



**ELEMENT
SUSTAINABILITY**

CIRCLE SQUARE 3, MANCHESTER CIRCULAR ECONOMY STATEMENT

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1. INTRODUCTION

Element Sustainability have been commissioned by Bruntwood Scitech to develop a Circular Economy Statement for the proposed Circle Square 3 office building, in Manchester.

The purpose of this statement is to outline the possible measures that will be integrated within the design proposals for both the office building and the public realm, to facilitate a circular economy approach. The Circular Economy Statement should be read in conjunction with the Environmental Standards Statement for the development.

This statement will demonstrate Bruntwood Scitech's commitment to a circular economy in practice, as well as highlight how the development seeks to reduce its carbon emissions and waste footprint through the principles of a circular economy, in line with local and national guidance.



2. POLICY AND GUIDANCE

2.1 Local Planning Policy

2.1.1 Manchester Core Strategy

Manchester's Core Strategy was adopted on 11th July 2012. The strategy sets out the long-term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against.

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 a 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.

2.1.2 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 carbon dioxide (CO₂) emissions.

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

The Draft 'Places for Everyone' (PfE) Plan is a new long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, and Wigan) for jobs, new homes, and sustainable growth. It has been prepared by the Greater Manchester Combined Authority (GMCA) on behalf of these nine districts.

The Draft Plan will determine the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces, while protecting green belt land from the risk of unplanned development. It will also ensure all new developments are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.

A version of the plan that was presented to the Joint Committee is available online. Within this it highlights the importance of resource efficiency and acknowledges the role that a circular economy and zero waste economy will play in helping Greater Manchester achieving its ambition to become a leading green city region by 2038.

The nine Places for Everyone local planning authorities are now inviting views on the Modifications Consultation 2023 from 11th October 2023 and ending on 6th December 2023. It is therefore considered that the Plan is in an advanced stage of preparation.



3. CIRCULAR ECONOMY STATEMENT

3.1 Circular Economy Principles

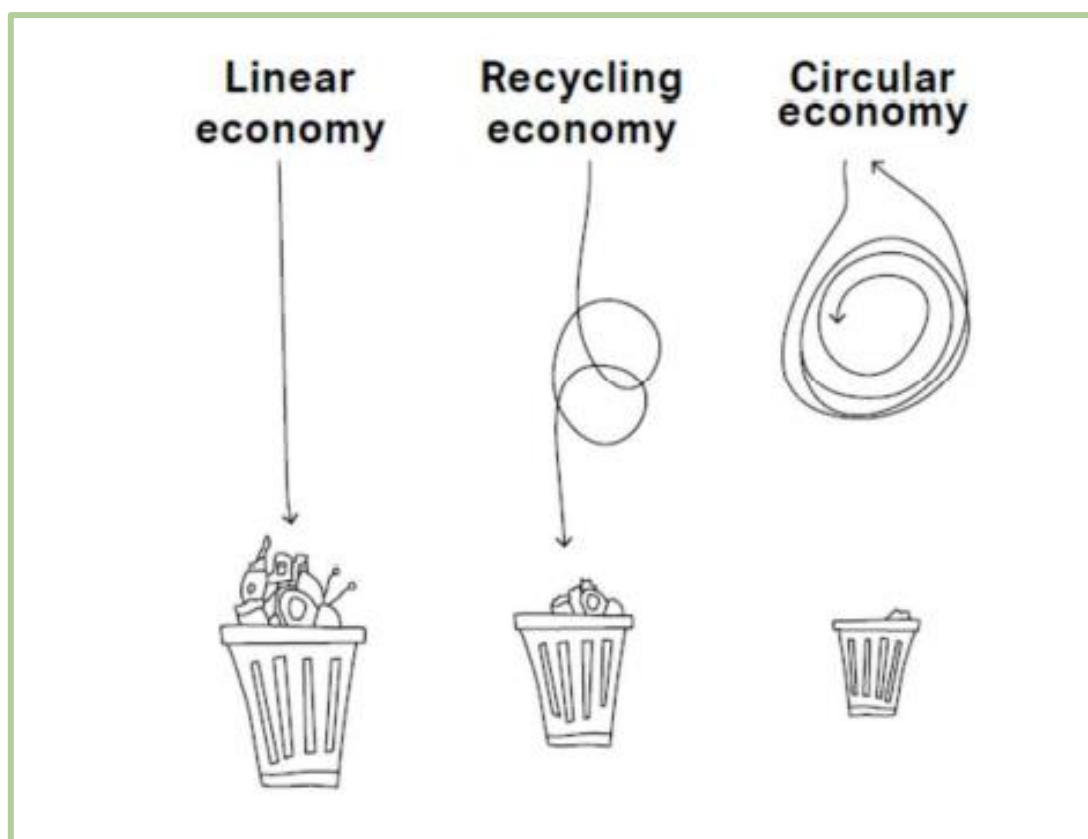
Circular Economy (CE) is typically defined as a closed-loop system where resources are retained for as long as possible and re-used and recycled continuously so that there is minimal or zero waste sent to landfill.

Often the by-product of one material becomes the raw material for another activity, so that there is a reduced demand for additional resource inputs, 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.

Figure 3.1 below shows the three types of economies and highlights the transformational change that need to be considered in the design of new developments.

Figure 3.1: A Comparison of Linear, Recycling, and Circular Economy Models



Source: Mayor of London Circular Economy Guidance, 2021



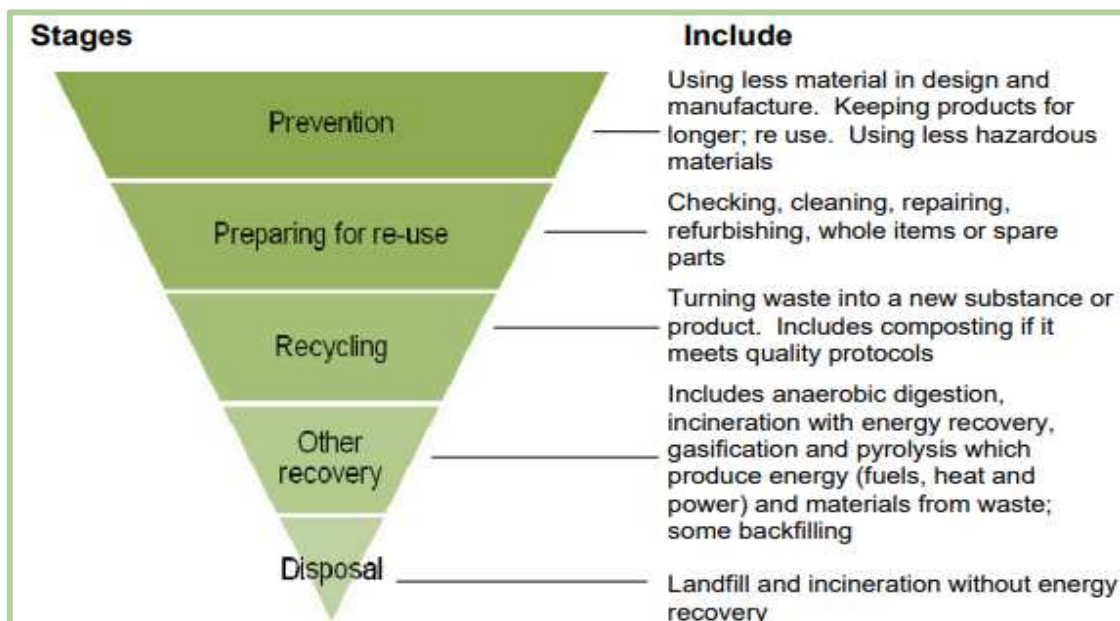
3.2 Best Practice Guidance

3.2.1 The Waste Hierarchy

The 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 2.1 - 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 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 2.2 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 2.2 - Principles of Circular Economy



Source: Ellen McArthur Foundation, 2021

3.2.3 Mayor of London Circular Economy Guidance

Whilst the Circle Square 3 development is not located within the Greater London area, the guidance set out within this document is currently the industry best practice relating to circular economy and as such will be used to inform the circular economy commitments for this development.

The London Plan 2021, through its policy **S1 17 Reducing Waste and Supporting the Circular Economy**, requires all new major 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 has been developed to help developers outline their circular economy commitments as well as structure their circular economy statements for planning approval.



3.2.4 London Plan Circular Economy Principles

The following six principles are listed within the London Plan Guidance and should be considered as a fundamental part of the building design process:

1. building in layers – ensuring that different parts of the building are accessible and can be maintained and replaced where necessary;
2. designing out waste – ensuring that waste reduction is planned in from project inception to completion, including consideration of standardised components, modular build, and reuse of secondary products and materials;
3. designing for longevity;
4. designing for adaptability or flexibility;
5. designing for disassembly; and,
6. using systems, elements or materials that can be reused and recycled.

These principles also support the application of the waste hierarchy, in that avoiding or reducing waste is prioritised.

3.3 Key Objectives

This statement has drawn from the guidance provided 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 PRINCIPLES AT CIRCLE SQUARE 3

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

Table 3.2 – Key Principles of CE at Circle Square 3

Key Principles of Circular Economy
• Designing out waste • Designing for longevity • Designing for adaptability or flexibility • Designing for disassembly • Using systems, elements or materials that can be reused and recycled.

4.1 Designing Out Waste

Waste is a misuse of resources and can have a detrimental impact on the environment. Therefore, the design team has considered ways to reduce the amount waste generated as part of the construction and operation phases throughout the design process.

The following measures have been taken to maximise resource efficiency and limit the amount of waste generated as a direct result of the Circle Square 3 scheme:

Pre-Construction

Prior to commencement of the construction phase, the site waste management plan (SWMP) will be referred to in order to limit and manage the on and off-site waste produced through development construction. The SWMP will detail:

- Recycled and secondary materials;
- Waste reduction;
- Waste segregation;
- Waste recovery; and,
- Waste disposal.

The site waste management plan will also identify opportunities to divert any unusable construction waste away from landfill to a waste transfer station, where it will be segregated into:

- Recyclable materials;
- Metals;
- General waste and debris; and,
- Hazardous waste.



Construction

- Full size tiles will be used to reduce the need for cutting;
- The building design has been designed to accommodate brick dimensions, to also reduce the need for cutting;
- The structural design has been optimised to reduce the quantity of concrete used on site. In addition to this, precast concrete has been specified for the top of the lift shaft. Precast concrete products are manufactured offsite under factory-controlled conditions, ensuring only the exact amount of concrete is used to create the required product. Thereby reducing the risk of spills of concrete when being poured onsite;
- The façade intentionally benefits from a repeating pattern that can be mass produced. Thereby limiting the number of variables and the need to cut materials to different sizes;
- The combination of a trapezoidal metal decking and concrete upper floor construction, reduces the amount of concrete required; and,
- There will be no formwork wastage within the superstructure.

Operation

The operational waste strategy for the scheme focuses on the segregation of waste at source, to maximise the potential for residents and visitors to recycle in accordance with Manchester City Council Core Strategy Policy EN19.

The proposed strategy has been developed in compliance with the above policy:

- Waste will be segregated at source with the help of segregated bins. It is expected that there will be multiple streams of waste – general, recyclables and compost / green waste;
- The number of bins and subsequently the size of the refuse store is based on waste generation figures for the building; and,
- Signage will be posted across the development to show the location of the bins and information on recycling will be provided to all building users.

4.2 Designing for longevity

A life cycle assessment (LCA) has been conducted to assess the environmental impact of the proposed scheme over its entire lifecycle. In accordance with both the RICS professional statement and the BREEAM MAT01 credit. The methodology for both LCA's assume a life span of sixty years, however, it is likely that the building will be designed to be functioning well beyond this. Measures that will assist in increasing the longevity of the design include:

- The brick façade is a hard-wearing solution that is built with longevity in mind. This will be able to withstand extreme weather events and requires minimal maintenance during operation;
- The building will be properly maintained and managed, in order to increase the longevity of the development; and,
- Robust materials such as permeable paving, block paving and stone will be utilised for hard landscaping. Therefore, minimising the frequency of replacement intervals and maximising materials optimisation and extending replacement intervals.



4.3 Designing for adaptability/ flexibility

To reduce the risk of the development becoming redundant in the future and as a result, being demolished because it no longer meets the needs of prospective occupants, it is important that the design is able to adapt and be flexible to potential future uses. Therefore, the proposed development benefits from the following:

- The steel frame utilises long span floor plates, which as a result requires fewer steel columns, meaning the tenants have more available floor space. Thereby providing flexibility for future occupants; and,
- The floor to ceiling heights of the proposed Circle Square development are suitable for a variety of uses, allowing the building to be adapted if required.

4.4 Designing for disassembly

Designing for disassembly allows sections of the building to be reused (ideally on the site) or, where this is not possible, off site (with nearby sites preferred). This approach also includes careful selective deconstruction of the building and material types that is, taking apart each layer and material type as much as possible, minimising damage to parts and maintaining their value, and then reusing those elements and materials. If reuse is not possible, materials may be carefully and selectively separated for processing and recycling into new elements, materials and objects. Therefore, the proposed Circle Square 3 scheme benefits from:

- A steel frame which can be easily disassembled. This may then be used in future schemes or recycled.
- The metal framework used to create the internal partitions can be easily deconstructed, in order to be reused or recycled.
- If removed carefully, at their end of life, the bricks used within the façade can be repurposed and used within other projects. Thereby extending their lifespan and reducing the number of materials sent to landfill.
- The windows can also be carefully removed and repurposed within a similar sized scheme. Conversely these can also be easily recycled.

4.5 Using systems, elements or materials that can be reused or recycled

The items listed within section 3.3.3 as mentioned, can easily be disassembled at their end of life, which will increase the rate of materials being reused or recycled. Likewise, the following materials can also avoid being sent to landfill:

- All concrete used within the scheme that cannot be touched up to extend its longevity or be repurposed can be crushed and recycled. Crushed concrete can be used for elements such as highway subbases or 6F2 aggregates;
- The Kingspan raised access floor components can be recycled as part of the Kingspan recycling programmes;
- The specified carpet tiles can also be easily recycled; and,
- If removed carefully at their end of life, the hard landscaping materials can be reused in any future scheme. In order to maintain continuity throughout the surrounding public realm or transported to other projects to extend their lifespans.

4.6 Using locally sourced materials

Sourcing materials locally is also encouraged to help reduce the environmental impact associated with transport emissions. This also helps to reduce the risk of materials being damaged during transportation, as these don't



need to be transferred between multiple modes of transport. Thereby reducing the amount of waste created. The design team have therefore favoured local materials throughout the design where possible, including:

- The façade brickwork has been sourced from Yorkshire.
- The precast arches are sourced from Stockport.
- The windows were sourced from Darlington.

Materials which are supported by Environmental Product Declarations (EPDs) will also be favoured, in order to identify their associated environmental impacts early on. Plus, EPDs which include whole life cycle Module D will be beneficial to assess any benefits or burdens occurring from the repurposing of elements discarded from the built asset, or any energy recovered from them beyond the project's life cycle.

Module [D] is intended to provide a broader picture of the environmental impacts of a project by accounting for the future potential of its components when these are repurposed i.e., recovered, and reused and/ or recycled.

4.7 Reduce Demand for the Quantity of Other Resources

The below section provides an appraisal of the specific approach, design features and specifications which will contribute to reducing the demand for various resources. Key specifications, site characteristics and design measures of the proposed development are considered below. These will help to reduce the demand for the quantity of non-material resources throughout the development's operational lifecycle.

Reduced Demand for Energy

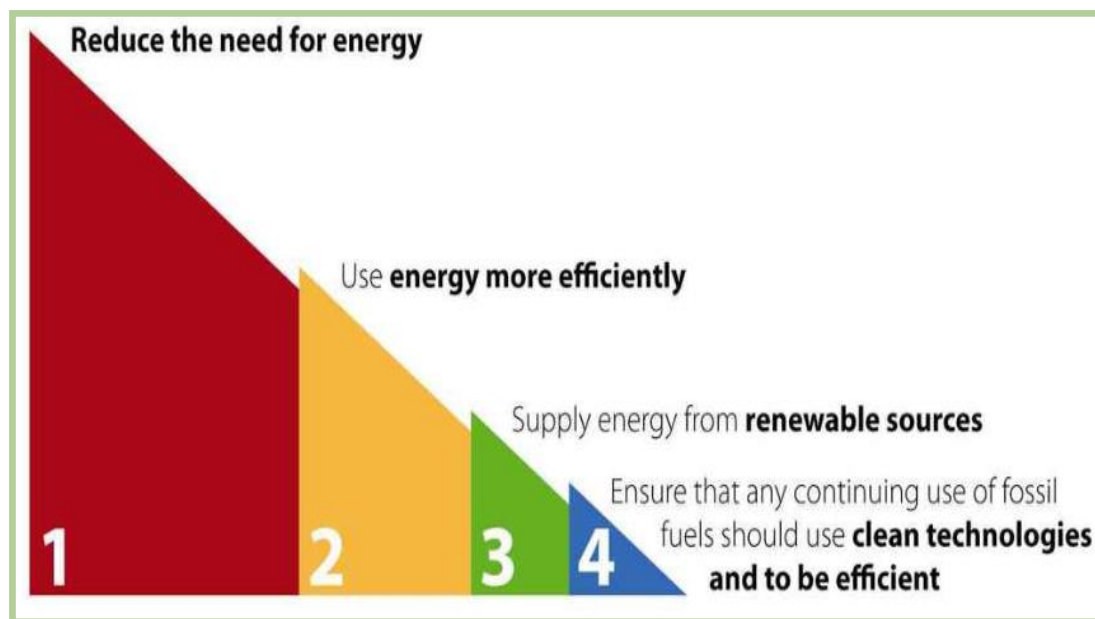
The energy strategy for the proposed development looks at a number of improvements in the building fabric, as well as the installation of energy efficient systems that will contribute to the reduced demand for energy.

The following measures have been specified:

- High performance thermal insulation;
- Low air permeability;
- Mechanical extract ventilation;
- Air source heat pumps;
- Sophisticated heating controls; and,
- 100% low energy and/or LED internal lighting.

The Energy Hierarchy has been used as a framework to guide this energy strategy to achieve practical and cost-effective carbon emission reductions. It is intended that the construction, design, and specification proposed for this scheme will deliver office and amenity space that is inherently efficient and cost-effective during occupation. The hierarchy prioritises such demand-side activities to reduce wastage and improve efficiency (see Figure 3.2).



Figure 3.2 – The Energy Hierarchy

Reduced Demand for Water

The proposed development will be designed to reduce mains/potable water consumption and will include the following water efficient design and equipment:

- 'A' rated appliances will be used for dishwashers and washing machines (where provided) for their water saving capabilities; and,
- Specification of efficient water fixtures throughout the scheme (low flow taps and showers, dual flush WCs, and low volume baths).



5. CIRCULAR ECONOMY MONITORING FRAMEWORK

A monitoring framework has been developed which outlines the objectives that this Circular Economy Statement has established. A number of key activities have been proposed which will be benchmarked against each objective. The person(s) 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

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	Pre-construction to 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. Recycling facilities.	Operator	During occupancy
Reduce the Quantity of Other Resources	Site visit and verification to record progress of the sustainability measures proposed.	Developer / Operator	Practical Completion



6. CONCLUSION

The design proposed for the Circle Square 3 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:

- Designing out waste
- Designing for longevity
- Designing for adaptability or flexibility
- Designing for disassembly
- Using systems, elements or materials that can be reused and recycled.

The development will meet the above criteria through the following measures:

- Waste arising during construction and the excavation phase will be minimised through the implementation of a Site Waste Management Plan (SWMP). The SWMP will be used to ensure that there is adequate management and storage of construction waste takes place. Opportunities for the possible recycling of construction from excavation works will also be considered in line with best practice.
- The building has been designed in a way that limits the amount of waste produced during construction. One way that this has been achieved is through creating a design that accommodates entire brick and tile dimensions, in order to reduce the need for cutting products to size, which would ultimately create waste.
- The implementation of the operational waste strategy has been designed to encourage the occupants to segregate their waste at source and maximise the potential for recycling.
- The development has been designed for longevity through use of durable materials. A brick façade has been specified as this is a hard wearing and long-lasting material, that can withstand extreme weather events. The specified external paving is also robust and built to last. Thereby reducing the amount of replacement intervals required.
- The steel frame utilises long span floor plates, which requires fewer steel columns, meaning the tenants have more available floor space. Thereby providing flexibility to future occupants.
- The steel frame can also be easily disassembled. This may be used in future schemes or recycled.
- The proposed development will also benefit from materials which can be reused or recycled e.g. concrete can be crushed and used for elements such as highway subbases or 6F2 aggregates, and the Kingspan raised access floor components can be easily recycled as part of the Kingspan recycling programmes.



- The enhanced fabric and mechanical specification coupled with the installation of efficient water systems will ensure that the proposed development has a smaller carbon footprint due to reduced operational resource consumption;

In conclusion, the Circle Square 3 development has embedded 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.

