of all costs – Consider the cost incurred over the life cycle, value for money achieved, and costs and benefits for society, the environment, and the economy resulting from its procurement activities
- Continual improvement – Work towards continually improving its sustainability practices and outcomes, and encouraging organisations in its supply chains to do the same

The key aims, objectives and targets of this Sustainable Procurement Plan include:

- 100% of timber and timber based products will be legal and sustainable as per the UK Governments Timber Procurement Policy
- Suppliers will demonstrate compliance with all requirements on human rights, discrimination and global labour standards
- Procure materials that have been certified to accreditations such as ISO14001 or BES 6001
- Ensure that at least 1 credit is achieved under Mat03 Responsible Sourcing for BREEAM but aim to achieve 2 credits
- Minimising demand for resources (e.g., by reducing purchases, using resource efficient products, considering end of life, etc)
- Minimising any negative impacts of goods, works, or services across their life cycle and through the supply chain (e.g., impacts on health, air quality, etc)
- Ensuring that fair contract prices and terms are applied and respected and that minimum ethical, human rights and employment standards are met
- Providing opportunities for small and medium businesses, voluntary sector organisations
- Procure construction materials locally, where possible
- Procedure to check and verify the effective implementation of this Sustainable Procurement Plan
- Procure materials with Environmental Product Declarations (EPD) or low carbon alternatives to business-as-usual materials and equipment

The target for the SPP is to enable products to be sourced that have the lowest social, economic and environmental impact by selecting products that meet certification schemes such as ISO14001 and BES6001.

Material Category	Responsible Sourcing Certification Required
Timber/Timber Based	FSC / PEFC / SFI certified
Concrete/Cementitious	Concrete Sustainability Council (CSC) (platinum level) certified or ISO 14001 (or equivalent).
Metals	CARES Sustainable Constructional Steel Scheme Aluminium Stewardship Initiative (ASI) certified
Stone	BES 6001 or ISO 14001 (or equivalent)
Clay based	BES 6001 or ISO 14001 (or equivalent)
Glass	BES 6001 or ISO 14001 (or equivalent)
Plastic, polymer, resin, paint, chemicals and bituminous	BES 6001 or ISO 14001 (or equivalent)
Insulation	BES 6001 or ISO 14001 (or equivalent)

Figure 13 – Responsible Sourcing Certification Schemes (Sustainable Procurement Plan by Scotch Partners)

The contractor will be expected to use suppliers who share the principles and values of the SPP. Manufacturers will be scored via the PQQ scoresheet and local suppliers will be favoured where possible.

For more information refer to APPENDIX H – Sustainable Procurement Plan (Scotch Partners).

4 Reporting

4.1 Bill of Materials and Whole Life Carbon Assessment

There is a close relationship between the Circular Economy Statement guidance and the Whole Life Carbon guidance. A Whole Life Cycle Assessment (WLCA) was undertaken in conjunction with a Circularity Assessment to determine the estimated carbon emissions associated with the site, and the material circularity, efficiency and end of life potential.

The Bill of Materials from the One Click software GLA Circularity Tool has been provided within Appendix E of this report. The Bill of Materials is based on estimated figures to demonstrate how the development's material demands have been minimised and on-site reuse and recycling maximised. This will be updated with each iteration of the Circular Economy Statement and will include the major building layers and elements.

The aim for at least 20% recycled or reused content, by value, has been targeted for the whole development in line with the GLA requirements. Following a Circularity Assessment, 18% of the Development's building materials comprise of recycled content. While this is slightly below the site aspiration, the design team will consider specifying materials with high recycled content. Further, the target of 20% recycled content will be included in the contractor requirements to encourage lower carbon impacts.

In summary, the results outlined of the WLCA for whole life carbon emissions (Modules A-C incl. B6 and B7) are 1,752,682 kgCO₂e (non-decarbonised scenario) and 1,236,285kgCO₂e (decarbonised scenario) over the 60-year study period. The overall life cycle embodied carbon (Modules A-C, excluding B6 & B7) across the proposed development displays a total of 908 kgCO₂e/m² GIA for the non-decarbonised scenario and 776 kgCO₂e/m² GIA for the decarbonised scenario. These estimated upfront carbon emissions (Module A) were 624 kgCO₂e/m². This was calculated over a 60 year study period.

Comparison against GLA WLC benchmarks can be seen below in Table 6.

Table 6 – Whole Life Carbon Assessment Results

Benchmark	Upfront Carbon (Modules A1-A5) (kgCO ₂ e/m ²)	Modules B-C (excluding B6 & B7) (kgCO ₂ e/m ²)	Life Cycle Embodied Carbon (Modules A-C, excluding B6 & B7) (kgCO ₂ e/m ²)
Ashby Farm Non-Decarbonised	624	413	908
Ashby Farm Decarbonised	624	281	776
GLA Baseline (Retail)	<850	<200	<1,050
GLA Aspirational (Retail)	<550	<140	<690

More details can be found in the accompanying Whole Life Carbon Assessment prepared by Scotch Partners.

4.2 End-of-Life Strategy

An end-of-life strategy has been identified by the design team within Table 7. The Outline Site Waste Management Plan (Appendix C) includes recommendations on how to promote best practice management of construction waste. There is an emphasis on the storage and organisation of waste and construction materials as part of good practice, and the promotion of the use of take back schemes where re-use is not viable.

In line the GLA targets, the applicant should aim to ensure a 95% diversion rate from landfill at the end of life. The principle contractor will be responsible for tracking and reviewing waste targets and arisings.

Table 7 - End of Life Strategy for Building Materials

Building Component	End of life strategy
Brick Paving	<ul style="list-style-type: none">Assess condition and reuse on other projects
Timber Panels	<ul style="list-style-type: none">Assess condition and can be reused on other projects if carefully disassembled
Steel Farm Gates	<ul style="list-style-type: none">Removal and reinstallation on similar projects

A more detailed end-of-life strategy will be set out as the design progresses ensuring that the scenarios align with the assumptions of lifespans and recyclability made in the bill of materials/ whole-life carbon assessment. The strategy will cover:

- How the end-of-life strategy will be communicated with future building owners, managers, and occupiers.
- How the building information will be stored during the building's life, e.g., through material passports, Building User Guides or BIM modelling, to facilitate disassembly and identify any key challenges.
- Plans for disassembling each building element/ layer, specification of materials and products that have been specifically designed for disassembly, or are certified as having met circularity criteria such as Cradle to Cradle certification.

The key priority of this development is to create a building that has an extended lifetime due to careful design and specification to ensure flexibility and adaptation. The design also aims to ensure that if the building is to be deconstructed at a later date that there is a clear process to follow.

The Applicant will look to consider efficient design solutions including increasing the utilisation factor of structural members; designing to standard material dimensions to reduce off-cuts and waste on site and allow for future reuse; removing redundant materials from the design to allow for ease of replacement and facilitate material recovery at the end-of-life of the building.

Table 8 – End-of-Life Strategy for Building Components

Material	End-of-Life Strategy
Substructure and Superstructure	<ul style="list-style-type: none"> All concrete and reinforcement can be recycled at the end of the life of the building. Re-use of parts of the concrete structure is feasible. Timber structure is demountable and parts can be reused.
Shell/Skin (Façade)	<ul style="list-style-type: none"> Hand fixed timber cladding can be easily disassembled Building materials, products and components should be chosen to enable disassembly and re-use at the end of their useful life. Façade can be repaired in small sections to extend useful life.
Building Services	<ul style="list-style-type: none"> Replace plant with like-for-like to minimise upstream or downstream alterations.
Space	<ul style="list-style-type: none"> Work benches and other items of furniture will be made of high-quality materials and will be able to be re-used in number of other workshop applications.
Construction Materials	<ul style="list-style-type: none"> Return packaging for reuse.

It is anticipated that the materials sector will undergo significant transformation over forthcoming years, and it would be sensible to re-evaluate these option again at the appropriate time as there may be better options at this point to improve the circularity.

Material exchange platforms can be explored as an option for donating or selling materials which are in a suitable condition. This will be included for all landfill/incineration materials. However, this cannot be committed to a choice as it is subjective to the marketplace at the time.

4.3 Plans for Implementation

The targets set out in this Circular Economy Statement will be the responsibility of the design team during the design stages. During the procurement and construction stage, the responsibility to carry on the principles set out in this statement will be with the principal contractor.

The principal contractor will be required to appoint a responsible individual to monitor the principles, targets and commitments set out in this statement. The key commitments will be achieved as follows:

1. Short-Term: Review further waste minimisation opportunities as well as implementing the following:
2. Medium-Term: Conserve resources by minimising the quantities of materials used, minimising the quantities of other resources used (energy, water, land), and specifying and sourcing materials responsibly and sustainably.
3. Short-Medium-Term: Design to eliminate waste (and for ease of maintenance) by designing for reusability/ recoverability/ longevity/ adaptability/ flexibility, and

designing out construction, demolition, excavation, industrial and municipal waste.

4. Medium-Term: Manage waste from demolition of the layers, excavation waste, waste arisings from construction of the layers (and reuse or recycling of this waste) and support operational waste.

4.4 Reporting Outcomes – Post Completion Report

A post completion circular economy statement will be provided to the GLA and shall report on the development's performance against the targets and commitments set out in this document, and supporting evidence shall be provided. This will be completed as part of the completion updates.

4.5 Lessons Learned

The post completion circular economy statement shall include a section on 'Lessons Learned' and shall review:

- Actual performance against quantitative and qualitative targets or commitments;
- Determine reasons for any differences; and
- Share key learnings that could inform best practice in the future, including: what went well or better than expected, what went wrong, and what could be done differently in the future.

5 Conclusion

This Circular Economy Statement has been produced to demonstrate how the proposed development at Ashby Farm has considered the circular economy principles and incorporated them into the development design.

The statement takes into consideration the following, with reference to the GLA Circular Economy Statements (March 2022), London Plan Policy SI7, the London Borough of Hillingdon's Local Plan (Parts 1 and 2), and the development's Circular Economy Aspirations. The aim of the report is to demonstrate ways the design team plan to maximise re-use of existing buildings where possible and practical to do so, reduce material quantities in the first instance, and reduce waste associated with the development, both in its construction, and at its end of life.

Following sustainability workshops with the design team and discussions with the Applicant, key commitments have been identified and will be reviewed throughout the design development, and construction of the project:

- Ensuring that a rate of 20% recycled content and recyclability of materials is considered and delivered during procurement in line with the WLCA and circularity assessment on One Click.
- Diverting a minimum of 95% of demolition, construction and excavation waste from landfill.
- Substructure and superstructure concrete frame can use cement replacement recycled products such as GGBS and limestone fines.
- Regular foundations, and loadings, allow for flexible future uses. Foundations and concrete superstructure designed for a life of 50+ years.
- Timber can be used for superstructure, if appropriate sizes are found, strength graded and treated.
- Ensure that recycled content and recyclability is considered and delivered during procurement.
- Explore materials/products that offer an end-of-life takeback/recycling scheme.
- Partitions are mostly non-structural, therefore providing flexibility for adapting layouts.
- Internal floorplates are relatively clear and allow for future flexibility.
- Timber structure is relatively transparent and can be flexible for new small openings.
- Plant will be specified from manufacturers that make spare parts/components available for a reasonable time even after the item has been discontinued allowing for component change rather than a system replacement.
- Brickwork façade can be added to or partially demolished easily.
- Design all systems to use standardised components, allowing for easy replacement when required.
- Provide accessible risers and clear labelling to allow tracing and removal of cables, pipes and ducts.

- Design all systems to be fully accessible and maintainable, thereby allowing for disassembly and removal of parts without any knock-on effect to other systems.
- Minimise the use of fixings/adhesives that cannot be disassembled.
- Limited number of window types in scheme to simplify replacement.
- Specify systems with long life expectancy to prolong the operation of active components.
- Doors and wall finishes will be appropriate for environment specified (kick plates to doors in heavy use areas).
- Durable products to be specified against spills /wear and tear.

Broad objectives for circular economy aspirations have also been set:

- Moving forward, future workshops will be held to develop and investigate circular economy objectives with specific metrics (design team, contractor, suppliers, and facility managers).
- Circular economy opportunities will be monitored throughout the design and construction process.
- On completion, success against objectives will be reviewed and an analysis will be undertaken on lessons learnt (whole design team, contractor, and relevant supply chains).

6 APPENDICES

6.1 APPENDIX A – Pre-Redevelopment Audit (Velocity)

6.2 APPENDIX B – Pre-Demolition Audit (Velocity)

6.3 APPENDIX C – Outline Site Waste Management Plan (Velocity)

6.4 APPENDIX D – Operational Waste Management Strategy (Velocity)

6.5 APPENDIX E – Bill of Materials (One Click - Scotch Partners)

6.6 APPENDIX F - Circular Economy Design Approaches (Team Input)

6.7 APPENDIX G – CES Data Document (Velocity)

6.8 APPENDIX H – Sustainable Procurement Plan (Scotch Partners)

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