Circular Economy Statement

Lanwades Woodland Park

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Revision History

Version	*Date Issued*	*Issued by*	*QA Check*
1	26/03/2025	Robert Holbrook BSc MSc	Tim James C.Eng MCIBSE BSc MSc

About Environmental Economics

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- *Sustainability Statements*
- *Compliance assessments and advice covering*
    - *Part L (SAP) & Future Homes Standard*
    - *Part F (ventilation)*
    - *Part G (water)*
    - *Part O (overheating)*
- *Overheating - TM59 dynamic modelling*
- *Overheating – simple method*
- *Life cycle carbon assessments*
- *Net zero carbon assessments*
- *BREEAM*
- *SBEM (existing and new build)*
- *Minimum Energy Efficiency Standards (MEES)*
- *Thermal Bridging (Psi value calculations)*

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1. Executive Summary

1.1.1. Environmental Economics Ltd has been commissioned by Lochailort Kentford Ltd to prepare a Circular Economy Statement for the residential site Lanwades Woodland Park.

1.1.2. The purpose of this Circular Economy Statement is to show how the proposed development at Lanwades Woodland Park has considered circular economy principles to minimise embodied carbon and operate within a circular economy, maximising the value extracted from materials and prioritising the reuse and recycling of materials.

1.1.3. The statement takes into consideration the following:

- *How demand for materials will be minimised;*
- *How secondary materials can be used;*
- *How new materials are being specified to enable their reuse;*
- *How construction waste will be minimised and how and where the waste will be managed in accordance with the waste hierarchy;*
- *How the proposal's design and construction will enable building materials, components and products to be disassembled and re-used at the end of their useful life;*
- *Opportunities for managing as much waste as possible on site;*
- *Adequate and easily accessible storage space to support recycling and re-use;*
- *How much waste the proposal is expected to generate, and how and where the waste will be handled.*

1.1.4. Key commitments include:

- *Broad objectives for Circular Economy aspirations have been set;*
- *Site analysis, in the form of detailed pre-demolition / pre-refurbishment audits, should be undertaken;*
- *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.*

1.1.5. The proposed development has been found to incorporate Circular Economy principles throughout the design stage and is in line with requirements laid out in the emerging local plan, specifically Policy LP4.

2. Project Overview

2.1. Description of Site

2.1.1. The site proposal consists of the construction of approximately 1000 residential dwellings, along with several non-domestic buildings including retail units, a care home, a school and office buildings.

2.1.2. The proposed site plan is shown in Appendix A.

2.2. Brief

2.2.1. Lochailort Kentford Ltd have commissioned a Circular Economy Statement for the site Lanwades Woodland Park to show how circular economy principles have been considered and will be implemented across the development.

2.2.2. The purpose of this statement is to demonstrate that the proposed development at Lanwades Woodland Park has considered circular economy principles to:

- *Minimise embodied carbon;*
- *Operate with a circular economy;*
- *Maximise the value extracted from materials; and*
- *Prioritise the reuse and recycling of materials.*

2.2.3. The aim of circular economy is to create buildings that are high quality, flexible and pay attention to the building lifespan, through appropriate construction methods and the use of attractive, robust materials which weather and mature well, along with improving resource efficiency to keep products and materials at their highest value for as long as possible and promote waste avoidance and minimisation.

2.3. Local Policy

2.3.1. The planning authority for this site is the West Suffolk Council. The documents containing the relevant planning policies are the Joint Development Management Policies Document 2015 (JDMPD) and the emerging local plan.

2.3.2. Within the emerging plan is Policy LP4, as follows:

2.3.3. Policy LP4 Reducing waste and the circular economy

All proposals for development are required to submit a waste reduction and circular economy statement demonstrating circular economy principles. This should demonstrate how:

a. Circular economy principles have informed the design of the building(s) and site layout.

b. Materials demand have been minimised and on-site reuse and recycling has been maximised.

c. The local sourcing of materials has been considered and the steps taken to secure local materials and components.

d. Construction waste is to be reduced, treated as a resource and managed on site.

e. The scheme has been designed to minimise partial or complete demolition of any buildings or structure on sites.

f. Where demolition is unavoidable, how materials will be managed by considering the implications of the loss of embodied carbon including:

- *An assessment of whether the materials are suitable for reclamation, with targets for reclamation and reuse, and*
- *How building materials, components and products are to be disassembled, are to be stored, re-used and recycled.*

2.3.4. Whilst the emerging local plan for West Suffolk has not yet been adopted, Lochailort Kentford Ltd are pre-empting its adoption during the planning and construction phase of the proposed development to show that the development will comply with future requirements.

2.3.5. This statement seeks to address the planning policies relevant for the proposed site and present a sustainable strategy.

2.3.6. This report should be read in conjunction with other reports prepared for this development.

3. Circular Economy

3.1. Circular Economy Principles

3.1.1. Current and future trends point toward the need for a fundamental shift in the way resources are consumed. A shift to a circular economy will provide considerable economic opportunities as a result.

3.1.2. In contrast to a linear economy (take, make, dispose), a circular economy keeps products and materials circulating through the system at their highest value for as long as possible, through reuse, recycling, refurbishment and remanufacturing. It is estimated that 60% of total UK waste is generated from construction, demolition and excavation, showing that moving toward a circular economy is essential.

3.1.3. The successful implementation of circular economy principles will help to reduce the volume of waste that a development produces and has to manage throughout both construction and operational phases. A key way of achieving this will be through incorporating circular economy principles into the design of developments, these principals are as follows:

- **Building in layers -** ensuring that different parts of the building are accessible and can be maintained and replaced where necessary.
- **Designing out waste -** ensuring that waste reduction is planned in from project inception to completion, including consideration of standardised components, modular build and re-use of secondary products and materials.
- **Designing for longevity -** creating a built asset with well-defined long-term needs, while being durable, resilient or able to cope with societal and environmental change. It would require little modification / no replacement of parts, due to its 'loose fit', generous proportions and readiness for alternative technologies.
- **Designing for adaptability or flexibility -** to meet the needs of the present but with consideration of how those needs might change in the future, and to enable change in the form of periodic remodelling and reconfiguration, including alterations or replacement of non-structural parts.
- **Design for assembly, disassembly and recoverability -** future proofing the asset by designing products and services to be assembled, deconstructed and reused or recycled on a part-by-part basis.
- **Selecting materials -** any new material specified in the development should aim to be low impact materials with little or no adverse effect on either the environment or on human health throughout its lifecycle. Recognise and encourage the use of recycled content and secondary aggregates, thereby reducing the demand for virgin material and optimising material efficiency in construction.

3.2. Circular Economy Implementation

3.2.1. Implementing a circular economy approach requires input from design team members throughout the design, planning, construction and operation phases of the development.

3.2.2. Figure 1 (RICS, 2016) defines a circular economy hierarchy for building approaches which maximises use of existing materials, with the ideal being to retain existing buildings:

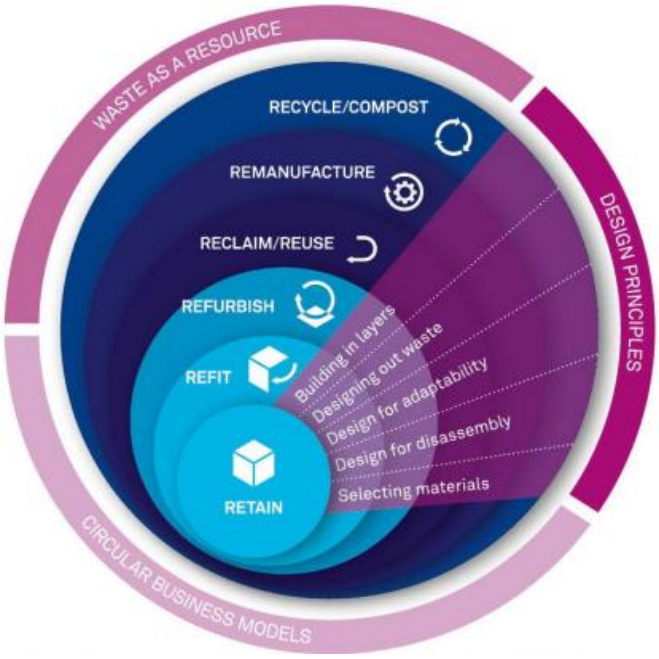

Figure 1 - Circular Economy hierarchy (RICS, 2016)

3.2.3. For circular principles to be successful, it requires a whole building approach. In order to achieve this, circular economy principles should be considered and incorporated throughout the 7 RIBA stages of development. Figure 2 shows the 7 RIBA stages:

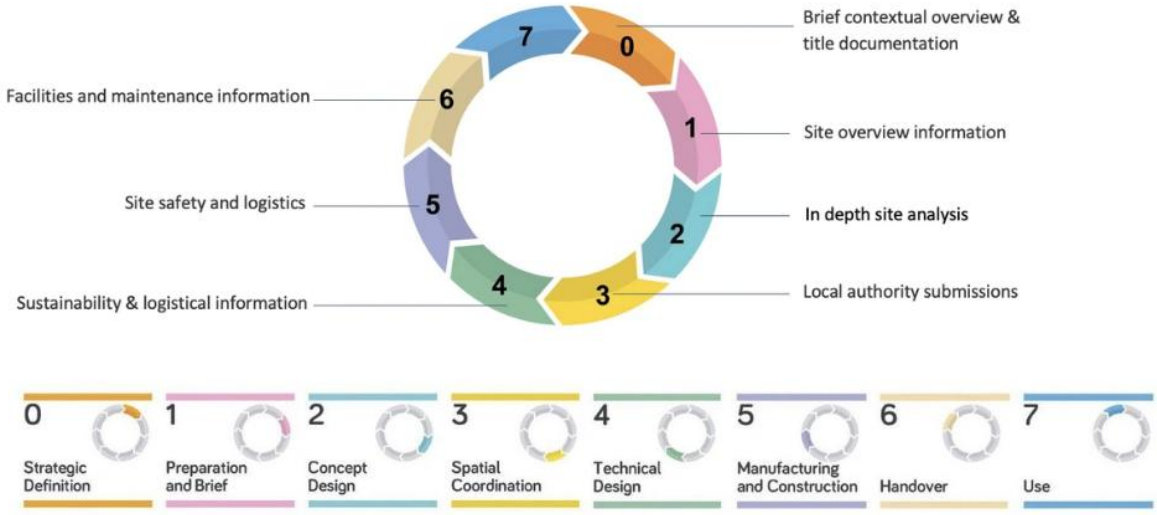

Figure 2 - RIBA Stages (RIBA, 2013)

3.2.4. Table 1 suggests methods to incorporate circular economy principles into a development process using the RIBA stages as an indicator of when the action should be undertaken.

Table 1 - Actions by RIBA stage

RIBA Stage	*Suggested Actions*
0-1	• Set broad objectives for Circular Economy • Assess current site and undertake pre-demolition / pre-refurbishment audits
1	• Develop objectives with specific metrics • Identify any further information required
2-3	• Hold workshops to investigate and CE alternative approaches • Agree opportunities, commitments and metrics
4	• Include metrics as clauses within procurement packages • Monitor design against metrics
5	• Monitor metrics with contractors and supply chain • Continue investigation into alternative products / materials
6-7	• Review success against objectives

3.2.5. These principles need to be proactively considered throughout specification, design, procurement, construction and operation. This includes collaborating with supply chains to explore and develop solutions which implement these principles and realise the benefits.

4. Design Principles

4.1.1. This section will review circular economy design principles and detail measures the proposed development could implement throughout the design, construction and operational phases in addition to those company objectives that are already in place.

4.2. Designing Out Waste

Minimising Material Use

4.2.1. Minimising material use can be achieved by adopting a design approach that focuses on material resource efficiency so that less material is used in the design and / or less waste is produced in the construction process, without compromising the design concept. For waste reduction, minimisation of excavation, simplification and standardisation of materials and components of choice, and dimensional coordination should be considered.

4.2.2. The development should aim to 'design out' waste through the consideration of material specification, such as maximising use of existing materials, and construction techniques in order to prevent and minimise waste generation.

4.2.3. When selecting and designing components the following is to be applied where feasible:

- *Design out the need for the component or material;*
- *Use reclaimed material and remanufactured components over new, where possible;*
- *Select products that can be remanufactured or reused at end of life;*
- *Use materials with recycled content;*
- *Select products that are designed for disassembly;*
- *Select materials that can be recycled or composted at end of life; and,*
- *Consider leasing short lived components.*

4.2.4. When applying the above, complete transparency and visibility throughout the supply chain will be encouraged. Early engagement with the contractor and partnering within the supply chain is required.

Waste Hierarchy

4.2.5. The design team will consider the Waste Hierarchy to optimise reuse, recycling and recovery opportunities for the purpose of minimising waste as far as possible. The principal contractor, once appointed, will be responsible for implementing the principles within the Waste Management Strategy and the Site Waste Management Plan (SWMP) during the construction phase of the proposed development.

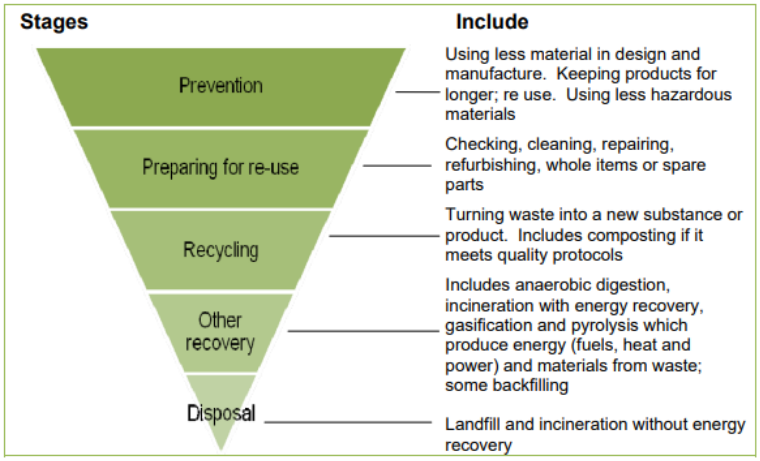

Figure 3- Waste Hierarchy (DEFRA, 2011)

4.2.6. The Waste Hierarchy is shown in Figure 3 below:

4.3. Reuse and Recovery

Site Analysis and Potential for Reuse

4.3.1. A site analysis including a pre-demolition and pre-refurbishment audits should be carried out to determine opportunities for reusing existing materials and/or components. The existing materials on site will be reviewed to determine if they meet the required functionality of the new design. Where no such opportunities exist, good practice measures will be taken in the demolition to ensure maximum recovery of materials through recycling. All elements from the deconstruction phase that cannot be reused on site are to be sent to organisations for onward use where feasible.

4.3.2. Investigations are to be carried out to establish where possible the extent of reuse, including reuse of materials and components from other projects and its practicality as early as possible. Throughout this process, carbon impacts should also be considered to ensure they are not compromised in material selection.

4.3.3. Materials such as steel, concrete, and timber will be carefully dismantled and repurposed for use in other projects, promoting a closed-loop system. By considering the end-of-life stage during the design and construction phases, the development aims to reduce the environmental impact associated with the disposal of building materials.

Site Waste Management

4.3.4. A Waste Management Strategy is recommended for the delivery of the proposed development at Lanwades Woodland Park.

4.3.5. The strategy should confirm that the hierarchy of waste management will be adopted in accordance with national policy requirements. The waste management methods should include preparation for reuse and material recovery. The recommended strategy will aim to support innovative design features to the proposed development to use materials in their current state and form (for example reuse of soils). This can occur either on or off site. The scale of the site lends itself to store materials and manage construction so that vehicle movements off-site can be minimised. For example, if appropriate, areas for temporary stockpiling of materials can be assigned.

4.3.6. A strategy will be put in place to minimise the space taken by storage of new materials. Frequently used items will be placed in easy to access areas. This will increase efficiency and minimise wastage due to damage. Prolonged storage of materials on site will be avoided, where possible, and implementation of accurate and timely deliveries will be targeted.

4.3.7. Options also include using waste materials found on site and recycling / recovering them into an alternative form that can be used for any construction purposes (for example crushing concrete for road construction material). By recycling onsite, carbon emissions associated with the proposed development are also reduced, rather than materials being taken away from the application site.

4.3.8. During the construction phase, materials recovered from any on-site works which may be suitable for reuse on-site will be utilised, reducing costs of transportation and procurement of new materials. This will help to minimise construction waste in line with the waste hierarchy.

Operational Waste

4.3.9. Waste reduction during the operational phase will also been considered. Signage will be provided, where feasible, in communal waste storage facilities to encourage correct use of the recycling service. New residents will be encouraged to reduce and prevent waste through good practice measures, which could be achieved via the provision of information packs to residents about how the waste segregation and recycling scheme operates. The information should also include details on waste prevention schemes within the local area, along with locations of local household waste recycling centres.

4.3.10. Adequate internal and external space for the storage and sorting of operational waste will be provided to allow for the sorting of recyclable and compostable waste. Waste collection is to be designed to be in line with the surrounding area so as to put as minimal additional strain on the local waste collection network as possible.

4.4. Whole Life Carbon and Material Resource Efficiency

4.4.1. A Whole Life Carbon (WLC) report has been produced by Environmental Economics Ltd for the proposed development. The initial findings and early recommendations have been included in the standalone report in support of the planning application. Once a fully detailed design and material specification is available, a full WLC assessment can be undertaken to analyse the specific build specification which is to be utilised for the construction.

4.4.2. Recommendations resulting from the assessments carried out for the report allow value engineering to balance low embodied carbon emissions with low operational carbon emissions. In addition, it can assess how materials may be re-used or disposed of at the end of a development's life, allowing for reusable and recyclable materials to be targeted for specification.

4.4.3. Further details of the Whole Life Carbon impacts of the proposed development can be found in the associated report.

4.5. Designing for Longevity

4.5.1. The proposed development seeks to design with durability and longevity in mind to ensure the built assets allow for challenging climatic conditions. Examples include protecting materials from degradation due to environmental conditions, adopting passive design strategies to provide resilience, and designing systems to cope with future climate scenarios.

4.5.2. The development has been designed with long-term sustainability in mind. Buildings are to be constructed with high-quality, durable materials to ensure longevity, reducing the need for frequent repairs and replacements.

Maintenance

4.5.3. Appropriate and simple maintenance strategies will be planned at design stage, including using condition-based monitoring for equipment.

4.6. Design for Offsite Construction

4.6.1. Offsite construction and manufacturing will be considered, where feasible. The benefits of offsite factory production in the construction industry are well documented and include the potential to considerably reduce waste, especially when factory manufactured elements and components are used extensively. Its application also has the potential to significantly change the operations onsite, reducing the amount of trades and site activities and changing the construction phase into a more simplified and manageable process. There are several benefits to this approach including:

- *Reduced construction related transport movements;*
- *Reducing on site errors and rework; and,*
- *Reduced construction timescales and improved programmes.*

4.7. Standardisation or Modularisation

4.7.1. The proposed development will consider designing and construction methods by applying, where feasible, standardised elements or modular designs for materials and products that enable a reduction in construction waste and easier reuse in next life.

4.7.2. Elements should use standardised design formats to enable future reuse, e.g. no bespoke cutting of materials as this can make replacements difficult to obtain.

4.7.3. Targets should be set for minimising specialised components which are difficult to repair or replace.

4.8. Designing for Assembly, Disassembly and Recoverability

4.8.1. Opportunities to develop a materials inventory for the proposed development will be explored, which would include a detailed breakdown of all the building elements that sets out the constituents of each product and material, the structural loadings, and the ability for each material to be reused and/or recycled.

4.8.2. The lifespan of internal fixtures is often over-estimated which leads to significant waste. Where feasible, components that are likely to have a shorter lifespan will either be made of biological materials which can be returned to the biosphere (for example breather board) or designed to be returned to the manufacture for reuse.

4.8.3. During material specification, materials with a known short life span should be selected with manufacturers which utilise take back schemes or that are procured through a service agreement.

4.8.4. Unnecessary toxic treatments and finishes will be avoided where possible. In addition, finishes that can contaminate the substrate in a way that they are no longer reusable will be avoided unless they serve a specific purpose.

4.8.5. Designing the building systems and components in layers will be considered. This enables the removal, adjustment or replacement of some elements, particularly for areas where different components have different life spans and maintenance needs.

4.8.6. All assets will seek to be designed to allow for easy assembly and reconfiguration for alternative future uses where feasible, for example, the design of interior systems for disassembly. Materials should have the option to be taken apart through mechanical and reversible fixings to allow for future reuse. Permanent fixing of products, such as by glue and cement mortar, should be avoided where possible to enable end of life deconstruction and salvage of building elements. Fixings will be easily accessible, where possible, for disassembly.

4.9. Designing for Adaptability or Flexibility

4.9.1. The buildings should be designed to be adaptable to future changes in use, reducing the need for demolition and minimising construction waste. This adaptable design will allow for easy retrofitting or repurposing to accommodate future needs, helping to extend the building's lifecycle.

4.9.2. The proposed development will seek to avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works. These changes could be required as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy.

4.9.3. Designing for adaptability and flexibility is to be considered in the design to ensure the built asset can cope with a diversity of scenarios. The proposed development has been designed to promote openness and ease of access.

4.9.4. Other examples include ensuring that insulation is not bonded to the prefabricated ground slabs or the roof membrane, allowing for maintenance or upgrades in future.

4.9.5. The development will seek to ensure that the mechanical and electrical design of individual buildings is zoned to allow for future changes in layout.

5. Conclusion

5.1.1. This Circular Economy Statement has been produced for the proposed development at Lanwades Woodland Park.

5.1.2. By implementing circular economy principles, Lochailort Kentford Ltd aim to create a development that not only meets the needs of today but also contributes to a more sustainable, resource-efficient future. The proposed development is committed to minimising environmental impact, reducing waste, and fostering a more sustainable approach to construction and development in line with national and local sustainability goals.

5.1.3. The purpose of this Circular Economy statement is to demonstrate that the proposed development at Lanwades Woodland Park has considered key circular economy principles to minimise embodied carbon and operate with a circular economy, maximising the value extracted from materials and prioritising the reuse and recycling of materials. The statement takes into consideration the following:

- *How demand for materials will be minimised;*
- *How secondary materials can be used;*
- *How new materials are being specified to enable their reuse;*
- *How construction waste will be minimised and how and where the waste will be managed in accordance with the waste hierarchy;*
- *How the proposal's design and construction will enable building materials, components and products to be disassembled and re-used at the end of their useful life;*
- *Opportunities for managing as much waste as possible on site;*
- *Adequate and easily accessible storage space to support recycling and re-use;*
- *How much waste the proposal is expected to generate, and how and where the waste will be handled.*

5.1.4. Key commitments include:

- *Broad objectives for Circular Economy aspirations have been set;*
- *Site analysis, in the form of detailed pre-demolition / pre-refurbishment audits, should be undertaken;*
- *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.*

5.1.5. The site is found to present a positive sustainable development based on the assessed criteria.

Appendix A – Proposed Site Layout