



ELEMENT
SUSTAINABILITY

FIRST STREET, MANCHESTER

CIRCULAR ECONOMY STATEMENT

DECEMBER 2021

REF: 2019.163



ELEMENT SUSTAINABILITY – ISSUE NOTES

Project No: 2019.163

Title: Circular Economy Statement

Client: Downing Living

Status: Final

Version:	1.1	
Date:	December 2021	
Prepared by:	Checked by:	Approved by:
		
Maira Azhar Team Lead	Shaun O'Neill Sustainability Consultant	Laurie Wills Director

Version	Version Details	Date Issued	Issued by:
0.0	Draft for client comment	02.12.2021	LW
1.0	Issued with client comments	14.12.2021	MA
1.1	Issued with client comments	20.12.2021	MA



ELEMENT
SUSTAINABILITY

© Report copyright of Element Sustainability Ltd.

phone: 01829 733 444

email: hello@elementsustainability.co.uk

www: www.elementsustainability.co.uk

Disclaimer

This report has been prepared for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. It is not intended for and should not be relied upon by any third party. Any such party relies on this report at their own risk. No part of this report may be copied or duplicated without the express permission of Element Sustainability Ltd. and the party for whom it was prepared.

CONTENTS

Contents	2
1. Introduction	3
2. Development Proposals.....	4
2.1.1 Pre-Development Site Description	4
2.1.2 The Proposed Scheme	4
3. Policy and Guidance	6
3.1 Local Planning Policy	6
3.1.1 Manchester Core Strategy	6
3.1.2 Greater Manchester Joint Waste Development Plan (2012)	6
3.1.3 Places for Everyone Joint Development Plan Document (Emerging Policy)	6
3.2 Best Practice Guidance	7
3.2.1 The Waste Hierarchy	7
3.2.2 Circular Economy Principles for Building Design	7
3.2.3 Mayor of London Circular Economy Guidance	8
4. Circular Economy Statement	9
4.1 Circular Economy Principles	9
4.2 Circular Economy Principles at First Street Downing	10
4.2.1 Reduce Demand for Materials and Minimise Quantities Used	10
4.2.2 Resource Consumption	13
4.2.3 Sustainably Sourced Materials	14
4.2.4 Design for Adaptability, Flexibility and Longevity	15
4.2.5 Management of Waste	16
4.2.6 Reduction in Embodied Carbon	17
5. Circular Economy Monitoring framework	18
6. CONCLUSION	20



1. INTRODUCTION

Element Sustainability has been commissioned by Downing Living to develop a Circular Economy Statement for the proposed First Street Development in Manchester.

The purpose of this statement is to outline the Circular Economy measures that have integrated with the design of the proposed development for both buildings and the public realm.

Element Sustainability has developed this statement as a response to Planning Condition 7: Material Circularity - Embedded and Monitored. This statement will help to demonstrate Downing Living's commitment to circular economy principles, as well as highlight how the development aspires to reduce its carbon and waste footprint through the principles of circular economy, in line with local and national guidance.

This Statement has been developed in collaboration with the following stakeholders:

- Downing Living (Developer)
- The Design Team;
- Downing Construction Limited;
- Sustainability Consultant; and
- LCA Consultant.

The following steps were taken in the development of the Statement:

- A Circular Economy (CE) Workshop was held among the key stakeholders (listed above);
- A study of international and local best practices and benchmarks;
- Review of existing documentation and plans;
- Integration of CE principles, where possible; and
- Recording and reporting of evidence of CE principles within the design.

This Statement has been written as a response to the Planning Condition by the Manchester City Council:

'Prior to commencement of development a Strategy for the reduction of embodied carbon and how material circularity will be embedded within the process of material sourcing, design, construction and stewardship/building management and how this will be monitored as part of the in-depth Life Cycle analysis, shall be submitted to an approved in writing by the City Council as Local Planning Authority.

Within 6 months of the completion of development a Monitoring Report to assess the performance of the Strategy, lessons learnt, constraints and any proposed mitigating measures for improving performance on futures phases and overcoming constraints shall be submitted to the City Council'.

This Statement should be read in conjunction with the Life Cycle Analysis (LCA) Report, which has also been submitted in response to the Planning Condition. This report outlines the strategy and rationale for material selection and choice of construction methods in context of reducing the embodied carbon from the construction, transportation and end of life stages of the project.



2. DEVELOPMENT PROPOSALS

2.1.1 Pre-Development Site Description

The proposed development site is located on First Street in Manchester city centre. It is bound by Hulme Street to the north, Wilmott Street to the east, Chester Street to the south with the Ring Road beyond that and Medlock Street to the west. Newcastle street also runs through the centre of the of the proposed development site.

The 1.22ha site currently comprises a brownfield and hardstanding area associated with the demolition of the previous development on this site. Therefore, no buildings or structures currently stand on site. The proposed scheme is situated in a locality comprising surface car parks, high-rise residential and commercial buildings.

Figure 2.1 – Pre-development Site



2.1.2 The Proposed Scheme

The proposals will deliver four, residentially led, mixed-use buildings up to forty-five storeys and comprising 2,224 co-living bed spaces (use class sui generis). The proposals also include for a total of 4,600 m² of amenity space and the public realm will be equivalent to the area of three football pitches.

A wide range of social and communal spaces is proposed, such as a lounge, yoga area, BBQ areas, co-working space, dining facilities, café' and health and wellbeing centre.

Significant greened landscaping proposals will provide the city with an extensive new public green space with pedestrian routes through the site. The First Street development will also offer an assortment of gardens, parks and greenery as well 600 bicycle spaces for residents and visitors.

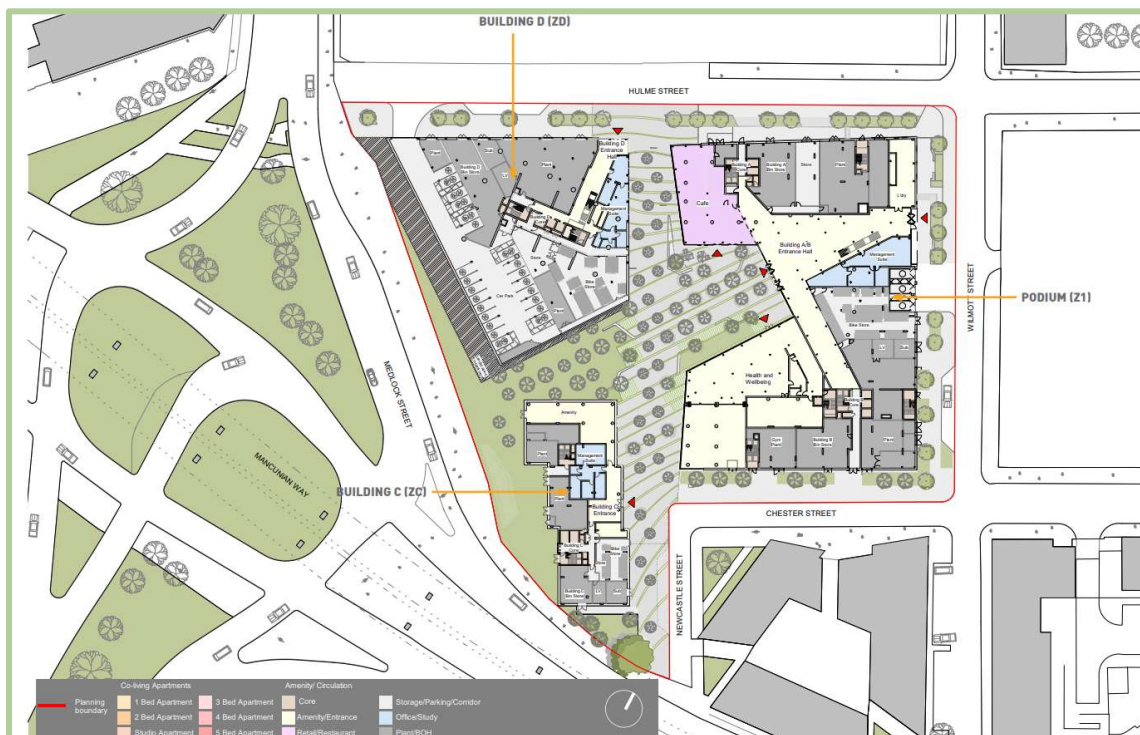
The proposed site which is located to the south of Manchester city centre in the First Street Estate will offer residents easy access to a range of retail, office, leisure, residential and transport infrastructure associated with the City.



Figure 2.2 – Proposed Scheme (North Elevation)



Figure 2.3 – Ground Floor Plan



3. POLICY AND GUIDANCE

3.1 Local Planning Policy

3.1.1 Manchester Core Strategy

Manchester's Core Strategy (CS) was adopted on 11th July 2012 and is the key Development Plan Document in the Local Development Framework (LDF).

Although there is no specific policy on Circular Economy within the Core Strategy, the following policies have been reviewed to ensure that the *intent* behind the principles of circular economy, namely resource conservation and climate change mitigation, have been captured within the design of the development. These policies, that have been considered relevant for the purpose of developing this statement are:

- **Policy EN4 – Reducing CO2 Emissions by Enabling Low and Zero Carbon Development** calls for the use of sustainable building materials with low embedded carbon
- **Policy EN19 – Waste** calls for proposals to demonstrate their alignment with the Waste Hierarchy principles. In addition, the policy requires the provision of sustainable waste management measures that promote a close-loop system.

3.1.2 Greater Manchester Joint Waste Development Plan (2012)

The Plan's objective is for the movement of waste up the waste hierarchy in order to maximise the diversion of waste from landfills. In addition, the Plan recognises the need to adapt to climate change through measures that seek to improve energy efficiency and reduce CO2 emissions.

3.1.3 Places for Everyone Joint Development Plan Document (Emerging Policy)

The PfE Plan, currently in its consultation period, intends to set the vision for 2037 and sets an ambitious target for Manchester to become carbon neutral by 2038. Under its objective 7 'Playing our part in ensuring that Greater Manchester is a more resilient and carbon neutral city-region', all new developments to become carbon neutral by 2028.

Another one of the Plan's ambitious target is to create a circular and zero waste economy through its **Policy JP – 7 Resource Efficiency**, which calls for:

Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use.

A Zero Waste Strategy is also currently in development and will expand upon the measures that developments will need to comply against to demonstrate evidence of circular economy and zero waste principles.

In addition, **Policy GM-S 2 Carbon and Energy** will prescribe developments to include a carbon assessment to demonstrate how the design and layout of the development sought to maximise reductions in whole life CO2 equivalent carbon emissions.



3.2 Best Practice Guidance

3.2.1 The Waste Hierarchy

Department for Environment, Food and Rural Affairs (DEFRA) provides guidance on applying the waste hierarchy for any kind of business or development that generates, handles or treats waste.

The Waste Hierarchy is a tool that ranks waste management options (top to bottom) from what is the best option for the environment (prevention) to the least preferred option (landfill disposal).

Figure 3.1 - DEFRA Waste Hierarchy Model



Source: www.defra.gov.uk

3.2.2 Circular Economy Principles for Building Design

The European Commission issued the Circular Economy – Principles for Building Design guidance in 2020 to present a set of principles for stakeholders within the built environment sector. The objective of these principles was to help design sustainable buildings with the aim to create less waste during the lifecycle of the development and facilitate the reuse and recycling of materials.

The three core principles relate to:

Durability: buildings to be better designed and improved construction systems that can extend the longevity of the materials;

Adaptability: buildings to be adaptable for future transformations where the buildings and their components can be re-used and recycled; and

Management of Waste: buildings to encourage occupants to be able to reuse, reduce, recycle and recover products where possible and using recycled products in construction.



Figure 3.2 presents these principles in action, where the input of raw materials is limited, and solutions are proposed for the output in terms of residual waste.

Figure 3.2 - Principles of Circular Economy



Source: Ellen McArthur Foundation, 2021

3.2.3 Mayor of London Circular Economy Guidance

The London Plan 2021, through its policy S1 17 Reducing Waste and Supporting the Circular Economy requires all new developments to submit a Circular Economy Statement in their planning applications on a bid to transition to zero carbon city by 2030.

To support this requirement, a guidance document (currently in draft) has been developed to help developers outline their circular economy commitments as well as structure their circular economy statements for planning approval.

This Statement has drawn from the guidance provided in this document and has applied the following key objectives that underpin and support the principles of circular economy:

- Conserve resources, increase efficiency and source sustainably;
- Design to eliminate waste (including design for adaptability); and
- Manage waste sustainably (all streams of waste).



4. CIRCULAR ECONOMY STATEMENT

4.1 Circular Economy Principles

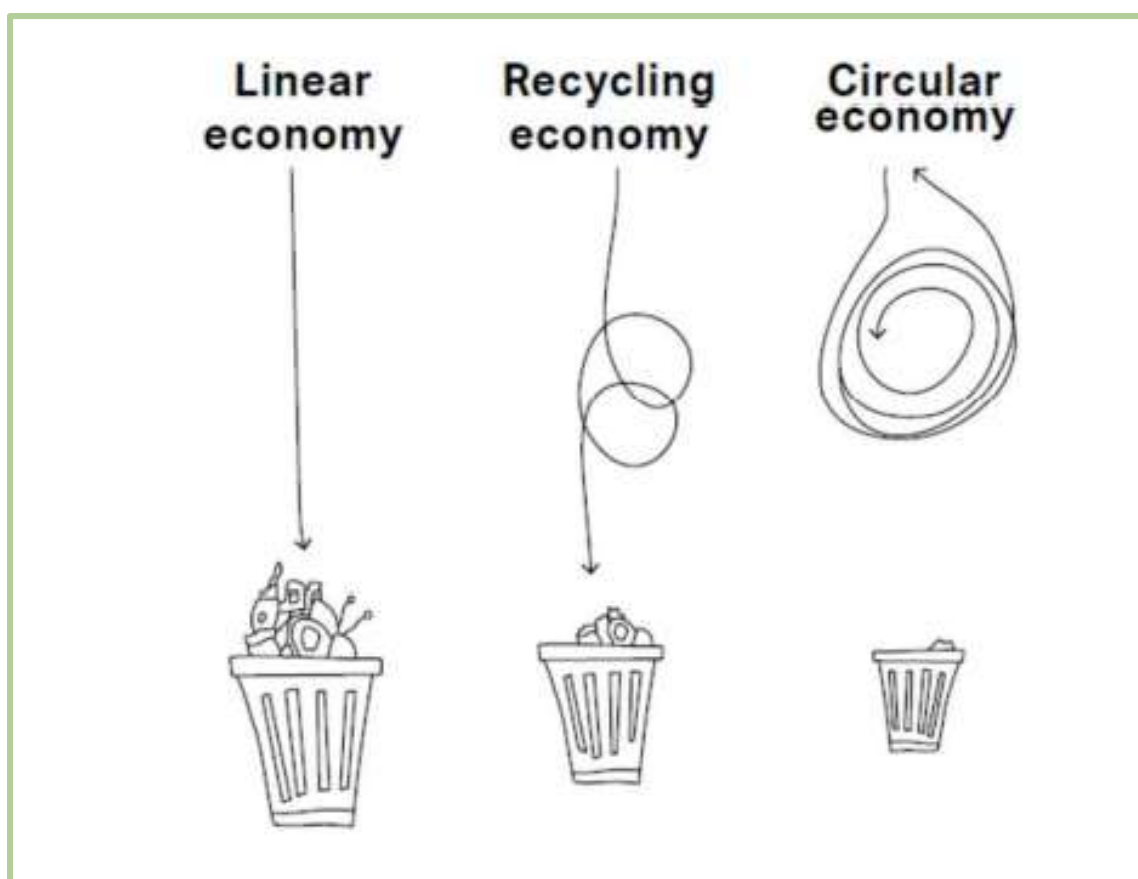
Circular Economy is typically defined as a close-loop system where resources are retained for as long as possible and re-used and recycled continuously so that there is minimal or zero waste sent to landfill.

Often the by-product of one material becomes the raw material for another activity, so that there is a reduced demand for additional resources, and as a result a smaller carbon footprint. It is envisaged that the emerging Places for Everyone Plan in Manchester will seek to follow the same pathway, especially given the city's aspirations for becoming zero carbon by 2038.

A Circular Economy differs significantly from a linear one, where often resources are used inefficiently and are sent to landfill, or when resources are recycled but eventually still end up in landfill.

The model below shows the three types of economies and highlights the transformational change that need to be considered in the design of new developments.

Figure 4.1: A comparison of linear, recycling and circular economy models



Source: Mayor of London Circular Economy Guidance, 2021



4.2 Circular Economy Principles at First Street Downing

This Statement has been prepared in line with international and national best practice and aims to reflect the following key principles of circular economy, which have been included within the design of the development.

Table 4.2 – Key Principles of CE at First Street Downing

Key Principles of Circular Economy
Materials: • Reduce demand for materials and minimise quantities used • Reduce the quantity of other resources – energy, water etc. • Source materials responsibly and sustainably Design: • Design for longevity, adaptability and flexibility Waste Management: • Reduce (and manage) the amount of waste generated, from: ○ Excavation and construction activities. ○ Operational activities.

4.2.1 Reduce Demand for Materials and Minimise Quantities Used

The design that delivers the shared living concept, that sits at the heart of this scheme, reduces the physical footprint of the building in terms of gross internal area per person, from that of a building designed to a more conventional layout. This is achieved in part through the design of more compact living spaces and shared facilities, the key design principles of which are set out below.

This not only reduces the carbon footprint associated with the construction phase, but with less space per person to heat, cool and services, fundamentally reduces the carbon footprint of the operational/occupancy phase. These needs bearing in mind when undertaking any comparative studies on the completed building on a sqm-by-sqm basis – at the most fundamental level, there is much less m² per person to begin with.

Compact Accommodation

Out of a total of 1,484 nr apartments, the design proposed for the site includes 875 nr single occupancy studios of 18 – 24m², which incorporate all the essential amenities that would be available in more conventionally design 1 bed apartments, usually minimum 37m².

The new design approach re-organises the functional elements of the typical apartment and also cuts down on excess circulation area within the unit. The amenity space is instead provided in the communal and co-sharing spaces throughout the development.

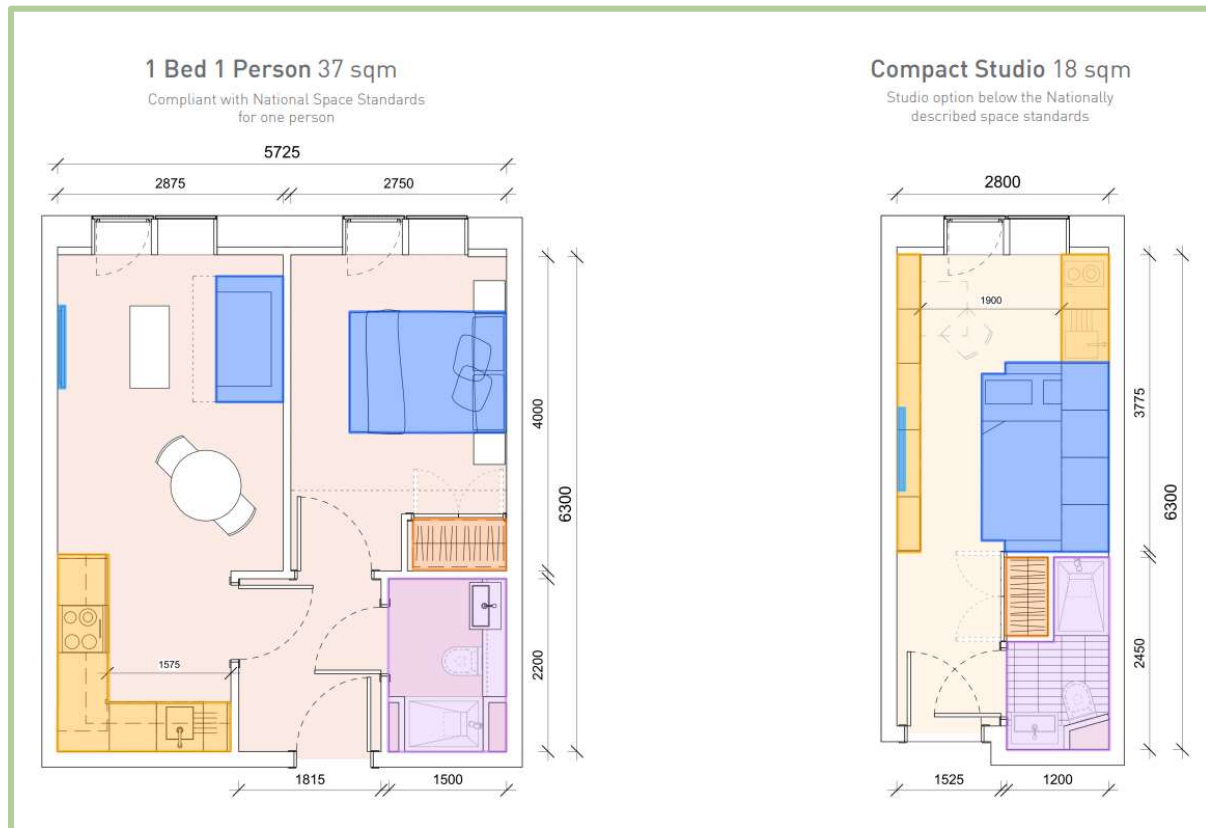
It is expected that this design solution will not only use less resources (both in terms of the building materials but also in the amount of energy required to service the space) but will also appeal to young people who prefer a more minimalistic lifestyle with a smaller carbon footprint.



In addition, the building has been designed from a longevity perspective as the design considers the lifestyle trends of future generations

The figure below shows a comparison between a typical and conventional design and the new design proposed for a 1-bedroom unit.

Figure 4.3 – The Conventional Layout and the New Layout



Co-Living / Communal Spaces

Downing Living proposes the development of 'co-living spaces' at First Street in Manchester. Co-living allows for the sharing of resources – both physical such as communal kitchen and utility rooms, as well as the sharing of services such as housekeeping and facilities management.

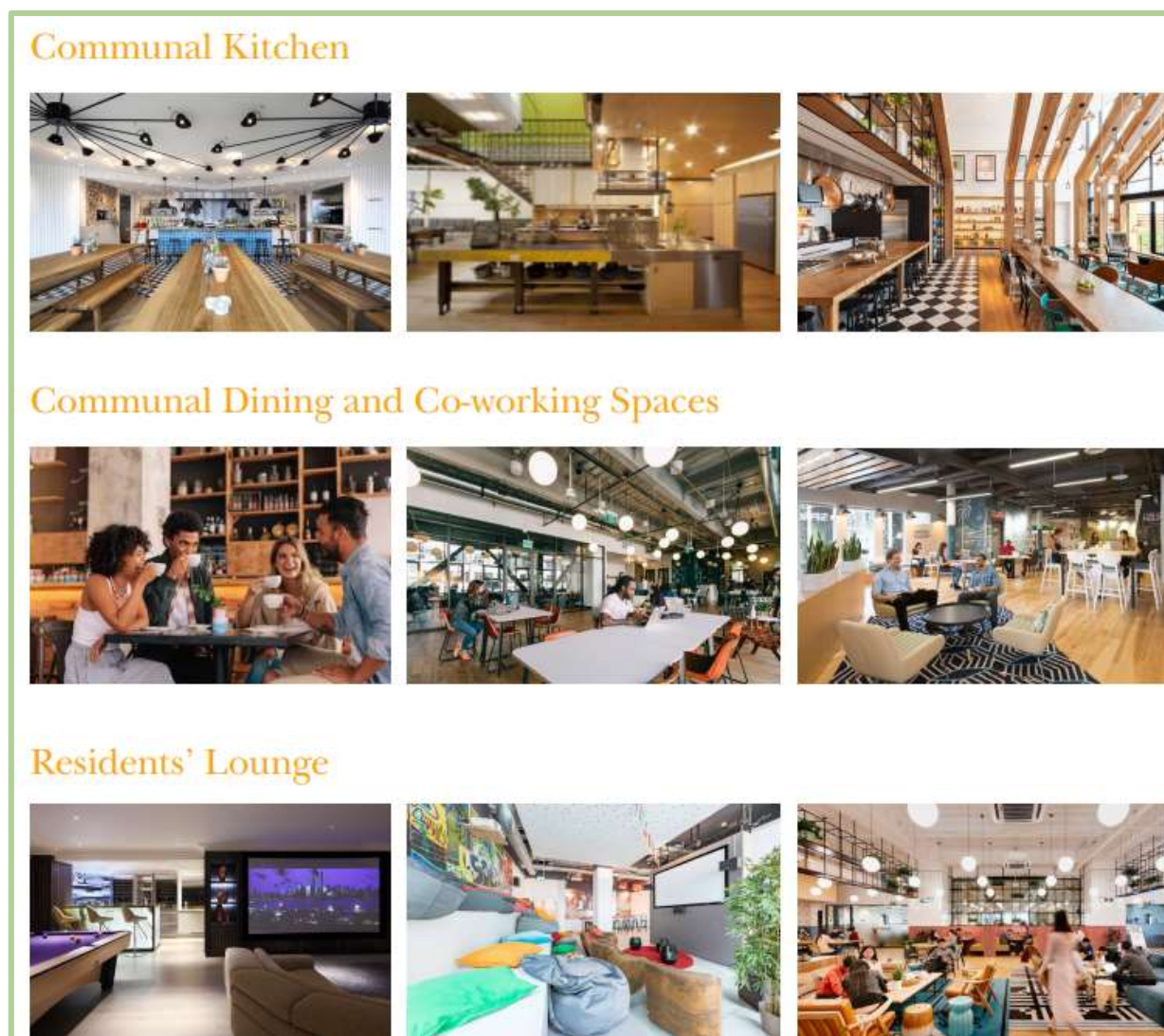
The design has been developed to encourage a wide range of shared community amenities (such as health and wellbeing centre), dining /kitchen facilities, spaces for rest and leisure and co-working areas.

As a result, there is a reduced the demand for additional materials that would have gone into providing additional floor space and building raw materials.

The images presented within Figure 4.4 details the proposed communal spaces for people to eat, work, play and socialise.



Figure 4.4 – Communal Spaces that encourage the concept of Co-Sharing



Sustainable Materials and Alternative Building Methods

Several design iterations were carried out to assess the potential for using a reduced number of concrete slabs for the buildings. Pre-cast slabs were also considered but judged to be unsuitable for the structural load requirements. Timber was another material that was considered for the building structures but failed to pass the fire and safety assessment.

Green terracotta tiles with brick plinth have been used for the podium facades for buildings A, B and D:

- Terracotta is a natural and eco-friendly material that is strong and durable. It also has a high level of recyclability and at the end of the building's life, it can be upcycled for other purposes; and,
- Brick is also a highly durable material than can be reused and recycled within the circular economy framework.



Figure 4.5 – Terracotta Tile Facade

4.2.2 Resource Consumption

Reduced Demand for Energy

The energy strategy for the proposed development looks at a number of improvements in the building fabric, as well as the installation of energy efficient systems that will contribute to the reduced demand for energy. The following measures have been specified:

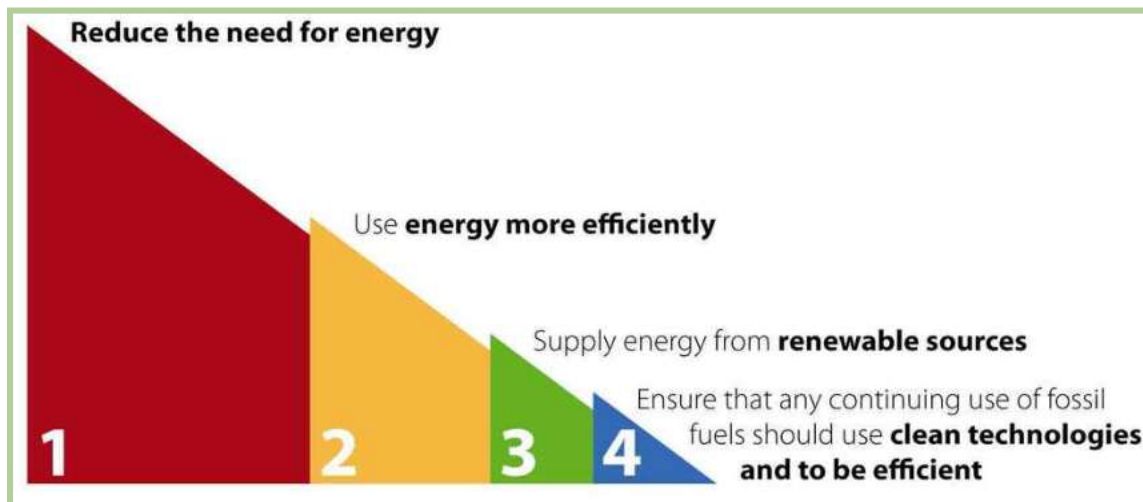
- Enhanced building fabric specification to limit heat loss (low U values);
- Air Source Heat Pumps (ASHPs);
- Use of Photovoltaic (PV) panels on the roof;
- High efficiency electric systems for heating;
- A and A+ rated white goods (with EU energy labelling);
- Electric car charging points;
- 100% low energy and/or LED internal lighting; and
- All external space lighting to be provided by dedicated energy efficient fittings and controls.



It is expected that these measures will meet the Manchester City Council's (MCC) Core Strategy Policy EN6 requirement for at least 15% reduction in Part L (2010) regulated carbon dioxide emissions from renewable and or low carbon technologies.

The strategy has been designed so that it is closely linked to the principles of the Energy Hierarchy and is heavily focussed on reducing the need for energy as the first principle in the hierarchy.

Figure 4.6 – The Energy Hierarchy



Reduced Demand for Water

The water strategy also looks at a number of design measures that will result in the reduced consumption of potable water. The following have been specified:

- A rated goods for water conservation;
- Low-flow water fixtures (taps, showerheads, dual flush WCs and low volume baths); and
- Landscape strategy that carefully considers plant selection with low water requirements.

It is estimated that collectively, these measures will result in less than 110 litres / person / day consumption.

Reduced Demand for Other Resources

The development's entire concept is based around the sharing of resources – from living spaces to communal facilities, which will result in reducing the demand for additional resources and reduce each occupant's carbon footprint.

In addition, the urban location and character of the site, plus the sustainable transport measures proposed in the travel plan for the site, will mean that not only there will be a reduced need for car parking spaces, but there will be fewer cars in the city as a result.

4.2.3 Sustainably Sourced Materials

Materials will be responsibly sourced from suppliers operating an Environmental Management System or procuring timber from FSC and PEFC sources, for example will be prioritised. A commitment has been made with Manchester City Council to maximise the use of local labour force, where possible, via a Local Benefit Proposal. In addition, consideration will also be given to the local sourcing of construction materials where



feasible and viable. Both these strategies will minimise the impact of CO2 emissions associated with transportation.

4.2.4 Design for Adaptability, Flexibility and Longevity

Flexible Design

If the need arises, each building has been designed in a way that the internal walls can be removed without making any structural changes and the accommodation unit can be reverted to a typical apartment layout. In addition, there are a number of other options for adaptability when it comes to the co-shared spaces.

These spaces are designed with flexibility in mind, in terms of space that can support a variety of alternative uses throughout the day/night, weekday/weekend and even seasonally.

For example, in some of the amenity areas, two or three rooms can be merged to create one large space. Partitions allow for a number of variations in room sizes and functions.

Figure 4.7 – Flexible Communal Spaces



Adapting to Climate Change

Given the future climate change projections, dense urban areas such as Manchester are expected to face the risk of the Urban Heat Island (UHI) effect. In the proposed scheme, the building design includes the use of white brick that will help mitigate against the UHI effect. Other materials with high Solar Reflective Index (SRI), in addition to other passive cooling measures such as trees and shading will be specified for the public realm.

Figure 4.8 shows the white bricks that will be used for ground floor elevations and light-coloured pavements.



Figure 4.8 – Light Coloured Building Façade and Cool Pavements



4.2.5 Management of Waste

Construction Waste

A Construction Management Plan has been developed for the scheme, which aims to maximise the re-use and recycling of waste and minimise the volume of construction waste from landfill. This is delivered through the application of the following measures:

- Best practice techniques (such as training for the staff) to prevent and minimise waste arising during the design and construction phases of the development.
- Waste storage facilities will be provided on each floor and transported through the hoist down to the correct skips on the ground site.
- The waste will be transported to a waste transfer station, where it will be segregated into:
 - Recyclable materials
 - Metal
 - General waste and debris
 - Hazardous waste

Waste from excavation (such as soil) will be used within the landscaped and public realm areas of the site.



Operational Waste

The waste from the operational phase of the project will be managed through the implementation of a waste management strategy. The strategy will be designed to allow for the maximum recycling rate possible, in line with the requirements of the Council. This will be achieved through the following steps:

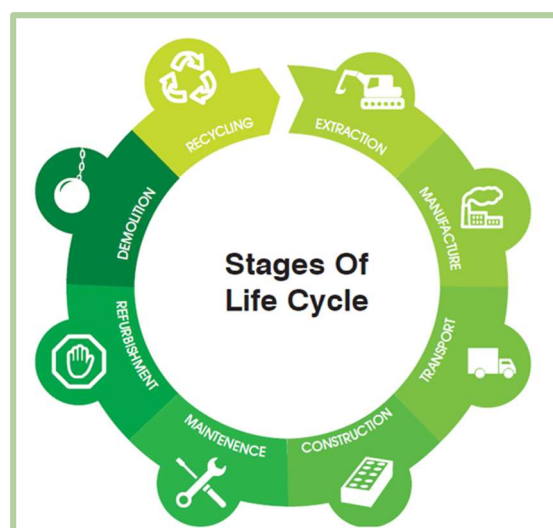
- Waste will be segregated at source to encourage a high rate of recyclability. It is expected that there will be two streams of waste – general waste (including organic) and mixed recyclables. Waste will be transferred via a chute system from the floors to the refuse storage room located on the ground floor of each block;
- These rooms will be designed to accommodate the standard 1100litre euro bins. The frequency of collection will determine the number of bins and the size of the room. Waste will be transferred from the refuse rooms to the allocated service areas by the management company. Waste from the public realm and co-shared facilities will be managed and transferred by the management company. All domestic Waste will be collected by the Council; and
- Signage will be posted across the development to show the location of the bins and information on recycling will be provided to all occupants of the scheme.

4.2.6 Reduction in Embodied Carbon

As the design progresses to RIBA Stage 4, a more detailed Life Cycle Assessment (LCA) will be undertaken to further drive improvement in reducing the embodied carbon during the project's construction, in-use and end-of-life cycle stages. A preliminary analysis has shown that the major contribution of embodied carbon will naturally occur at the 'Materials' stage (mainly as a result of the sourcing, assembly and transportation activities) and material selection and sustainable construction techniques will be considered to reduce the carbon impact of these activities. There is also potential to decrease the carbon impact of non-hazardous waste disposal activities in the later stage of the project's lifecycle.

The following figure shows the typical lifecycle stages of a project in the context of the built environment. For the First Street scheme, the Developer will commit to reducing energy demand from embodied carbon and in-use operational stages of the project.

Figure 4.9 – Typical Lifecycle Stages in the Built Environment



5. CIRCULAR ECONOMY MONITORING FRAMEWORK

A monitoring framework has been developed which outlines the objectives that this Circular Economy Statement has been developed against. A number of key activities have been proposed which will be benchmarked against each objective. The person responsible for delivering the evidence supporting the activities and the project's lifecycle stage in which these activities will be carried out has also been assigned in the table below.

Table 5 – Monitoring Framework for First Street Development

Objective	Activity	Lead / Responsibility	Timeline
Reduce Demand for Materials and Minimise Quantities Used.	Issue a Pre-Qualification Questionnaire (PQQ) to check compliance of suppliers with the Developer's Circular Economy commitments. Bill of Materials to benchmark quantity of recycled content and re-used building materials.	Developer / Construction Contractor	Pre-Construction to Post-Completion
Source Materials Responsibly and Sustainably.	Request for Environmental Product Declarations (EPD) for recycled products, and products with low embodied carbon.	Developer / Construction Contractor	Construction Phase
Reduce the amount of construction waste.	Construction Environmental Management Plan, with a Construction Waste Management Strategy to maximise diversion of construction waste from landfills.	Construction Contractor	Construction Phase
Reduce the amount of operational waste.	Operational Waste Management Plan.	Operator	During occupancy
Reduce the Quantity of Other Resources (energy and water for example).	Site Visit and ESS Verification (Planning Condition 14) to record progress of the sustainability measures proposed. RICS whole life carbon assessment – a more detailed iteration of the exercise that would also include operational energy use.	Developer / Operator	During Occupancy



In response to Planning Condition 7, a Post Completion Report will be submitted to the Council for evaluation. This will look at the following:

- Verify the progress of the development in context of the Circular Economy objectives;
- Lessons learnt (including opportunities and constraints); and
- Proposed mitigating measures for improving performance on futures phases.



6. CONCLUSION

The design proposed for the First Street Development has been assessed against the key principles of Circular Economy, which have been influenced by national guidance and local planning policy framework.

These principles were based around the following criteria:

Materials:

- Reduce demand for materials and minimise quantities used
- Reduce the quantity of other resources – energy, water etc.
- Source materials responsibly and sustainably

Design:

- Design for longevity, adaptability and flexibility

Waste Management:

- Reduce (and manage) the amount of waste generated, from:
 - Excavation and construction activities.
 - Operational activities.

The design meets the above criteria through the following measures:

- The co-sharing / co-living concept of the development will lead to the use of less resources as space as well as building materials are more efficiently utilised;
- The enhanced fabric specification (over the baseline) and the installation of energy and water efficient systems will mean that the proposed development a smaller carbon and ecological footprint, as less resources (for example energy, water and land) is utilised;
- The use of renewable energy technology such as PVs will further reduce the scheme's reliance on the production of fossil fuels;
- The development has been developed for longevity, flexibility and adaptability, as the design of the units can interchange from a compact studio back to a traditional apartment layout. Since the structural elements will be untouched, this extends the use and longevity of the building;
- Mitigation measures to reduce the impact of climate change have also been considered, as material selection for the building façade and pavements will be used to combat the Urban Heat Island Effect;
- The implementation of the construction waste management plan will help to divert waste from landfills;
- The implementation of the operational waste management facility has been designed to encourage the occupants to segregate their waste at source and maximise the potential for recycling.

In conclusion, the First Street scheme is aligned with the principles of Circular Economy, accords with national best practice and supports the vision for Manchester City to become a zero waste city in the near future.

