CIRCULAR ECONOMY (CE) STATEMENT

PROJECT:
Plymouth Grove, Manchester

PROJECT NUMBER:
P2643

DOCUMENT REF:
P2643-CES-R02

Revision	Date	Details	Authored	Checked
R1	23/05/2023	Issued for comment	W. Liu	C. Armstrong
R2	02/10/2023	AY comments	W. Liu	C. Armstrong

KENT (HQ)
Unit 3 Grove Dairy Farm Business Centre I Bobbing Hill I Bobbing I Sittingbourne I Kent I ME9 8NY

LONDON
One Bridge Wharf I 56 Caledonian Road I London I N1 9UU

CONTENTS

1.0 EXECUTIVE SUMMARY 3

2.0 INTRODUCTION 4

3.0 PLANNING POLICY AND LEGISLATION 4

4.0 DESCRIPTION OF DEVELOPMENT 5

4.01 Location 5

4.02 Current Site 6

4.03 Proposed Development 6

4.04 Method Statement 6

5.0 STRATEGIC APPROACH 6

5.01 Building in Layers 6

5.02 Implementing Circular Economy 7

6.01 Operational Waste Management Strategy 8

6.02 Waste Hierarchy 9

7.0 CIRCULAR ECONOMY COMMITMENTS 11

7.01 Key Circular Economy Commitments Narrative 11

7.02 Key Commitments: Sustainable Consumption & Production Plan 12

7.03 Recycling & Waste Reporting 19

7.04 Implementation Strategy 19

8.0 END OF LIFE STRATEGY 21

9.0 BREEAM ANALYSES 21

10.0 CONCLUSION 23

1.0 EXECUTIVE SUMMARY

QuinnRoss Energy was commissioned to develop a circular economy statement to support a planning application for a proposed student accommodation development on land at *Plymouth Grove, Greater Manchester* that will outline how the development has been designed with the circular economy being a key driver and the project team has fully considered all waste issues throughout the design and construction process to maximise the inclusion of these features and practices wherever possible. This approach will help to mitigate the impact of the development on waste.

The site is located in Greater Manchester. The proposals are a new student accommodation development consisting of 239 student residential units providing a total of 263 student beds with refuse, gym, cycle store, indoor and outdoor amenity spaces.

The building circularity for the proposed scheme follows the following principles and approach:

Sustainable resource management, design, production and resource efficiency and sustainable procurement

- Minimise quantities, use low embodied carbon and/ renewable materials to ensure the carbon footprint of the development is considered.
- The building layers with longer life expectancy will be designed for longevity, flexibility and adaptability and layers with shorter life expectancy for ease of maintenance, recoverability, and replacement.
- The material will be procured sustainably. All timber or timber-based products will be FSC or PEFC certified.
- The use of suppliers with ISO 14001 or equivalent environmental management system will be encouraged for material procurement.

Manage waste sustainably

- At least 95% of the waste can be diverted from going into landfill.
- A site waste management plan will be implemented on site to minimise waste generation and then manage waste responsibly.
- An operational waste strategy will be implemented to ensure municipal waste is managed sustainably.

2.0 INTRODUCTION

QuinnRoss Energy was commissioned to develop a circular economy statement to support a planning application for a proposed student accommodation development on land at *Plymouth Grove, Greater Manchester* that will outline how the development has been designed with the circular economy being a key driver and the project team has fully considered all waste issues throughout the design and construction process to maximise the inclusion of these features and practices wherever possible. This approach will help to mitigate the impact of the development on waste.

The site is located in Greater Manchester. The proposals are a new student accommodation development consisting of 239 student residential units providing a total of 263 student beds with refuse, gym, cycle store, indoor and outdoor amenity spaces.

3.0 PLANNING POLICY AND LEGISLATION

This section describes the planning policies and regulations that will affect the proposed development's circular economy credentials. These are outlined below:

- Manchester's Local Development Framework – Core Strategy (2012-2027)
- Greater Manchester Joint Waste Development Plan Document (2012-2027)
- Sustainable Consumption & Production (SCP) Plan (2021-2025)

Policy	Description / Summary
Manchester core strategy (2012-2027)	
Policy EN4	All development must follow the Energy Hierarchy, to use low embodied carbon and / renewable building materials in new development and refurbishment schemes where possible.
Policy EN19	Policy EN19 requires all developers to design in line with the principles of the waste hierarchy (prevention, reduction, recycling/composting, energy recovery, final disposal). To submit sustainable waste management plan on how construction and demolition waste will be minimised and recycled on site. Demonstrate how the end user meet the sustainable waste management needs. Waste management practices are required to have full regard to the environmental, social and economic impacts of the development.
Greater Manchester Joint Waste Development Plan Document (2012-2027)	
	Waste management plan is required based on the waste planning strategy set out and adopted by all ten Greater Manchester districts to deliver sustainable waste management.
Sustainable Consumption & Production (SCP) Plan (2021-2025)	

	The SCP sets out four priority areas of moving to a circular economy, managing waste in sustainable way, reducing food waste and moving to a sustainable lifestyle to achieve Greater Manchester's aspirations.
Policy 3.1.1	To increase the reusability and recyclability of sustainable products and minimising the use of raw material.
Policy 4.2.1	To minimise waste that is sent to landfill by promoting the waste hierarchy.
Policy 4.3.1	Four bin system to reduce household waste generation through prevention, reuse and recycling.
Policy 4.3.2	Targeted on England's Waste and Resources Strategy to reduce commercial waste generation through prevention, reuse and recycling.

Table 01: Waste planning policies

4.0 DESCRIPTION OF DEVELOPMENT

4.01 Location

The site is located at the corner of Plymouth Grove and Dryden Street in the Ardwick area of Manchester, just south of the city centre. The site boundary is shown edged red below:



Figure 01: Existing site plan

4.02 Current Site

The site currently has no structures or hardscape.

4.03 Proposed Development

Development of site to provide 239 studio apartments, comprising 263 student bed spaces, in a building ranging in height from ground +0 to ground +7 floors with gym, cycle store, refuse, internal and external outdoor amenity including gardens and roof terrace.

4.04 Method Statement

A holistic approach has been adopted to establish the approach and targets for the project. The focus has been to create an architecture where the circular economy principles could be embedded in the design rather than an afterthought. Having a clear understanding of the objective of the Manchester's Core Strategy policies EN4 and EN19, the concepts of whole life carbon and circular economy were considered comprehensively given that Manchester does not have any landfill capacity. The design approach follows the following framework:

- Rethink: Choose longer lifespan products.
- Retain: There are no existing buildings or structures to retain.
- Reuse: There are no existing buildings or structures to reuse.
- Recycle: Use recycled and recyclable material for construction as much as possible.
- Recover: Use energy recovery technologies rather than landfill

Discussions were held with the key stakeholders for establishing an integrated approach tailored for the project. This included a circular economy workshops attended by the architect, structural engineer, building services engineer and project manager. Additional workshops are to be undertaken at the detailed design stages with the team and the main contractor.

5.0 STRATEGIC APPROACH

5.01 Building in Layers

The proposed scheme design has been broken down into building layers to design out waste, optimise material use and keeping building elements/materials in use after the end of their life cycle. Please refer to the summary of strategies in Table 2. A new comprehensive precast frame is proposed.

The design objective for the elements with longer life cycle (more than 25 years) is to design for longevity, adaptability, and flexibility. Concrete provides longevity and high thermal mass whilst steel is highly recyclable.

Building layers with shorter life expectancy (less than 25 years) will be designed for ease of maintenance, reuse, and recoverability. The building services, in this case a water based heat pump system is proposed, will be made accessible for replaceability and maintenance.

Opportunities will be explored for reusing hoardings and scaffoldings. Discussions with suppliers with regards to the possibility of sending back the packaging for reuse will be explored. Offsite and modern

methods of construction (MMC) is being proposed to further optimise material use and waste minimisation.

Layer	Constituent Elements	Strategies
Site	The geographical setting, urban location, and external works	Retain and reuse landscaping materials where possible.
Substructure	Excavations, foundations, basements, and ground floors	Longevity – durable and resilient. readiness for alternative technologies Adaptability – how the current needs might change in the future Flexibility – potential for reconfiguration/future refurbishment of non-structural parts
Superstructure	Load-bearing elements above plinth including roof supporting structure	
Shell/Skin	The layer keeping out water, wind, heat, cold, direct sunlight, and noise	
Services	Installations to ensure comfort, practicality, accessibility, and safety	Reusability – designed to be redeployed or reused as kit of parts Recoverability – designed to be deconstructed and reused/recycled
Space	The layout of internal walls, ceilings, floors, finishes, doors, fitted furniture	
Construction	Any temporary installations/works/ materials, packaging, and equipment	Reusability – Use of re-usable hoardings and scaffolding Waste minimisation, material optimisation

Table 02: Strategies for building layers

5.02 Implementing Circular Economy

For circular principles to be successful it requires a whole building approach. The table below show the design team's methods to incorporate circular economy principles into the development process using the RIBA stages as an indicator of when the action should be undertaken:

RIBA Stage	Description / Summary
0/1	Set broad objective for circular economy aspirations.
	Pre-demolition audit is N/A as no existing buildings on site.
1	Develop objectives with specific metrics.
	Identify further information required e.g., carbon/ cost consultant, case studies.

2/3	Hold workshop to investigate CE alternative approach.
	Agree opportunities, commitments, and metrics/ targets.
4	Include metrics as clauses within procurement packages.
	Monitor design against metrics, continue to engage with suppliers.
5	Monitor metrics with contractor.
	Continue to investigate alternative materials/ products.
6/7	Review success against objectives.
	Lessons learnt workshop.

Table 02: CE principles at each RIBA stage

6.01 Operational Waste Management Strategy

The operational waste management strategy (provided as a separate planning document) has been guided by the following policy/recommendation documents:

- Ministry of Housing, Communities and Local Government (MHCLG), National Planning Policy Framework (2021).
- MHCLG, National Planning Policy for Waste (2014).
- Department for Environment, Food and Rural Affairs (DEFRA), Our Waste, Our Resources: A Strategy for England (2018).
- DEFRA, Waste Management Plan for England (2021).
- HM Government, A Green Future: Our 25 Year Plan to Improve the Environment (2018).
- Manchester's Local Development Framework – Core Strategy (2012-2027)
- Greater Manchester Joint Waste Development Plan Document (2012-2027)
- Sustainable Consumption & Production (SCP) Plan (2021-2025)

6.02 Waste Hierarchy

Aspect	Steering Approach	Explanation	Target	Supporting analyses
Circular economy approach for new development	The following design principles have been adopted for the proposed scheme: ● Retain, repurpose, reuse, recycle where possible to reduce the material use. ● Following lean design principles such as low energy demand, light weight construction. ● To use material efficiently optimise grid sizes, structural loads etc. ● Thinking in layers and how each building layer can be designed for material efficiency. ● Designing for longevity and future adaptability and flexibility of use. ● Using materials with high recycled content. ● Resilient design to last the life of the building. ● Prioritising sustainably sourced material e.g., FSC or PEFC certified timber, suppliers who operate a compliant environmental management system. ● Prioritise specifying material with compliant EPD's.	The following key stakeholders were engaged from the very outset of the project to consider design interventions in line with the approach: ● Architect Structural engineer ● Building Services engineers ● Sustainability consultants ● Project managers ● Client	95% diversion from landfill at the end of life and Waste generated during construction to be no more than 3.0 tonnes/100m^2.	BREEAM workshops and discussions on waste and materials BREEAM pre assessment Sustainable Procurement Plan

	• Low embodied carbon construction. • Minimising energy and water use during construction and operation.			
Circular economy approach for the existing site	• The team considered the pre-demolition audit however it is N/A as they are no existing structures on site. • The contractor will implement a compliant Site Waste Management Plan (SWMP). • Diversion of 95% (by tonnage) of the excavation waste from going into the landfill.	• Use durable materials with low embodied carbon. • Waste streams arising from the strip out and demolition works to be segregated. Waste hierarchy of prevention, reduction, reuse, recycling/composting, energy recovery and final disposal is to be followed	95%diversion from landfill at the end of life	SWMP
Circular economy approach for municipal waste during operation	• Separate bin store for recyclable waste to be provided • Food bins to be provided • Facilities manager (FM) to oversee the waste collection spaces daily	• The aim is to reduce the waste going to landfill or incineration. Therefore, waste segregation strategy is key.	At least 95% diversion from landfill	SWMP

7.0 CIRCULAR ECONOMY COMMITMENTS

The project is adopting exemplary circular economy commitments that go beyond standard practice:

- A Sustainable Procurement Plan (SPP) will be produced by the design team.
- A bespoke Site Waste Management Plan (SWMP) will be produced and adopted by the contractor.
- Contractor to target diversion of 95% of construction waste and 95% of the demolition/excavation waste from going to landfill.
- Contractor to target a benchmark resource efficiency of 3.0 tonnes of waste per 100m^{2}GIA.

7.01 Key Circular Economy Commitments Narrative

Minimise material quantities: The development will use offsite modern methods of construction for frame, façade, balconies, and bathroom pods to reduce material usage.

Minimise fuels, land & water: The development is on a brownfield site and designed for energy and water efficiency in operation. Construction processes will prioritise fuel and water conservation, including delivery and storage coordination for example.

Specifying & sourcing materials: This involves designers and contractors collaborating for optimum results and includes reference to a bespoke Sustainable Procurement Plan. A high priority will be given to locally sourced, high recycled content materials and products with EPDs.

Design for longevity, adaptability/flexibility, and reusability/recoverability: Materials will be specified for durability and longevity. Waterproofing detailing, profiling, drainage details, fixings and general geometry will be thoroughly assessed. The strategic approach SCP's circular economy waste prevention towards designing for adaptability and longevity for the development. Non-load bearing internal partitions may be dismantled to accommodate the needs of the future tenants and adaptability without damaging the building structure (building in layers).

Design out waste: Apply the building in layers approach, the design objective for the elements with longer life cycles (more than 25 years) is to design for longevity, adaptability, and flexibility. Building layers with shorter life expectancy (less than 25 years) will be designed for ease of maintenance, reuse, and recoverability. The plant will be made accessible for replaceability and maintenance. Target a benchmark for resource efficiency of 3.0 tonnes of waste per 100m^2 GIA.

Manage waste sustainably and at the highest value: A site waste management plan and an operational waste management plan will ensure optimum management and auditing of demolition, construction, and municipal waste. The team aims to divert 95% of construction waste and 95% of the demolition/excavation waste from going into the landfill.

7.02 Key Commitments: Sustainable Consumption & Production Plan

Priority 1 : Moving to circular economy	
Sustainable resource management: Minimising the quantities of material used	
Site	The development will use an offsite and modern methods of construction in order to reduce material usage.
Substructure	The development will use an offsite and modern methods of construction in order to reduce material usage.
Super Structure	The development will use an offsite and modern methods of construction in order to reduce material usage.
Shell/Skin	An offsite and modern methods of construction precast façade are proposed to reduce material required. Aspiration for high recycled content aluminium for the apertures.
Services	Services to be accessible for ease of maintenance and replacement without damaging internal or external building elements. Services capacity is to be sized to ensure thermal comfort and not over-sized.
Tenant	Circular economy principles will be encouraged with incoming tenants.
Construction	Use of demountable and reusable scaffolding. Promote the taking back of building materials packaging.
Summary	Optimising the design to reduce material use and waste.
Challenges	There may be some unforeseen challenges during construction, i.e. accidents / curved corners in precast / human error that require additional materials to resolve.
Who and when	Structural Engineer, Architect, Sustainability Consultant during early design stages.
Proof	QS report

Table 04: CE Principles for minimising quantities of materials

Sustainable resource management: Minimising the quantities of other resources (energy, water, land)	
Site	The project is located on previously used land (brown field) with no impact on virgin land.
Substructure	GGBS (a waste by-product of iron and steelmaking by product) will be used for cement replacement to reduce impact on the land to generate cement and reduce the embodied carbon.
Super Structure	A low heat loss form factor is achieved due to the compact geometry design, thus reducing heating demand.
Shell/Skin	A low heat loss form factor design reduces the exposed façade area.
Services	Targeting a low water consumption of 105 litres/person/day. Energy demand is reduced following the energy hierarchy as outlined in Policy EN4 Page 174 of the Core strategy 2012, providing passive design, enhancing the fabric performance, servicing strategy selected and building services efficiency as noted in the Energy Assessment. All services are designed to be replaced with ease at end of life.
Space	Repetitive layouts are used across the different floors. Repetition and the reduction of bespoke pieces result in a lower amount of construction waste.
Tenant	Circular economy principles will be encouraged with incoming tenants.
Construction	A Resource Management Plan (RMP) or Site Waste Management Plan (SWMP) will be implemented on site. Energy, water, and waste will be monitored on site.
Summary	Material specification to be reviewed in line with the objectives. Best construction practices to be adopted
Challenges	Shortfalls in the supply chain. EPD's not available for all building material.
Who and when	Structural Engineer, Architect, Sustainability Consultant during early design stages Contractor during construction stage.
Proof	Resource management and sustainability procurement plans to be implemented. Contractor to report energy and water use during construction.

Table 05: CE Principles for minimising the quantities of other resources

Sustainable procurement: Specifying and sourcing materials responsibly and sustainably	
Site	Select locally sourced materials where possible.
Substructure	Use significant percentages of cement replacement alternative binders, such as Ground Granulated Blast-Furnace Slag (GGBS) in concrete elements. Concrete steel rebars to have recycled steel content. Prioritise the use of products with an EPD.
Super Structure	Use significant percentages of Cement replacement alternative binders, such as Ground Granulated Blast-Furnace Slag (GGBS) in concrete elements. Concrete steel rebars to have recycled steel content.
Shell/Skin	Consider the use of low embodied carbon façade cladding.
Services	Use of low GWP refrigerant.
Space	Use only FSC certified wood.
Tenant	Circular economy principles will be encouraged with incoming tenants.
Construction	Using only FSC or PEFC certified timber.
Summary	Suppliers to provide EPDs or disclose supply chain. Local manufacturers to be given preference. Manufacturers using renewable energy to be given priority.
Challenges	Limitations with the supply chain.
Who and when	All parties during design and construction stages.
Proof	Contractor to ensure the objectives are achieved and if EPDs are not available then request for material disclosure through a standard questionnaire.

Table 06: CE Principles for specifying and sourcing materials responsibly and sustainably

Priority 2: Managing waste sustainably	
Sustainable resource management: Designing for reusability/recoverability/longevity/adaptability/flexibility	
Site	There are no buildings on site therefore zero demolition waste. Excavation waste will be first used on site where possible. Possibilities for re-use on other local sites will be explored.
Substructure	The development will use an offsite and modern methods of construction in order to reduce material usage.
Super Structure	Materials specified for durability and longevity. Non-load bearing internal partitions may be dismantled to accommodate the needs of the future tenants and adaptability without damaging the building structure (building in layers).
Shell/Skin	Materials will be specified to ensure they are durable. The design criteria to ensure the protection of the roof, will consider the material selection thoroughly for its robustness. Waterproofing detailing, profiling, drainage details, fixings and general geometry will be thoroughly assessed.
Services	Building services consider future climate change scenarios Future resilience provided as the development is being designed to connect to a district network in the future.
Space	The spans used provide flexibility of use. The location of cores allows for flexibility.
Tenant	Tenant's responsibility.
Construction	Sustainable Procurement Plan to be developed. To be reviewed with contractor during preconstruction supply chain engagement.
Summary	The design has been developed keeping in mind long term use of the building and how it can adapt to the changing needs in the future.
Challenges	There might be some unforeseen challenges during excavation, i.e., thus far undiscovered pipe work or underground stones that require removing. This is unlikely however.
Who and when	All parties during concept design and technical design stages.
Proof	Contractor's Sustainable Procurement Plan.

Table 07: CE Principles for designing for reusability/recoverability/longevity/adaptability/flexibility

Sustainable resource management: Designing out construction, demolition, excavation, and municipal waste arising	
Site	A target benchmark for resource efficiency, i.e., 3.0 tonnes of waste per 100m^2
Substructure	A site waste management plan will be produced and followed. Concrete and masonry waste will be crushed and re-used on site as piling matt, minimising traffic impact. The surplus may be re-used on other local sites where possible.
Super Structure	A site waste management plan will be produced and followed. Concrete waste will be processed off site at a recycling facility for eventual use as aggregate products.
Shell/Skin	Off-site and modern methods of construction to reduce waste on site is being designed especially for building frame, facades and bathroom pods. Glass can be recycled and reused in other glass products or as aggregate.
Services	Careful passive design helped to design out the need for cooling in residential areas. Careful plant sizing avoids over-sizing. Heat pumps refrigerant to be captured at end-of-life.
Tenant	Tenant's responsibility.
Construction	A site waste management plan to be prepared and followed on site To be reviewed with contractor during preconstruction supply chain engagement.
Summary	Minimise waste and manage waste responsibly.
Challenges	Unforeseen additional materials.
Who and when	Structural engineer and main contractor during design and construction stages.
Proof	Sustainable Design & Construction Strategy. Sustainable Procurement Plan.

Table 08: CE Principles for designing out construction, demolition, excavation, and municipal waste arising

Waste management: Demolition waste (how waste from demolition of the layers will be managed)	
Site	There are no buildings on site therefore zero demolition waste
Substructure	
Super Structure	
Shell/Skin	
Services	
Space	
Tenant	
Construction	
Summary	
Challenges	
Who and when	
Proof	

Table 07: CE Principles for managing demolition waste

Waste management: Excavation waste (how waste will be managed)	
Site	There are no buildings on site, therefore zero excavation waste from existing structures required.
Substructure	Excavation waste will be first used on site where possible. Possibilities for re-use on other local sites will be explored.
Super Structure	N/A
Shell/Skin	N/A
Services	N/A
Space	N/A
Tenant	N/A
Construction	N/A
Summary	N/A
Challenges	Unforeseen materials discovered on site may not be recyclable or suitable for re-use.
Who and when	Contractor during excavation and construction stages
Proof	Contractor's Sustainable Design & Construction Strategy

Table 07: CE Principles for managing excavation waste

Waste management: Construction waste (how waste arising from construction of the layers will be reused or recycled)	
Site	A target benchmark for resource efficiency, i.e., 3.0 tonnes of waste per 100m^2.
Substructure	
Super Structure	
Shell/Skin	
Services	
Space	
Tenant	Tenant's responsibility
Construction	To be reviewed with the contractor. Contractor will segregate and monitor waste generated during construction
Summary	Reduce waste arising during construction. Segregating waste and reducing waste going to landfill
Challenges	Organisation of waste storage and segregation may be a challenge
Who and when	Contractor during excavation and construction stages
Proof	Contractor's Sustainable Design & Construction Strategy Site waste management plan

Table 07: CE Principles for managing construction waste

Waste management: Municipal Waste (how waste will be managed)	
Site	A central waste storage area will be provided within the Proposed Development at ground level for the storage of residual waste, DMR and food waste. Spaces will be clearly labelled in line with BREEAM Wst 03 criteria.
Substructure	Refuse store with area planned.
Super Structure	N/A
Shell/Skin	N/A
Services	N/A
Space	The central waste storage area will be overseen by the on-site FM team on a daily basis
Tenant	Each kitchen unit will be provided with a segregated waste bin, which will be fixed in to an appropriate kitchen unit.
Construction	Contractor will segregate and monitor waste generated during construction
Summary	Development will provide as much signage and refuse space as possible to encourage tenants.
Challenges	Very limited control of how tenants will monitor their waste.
Who and when	Waste consultant as well as contractor
Proof	Contractor's Sustainable Design & Construction Strategy Operational waste management plan

Table 07: CE Principles for managing municipal waste

7.03 Recycling & Waste Reporting

A summary of predicted waste production from construction processes is shown below by category:

Waste Category	Type of Material	Estimated Volume (tonnes)	% Diverted From Landfill	Diversion Method
Inert	Brick / Block	55	100%	Recycling & reuse
Inert	Concrete	55	100%	Recycling & reuse
Inert	Glass	5	100%	Recycling
Inert	Subsoils	20	100%	Recycling
Non-hazardous	Cardboard / Paper	0.5	100%	Recycling
Non-hazardous	Green	0	100%	None Expected
Non-hazardous	Metal	20	100%	Recycling & reuse
Non-hazardous	Plasterboard	2	100%	Recycling
Non-hazardous	Insulation	2	100%	Recycling & reuse
Non-hazardous	Plastics	1	100%	Recycling
Non-hazardous	Wood	5	100%	Recycling
Non-hazardous	Ceramics	1	0%	-
Hazardous	Asbestos	0	100%	-
Total volume of waste per 100 m^2/floor area			3.0	
Total % diverted from landfill			100%	

Table 09: CE Predicted waste volumes

The Waste Management Strategy notes, that in line with the Waste (England and Wales) Regulations 2011, waste collection authorities must collect waste paper, metal, plastic, and glass separately. This legislation also imposes a duty on waste collection authorities, from the date, when planning for the collection of such waste, to ensure that those arrangements are by way of separate collection.

The Proposed Development supports separate collection of residual waste, dry recyclables, and food waste for residential uses.

Please find a mark-up of where such separated waste will be collected on site in Appendix A.

The on-site management team will agree with the local council on how the waste will be collected and reported as required by the Joint Waste Development Plan Document.

The client confirms that the on-site management team will adopt the waste collection coordination that the Manchester City may incorporate at any later date.

7.04 Implementation Strategy

A Site Waste and Resource Management Plan (SWMP/RMP) will be produced on the appointment of the contractor. It will include the following procedures and commitments to sort and divert waste from landfill, through either.

- Reusing the material on site (in-situ or for new applications).
- Reusing the material on other sites.
- Salvaging or reclaiming the material for reuse.
- Returning material to the supplier via a 'take-back' scheme.

- Recovery of the material from site by an approved waste management contractor and recycled or sent for energy recovery.

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

The SWMP should include the target benchmark for resource efficiency i.e., 3.0 tonnes of waste per 100m^2.

The SWMP should also cover the following:

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

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

The waste reports and records will be reviewed and audited periodically. They will be discussed with the Sustainability champion on site and the BREEAM assessor from time to time. At least 95% of excavation, demolition and construction waste will be diverted from landfill.

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

- The contractor will register with the Considerate Constructor's Scheme and aim to attain a high score in all categories.
- Energy efficient equipment, services and construction methods will be adopted to reduce energy consumption.
- Water use will be minimised during operation, installation, and construction processes
- Energy including fuel and water use will be recorded on site during the construction process.

8.0 END OF LIFE STRATEGY

In line with Circular Economy principles, the main priority is to extend the lifetime of the building through careful design and specification through the measures listed in this document. A 'Disassembly Guide' will be developed providing guidance on which materials, elements or components can be reused, recycled, or composted; and how to disassemble the building to minimise wastage and facilitate reuse, recycling, or composting. The Disassembly Guide will address techniques for prolonging the life of the building and reducing operational CD&E waste, as well as laying out an 'end-of-life' strategy, recognising that this may be defined differently for different components or layers of the building.

The intention is for consultants and project team members from different disciplines to contribute sections to this guide, which will lay out key considerations when modifying or disassembling the building. The Disassembly Guide will benefit from information provided by the original design team, it may also include details of; expected ways that the development is able to adapt to alternative uses including removal of demountable elements, for example if a demountable parking structure were provided or the proposed operation of modular partitioning elements. Details of the material build ups to allow deconstruction and responsible disposal/or reuse will be provided. Maintenance information will be included to allow for elemental replacement where repairs are not possible. At detailed design stage, consideration might be given to the jointing arrangements for steel elements and precast concrete, to make it more feasible for components to be disassembled.

This guide forms part of the Waste 06: Design for disassembly and adaptability BREEAM requirements, as outlined in the next section.

9.0 BREEAM ANALYSES

The client intends to achieve BREEAM Excellent for the development and the following credits will be targeted in relation to the CE:

- Management 01: Life Cycle Cost (LCC) – An LCC exercise will be undertaken outlining all costs involved, including site activities, to encourage performance targets and ensure viability of the development for all stakeholders.

- Management 03: Responsible Construction Practices – The contractor will have to have in place a UKAS accredited environmental management system. They will also have to achieve a Considerate Construction Scheme (CCS) score of at least 40 and monitor all site energy & water consumption along with all vehicle deliveries and waste vehicle removal distances from site.

- Materials 01: Life Cycle Assessment (LCA) – A building LCA has been performed for planning, see document P2643-LCA-01 issued 05/11/2021. The outputs of which will be used for the Mat 01 submittal for BREEAM. The initial findings and early recommendations have been included in the standalone report in support of the planning application. The assessment will support BREEAM Mat 01 credits to be achieved and will consider, for RIBA stage 2-4, design for superstructure, substructure, and core services.

- Materials 02: Environmental Product Declarations (EPDs) – All materials will only be sourced if an accredited EPD accompanies the product manufacturer.

- Materials 05: Designing for durability and resilience - 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. Examples include flexible planning, location of cores and generous floor to ceiling heights or ensuring that insulation is not bonded to the prefabricated ground slabs or the roof membrane, allowing for maintenance or upgrades in future.

- Material 06: Material efficiency – Types and quantities of materials will be investigated at each RIBA stage to ensure re-use where possible and avoid unnecessary use from over specification.

- Waste 01: Construction waste management – The development will aim to achieve the maximum levels of waste reduction available by keeping volumes of waste below 3.2 tonnes/100 m^2 of floor area and ensuring at least 95% of waste is diverted from landfill. The existing structures will also undergo a pre-refurbishment audit to ascertain the quantities of materials that can be re-used and/or recycled avoiding anything being sent to landfill as much as possible.

- Waste 03: Operational waste – See section 6.02 (above).

- Waste 04: Speculative finishes – The commercial spaces will not be fitted with any internal finishes at all to avoid future tenants removing unwanted finishes and sending them to landfill.

- Waste 05: Adaptation to climate change – A study will be conducted to ensure materials are only chosen to cope with climate change ensuring replacement is not necessary in line with more extreme weather, such as increased rainfall and wind.

- Waste 06: Design for disassembly and adaptability - All assets will seek to be designed to allow for easy assembly and reconfiguration where feasible, for alternative future uses, for example, the design of interior systems for disassembly. Materials will have the option to be taken apart through mechanical and reversable fixings to allow for future reuse. Permanent fixing of products, such as by glue and cement mortar, will be avoided where feasible, to enable end of life deconstruction and salvage of building elements. Fixings will be easily accessible, where possible, for disassembly.

A separate BREEAM analysis will be submitted as part of this submittal details all BREEAM credits targeted.

10.0 CONCLUSION

The purpose of this Circular Economy statement is to demonstrate that the proposed development at Plymouth Grove in Greater Manchester has considered the 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, with reference to the SCP priority 1 & 2:

- 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 much waste the proposal is expected to generate, 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 managed.
- Broad objectives for Circular Economy aspirations have been set. Moving forward, 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).